

THE HISTORY OF THAR DESERT

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Environment, Culture & Society

MANISHA CHOUDHARY



INDIAN INSTITUTE OF ADVANCED STUDY
Rashtrapati Nivas, Shimla

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*Dedicated to the desert
that made me-
who and what I am?*

*The desert
is
the basis and reservoir of civilization and cities.*

&

*I have discussed desert civilization first,
because it is prior to everything else,
as will become clear later on.*

—IBN KHALDUN

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Rise from Dust the Tulip with Scar!

∞

Love is a drop of tear that nascent in the eye of god.

Acknowledgements

While living in one of the most prominent cities of Thar Desert, I have been regularly visiting the regions of intense dunes for last few years. The constant change in the attitude and approach of the inhabitants has motivated me to undertake this work. The cities of Bikaner, Jodhpur, Jaipur and Jaisalmer and their distantly located tiny villages without resources have ensured to me that it's only the will of humans that has prompted the inhabitants (in this case the Thar inhabitants) throughout the history to make best out of the available resources. The fascination for the nomadic life has permitted them for the continuous stay in this arid region. Thus, most of the agro-pastoral communities have not moved out from their historical locations. Similarly, the trading communities have survived in dry Thar. Both these communities were and even today are the prominent stakeholders in the Thar of twenty-first century. At the outset, I would like to express my gratitude towards both these communities, whose hospitality I regularly enjoyed in the last decade.

This present volume is an original text of my experiences, fieldworks and travels across the desert cities, towns and villages. I extend my heartfelt gratitude to the Director (Prof. A.K. Chaturvedi), Indian Institute of Advanced Study (IIAS, Rashtrapati Nivas, Shimla) and Fellow Selection Committee for showing faith in my project titled '*The History of Thar: Environment, Culture and Society*'. The library of IIAS is immensely rich. The librarian, Mr Prem Chand, and his professional approach allowed me to browse through a large variety of books and primary sources. Being

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An inquiry by Prof. Kapil Kapoor made at an informal gathering inspired me to search the total nature and environment of Thar Desert. He also encouraged me for a deeper creative possibility that is rooted in past experiences and ideas.

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The Study 23 A & B (Governor's Room) at IIAS is historic and has now become a memorable part of my life. I cherish the moments spent and tasks executed in this study. The Fellow House-03 was my residence and the time spent there will always be fondly remembered. The intense reading that I thoroughly enjoyed during the two years of my residency at my IIAS residence, with interludes of looking at the deep valley, the Hanuman statue of Jhaku and the lonely placed single unit of Tara Devi temple on a hill top, through the various seasons and shades of Shimla hills.

A few friends have made this journey joyful. Dr Ashok Kumar Bishnoi, an orthopaedic surgeon residing at Jodhpur, has helped in

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Throughout this research, my family has been a great source of strength. My parents—Devi Singh Choudhary and Rameshwari Devi—were always helping me with my translations and in understanding the difficult words of Marwari language (ones that are no more in usage) and their contexts. Their faith in the potential of my work kept me going. Rajeev and Durga have supported me in numerous ways to accomplish this work. The ladies of the house—Kiran, Monica and Kanika—had shown interest in the unknown past of Thar Desert and it kept me motivated to explore more and more, and at times even pushed me to visit the various Jurassic sites. Various discussions with brothers, Om Prakash, Sachin and RishiRaj, have been a cocktail of thoughts and helped in encountering some completely untouched stories of these areas. The presence of Aditya, Abhimanyu, Maaaira, Meera, Vani (Dhani) and Era have always been refreshing and a blessing of different form. Lovely friends of different species, Rio and Shibu deserve a special mention.

All shortcomings and mistakes of this book, if any, are only due to my limitations.

Delhi
19th August 2020

MANISHA CHOUDHARY

Introduction

In Nature, parts appear before the whole!

*Sawan baje suryo, Bhadron purvai;
Asoj baje samandri, to hove sakh sawai**

The saying in the Rajasthani dialect, mentioned above, is one out of many similar kind of wisdom capsules that are helping the people of Thar Desert for centuries to stay contained in their dry and arid habitat but with the hope in place.

In recent years, extremely interesting developments have shaped the historical studies. The most inspiring shift is about the fact that now historians seek a whole history of human experience rather than only digging and hammering at the events. The human experiences were composite result of the interactions of many phenomena, which were either autonomous or partially due to human violations. Thus, the inherited idea here is to understand the individual within a comprehended social context. With the Annals schools interventions, it was believed that external context could be observed, analysed and understood in the same logic as it is employed in the natural sciences. *'Histoire a part entire* was therefore a history that sought a synthesis of all the material, physical and mental forces that had shaped the life of man in

*If the direction of wind is from NW to SE in the month of July, from NE to SW in August and from SW to NE in the month of September then the yield will be one quarter more than the regular production or a bumper crop.

past societies'.¹ So, with the efforts of Bloch and Febver, history became a discipline that brought together geography, psychology, economics, sociology, anthropology, philology and other relevant natural sciences, pulling up a total picture of the past societies and their surroundings. This permitted an analysis from the mono-causal to multi-dimensional explanation. Further, it helped to perceive about something that was previously perceived as 'without history' or in language turns of history to be unhistorical. With this, the sources for the construction of the unsaid past also expended from the previously accepted conventional and legitimate (considered) material, into a large variety of unwritten and unconventional evidences. And, with these interventions, history became a subject matter and domain of the imaginative and enterprising scholars.

Coming to the sources of the history writing, one has to be careful while picking up evidences. For, the history shall not be webbed without the sources and the source shall be allowed to speak for itself rather than putting each words for it. Some medieval and modern sources are carry-overs from the ancient world as the creators continued to work on the same piece of metal or stone, over and over. The sources that range from 1100 AD onwards till 1800 AD are very unlikely to fill and untangle the whole of medieval span. Thus, to approach the history of any landmass, archeology is one of the most significant sciences, lanced with skills of art. So, rather than running through lists of the main types of primary evidence, the discussion here focuses on some of the reasons — why written sources, which are the staple sources for most medieval historians that have survived and, equally on, why we have lost a great deal of tangible materials.

Primary sources are not simply the means to the ends of historical analysis; they are a fundamental part of the story. Nowhere it is more appropriate than it is with medieval history. So even at an early stage of exploration of the subject, it is important

¹ Colin Lucas, *Introduction* in Jacques Le Goff and Pierre Nora (eds), *Constructing the Past: Essays in Historical Methodology*, Cambridge University Press, Cambridge, 1974, reprint 1987, p. 4.

for any history researcher to be alive to some of the possibilities that sources open up and the constraints that they impose. To 'think medieval' without 'thinking sources' is impossible. For the medieval India, 'There is no medieval Pompeii frozen in time under volcanic ash'.² The phase of the medieval ages feels closer to us in some ways, but that only makes it more difficult to see it-in the linear chronology. Therefore, to explore the place of the medieval period in modern popular culture phase involves locating several different strands of ideas and images, many of which do not fit together neatly. But in terms of environment, researchers have said with assertion that the Medieval Ages were simpler and more harmonious times, where people respected nature. Over the course of the medieval period, enormous changes were made to the environment such as vast swathes of forest were felled, marine and land routes were altered, agricultural expansion was at its peak, for the revenue purposes. The different types of sources indicate to the activities of the traders and raiders, who were constantly engaging and negotiating with the natural phenomena.

The environmental history came up as a branch of the intellectual history and later in the decade of 1980s; soon it was able to grasp the approach of historical writings. This branch of history writing didn't leave any dimension of the nature and society untouched. The extension of the environmental history studies into the forests, grasslands, wildlife, reptiles, rivers, etc. made it a much happening ground. The forerunners in the field even proved that the major civilization of the world have landed in destructions due to the environmental factors. The most famous and alarming example of the same had been presented through the decline of the Harappan Civilization. Researchers have proved that the Harappan settlements were pushed into the collapse due to the deforestation, which ultimately caused furious and sweeping floods. Similarly, many other events of the past have been successfully explored by the historians with the study of the environmental factors. The training of the discipline (environmental history) doesn't allow

² Marcus Bull, *Thinking Medieval: An Introduction to the Study of Middle Ages*, Palgrave Macmillan, New York, 2005, p. 10.

seeing of the facts and events in isolation. So, it is required to insert them in some larger canvas to imagine and perceive a complete picture of any geographical location or to get micro-phenomenon of the territory. Consequently, to understand the collective behaviour and enduring physical, mental and material structures of a geographical area, it must be studied over *longue duree* (long duration). Different historians appear to envisage different time spans to appropriate the long, small and medium durations. 'Braudel defines long duration as almost motionless history (as, for instance, in physical geography) and conjuncture as the history of slow rhythms perhaps over centuries'.³ Yes, it stands true and fully applicable in terms of the environment because the natural phenomena take centuries to evolve.

As history is an obsession with all that is quantifiable and dismissal of what is not. Therefore, the practitioners of diagnosis of the past look for the data and try to attain quantification. This approach is well established for the writings of the social histories but subsequently fails while approaching the cultural and political testimony. Epistemically, the events of nature can't be quantified, as the happenings of the environment are at times sporadic, sometimes temporary and a few aspects are ever changing and in movement. Each event is special and unique in nature. Therefore, the uniqueness of the events and their processes have to be noticed, collected and studied. The benefit of studying history to an advanced level is that it primarily acquaints and equips people to see through all the misconceptions and half-truths about the past, which are floated and continue to exist in the public domain. The normal experience of the discipline is to encounter a variety of images and artefacts from different times and locations, which cumulatively create a sense of the 'past-ness' that gets communicated by the place, certain things which cannot be pinned down to a particular year and, at times, by the time spans like decade or many a times, even century.

³ Colin Lucas, *Introduction* in Jacques Le Goff and Pierre Nora (eds), *Constructing the Past: Essays in Historical Methodology*, Cambridge University Press, Cambridge, 1974, reprint 1987, p. 6.

Various historians have developed the art and science to understand the environmental factors that have led to the causation of many events. This has led to a developed understanding about the particular branch (environmental history) and its specifications that have developed and refined over the years. Even at this stage, one is left to ask: What is environment and what all are its ingredients? This is an obvious start point, as every researcher carries forward an independent understanding about the subject of explorations to be either carried out or to take forward something which is already established in the studies. Very often the scholars try to justify the varied dimensions of the components which constitute our environment. In the 20th century, the British colonial power was making efforts to collect data about the lands that were controlled by them. The same collection of information acquainted them with the fact that overall the ecology and the environment of the colonies was heading towards decline. Further, the great smog that happened in the 19th-century England has made the colonial masters to realize that it was essential and important to maintain and conserve the ecologies. The awareness caused in early 20th century made the British imperialists to take up the cause of environment, which became evident in form of the conservation parks and wildlife sanctuaries in the different colonies, especially India and Africa. Further, it led to the intense researches on the environmental factors of the colonies and the ways forward as suggested and, put in place by the imperial masters, in order to ensure the conservation of nature. All their efforts were recorded and highlighted in the golden words. The environmental studies so far have mainly explored the forestry, big cats, huge mammals and huge birds such as ostrich, vulture and flu. The domesticated animals like sheep, goat and rabbit have been studied only in terms of the laboratory experimentation and, introduction and effects of these constant grazers in new lands;⁴ for

⁴ Donna Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science*, Routledge, London, 1989; William Beinart and Lotte Hughes (eds), *Environment and Empire, The Oxford History of the British Empire*, Oxford University Press, New York, 2007, pp. 93-110;

example, the effects of introduction of Marino sheep and rabbits in the Australian Continent.⁵ All these works do indicate a wide range of environmental aspects and their roles. In the long run, all these researches have helped to join the scattered dots which ultimately provide a structure to understand the ecology of the entire earth as only one unit and proves its inter-connectedness. Overall, these studies have helped to feel that earth is 'a planet' and everyone needs to participate effectively to maintain its vibrancy.

So far, the forests and the colonial forest policies have been studied mainly in terms of the contraction and degradation of the forest and its associates.⁶ The material benefits of forest and its associated industrial usages were considered as major factors for deforestation and introduction of new forest policies in the tropical zones. Later, these exploiters were called 'the killers of the local ecology'. The imposition of mannerism in the jungle areas and control over forest lands was a pioneer effort by the colonial authorities. These efforts got reflected in the structures of the railways, roads and many dams. Scholarly works have contributed to understand the forests⁷, introduction of railways,⁸ its effects on the forests, deforestation, parallel infrastructural developments of the port and imperial cities.⁹ Another branch of the environment

Australian Bureau of Agricultural and Resource Economics and Sciences 'Economic and Environmental impacts of Rabbits in Australia' published in *Pest Smart*, feral.org.au.

⁵ William Beinart and Lotte Hughes (eds), *Environment and Empire*, pp. 93-110.

⁶ Irfan Habib, *Man and Environment: The Ecological History of India, A People's History of India*, vol. 36, Tulika Books, New Delhi, 2010; *Ibid.*, pp. 111-129;

⁷ William Beinart and Lotte Hughes (eds), *Environment and Empire*, pp. 111-130.

⁸ Mahesh Rangarajan, 'Imperial Agenda and India's Forest: The Early History of Indian Forestry, 1800-1878', *The Indian Economic and Social History Review*, 31/2, 1994.

⁹ Felix Driver and David Gilbert, *Imperial Cities: Landscape, Display and Identity*, Manchester University Press, Manchester, 1999; Beinart, William and Lotte Hughes (eds), *Environment and Empire*, pp. 148-167.

history writing has been looking at the big cats and the huge animals. The famous works on cheetas,¹⁰ Asiatic lion,¹¹ tigers,¹² elephants¹³ and bisons¹⁴ have been proved as landmark researches that have dealt nearly with every aspect of these animals, their physiology and the capital hanging on their bodies. All these works have highlighted varied dimensions and have contributed immensely to the history of environment. The third category of contributions to the ecological writings is dealing with the works which look at the innovations of the 20th century such as crude oil,¹⁵

¹⁰ Valmiki Thapar, Romila Thapar and Yusuf Ansari, *Exotic Aliens: The LION and the CHEETAH in India*, Aleph Book Company, New Delhi, 2013; Divyabhanusinh, *The End of a Trail: The Cheetah in India*, Banyan Books, New Delhi.

¹¹ Sudipta Mitra, *Gir Forest and the Saga of the Asiatic Lion*, Indus Publishing Company, New Delhi, 2005; Divyabhanusinh, *The Story of Asia's Lions*, Marg Publications, 2005.

¹² Peter Boomgaard, *Frontiers of Fear: Tigers and People in the Malay World, 1600–1950*, Yale University Press, New Haven & London, 2001; Julie H. Hughes, *Animal Kingdoms: Hunting, the Environment, and Power in the Indian Princely States*, Permanent Black, Ranikhet, 2013.

¹³ Raman Sukumar, *The Living Elephants: Evolutionary Ecology, Behavior and Conservation*, Oxford University Press, New York, 2003; Stephen Alter, *Elephas Maximus: A Portrait of the Indian Elephant*, Penguin Books, New Delhi, 2004; F. Edgerton, *The Elephant-lore of The Hindus*, Motilal Banarsidass, Delhi, 1985; Thomas R. Trautmann, *Elephants and Kings: An Environmental History*, Permanent Black, New Delhi, 2015; John F. Walker, *Ivory's Ghosts: The White Gold of History and the Fate of Elephants*, Grove Press, New York, 2009.

¹⁴ Andrew C. Isenberg, *The Destruction of the Bison: An Environmental History, 1750–1920*, Cambridge University Press, New York, 2008; William T. Hornaday, *The Extirmination of the American Bison*, Government Printing Office, Washington, 1889.

¹⁵ Marian Kent, *Oil and Empire: British Policy and Mesopotamian Oil, 1900–1920*, Macmillan, London, 1976; Jill Crystal, *Oil and the Politics in the Gulf: Rulers and Merchants in Kuwait and Qatar*, Cambridge University Press, Cambridge, 1990.

automobiles,¹⁶ shipping industry, and railways, etc. One more classification exists in the history of environment, which has tried to give a sense of conservation but these inventions related to the conservation and preservation have further contributed to the degradation of the ecology and created alternate means to kill the wildlife.¹⁷ The introduction of the Sanctuaries, National Parks and Conservation Parks are serving as live examples of this classification.¹⁸ A few researches have served as the patch works, which are crucial to fix the missing links.¹⁹ The themes, relationships and issues (related to the environment) that have been highlighted so far are the connections that existed between forest, pastoralists and agrarian societies (negotiations that were at work among these contestants and the effect of their activities on the nature), shifting cultivation and its effects, small dams/big dams and the problems of water-logging, malaria and displacement of the forest tribes in the name of progress which is paving way for a civilized world (*sic!*). These works are limited in approach as they look only at the transitions which occurred from the pre-colonial to the colonial times and their effects.

A beginner in the environmental history writings in India was provided by Mahesh Rangarajan through his fascinating monograph titled *India's Wildlife History*. This lucid text justifies all the topics and the areas attempted by the author. But the text

¹⁶ Ibid.; W. Beinart and Lotte Hughes (eds), *Environment and Empire*, pp. 251-269.

¹⁷ David Arnold and Ramchandra Guha (eds), *Nature, Culture and Imperialism: Essays on Environmental History of South Asia*, Oxford University Press, New Delhi, 2009; M. Rangarajan and K. Sivaramakrishnan (eds), *Shifting Grounds: People, Animals and Mobility in India's Environmental History*, Oxford University Press, New Delhi, 2014; M. Rangarajan, and Ghazala Shahabuddin (eds), *Making Conservation Work: Securing Biodiversity in this New Century*, Permanent Black, New Delhi, 2007.

¹⁸ William Beinart and Lotte Hughes (eds), *Environment and Empire*, pp. 269-350.

¹⁹ David Arnold and Ramchandra Guha (eds) *Nature, Culture, Imperialism*.

works more as a hand-book for any lay reader who is interested to know about the various paradigms of forests in Ancient India, hunts in Mughal India, the venomous snakes, dangerous beasts, royal preserves, antelopes, shifts from Guns to Cameras, Independent India's Naturalists, Project Tiger and second wildlife crisis.²⁰ No doubt the themes are bewitching and author's presentation is impressive while being catchy. Many independent researchers have attempted to understand the significance and role of elephants. However, so far all these researches are mainly in terms of the 'shifts in the identity' of the animal from 'beast of burden' to the 'war-animal' and its deployment in the military activities during the ancient and medieval times. Recently, Trautmann has looked at the Asian elephant from a different perspective wherein the association of elephant with king and god, its employability in war has been highlighted.²¹ Another work which makes an impressive and interesting reading about the Asian elephants is by Raman Sukumar. His magnificent work brings alive the entire history of the animal (Asian elephant) along with its behaviour, physiology problems of conservation and the challenges this animal is encountering in everyday living. The apt title of the book makes the text self-explanatory and is captivating.²² The vivid portraits of the elephant still survive in Indian religion and culture, and are reflection of the unique relationship that existed between history, mankind, religion and myths. Alter charts the elephant in art, religion, folklores, royal festivals and beautifully brings out the complex past and the endangered present of this majestic creature, with a hope in its future.²³ Satisfactorily good works has been done on Asian elephants, which are sufficient to draw a sense about this huge animal and its vivid engagements in the past by diverse set of people. These works are the visible efforts of the desires that

²⁰ Mahesh Rangarajan, *India's Wildlife History*, Permanent Black in association with The Ranthambore Foundation, Delhi, (fourth Impression) 2015.

²¹ Thomas R. Trautmann, *Elephants and Kings*.

²² Raman Sukumar, *The Living Elephants*.

²³ Stephen Alter, *Elephas Maximus*.

aspired to understand this animal, its religious and cultural past and most importantly they explored the initiatives to be taken in future for its conservation. In general, these isolated works are clear and substantial additions to the large canvas of environmental history writing, which were awaited by the India subcontinent, to acknowledge its wide ecological and natural resources.

The other important components of ecology that are considered indigenous and have been extensively studied are the big cats (lion, tiger, leopard and cheetahs). The employment, presence, and association of these animals in the royal representations have paved for these studies. These furious cats were made representatives of the power and grandeur for varied dynasties, such as Mauryan state (Lion: on Sarnath pillar top), Mughal Empire (Lion: depicted on the Mughal flag against the rising sun) and British colonial empire (Lion & Unicorn: in the logo to reflect power, dignity, ferocity, elegance and uniqueness) during ancient, medieval and modern times respectively. The depiction of power, prestige, and dignified authority by employing the furious, unique and powerful animals was essential for any empire to telecast its assertive will, the ability to control and rule over the masses. Thus, the ruling dynasties and empires made efforts and incorporated these wild animals in their symbols and representations, and further implemented and projected them with firmness. During medieval times, the interaction with the lions, tigers and cheetahs was an exclusive prerogative of the king and the royal blood. Few elites had the luck to hunt big cats but only with permission of the emperor. The hunting of the lion was an exclusive right of the Mughal Emperor.²⁴ The fascinating work titled *Exotic Aliens: The Lion and the Cheetah in India* provides a deep insight into the employability, nature of treatment extended to these animals in

²⁴ Divyabhanusinh, 'The Great Mughals go Hunting Lions', in *Environmental Issues in India: A Reader*, Mahesh Rangarajan (ed.) Pearson Longman an imprint of Pearson Education, (Second Impression) 2008, pp. 49-69.

the court and in the forest areas.²⁵ The lion was a metaphor of superiority and prowess throughout the ancient and medieval world, and Bharatvarsh was no exception to this. The goddesses, such as Inana, Ishtar, Ashtoreth and Durga, are either shown to be seated on a lion, standing by a lion or seated on a lion throne. Further, the lion figurines entered the architectural structures of the royal and the religious buildings.²⁶ The cheetah is known for its swiftness of movements and speed. The training of the animal along with its speed made it a perfect animal of the chase. With the introduction of the Islamic rulers in India, the introduction of the 'animal of the chase' for hunting found merit because it had the Quranic sanction.²⁷ The religious sanction and the qualities of the chaser made it an inseparable royal companion. During company rule these animals lost all the associations and companionships with the royal powers and became feeble-frail targets for the deluxe rifles of the adventure oriented company officials. The big cats count and the associated royalty of these animals both evaded in close companionship and it entered a phase of endangered species. Similar is the narrative of the tiger, a simple massive beast who has been made to travel through traditions, rituals, worships by the humans and finally fixed as a 'man-eater'. This attainment (man-eater) made tiger a direct target for hunting; in name of making the areas 'safe zones and free of man-eaters'. The reasons contributing to this attainment are many and vast. The encroachment of forest areas is the most substantial cause for change in the eating habits of tigers and it has brought the animal in direct confrontation with the humans which led to making of this animal 'an easy target' to be shot down.

²⁵ Valmiki Thapar, Romila Thapar and Yusuf Ansari, *Exotic Aliens: The LION and the CHEETAH in India*.

²⁶ Lions are represented in many paintings and pillars. Buddhist Stupas are fine examples of it. To support *kanguras* and *chaja* in buildings the hangings depicting the lion face or a roaring lion are inducted in walls. At times the elephant trunk is also seen. See plate-1 & 2.

²⁷ Valmiki Thapar, Romila Thapar and Yusuf Ansari, *Exotic Aliens: The LION and the CHEETAH in India*, pp. 68-9.

Eminent environmental thinker and activist Vandana Shiva has numerous researches to her credit. She is well known for conceptualizing eco-feminism, which has been the feminism of ordinary women. She brings out that women are not genetically wired to be closer to nature but are culturally wired so. Therefore, women become experts of life entrusted with responsibility. She further exerts and successfully defines eco-imperialism. Her work is a significant contribution to the main stream of environmental history writing.²⁸ Another important text by the author highlights the changes of the 21st century, wherein she argues that the wars in 21st century are wars against the Earth and natural resources like soil, water, minerals, seeds and forests and the global corporate is responsible for these food wars and water wars. She demolishes the myths propagated by the corporate in pursuit of power and profits and holds corporate responsible for violation of all ethical and ecological limits. The promotion of technology, enhanced production based on genetic engineering, geo-engineering and toxins, industrial expansions through forcible appropriation of lands, rivers and mountains has depleted the natural diversity of the lands in Africa, Asia and South America which is unsustainable and unbearable. Further, she suggests that the shift to the earth-centric politics is our only chance of survival and a collective resistance to corporate exploitation can open the way to new environmentalism of interdependence and earth democracy.²⁹ *The Shifting Grounds*³⁰ is another recent addition to this branch of history but again the topics which dominate the major percentage of the work are same. The new insight is provided only by looking at the one-horned

²⁸ Vandana Shiva, *Talking Environment*, Oxford University Press, New Delhi, 2013.

²⁹ Vandana Shiva, *Making Peace with Earth, Beyond Resource, Land and Food Wars*, Women Unlimited, an association of Kali for women, New Delhi, 2012.

³⁰ Mahesh Rangarajan and K. Sivaramakrishnan (eds), *Shifting Grounds*.

rhino³¹ and wild boar.³² The recent work of Sunita Narian³³ is a landmark work to see the varied aspects affecting the environment presently but all the themes have been given cursory attention. The marine animals have not been studied so far. Only seminal works exist on the dolphins, whales and sharks and that too in terms of the globally affected fishing industry. The historical studies on certain aquatic mammals and reptiles such as turtles, crocodiles, blue whales, etc. are completely absent. Similar type of negligent treatment has been extended to the region of Thar Desert and the hills of North-East India, whereas both are habitats for diverse species ranging from the reptiles to the big animals.

Recently, Thar Desert and its extensions appeared many times in the national news due to the locusts attack. The specialists in fields of agriculture were worried about the destruction of crops due to the locusts attack. The central and state governments were worried about the fanning out of locust swarm in other adjoining states of India. The experts in the studies of locust across the globe took it as an opportunity to highlight the significance of deserts for the survival of human civilizations. Thus, the western frontier of India (Thar Desert) which was under locusts attack became a significant zone for all the ones who wanted to get rid of the locusts and their fear. Otherwise, generally the desert remains out of mind and discussions. Thus, its significance and contributions to the evolution of human civilizations is always a miss. So far, the region of Rajasthan has been explored by many scholars but only in terms of the Rajput States³⁴ and their political and economic

³¹ Shibani Bose, 'From Eminence to Near Extinction: The Journey of the Greater One-horned Rhino', in Mahesh Rangarajan and K. Sivaramakrishnan (eds), *Shifting Grounds*, pp. 65-87.

³² Julie E. Hughes, 'Environmental status and Wild Boars in Princely India', in Mahesh Rangarajan and K. Sivaramakrishnan (eds), *Shifting Grounds*, pp. 109-131.

³³ Sunita, Narain, *Why shall I be Tolerant: On Environment and Environmentalism in the 21st Century*, Center for Science and Environment, Delhi, 2016.

³⁴ Shyam Singh Ratnawat, *Rajput Nobility with special reference to the Kachharwaha Nobility of Jaipur during 1700-1858 A.D.*, Panchsheel

activities.³⁵ Few studies have explored the region in terms of its trade and trade routes. Yet, no work has been done on this vast region to explore its environmental history. Historically, the Thar Desert has been a habitation for varied animals, birds, reptiles and diverse species of plants and trees. The flora and fauna of Thar Desert have contributed immensely in shaping the culture, society and economy of the region over the centuries. The impact of the Thar Desert and its ecology is dominantly visible in the day-to-day activities of the indigenous inhabitants and their cultures. Broadly, the aridity of Thar Desert has shaped and polished the idea of collective community living while respecting available resources and conserving them for future needs. The aim of collective pooling, joint efforts, and sharing is to get the best possible deal pulled from the nature!

Historically, Thar was not a region for agriculturally rich economy and even today it is not. The dearth of agricultural

Prakashan, Jaipur, 1989; R. K. Saxena, *Rajput Nobility: A Study of 18th Century Rajputana*, Publication Scheme, Jaipur, 1996; Refaqt Ali Khan, *The Kachhwahas under Akbar and Jahangir*, Kitab Publishing House, New Delhi, 1976.

³⁵ Dilbagh Singh, *The State, Landlords and Peasants: Rajasthan in the 18th Century*, Manohar, New Delhi, 1990; R. P. Rana, *Rebels to Rulers: The Rise of Jat Power in Medieval India c. 1665-1735*, Manohar, New Delhi, 2006; Narayan Singh Bhati (ed.), *Sources of Socio-Economic History of Rajasthan and Malwa (1700-1900 A.D.)*, Maharaja Man Singh Pustak Parkash, Jodhpur, 1989; Harbans Mukhia, 'Illegal Extortions from Peasants, Artisans and Menials in Eighteenth Century Eastern Rajasthan', *The Indian Economic and Social History Review*, Vol. XIV, No.2, April-June, 1977, pp. 231-245; R.P. Rana, 'Chakar to Raja, The Emergence of Naruka State of Alwar (c.1660-1790)', *Social Science Probing*, June, 2006, pp.59-79; S.P. Gupta, *The Agrarian system of Eastern Rajasthan*, Manohar, Delhi, 1986; S.P. Gupta, 'Methods of Revenue assessment and Realization in Eastern Rajasthan during the 17th and 18th Century' *Proceedings of Rajasthan History Congress*; Dilbagh Singh, 'Contesting Hegemony: State and Peasant in Late Medieval Rajasthan' in *Rethinking Millennium: Perspectives on Indian History from the Eight to the Eighteenth Century, Essays for Harbans Mukhia*, (ed.) Rajat Dutta, Aakar, Delhi, 2008, pp. 300-314.

activities in the region didn't make it irrelevant to the larger economy of the Indian subcontinent. The lack of the agriculture activities made it a free zone for the movement of diverse troops and groups, who engaged in economic and nomadic activities. Thus, the tracts of Thar were freely available for both traders and raiders. Subsequently, these movements in the Thar led to the development of this region as a zone which was webbed with multiple networks of trade routes that gradually led to emergence of various centres of exchange and trade. The ruling Rajput states of Jaisalmer, Jodhpur, Bikaner, Udaipur and Jaipur also contributed a lot for the protection and expansion of the trade activities in the region of arid Thar, which was not engaging in the agricultural production extensively. The economy around these centres of exchange and trade routes was immense and the ruling dynasties controlled, guided and regulated the movements of the trading communities and nomadic groups in and around the Thar Desert. The movement of these groups was not in isolation. All the groups travelling in the region of Thar required varied facilities such as the animals for movement, food, water and safe halting stations. To make these facilities readily available, engagement with the inhabitant communities became essential. This led to a constant exchange between the nomadic groups, various agro-pastoral communities on one side, and the ruling elite and the traders on the other. The ruling elites and traders depended upon the agro-pastoralist and the nomadic groups for collection of revenue and smooth transitions, respectively.

Most of the communities who lived in the Thar were engaging in pastoral and trading activities. Certain groups were participating in the handicraft industry and were predominating making items that were made out of animal products. Some groups specialized in carving of bones, cutting of marbles, embroidery etc. Few communities were working in the Salt industry and were dealing in the products associated with it. The wool industry around Sheep and Camel was also very vast and it clubbed many groups, starting from acquiring of wool from animal to its cleaning, washing, dyeing and spinning. Many a times it was until the attainment of the final product. The wool production and its profits helped

in formation of a specialized group for rearing of the sheep and camels. The development of the *Rebari* community is along the similar lines that specialized in camel rearing. Many groups who exclusively rear cows, sheep, camels and bulls still exist. The Banjara community, which is heterogeneous in nature, specialized in the oxen rearing due to their dependence on the animal for carrying out the transportation activities. The ox was an important asset for the peasant community. During the 11th century, the *Maiids* (Mers) were also popular in the North-Western frontier (in the desert beyond the Indus) for pastoral activities. Many Arab geographers who exchanged these animals in the frontier towns of Al-Hind, from 9th century to 11th century have written extensively about them. Besides these domesticated animals, a variety of the birds, mammals and reptiles such as monster lizards and various varieties of snakes have their habitation in these deserts. All these facets of Thar do require a detailed study on the basis of manuscripts, inscriptions and varied archival records preserved at the Rajasthan State Archives, Bikaner and various other district archives such as Chopasani (Jodhpur), Udaipur, Tonk (Jaipur) and Dausa (Jaipur). There are no archives to record the cultural and the day-to-day activities that were actions for survival. Thus, to get a sense of life in an intense desert, one needs to comprehend the living experiences of the inhabitants. The wisdom attained through the experiences indicates specifically towards the feelings and the history that has been felt and lived by them.

The revenue records of the various medieval Rajput states of Rajasthan available in different forms (*Tozi*, *Arsattha*, *Bahi*) put light on different sources of income for the state. The *Arzdashta* records of Amber-Jaipur state are of immense value to understand the nature of the tussles, problems faced by the officials and local populace. These documents are also immensely rich in the information about the animals found in this region of Thar and the nature of varied activities performed by different groups. The *shikar* records and hunt diaries available from various medieval states of Rajasthan indicate the vastness of the wildlife and also provides insight into the treatment that was extended to the fauna by the elite hunters. The folklore is a rich depository of the environmental

understanding and it needs to be harnessed for collecting the information about the essence of nature (in Thar Desert) and its components, and the diverse emotions and affections felt towards the surroundings. Nearly all the fairs and festivals of Thar Desert are very colourful and its associated celebrations are also very extensive. The main attractions of the fairs were the processions that were carried out with diverse engagements of the animals. The processions of state, festivals, and fairs were centred around the parade of elephants, camels, horses, cow and Ox. It is interesting to note here that none of the activities were extending cruelty towards the animals (as visible in Jalikattu, Spanish bull-fights, etc.). Much care was ensured for the safety of animals before their employment in any activity. Here, the animals were also means for carrying the state's political and religious figures and symbols. For example the procession of *Gangaur* in Jaipur is carried on a bullock cart. Generally, the *Gangaur* is fixed on the cart with extensive decorations. Many such examples still exist in Thar region which reflect animal as the centre of the celebration. The overuse and the employment of the animals in various activities was the essential requirement in absence of the automobiles and other means of transportation. The introduction of the railways, automobiles and roadways has made vehement changes in the environment of the Thar and its ecology, which are visible through the constant decline in the number of animals, shifting cultural and social trends and the changing values that were held as guides in the past ages. The effects of these innovations have been immense on the wildlife of the Thar, which included the effective scavengers like vulture, which is now extinct. A similar story is emerging around the ship of desert i.e. camel. The monster lizards are not very far from their turn in this sequence. Similar condition prevails for various uncounted animals, reptiles and birds.

Historically, some evident efforts towards conservation have been made by the local people. The role of the *Bishnoi* community around the forest areas of the Jodhpur is immense and can't be ignored. For last six hundred years, this is the only community, who is explicitly working in the region of Thar to conserve forest and its wildlife. But their role is limited around the region of

Jodhpur and some pockets of Jaisalmer and Barmer. It is a classic case of conserved traditional knowledge systems, which is still in place due to its major disconnect with the developed regions and their effects. Being a region still untouched by the effects of developments, it is able to maintain its cultural roots firmly. The Rao Jodh Desert Rock Park is at Jodhpur and it is an illustrious example of the conservation and preservation activities that have been undertaken by the Mehrangarh Fort Trust and Museum. The conservation activities of park are maintained by reclaiming and employing the traditional knowledge systems. The local communities and their cultural set-ups are the banks which retain the traditional knowledge and do act as carriers and transmitters for the future generations. These scanty efforts have been keeping the desert going and their contribution can be appreciated for the fact that through these practices they have survived over the centuries. Presently the constant mining of the Aravalli ranges is posing a great threat to the ecology of this region. The Aravalli was a major embankment between the unproductive lands that lie in the north-west of the hill and the fertile land that is in the south-east of these ranges. The constant mining is making this natural deterrent weak and fragile, which will ultimately allow the desert to explode on the southern and the eastern sides.

Various sources in the Rajasthan state archives at Bikaner throw ample light on the environmental aspects of the Thar region. The material is scattered and less classified and an extensive reading will help to locate the hidden aspects of the aforesaid theme. Besides the domesticated animals (cow, oxen, goat, sheep and camel), various other species, such as gazelles, vultures, eagle, *neelgai*, monster lizard, jackal, *bhaidiya*, *siyar*, wild mules, etc. also figure. All these are listed under the category of wildlife for this study. So far no work has recognized these participants of environment. The changing plantation patterns and pro-agriculture approach in the arid Thar requires a close analysis because these activities are causing reverse effect on the fauna. The encroachment of dry lands for harnessing the geo-resources have destroyed the ecology of dry and arid regions which was best suited for certain flora and fauna.

The close perusal of the diverse literary materials, memory, oral

traditions and archival records will help to locate the reasons that were responsible for the destruction of these animals. The animal-human conflict, though very old, became more visible around the close of the 19th century. The economy of fur and skin made these animals direct targets for the poachers and smugglers. Further, the isolation and harsh conditions prevailing in the desert proved conducive for the hunters.

The studies of environmental issues have historically led to the classification of environmental history themes, thus, its writing falls in three broad categories³⁶:

- i. The effect of environment on human history.
- ii. Environmental changes caused due to human actions.
- iii. The human thought and attitude towards environment and its motivations.

This work will come up around the aforementioned three categories. It aims to locate the changes and the shifts that have occurred over the centuries in the region of Thar Desert due to the excess human penetration and their activities. The main sources for collection of information and data will be the imperial reports, letters, *bahis/arsbttha* (revenue records) and the *Arzdasht* written by the officials and the locals, for seeking the state's directives to deal with problems and apply the remedial methods as suggested by the state. The rich information about the communities, wildlife, and the surrounding of the Thar is also available in various *vigats* and *khyats*. Majority of the *vigats* and *khyats* written in the 17th and 18th centuries throw ample light on the happenings of our research area. Further, the tradition of record-keeping as maintained by the local people is also a significant source, wherein the information about the social activities of the family and its celebrations are recorded annually by an exclusive member of *bardic* community, called *bhopa*. These sources provide ample evidences to understand the effects of human activities on the environment and to understand the animal-human interactions and conflicts

³⁶ Donald Hughes, *What is Environmental History?* Polity Press, Cambridge, 2006, p. 3.

that were churning in the desert of Thar. In nutshell, it can be said that this work will be an effort to depict the larger conflicts that existed between the Man and the Nature. Consequently, this study will also try to explore and see the desert from a different perspective, altogether in a new light. Herein, the desert will be assessed through an insight of the inhabitants, who strongly believe in this desert as a life-giver. For them the desert of Thar is not at all hostile to the human activities and provides ample resources which are more than sufficient for the subsistence of humans and their cattle wealth.

Historically, the geography of Thar Desert has allowed the tribes of this region to assemble in an organized way. The challenges posed by the nature have allowed the people to come together and connect, for forming associations, in order to carry out the joint exercises. This made desert a region which allowed the culmination of ideas brought in by diverse groups, and together they all attained the common goals. Ibn Khaldun has written extensively on the significance of the deserts for the formation of the royal dynasties. His philosophy about desert was shaped and formed through his own experiences and challenges, which he encountered in the deserts of Cairo. His writings indicate to the reverence that he held for the desert that shaped him smooth as flows of dunes. His vast and rich experiences were accumulation of his service career encounters that came down to him being in the office of Judge, and while serving as a state treaty-maker. The reverence for the desert as upheld by the central Asian cities and tribes has been explained in his work with elaborate details of the political events. In his descriptions of the deserts, he is able to bring out their importance as a space from where the civilizations and dynasties emerge. Many contemporary and the early medieval works have been extensively used by the author to define the mystical and other existing cities that have groomed the understanding about the desert and its significance. The illustrious example of 'Copper City' has been incorporated from al-Mas'udi's story. 'This is said to be a city built wholly of copper in the desert of Sijilmasah which Musa b. Nusayr crossed on his raid against the Maghrib. The gates of (the Copper City) are said to be closed. When the

person who climbs the walls of the city in order to enter it, reaches the top, he claps his hand and throws himself down and never returns. All this is an absurd story. It belongs to the idle talk of storytellers. The desert of Sijilmasah has been crossed by travelers and guides. They have not come across any information about such a city'.³⁷ This is an intelligent contribution by the recorder, who has declined the existence of any such city but has definitely confirmed the existence and the exchanges that happened with the desert of Sijilmash. He dismisses the theory about the covering of a city with metal by a simple argument that 'Metal exists at best in quantities sufficient for utensils and furnishings. It is clearly absurd and unlikely that there would be enough to cover a city with it'.³⁸ Critical investigations and 'the knowledge about the nature of civilization' facilitates to understand the natural facts and allows their application. A similar kind of approach will be attempted in this work to understand the social organization of the Thar Desert and its surroundings which is the focal point of this study. Many interesting facts, stories, events, and processes tickle the think-bank while someone travels through the desert of Thar. The most disturbing and astonishing fact is the extent of the dry sand ocean that continues like an un-accomplishing, a never-ending, and an ever-growing sea of dust and sand. Further, this scenario gets intense as the density of the demography is known. Most of the inhabitants have been surviving in this region for years altogether with the long family histories and claims that they have lived prosperously and peacefully in this desert. Surprisingly, all the communities of Thar cherish their environment, history, and social histories proudly, as they never depended on any direct water source. The mechanisms of adaptation and effective utilization of the limited resource (mostly rain water) intrigues any researcher and visitor. The skills of these groups to manage

³⁷ Abd Ar Rahman bin Muhammed Ibn Khaldun, *The Muqaddimah: An introduction to History*, translated from Arabic by Franz Rosenthal, 3. Vols., Bollingen Foundation, Princeton University Press, Princeton New Jersey, second print of second edition, 1980, p. 7.

³⁸ Ibid.

in limited resource are excellent and at par with the availability extended to them by the Nature.

All the accidents and encounters involved in every manifestation of Nature, environment, and intellect deserve a study. Any topic that is real, approachable, and intangible, requires its own special science for exploring its nuances. Looking at these matters, in terms of the desert, it seems that the scholars were mainly (or only) interested in pursuing individual interests and specializations. This work will try to explore the historical information which is necessarily not only based on the layers of rock. Writing about any landscape shall be the work of the mind which is loaded with complicating memories, myths and meanings. Here the concern is to understand a landscape, its Nature, and the human perception for it in total rather than separating them into two realms, which is generally the practice. In fact, they should be treated as indivisible. Scholars mention that human beings cooperate with each other for their existence and, therefore, need other souls to arbitrate among them and exercise a restraining influence. As in any other society it is also visible in the society of Thar, who apply exchanges with the nature and its blessings, with a firm understanding to secure a 'long-term bond', which they need to hold in order to survive through the harsh, hostile and rude weather conditions. As every science has its own means to express its arguments, thus, the tricks, skills, science and the principles of survival do develop a language of their own, to float the 'arguments of necessity'. The same language reflects a fact that people first need the means to survive and later they express their intentions. And, in the tough weather conditions, co-operate of human resource becomes a habit, which facilitates the social organizations that are made easier by proper expressions and apparently it forms nature of inhabitants.

Throughout this work, an ongoing effort will be made to explain and understand various aspects of the desert civilization (Thar) that channelized the social organization of human beings, as royal authority, in gainful occupations, sciences, and crafts. In the light of various arguments, it will aim to show the true nature

of the varied knowledge systems of the elites and the common people, by repelling misgivings. Before coming to the specifications of the Thar Desert and its complications and challenges as extended by its geographical and environmental feature into the lives of inhabiting humans, I would like to highlight the importance of human beings as a component of the environment, and distinguish it from the other fellow living beings. Man (used to signify human beings) has been distinguished from the other living beings by certain qualities peculiar to them only, such as, the sciences and crafts which are results of their 'ability to think'. This peculiar feature not only distinguishes man from the other beings but also exalts him as a 'thinking-being' over all other creatures. Besides, they do understand the need for restraining influence and strong authority. Since humans cannot exist alone without other animals and environmental factors, thus they devised the formulas for co-existence in order to secure a better and sustainable living. Many other living beings also acquaint themselves with the surroundings but their efforts are no match to the actions of man. By any chance if they have something similar, it comes to them through inspiration not through thinking or reflection. Most significant effort of man is making of a living and his concern with the various ways of obtaining and acquiring the means of life. It channelized due to man's need for food to keep alive and subsist, apparently this guides him to desire and seek a livelihood. And finally, in order to make all the livings possible and for safe business they developed civilizations. This means that human beings dwell in common and settle together in hamlets and cities for the comforts of companionship and to fulfil human needs up to their satisfaction. In the words of Ibn Khaldun, 'Civilization may be either desert (Bedouin) civilization as found in outlying regions and mountains, in hamlets near suitable pastures in waste regions, and on the fringes of sandy deserts. Or it may be sedentary civilization as found in cities, villages, towns, and small communities that serve the purpose of protection and fortification by means of walls. In all these different conditions, there are things that affect civilization essentially in as far as it is social

organization'.³⁹ A close perusal of sources indicates that a similar approach, as visible in the Desert Central of Central Asia, was at work in the terrain of Thar dunes as well. The only deviation that existed in the social organization of the Thar was the absence of the tribal confrontations for pushing the religious claims. This absence can't be worked on, as the changes that were knocking the Central Asia in the medieval centuries were entirely different from the ones that were churning in the region of Thar. But this surely shouldn't be mistaken as prevalence of complete peace and absence of wars and confrontations in Thar.

The confrontations and encounters in Thar were mainly to gain control over the economic resources as they were scanty. The main component of economy was animal wealth, followed by varied taxes collected over the trade routes, which were sources of direct income in form of goods and money. The groups who controlled these trade routes did provide security on the routes of desert by charging a fee in-exchange of the service extended to the traders and merchants. Thus, the desire to control the trade routes was obvious. An acquaintance with the desert routes, along the sand dunes made some of them well versed in the *gela-kade* (finding path), that too throughout the spans of desert. Usually, this intense effort was undertaken to earn some means for the living. The nature is scant and its blessings are too limited for the region of the Great Indian Desert. As discussed earlier, the resources in the region have been limited and the same limitation has made the inhabitants too much dependent on what is available. The interesting feature of the communities, who inhabit in this desert, was and even to this date is absence of willingness to leave the region and to settle in some other region, which can extend the base of the resources and could be an opportunity to make a better living. Why these communities of Thar are such and what keeps them attached to this dry region? Thus, at this stage, one is forced to explore their philosophy for life, how they are able to manage all their necessities with such limited availability of natural vegetation and finally what are their mechanisms to accomplish it?

³⁹ Ibid., pp. 10-11.

This work will attempt to look in all the aspects of the Great Indian Desert. Accordingly, it has been classified in seven chapters. Chapter one deals with the geographical aspects of the Thar Desert and highlights the physical features of the region. Historically, the present desert of Thar was a sea coast. This region was full of regular activities that were mainly exercised by varied large mammals and marine creatures. The fragmented fossil sources indicate Jurassic age activities in the region. Many geomorphologic evidences exist that suggest volcanic activities. The rocky tops of the Jodhpur city and rock deposits around Jaisalmer are surviving examples of it. The political and social activities by humans in the region have been immense since the ancient times and this has contributed vividly to the archeological evidences. These evidences do highlight the types of human engagements and provide insight in the utilities of this region. The sand of Jaisalmer is very different and the presence of the yellow sandstone in this belt indicates a different kind of engagement with this region. The area of Barmer is immensely dry but it reflects the most extensive exchange of the humans, due to its geographical location and exploration of the routes. The archeological evidences and the geological findings have proved it many times and continue to strengthen it. Another region that indicates a distinct geo-terrain is Bikaner, which was popularly known as *jangal desh* during the medieval times. Prior to the 15th century, this region was inhabited by the nomadic tribes and bards. The first state formation in this region became possible under the leadership of Rao Bika. After foundation of Bikaner (after Rao Bika), the nature of exchanges with this region completely changed and it attained its status as an imperial state that was able to lesion with the nomadic and bardic groups. The semi-arid areas of the Thar includes the present districts of Sikar, Churu, Jhunjhunu, along with some environs of the present Jaipur district. A few provocative and revealing political happenings of the Rajput states will also be discussed to understand the politics of natural frontier.

The following chapter is titled 'The Thar and its Components', where the flora and fauna of the Thar Desert will be described along with their purposes and utility. Many plants are considered

as useless and taken as not serving plants, but interestingly most of these plants are used by the inhabitants for the indigenous medical purposes and meeting the nutritional requirements. The animals, birds, and reptiles are also an economy resource and main channels to access the finances. Many birds have significant role as cleaners in the environment. A few of them are able to secure a space for themselves in the royal symbols but for different reasons. And, acceptance for some came through the religious path. Whatever may have secured them an entry in royal arenas is a different matter to take-up, but it has secured them respect and admiration, which is helping to conserve these birds and animals. Sand is a main component of the Thar and different types of sands and soils are used for different purposes. Along with it a large varieties of stones are also available and those geo-resources have been a prominent source of income since the 12th century. The Sambhari salt has been the main item of export from the sandy tracts of Thar Desert. Many other such items of regular usage are also available in the region and have secured a significant place in the economy of the states.

Chapter three is the soul of this work in which an effort has been made to understand the environment of Thar Desert and managerial skills of Thar inhabitants which have been helping them to stay continuously in this region, happily and vibrantly. The ideology and the concept of the environment, as it has been understood by its inhabitants, is also highlighted. An attempt is made to depict the general understanding of the environment and Nature, as understood by the environmentalists. Interestingly, both the stakeholders have secured the opposite position and, this limitation (not exchanging the understandings and experiences of each other and rejecting the idea of opposite party) has served as a gulf in the environmental studies of the subcontinent for long. The same fate falls on the Thar as well! The absence of certain features has held back the experts of discipline. The ideology that helps the inhabitants to connect with the surroundings and preserve it is very inspiring. It helps them to live self-contained and self-sustaining. For example, absence of the lush green fields and the forests have made people believe in shades of green, as a colour

of prosperity and even a glimpse of it is considered auspicious. Similarly, many other wonders of the Nature have become the key players in the lives of the natives. The treatment extended to the animals will also give an insight in their philosophy of survival. The memories, sayings, proverbs, and depictions around the rains are broadly helpful in framing of the robust and vigorously rooted human perceptions and conventions. The belief they carry around these symbols and items are motivating and appear convincing to push life in this vast and diverse desert. In Thar, the protectors have reversed the general convention of the environment by keeping all the components (animals, vegetation, and humans) together, without putting any above the other. I believe these associations have kept them vibrant throughout the ages and alive in their naturally allotted solitude in an alienated desert.

The entire economy of survival in Thar Desert is based on the products that are received from the plants and trees or extracted from the animals available in the region. Chapter four is an engagement to depict the significance of the products that have secured an important space in the economy of this region. The main sources of income in Thar Desert are coming from the collection of vegetation products, large variety of minerals and variety of stones that are available in abundance. Rich deposits of stones and minerals are available in the entire region of Thar. The ranges of Aravalli are also rich depository of a large variety of minerals and have served as a major embankment between the expanding desert and the fertile lands of the Yamunna doab. These vastly available natural resources compose major share of income. The water is scarce in the region of Thar due to which it is respected upmost. All the efforts are directed towards conserving water. In the past, the water that flowed out of river tributaries was also used intelligently and it helped in production of a large variety of winter crops. Various techniques for water harvesting were practiced on a large scale along with varieties of mechanisms oriented to minimize the wastage of water and maximize its utilization. Water was classified in many varieties on basis of diverse qualities. Other engagements that contributed to the economy of the region were activities of salt-production, taxes levied on *johads*, pastures,

houses, and animals. The engagement of state in conserving the wildlife and water resources has also been attempted.

As is evident from the records, it can be asserted that since medieval times the *karkhanas* of the Thar states have performed well and were generating ample revenue. For example, the prominent *karkhanas* were *rangraizi* (dying), *bandhaij* (tie-dye), leather industry (mainly camel leather), the handicraft items made out of bone, etc. The vibrancy of handicraft industry clearly indicates that the limited availability of resources have pressed the inhabitants to invent more and more, creatively. If the invention is not getting through they do make the superficial artistic alterations, and through it they have been able to sustain in the mass scenario of India. The school of painting developed with the interaction of Mughals and has survived well through the tropy-troves of the modern and advanced technological ages. The economic aspect of desert states that were related to the product of flora and fauna will be discussed with extensive details. Hopefully, these details will be interesting and helpful to relate in the present.

The deserts of all the civilizations have been understood as the spaces for nomadic communities. Thus, in chapter five, the focus will be on the social groups of the Thar Desert along with their cultural and social organizations. The nomadic groups of Thar are not devoid of any culture. These nomads have been actors and carriers of varied cultures at one point in time. During the periodic, seasonal, and temporary (occupational) migrations, they unknowingly became carriers of cultural transmission. A similar process continued on the return journey as well. Thus, nomads contributed in the crossing over of cultural rituals, across multiple regions. Many nomadic communities engaged in music, dance, singing, and instrument-playing, which was a significant feature of any migrating group. Varieties of loud music, rudimentary instruments, thrilling acrobatics, and complex dances served as means for entertainment in the Thar Desert, which was devoid of large gatherings, organized theatres or literary circles. All their musical instruments were designed and assembled locally. Even today, the same practice is continuing. The best and recent example in this series is *rawan-hata*. Out of many such groups, presently,

the Manganiyars, who are popularly known as *barmer* boys, are most popular for their musical compositions and singing styles. Composition of each group is unique and each group is peculiar to maintain its distinct identity. Even then, they share many things in common. The only common feature that binds all these nomadic groups is the dry terrain of the Great Indian Sand Ocean and its *dhorras* (dunes). The food habits are similar across communities because they are silently governed by the unique environmental conditions. Besides similar kind of food, all the communities hold their social and cultural identities in strikingly different manner. Apparently, the nature has not distinguished but the humans have developed the means and mechanisms to place and portray each other differently. In the long run, these have taken the garb of culture and eventually social set-ups, which has finally become a way to identify one against another. There are numerous nomadic groups in the Thar, such as *Raikas, Rebaris, Banjaras, Mers (Maid)s*, etc. The lifestyle of each of these communities is little identical to the other. But similarity of professional engagement has become the only base for exchanges amongst them. Many religious sects/cults, who mainly engaged with the nomadic and pastoral groups, evolved in this region during the medieval times. The rise of the deities that guided the royal families/houses that were located in the Great Indian Desert was a significant feature in the polity that was evolving in the Thar. So, chapter five will be a way ahead to understand the communities of Thar Desert and nuances of their cultural and social set-ups.

Subsequently, in chapter six, this work will develop along the lines of the groups and communities who form the larger communities of the inhabitants. The ruling dynasties divided the inhabitants into many layers of stratification to channelize the mechanisms of revenue. These stratifications were efforts to hold back the revenue paying populace. The state kept them attached with the activities that facilitated in generating the resources of revenue which ultimately allowed the collection of taxes. The states located in Thar Desert also extended to negotiate and contest with the rebellious and recalcitrant groups because they were the revenue paying units and the states didn't want to lose

them. The actions of state in this direction were obvious. At times, in order to hold back the revenue paying bodies, the states adopted receding and accommodating techniques. Even after application of all these methods, the use of force never attained a back seat. The appeasing attitude of states gets reflected through the explicit choices made by them, of not interfering with the local matters of villages, the social affairs of the diverse castes, communities and social groups, who were otherwise under the guidance of the states. The states permitted the social norms of the communities to exist autonomously. In social matters, the authority and decisions of the community *panchayats* were upheld as the final. The state authorities interfered only when a pressing need arose. All these aspects of the medieval states have been studied well. Thus, chapter six will be a deviation and will provide an insight into the social happenings and the participation of the states in these activities. It will also highlight the local networks that worked in the subjective spaces of Thar, that were formed by the inhabitants for achieving the diverse goals, in order to meet the challenges that were part of the collective memory and experiences. Thus, making Thar Desert an objective space of subjective connectivity where the associations of localities were allowed to cross the thresholds of the social and political frontiers.

After the twilight of Mughals in the 18th century, various states declared themselves independent from the imperial yoke and were looking for the alternative sources of legitimacy. In the absence of any powerful centre, the states diverted their energies towards the subject groups and constantly tried to relate with them through various ceremonies and celebrations, in order to instill loyalty and in return aspired to gain acceptance for their authority. The 18th century was completely a changed scenario with little continuities of medieval times. During this century none of the Rajput states located in the Thar Desert were maintaining large armies. This was due to the absence of the resources at the hand and the alienation from the Mughal revenue resources which were previously enjoyed by the Rajput kings, while serving as Mughal *mansabdar*. Some effective efforts were made to keep the society at peace and to generate new sources of the revenue.

The seventh chapter is titled as 'The Exploration of Imperial Connects'. This chapter will be an exercise to look into the connections that were established by the Delhi sultanate and the Mughals in the dry and arid regions of Thar Desert. The expansions of Delhi sultanate and the interactions of the Mughals in this region have contributed significantly to the change in demography and cultural set-up. The coming in of new groups along with a new religion has led to the foundation of the Sufism in India, which has influenced the various sections of the inhabiting societies. Further, it led to the foundation of a new cultural set-up which permitted the assimilation of various rituals and ceremonies that were mainly taken up from the pre-existing cultural performances. Ajmer became the first seat of Sufism in India and the culture that emerged around the hospice of Mohinuddin Chisti (more popularly known as *Garib Nawaz*) inspired the other distantly placed Sufi centres. With the migration and settlement of the Sufi *murshids* in the distant lands, the culture of Ajmer *dargah* also travelled with them and reached the new lands. An interesting exception in Sufi tradition is visible at the shrine of Hamiduddin Nagori located at Nagour. This shrine is maintaining a different kind of culture which is very deviant from the rituals and ceremonies of the chief line (Ajmer), whose following is visible nearly at all the *Chistiya* shrines extending in eastern frontiers up to Bengal and even in the southern peninsula till Bijapur. The episodes that made this diversion possible will be discussed in the relevant place.

In general, many human civilizations have evolved in different times, on different zones of the earth. A few deserts have also served as support bases for the civilizations and gradually allowed the tribes to develop into the states. When the desert tribes slowly turned to the sedentary lifestyle, they settled in one region. Here, they became able to develop certain norms and regulations for maintaining law and order. The tribes who were able to maintain their stability did survive for long. Later, they set their claims on the caliphate and acquired the royal authority. The sedentary lifestyle along with the authority allowed many of the tribes to climb up in the social hierarchy. The same development paved way

for the establishment of the states. Later, with the accumulation of resources, the thought of a city became attainable. A similar pattern worked for the Rajput groups of the Thar Desert, who later formed the Rathor and Bhatti states. The Mughals ensured their say in the regions of the Thar by controlling the strategic locations like Sojat, Merta, Nagaur and Ajmer. By forming the matrimonial alliances with the share-holders of desert kingdoms, the Mughals ensured the continuity of their political control. Many medieval cities such as Istanbul, Samarkand, Isfahan, Akbarabad (presently Agra), Delhi (Shhajahabad), Lucknow, Jaipur, Jodhpur, etc. are remarkable and living examples of this process. All these cities are known for the gainful occupations, crafts and various other aspects of culture, architecture and technology.

I have discussed the desert first because it is crucial to understand the geography of any region in order to understand its resources, encounters, limitations and finally scopes it offers. A large process of prolonged interactions helps to shape any region and Thar is no exception to this process. The history of the Thar could be explored well when it is seen from the perspective of its people who have been living in this area for many generations and have a sense of attachment to this region and its resources. Generally, history as a subject is widely cultivated in the nations, races, and individuals and interestingly, it is the most sought-after discipline (not always professionally) in which everyone wants a slice. The range of claim-seekers in the large melon of history is vast, arching from the ordinary man, to the street watcher, kings and presently even leaders are eyeing for it. Travelogues, stories, legends, folklore, biographies, letters (public, personal and private), revenue records, manuscripts, etc. all help to reconstruct the narratives of history. The attraction and commitment felt by many non-professional historians towards the discipline have magnetic effect as per the running political stage and scenario, which throws the discipline in diversions. These insurgencies in the subject do have their effects and many of them become part of the popular imagination and narratives. The most infamous example of it is Jodha Bai's marriage to Akbar. The historians are having a tough time to prove that Jodha was wife of Jahangir, not of Akbar. Akbar

was the father-in-law of the Rajput princess (Jodha Bai). As both the learned and the ignorant are able to understand it, as on the surface history is nothing more than information of the political events, dynasties, and occurrences of the remote past, which is elegantly presented and spiced with proverbs. It serves to entertain crowded gatherings and brings us to an understanding of human affairs. It reflects how the changing conditions affected human affairs, how and why certain dynasties came to occupy a wider space in the world, and how they settled the resources until their time was up! The decline of many dynasties do provide an understanding about the gradual processes that set in and acted like the restless moths and termites, until the entire system collapsed apart. On the other hand, the soul of history and its inner meaning involves speculations and an attempt to get at the truth, subtle explanation of the causes and origins of existing things. And, if the deep knowledge of any event is not possible, at least a dip in the great ocean of the how and the why of the event will serve the primary purpose. With this inner jostling, history firmly gets rooted in philosophy.

In the present context, Thar as a desert has never been able to secure its position in the debates of the environmental issues. The general understanding of the environment limits the researchers to the forests, grasslands and the other lushly visible components of the nature. The absence of the thick flora in desert makes the scholars to stay away from this zone, as this region is considered devoid of the Nature's blessings in the form of trees and forests. A miss of particular kind of vegetation and terrain becomes the cause for the absence of the environmental narrative for this region. In the 20th century, it (Thar Desert) has often been used as a place fit for experimenting with various weapons that have been developed in independent India. To the physical scientist, Thar appears more like a region that is suitable for the production of the solar energy and power generation. Recently, various cosmetic companies and pharmaceutical agencies have started investing in the arid and semi-arid zones of Thar for the production of certain plants that are extensively used in these industries. Aloe vera is the most abundantly grown plant and it is extensively produced

for feeding the cosmetic and pharmaceutical industries. Another tree that is grown in abundance to feed similar type of industries is castor (in Rajasthan it is popular as *arandi*). The seeds of the tree are used for extraction of the castor oil which serves the purposes of drug and the cosmetic industry. The experiments on the jujoba plant are also keeping the scientists occupied in the Thar along with the multifaceted teams of the petro-chemical industries who are trying to find the oil and gas treasures in the womb of this extensive desert.

The above paragraph is a deviation from the regular path of the history writing but was crucial to give an insight in the nature of present engagements with Thar Desert. However, the book will try to look into the environmental and political economy of the region. The history of the landscape will be weaved through the memory, myths, and elaborate meanings that have been nurtured by the human perceptions, community interactions, and experiences. The groups who live in Thar do share resources with the others, who live in the vicinity, and never emphasize on exclusive access. The absences of these claims are striking points to start with for understanding the social perspective of the Thar Desert. The political and climatic stress did lead to the desertion of some 'niches' and migrations. But none of them was a mass migration. Similarly, the groups who survive on the pastoral activities do migrate but their migrations are usually to deal effectively with seasonal dips. The movements and migrations in Malwa are temporal, usually for a period of two-to-three months. The patterns of migration are also same for each dry season. The exception and deviations are visible as per the showers of monsoon. Overall, the framing of the Thar Desert will be attempted through varied contours.

This work will also present the biological lives and environment that have been guiding the economy, society, and culture of the Great Indian Sand Ocean for centuries. Since time in-memorable, the conflicts between various contesters are normal phenomenon which have been the guiding principles for the lives on earth. The environmental history of any region has always been written with an aim to locate and fix the struggle between the Man and the Nature. As this work is a slight deviation from this regular trend

of environmental history-writing. Thus, the purpose of this study is not to locate the struggle but to explore how the co-operation with various ingredients of the dry Nature has been attained. Hence, this study will look into the aspects of environment that became the guiding forces for the lives and helped to form the *principium* of survival.

The attitude for desert differs among the people at different stages. The ones who live in the intense deserts will have an interactive approach with the sand, winds, sandstorms and sand dunes. As all these are central to their lives and do influence them significantly. They will never be untouched by any intense storm and will always stay keen and alert to see and understand the flow of the winds, in order to be with the movements of the desert and its sand. This is an intense philosophy which requires a deep knowledge about the sand, its movements, a rich experience in the desert and finally strong mental, emotional, physical and psychological beings who have strength to deal with these cruel and unsympathetic upheavals of the sand. The unregulated winds do take away the unaccounted sand along with its flow and as the top layers erases out, the paths (marks of the footprints that form on the sand to be followed as route) also wither away and the ridges of the desert appear like a labyrinth. With this, once again the tedious task of identifying the routes and the paths through the intense desert of Thar comes up! And in this situation only an experienced being can be of some help. As the entire landscape appears like an ocean and the gravity of difficulty lies in the fact that it generates a feeling as if someone is 'caught in the mid of the ocean', without any idea of direction. All animals are also equally affected except the camels as they have capacity to remember the routes, alike elephants. The groups and the communities who don't inhabit in the intense desert, but are surviving on the fringes, have a little detached feeling with the desert as they are not directly affected by its movements. The distantly located groups only receive the sand and have no worries of losing routes and ways. So, the distance defines the affection for, approach towards and the treatment of desert by the societies and communities. With the passage of time these shifts become visible in the individuals,

and it reflects in their inadequate understanding and inefficiency to encounter the surprises and dangers possessed by the desert, and this keeps them fixed in an illusion where they consider the desert as a puzzle that is not to be attempted and with it the desert attains the status of a 'no-go area'⁴⁰ for them. This stage clearly alienates them, thus making the base of their civilization dead and non-existent. As the desert attitude differs among the people in different stages so does their understanding and treatment. The cultural vibrancy and the social warmth that has been guiding the lives in desert fades fast with the multi-layered distances that are created from the desert. The philosophical norms that taught the inhabitants to be physically strong; emotionally contained, and mentally firm along with the warmth of compassion and upmost respect for the lives and resources also become redundant with the distance. The long-term detachment pushes the desert away from the imaginations and with passage of time, distance and segregation, the desert becomes the place of the savages!

⁴⁰ Sumit Guha, *Environment and Ethnicity in India 1200-1991*, *Cambridge Studies in India History and Society*, vol. 4, Cambridge University Press, Cambridge, 1999, p. 4.



The Valley of Sand

‘*Dharti Dhora ri*¹ (the land of undulating sand dunes)’

‘Rajasthan is the collective and classical denomination of that portion of India which is “the abode of Rajput princes”. In the familiar dialect of these countries it is termed Rajwara, but by the more refined Raethana, corrupted to Rajputana, the common designation amongst the British to denote the Rajput principalities², this was the understanding of Col. Tod in the 19th century about the domain of the Rajput states who had their ruling houses in the territories of the present Rajasthan. In the last few decades, this concept has been overhauled and no more in light of diverse researches (which bring out the various aspects of the region) it is possible to hold the region of Rajasthan as ‘the abode of Rajput princes’. Large variety of research has pushed the region of our study to the stature of ‘an idea’.³

The very word and concept of ‘Rajasthan’ and ‘Rajputana’ first came to be used in the 19th century only and that too by Col. James Tod, who was appointed political agent to the state of Mewar. This

¹ Kanhiya Lal Sethiya, *Jalam Bhom* (the land of birth) and *Dharti Dhora ri* (the land of sand dunes), <http://kavitakosh.org>. For full poems see Appendix-1 & 2.

² Col. James Tod, *Annals and Antiquities of Rajasthan*, William Crooke (ed.), 3. Vols., Humphrey Milford-Oxford University Press, London, 1920, vol. 1, p. 1.

³ Karine Schomer, Joan L. Erdman, Deryck O. Lodrick & Lloyd I. Rudolph (eds) *The Idea of Rajasthan: Explorations in Regional Identity*, 2. Vols. Manohar, New Delhi, 2001.

was done in order to distinguish this region whose royal authorities were in hands of different clans of Rajputs. The word Rajputana stood for 'the country of the Rajputs'.⁴ The territorial extent of Rajasthan as communicated by Tod was lying between 'the valley of the Indus on the west and Bundelkhand on the east; to the north, the sandy tracts (south of the Sutlej) termed *Jangaldesh*; and Vindhya mountains to the south'⁵, prior to the rise of Mandu and Ahmedabad with capitals at Malwa and Gujarat respectively. The administrative extent of the Imperial Rajputana included eighteen native states and two chief-ships.⁶ The state as defined by the imperial administration was an irregular rhombus with the boundary lines of the states of Bikaner, Jaisalmer, Banswara and Dholpur. The districts of Ajmer and Merwara⁷ were also part of the territorial circle formed by the British administrators. Placing the state in context of the geographical territory, it was bounded by Sindh on west, Bhawalpur defined the north-western boundary and Punjab fixed the north and north-east territory. The eastern frontier of the state was limited by the borders of Oudh and Agra. The above marking of the state frontiers reflects that the territories of India till the beginning of the 20th century had carried the impact of Mughal administrative distribution. A look at the layout of the various states that existed within the Rajputana at the beginning of the 20th century will be helpful to understand the geographical and cultural entity of Rajasthan. The states of Jaisalmer, Jodhpur (more popular as Marwar) and Bikaner formed a homogenous group in the west and north. Shekhawati was subject to Jaipur state and along with Alwar (erstwhile Macheri) formed the north-eastern boundary. Jaipur, Dholpur, Karauli, Bundi,

⁴ *Imperial Gazetteer of India, Provincial Series: Rajputana*, 1908 (Superintendent of Government Printing, Calcutta), reprint 2007, Books Treasures, Jodhpur, p.1.

⁵ Tod, *Annals and Antiquities of Rajasthan*, vol. 1, p. 1.

⁶ *Imperial Gazetteer of India, Provincial Series: Rajputana*, 1908, p. 1.

⁷ In his work, Tod defines that the territory of Merwara ranges from Kumbhalmer to Ajmer and is inhabited by the Mair and Mer, a mountain race. Tod, *Annals and Antiquities of Rajasthan*, vol. 1, p. 12.

Kotah, Jhalawar and Bharatpur formed the eastern and south-eastern frontier. Sirohi marked the south-west and Pratapgarh, Banswara, Dungarpur and Udaipur formed the southern extent of the state. The district of Ajmer-Merwara and Kishangarh state formed the centre. Even today, these boundaries are at work for various purposes. From the above description, it can be derived that the territories of the state has not shifted much since the 20th century. Most of the states in Rajputana were more or less, autonomous in their political operations but were supervised by the imperial masters. Thus, it is important to note that 'Rajputana' doesn't hold any political or cultural sanctity. It was a cunning and creative introduction by Col. Tod to appease the Rajputs, in order to ensure his comfortable stay being a political agent, who was interested in writing the details of the region.

Moving ahead of the territorial marking, it is important to take stock of the natural boundaries that dotted the present state of Rajasthan. The oldest range of mountains in India is Aravalli. Since ancient times, this region gets its identity shaped and conceived through the extensive branches of Aravalli. As per the Gazetteer, 'about three-fifth of Rajputana lie north-west of this line, leaving two-fifth on the south-east. The heights of Mount Abu are close to the south-western extremity of the range, while its north-eastern end may be said to terminate near Khetri in the Shekhawati country...'⁸ As the Aravalli ranges have marked the state into two clear divisions, north-west and south-east, this demarcation by natural barrier has been taken as the starting point for this work to limit the frontiers of the Thar. The north-west is the dry, arid, unproductive and ill watered area, but gradually towards the north-east the mere desert improves a bit from being merely sandy into a comparatively fertile and habitable land. To study the Indian states, our informer has classified the territory of Rajasthan into eight categories and interestingly, 'the Indian desert to the valley of the Indus'⁹ has ranked at the eighth place. This has

⁸ *Imperial Gazetteer of India, Provincial Series: Rajputana*, 1908, p. 2.

⁹ Tod, *Annals and Antiquities of Rajasthan*, vol. 1, p. 2. The sequence followed to review the states was initiated from Mewar or Udaipur,

to be appreciated for the fact that he was aware and vigilant of this landmass which has been ignored by many previous information-gatherers, who were either freelancers or were appointed by the imperial states.

The south-east of the Aravalli contains the higher and more fertile regions, starting near Mount Abu and then busting out in three directions: eastern, south-eastern and into northern frontier of Gujarat and Malwa. The area is gifted with the river Chambal and many of its tributaries, which make the southern and south-eastern Rajasthan a cultivable and inhabitable area. Much of this zone is covered with rocks, sand and volcanic rock formations which puts much of its land out of the cultivable area. This situation (availability of water and non-availability of the cultivable land) creates a base for the archeologists and the environmental historians to refer this area as the 'Wet Thar', and this appears as a parallel to the 'Dry Thar', which lies in the north-western frontier of the state. The territories on both the sides of Aravalli are called Thar, the only difference that exists is of the prefix, Wet and Dry. This research will be an effort to explore the 'Dry Thar' and its various dimensions to understand this arid area and its ecological, social, and cultural environs. Thus, this work is a maiden voyage to look into the environmental aspects of the Thar Desert, its biotic and abiotic components that have evolved its economy, society and culture.

Generally, the environmental surroundings and the availability of the natural resources shapes and guides the social and political economy of every region and the long term efforts, circumstances and contributions leads to the formation of specific cultural set-ups. This is well established by various environmental history researches. To understand any region, a researcher is primarily recommended to explore the geographical aspects of the region and further see the environmental factors that are regular and for the mean time have become permanent features. Along with it,

followed by Marwar or Jodhpur, Bikaner and Kishangarh, Kotha and Bundi (jointly called Haraoti), Amber or Jaipur, Jaisalmer and finally the Indian desert.

marking and recording of the natural spurts that occur occasionally is also essential. These days it is easy to keep track of the climate due to the statistical data made available through the recordings of meteorological departments. These statistics help to understand the history of the climate, rains and other contours of the weather. An analysis of the shifts in the weather has also become possible through these large and exhaustive data collections.

The field of research for this work is 'Thar Desert—that is dense, dry and hot. The inspiration to explore a desert is well defined in the work of Ibn Khaldun, who wrote extensively about the ins and outs of the Egypt desert. His work has been an inspiration for many scholars to work in the hot and arid areas. Ironically, his work has been used seminally and has yet not received its recognition as a remarkable historical work on 'the contributions of desert in the life of the societies' and the way desert has 'influenced and aspired', the societies and the communities to march ahead in 'the process for the formation' of dynasty, and setting up the cities. Our author of the voluminous history of Egypt was able to attain inspiration for his work only from the desert of Cairo, where he retired to pull up his work. Franz Rosenthal puts in, 'He retired in Desert (Rabit Abu Madyan) busying himself in solitude with study and reading'.¹⁰ It may be noted that this was not the first case to aspire for the solitude in history. We do come across many such instances in the episodes of history. The alienations and the solitudes always had immense effect on the individuals (either positive or negative, which is a different story) and the same has been proven by the historians. The *Mamluk* slaves of the medieval ages are most notable examples to see the effect of alienation on human personality. And the way it has set and revolved the discourse of the times is also worth consideration. The finest *Mamluks* were the ones who had suffered the twin effect of 'natal alienation and social death'.¹¹ This particular social experience made them the finest slaves

¹⁰ Muhammad Abdullah Enan, *Ibn Khaldun: His Life and Works*, Shaikh Muhammad Ashraf, Lahore, 1941, p. 49.

¹¹ Orlando Patterson, *Slavery and Social death: A Comparative Study*, Harvard University Press, Cambridge, 1982.

whose loyalty and honesty were reserved only for their respective owner and their projects. Mostly they were the flag-bearers of the capitals. Ibn Khaldun also suffered alienation and distance from his family but he was never forced into social death. He chose solitude over social life for compiling his experiences which he had gathered being in the office of Chief Judge. The solitude of the author in the desert led to a creative creation, *The Muqaddimah*,¹² which serves the foundation for many modern-day disciplines. This effect and outcome of solitude in the desert makes one to purpose that the deserts are very much contained frames of life and they deserve their due as an ecological module. The thinking and writing of the great text (*The Muqaddimah*) was a rich exercise which became possible due to the amazing contributions of a desert and a happening retirement secured by author, in its sands!

This study is an attempt to understand the contours of Thar Desert of Rajasthan and to explore the features that have kept the various desert states (Jodhpur, Jaisalmer, Barmer, Jaipur and Bikaner) and their populace sustaining in this region throughout the ages. Here the effort will be to sit away from the political history and the social history of the ruling dynasties. The aim of this study will be to locate the various means, resources and the objects that were available to the settlers of this desert and how through these limitedly available resources these inhabitants were able to create an economy and had sustained it effectively. The same economy not only allowed the foundation and formation of the states, however it also ensured their continuation and expansion over the centuries. The constant efforts made by various Rajput states for continuing their rule in the Thar Desert are constant indicators of the fact that this desert was nourishing all of them efficiently. The desert became an important engrain for their survival and continuity was made effective through various limbs of the state. The absence of efforts to move out of this desert by the

¹² Abd Ar Rahman bin Muhammed Ibn Khaldun, *The Muqaddimah: An Introduction to History*, translated from Arabic by Franz Rosenthal, 3. Vols., Bollingen Foundation, Princeton University press, Princeton New Jersey, second print of second edition, 1980.

inhabitants, the royals, and their establishments clearly indicates that the Great Indian Desert was not inimical to the nomads, sedentary societies, royal authorizes, cities and civilizations that were developing and prospering in this dry and hot region. This research will be developing along these lines to address the facts that inimical features were present in the environment but they were never the cause for the inhabitants to move out of the Thar Desert, permanently. However, with the limited availability of resources, the inhabitants were able to make a worthy life. The temporary migrations were, and even today are, a regular feature for the inhabitants but these are the actions only to sustain the pastoral commodities and the economy guided by them.

Looking at the Thar Desert in the light of Ibn Khaldun's work, it can be asserted that this desert was also a space of many activities that went unnoticed by the historians on the pretext of harsh natural conditions. Majority of the studies about the states that are territorially and historically fixed in the Thar Desert (Bikaner, Jaipur, Jodhpur, Barmer and Jaisalmer) have been to understand their revenue systems and cultural set-ups. Broadly, maximum efforts have been made only to explore the nuances of the social and economic history. The complete absence of the research that could see all these states as the blooms of the Thar Desert is disheartening. And, somewhere it indicates to the 'not-interested in attempting un-approachable natural conditions' kind of approach that has been adopted by the researchers. Historian have stayed at bay from the environmental aspect of all the Rajput states that flourished in this vast desert, and never attempted to understand the causes for continued struggle in the desert region for sustaining the respective kingdoms. A few seminal works have tried to explore and study the water-harvesting mechanisms that were put in place by the states, being the organizers of Thar Desert.

The domain of this study (i.e. Thar Desert) has been fixed in line with the historical time frames and geographical zones, with an aim to explore the analysable features, and processes of that particular age, or an identified region. A study of geographical domain and historical timeline will be followed with an insight of the environmental factors and their consideration, as it will help to

understand the spirit and zeal that has guided and motivated the humans in this desert. The political circumstances get shaped as per the spirit of the environment and both jointly guide the light (discourse) of history.

For the pre-colonial dynasties the desert was a 'no-go area'¹³ and the interactions with the desert were only extended to curb and contain the rebelling forces.¹⁴ The Sanskrit and Persian literature is full of the similes and metaphors that are drawn from the nature. The Mughal sources went a step beyond and picked comparatives of the nature to convey the meanings of the political situations. The traitors were referred as scorpion without self-control in stinging.¹⁵ Similarly, the natural terrains were interpreted as per the qualities of terrain, ecological conditions, and the spirits drawn from those surroundings. In the famous work of Abul Fazal (*Akbarnama*), the desert always stands as an equal of destruction, bewilderment, waste, wilderness, a place of illusions, purposeless wandering, ignorance, ruin, madness, error, defeat, annihilation, downfall, calamity, folly, imitation, darkness, savages, exile, failure, asceticism, etc. Contrary to it, the cities were considered as an equivalent of the inquiry, prosperity, civilization and truth. The Mughal court historian has always treated desert as a destination/destiny which 'rebels will meet'¹⁶, and the rebels were called 'desert vagabond'¹⁷ and, 'desert of failure'¹⁸ was an equivalent of defeat. It is interesting to note

¹³ Sumit Guha, *Environment and Ethnicity in India 1200-1991*, Cambridge Studies in India History and Society, vol. 4, Cambridge University Press, Cambridge, 1999, p. 4.

¹⁴ Various instances that appear in the Persian sources indicate that the Mughal forces reached up to Nagaur and the peripheries of Jodhpur to curb down the rebellions of Maldeo and to make him surrender. Similar was the approach towards the dense forests area of Jharkhand that became a safe abode for the rebels.

¹⁵ Abul Fazal, *Akbarnama*, 2. Vols., H. Beveridge (tr.), vol.1, Low Price Publication, New Delhi, 2010, p. 576.

¹⁶ *Ibid.*, p. 434.

¹⁷ *Ibid.*, p. 459. This usage was for Rana Pratap while he was rebelling in the area of Chittor.

¹⁸ *Ibid.*, p. 466.

that the two historians, Ibn Khaldun and Abul Fazal, clearly hold opposite views on the desert. The former has considered the desert as base of any civilization and the later has placed it on altogether different platform of ignorance, error, ruins, etc. For Khaldun, 'Civilization may be either desert (Bedouin) civilization as found in outlying regions and mountains, in hamlets (near suitable) pastures in waste regions, and on the fringes of sandy deserts'.¹⁹ By observing these two different opinions about the same natural terrain one can easily note the effect that was exerted by the surrounding environment and ecology on the souls. Accordingly, it further helps to extend and put forward that the influences and the effects exerted by the desert over the souls and their psychology were directly linked with the proximity and the distance enjoyed and experienced by them. Abul Fazal had an experience of fertile and agriculturally rich zones which were served well by the rivers and their multiple tributaries along with various other sources of water. So, for him the desert (which was devoid of agriculture and rivers) was an equivalent of decline. Whereas Ibn Khaldun lived and worked in the desert of Egypt, therefore, for him the desert proved as a centre of civilization and a space to retire in 'solitude with studying and reading'.²⁰ This creative approach for desert was completely missing in and unattainable for Abul Fazal, who had altogether experienced a different terrain of geography which was completely opposite to the desert. Thus, the affinity with the desert allowed one to appreciate it extensively and the distal pushed the other to mark it as a region devoid of any intellectual activity.

To base his theory of sociology, Ibn Khaldun spoke about the science of the subject and 'explains the nature of society, the necessity for it and how it varies according to the climate, how it is affected by changes of weather hot, cold and temperate zones, the effect of atmosphere on the character, colour, and condition of

¹⁹ Ibn Khaldun, *The Muqaddimah: An introduction to History*, pp. 10-11.

²⁰ Muhammad Abdullah Enan, *Ibn Khaldun: His Life and Works*, p. 49.

men and...the geography of the world...'²¹ Further, 'to understand the political development...it was necessary to include in the study all aspects of social life and to understand...it was needful to take into account the physical factors...widening the scope of history, and the broadening of the historian's task'.²² Thus, it is evident that the deserts were also shaping the great philosophers and it was no hindrance in the inventions that were aspired by the sciences. In the same light the desert of Thar can also be studied and efforts can be made to explore the contributions that this desert has made to the Indian subcontinent over the centuries.

The territorial location of any geographical area provides the visitor with data and each traveller perceives the territory as per his/her reasoning and understanding. So, the insights for one same region do vary in the minds, recordings, and observations of different visitors, scholars and historians. The ethnographers and anthropologists try to see each region as it is perceived by the people living and working there. They work on the contemporary conditions and try to see the flow accordingly, whereas, the discipline of history aims and tries to explore past through convincing evidences. The Thar Desert also deserves this kind of treatment where the historians shall explore and the ethnographers and the anthropologists shall see the continuities that are guiding its population. Thus, a joint and inter-disciplinary study is the need of day to understand this region wholesomely. Some of the geographers and historians during the medieval times (from eleventh century to eighteenth century) have noticed the desert and mentioned about it in their memoirs, histories and travelogues. Ibn Khaldun tried to understand the geography of the globe and for it a map was drawn on basis of the information found in the *Book of Rogers* and the *Geography* of Ptolemy. He notes: 'Information about the cultivated part and its boundaries and about the cities, towns, mountains, rivers, waste areas, and sandy deserts it contains, has been given by men such as Ptolemy in the *Geography* and, after him, by the author of the *Book of Roger*.

²¹ Ibid., p. 126.

²² Ibid., p. 186.

These men divided the cultivated area into seven parts which they called the seven zones. The borders of the seven zones are imaginary. They extend from east to west. In width (latitudinal extension) they are identical, in length (longitudinal extension) different. The first zone is longer than the second. The same applies to the second zone, and so on. The seventh zone is the shortest'.²³ All these details about the geography of the earth are provided in the chapter which begins with the opening statement: 'The parts of the earth where civilization is found. Some information about oceans, rivers, and zones.'²⁴ Details about the entire globe have been laid down well with extensive narrations and information about the locations of the sea, sand, deserts and oceans that mark the territories of these geographical territories that have been called civilizations by Ibn Khaldun. Interestingly, the Eastern India (49), Western India (40) and the desert (46) are components in the key to the Map designed by Al-Khazani, who was a leading scholar of geography.²⁵ Looking keenly at the map, it can be said that the western India (dot point 40) has been kept quite close to desert that is marked by number forty-six.²⁶ The information perceived and presented by the author of *Muqaddimah*, helps us to identify his idea of India. He mentions: 'In the middle of the first zone, in the fifth section, the Indian Ocean terminates. It comes down from the region of China and covers most of the first zone to the fifth section. Consequently, there is not much civilization there. Civilization exists only on the islands in (the Indian Ocean) which are numerous and said to number up to one thousand. (Civilization also exists) on the southern coast of the Indian Ocean, the southernmost limit of the cultivated part of the earth, as also on its northern coast'.²⁷ This information clearly indicates to the frequency of activities and the cultural developments that

²³ Ibn Khaldun, *The Muqaddimah: An introduction to History*, p. 91.

²⁴ Ibid., p. 90.

²⁵ Ibid., pp. 96-8.

²⁶ See plate- 3: Map made by Ibn Khaldun and his team.

²⁷ Ibn Khaldun, *The Muqaddimah: An introduction to History*, p. 103.

were happening in the Indian Ocean and their influence over the Indian subcontinent.

Similar kind of exercises were also executed in Indian territories. While extending commentaries on the frontiers as mentioned in *Al-Hind*, Andre Wink refers to the desert and its wanderers that have been mentioned by the Arab geographers around the frontier town of Hind.²⁸ Taking from Ibn Hauqal, he says that 'the *Mids* wandered "along the banks of Mihran" from the boundary of Muslim kingdom of Multan to sea, and in desert between Makran and Qamuhul (Famhal), "the frontier town of Hind".²⁹ In 1810-11, Tod dispatched two parties for conducting the survey, 'one to the Indus, the other to the desert south of the Sutlej'.³⁰ He further mentions about 'the deserts of Dhat, Umrasumra (it joins in Jaisalmer) and many of the states of Rajasthan'.³¹ Idrisi locates the *Mids* outside the desert and confirms the wandering nature of the tribe.³² Gradually, confirming the activity area of the *Mids* from the 9th century to the 11th century, Andre Wink also established that the interstitial pastures along the Indus and the desert were zones of high nomadic activities along the western frontier.³³ The *Tarikh-i-Sind* of 1600 AD mentions the desert of Thar. When the authority of Masud (son of Mahmud) was rejected by the people of distant regions, 'the men of Sumara assembled in the neighbourhood of Thari (Thar) and raised a name Sumara to masnad who had passed a long time as the head of the Sumara tribe'.³⁴ The presence of the name 'Thari' in the sources of the 9th and the 11th centuries clearly indicates the usage of this term then onwards. The western desert has been viewed as '*Thal ka*

²⁸ Andre Wink, *Al-Hind: The Making of the Indo-Islamic World, Early Medieval India and the Expansion of Islam 7th-11th Centuries*, vol.1, Oxford University Press, New Delhi, 1999, p. 165.

²⁹ Ibid.

³⁰ Tod, *Annals and Antiquities of Rajasthan*, vol. 1, p. 5.

³¹ Ibid., p. 6.

³² Andre Wink, *Al-Hind: The Making of the Indo-Islamic World*, p. 165.

³³ Ibid., p. 166.

³⁴ U. M. Daudpota (ed.), *Tarikh-i-Sind*, Poona, 1938, p. 60.

*Tiba*³⁵, which literally means the sand ridges of the desert. Luni river marks the 'extensive plain of ever shifting sand, termed in Hindu geography Marusthali, corrupted to Marwar'.³⁶ The *Thal ka Tiba* is basically a corrupt version of *Thul ka Tiba*, where the word *Thul* signifies the sand and the *Tiba* stands to represent the dune. Similarly, the *Marusthali* is also a land which takes you near death due to its harsh dry weather conditions and absence of the potable water resources. Both these terms are still in use. The locals rarely address this western desert of India as Thar. For them, this vast desert is only *Dharti dhora ri, ei par dev raman ne aawa; ei ro jas nar-nari gava, dharti dhora ri*³⁷ (it's the land of undulating sand dunes, the gods incarnate to inhabit on this land; man and women sing its praise, it's the land of undulating sand dunes).

In regard of the Potlemys' work, Yule mentions that *Geography* is 'a precious mine of material for the study of the ancient geography of India'.³⁸ This same work of Ptolemy was used by our 14th century historian Ibn Khaldun to mark his map but explicitly he never indicated to the desert beyond Indus as 'Thar'. The usage of the term in the 11th century for the region is a substantial proof to believe that the term didn't fell out of use since then. While defining the seventh section of the world map drawn by him and his associates, Ibn Khaldun notes: 'The south-western part of the seventh section contains a portion of the Persian Gulf connecting with the other portion of it in the sixth section. The Indian Ocean covers all the southernmost area of the seventh section. There, western India lies along it, up to the country of Mukran which belongs to western India. Opposite it, is the country of at-Tawbaran which also belongs to western India. All of western India lies in the western part of the seventh section. Western India is separated from eastern India by stretches of desert (this is the location of Thar), and is traversed by a river

³⁵ Tod, *Annals and Antiquities of Rajasthan*, vol. 1, p. 19.

³⁶ Ibid.

³⁷ See Appendix-2: *Dharti Dhora ri*

³⁸ J. W. McCrindle, *Ancient India: As described by Ptolemy*, Trubner & Co., London, 1885, p. 11.

(the Indus) which comes from the eastern part of India and flows into the Indian Ocean in the south. Eastern India begins on the shore of the Indian Ocean. Directly to the east, there lies the country of Ballahra. North of it is Multan, the home of the great idol (the statue of Buddha, that was destroyed by carriers of Taliban ideology). The northernmost part of eastern India is the southernmost part of the country of Sijistan. The western part of the eighth section contains the remainder of the country of Ballahra that belongs to eastern India. Directly to the east of it lies the country of Gandhara. Then, at the southernmost part (of the section), on the shore of the Indian Ocean, there is the country of Malabar (Munibar). North of it, in the northernmost part (of the section), there is the country of Kabul. Beyond (Kabul) to the east is the territory of the Kanauj, between inner and outer Kashmir at the end of the zone. The ninth section, in its western part, contains the farthest eastern India, which extends to the eastern part (of the section) and stretches along its southernmost part up to the tenth section. In the northernmost part here, there is a portion of China. It includes the city of Khayghun. China then extends over the whole tenth section up to the Surrounding Sea³⁹...the eighth section contains, in the southwest, the plains of the Khalaj, a Turkish nation. They adjoin the land of Sijistan in the west and the land of Kabul of Eastern India in the south. North of these desert plains are the mountains and country of al-Ghar starting with Ghaznah, the key to India. Where al-Ghur ends in the north, lies Astarabadh. Then, to the north is the country of Herat in the middle of Khurasan, extending to the boundary of the section. It includes Isfarayin, Qishan, Bushanj, Marw-ar-rudh, at-Taliqan, and al-Juzajan. This part of Khurasan extends to the river Oxus. Khurasanian places on this river are the city of Balkh to the west, and the city of at-Tirmidh to the east. The city of Balkh was the seat of the Turkish realm'.⁴⁰ All these specifications indicate to the significance held by India in contemporary times.

In the 19th century, while describing about the kingdom of

³⁹ Ibn Khaldun, *The Muqaddimah: An introduction to History*, p. 105.

⁴⁰ *Ibid.*, pp. 108-9.

Jaisalmer, Col. Malleon mentions that the descendents of the Yadu tribe were pushed out from Punjab by the King of Ghizni and they fled into the Great Indian Desert and 'built a fortress in the desert, which they called Tanot and made it their capital in AD 731'.⁴¹ K. C. Jain is a noted historian who has worked extensively on the western borders of Rajasthan. In terms of Thar Desert he asserts that 'both the archeological finds and certain climatologically features, however indicate that Ghaggar did not carry water as a river after the middle of the sixth century AD... the correct climate tradition about this region is also recorded in the *Vamana-Purana* which was compiled in Kurukshetra. There were several holy places which were once associated with big ponds, felt helpless against the advancing dunes of sand'.⁴² He has not used the word 'Thar' for the desert, but the vivid descriptions of the locations confirms about the desert that was expanding in the region of present Rajasthan due to drying up of river Ghaggar. As per the geographers, 'there are archeological evidence that the region was better watered as recently as the 8th century AD and the flow in Ghaggar did not cease until 1790 AD'.⁴³ Thus, the first instance for the expansion of the desert towards the eastern frontier can be located around the 6th century AD. All the specific territorial demarcations and the geographical descriptions given about the physical surroundings in the memories and the histories that were written in different times by large variety of authors indicate the presence of the Great Indian Desert. Might it has not been treated well and at times rejected, but it was always present as a harsh fact.

The surroundings of the Great Indian Desert, its location and

⁴¹ Col. G. B. Malleon, *An Historical Sketch of The Native States of India: In Subsidiary Alliance with the British Government*, (Longmans Green and Co., London, 1875), Asian Educational Service, New Delhi, 2005, p. 118.

⁴² K. C. Jain, *Ancient Cities and Towns of Rajasthan*, Books Treasure, Jodhpur, third edition-2016, p. 573.

⁴³ Rajkumar Gupta, Ishwar Prakash (eds.), *Environmental Analysis of the Thar Desert*, English Book Depot, Dehradun, 1975, p. 11.

the difficulties faced by the imperial forces of Mughal emperor Akbar in and around this desert were narrated in brief by the court historian, Abul Fazal.⁴⁴ He also highlighted the importance and requirement of water and food in the desert as their shortages were experienced by the imperial forces. Further, he called the Central Asian desert as *Cul* and its people were referred as *culi*.⁴⁵ He refrains from putting any such label on the inhabitants of the Thar Desert, in which the imperial forces faced troubles. Perhaps, it was due to the absence of any uniformity amongst the nomadic groups who were living and traversing in the Thar Desert. Or, might be this desistance was due to the non-acquaintance with the region and its people, who held lot of cultural diversities. The desistance from labeling could also be an act of diplomacy, as the Mughal Empire under the reign of Akbar was trying to expand its horizons in order to gain legitimacy over the extensive territories of Hindustan. The aim of these multi-directional expansions (pushed by the Mughal centre in the 16th century) was clearly economic for extracting more and more revenue, which was required for imagining and building a grand empire.

Tod has done a more confirming job while marking the boundary and has defined the desert as: 'From the north bank of the Luni to the South, and the Shaikhavat frontier to the east, the sandy region commences. Bikaner, Jodhpur, Jaisalmer are all sandy plains, increasing in volume as you proceed westward... Jaisalmer is everywhere encircled by desert; and that portion round the Capital might not be improperly termed as oasis, in which wheat, barley and even rice are produced. Though all these regions collectively bear the term *Marustabli*, or 'region of Death', the restrictive definition applies to a part only that under the dominion of the Rathor race. From Balotra on the Luni, throughout the whole of Dhat and Umrasumra, the western portion of Jaisalmer and a broad strip between the southern limits of Daudputra and Bikaner, there is real solitude and desolation. But from the

⁴⁴ Abul Fazal, *Akbarnama*, 2. Vols., H.Beveridge (tr.), vol.1, Low Price Publication, New Delhi, 2010, pp. 371-5.

⁴⁵ *Akbarnama*, p. 412.

Sutlej to the Rann, a space of five thousand miles of longitudinal distance, and varying in breadth from fifty to one hundred miles, numerous oases are found, where the shepherds from the valley of Indus and *Thal* pasture their flocks. The spring of water in these places have various appellations, *tar, par, rar, dar*, all expressive of the element, round which assemble the Rajars, Sodhas, Mangalias and Sahariyas, inhabiting the desert...the valley of Indus and eastward of the stream, the termination of the sand ridges of the desert...of this eastern portion of the valley, which forms the western boundary of desert. A traveller proceeding from Khichi or flats of Sindh to the east, sees the line of the desert distinctly marked, with its elevated *tibas* or sand ridges...these sand-hills are of considerable elevation, and may be considered the limit of the inundation of the 'sweet river', the Mitha Maran, a scythic or Tatar name for river, and by which alone the Indus is known, from the Panjnad to the ocean'.⁴⁶ This description is helpful to understand the geographical extent of the Thar, and with help of all these illustrations it can be said that the extent of the sand hills (*dhoras*) in Thar was and is limited to the regions of Barmer, Jaisalmer, Jodhpur, Ganganagar and Bikaner with a little depletion in the sand dunes while moving towards Sikar, Jhunjhnu, Churu and Nagaur (historically all these districts constituted the territories of Jaisalmer, Jodhpur, Bikaner and Jaipur-Shekhawati).⁴⁷ Beyond it the effect of the desert was felt till the north-western extent of the Aravalli hills. More specifically Indus formed the north-western frontier of the Thar and the Aravalli ranges limited the south-eastern extent of the Great Indian Desert. The introduction of the Indira Gandhi Canal, which carries water up to Ganganagar, has changed the understanding of desert and has subdued the effect of large tracts of dunes in the lives of inhabitants. The change is very identical to the one defined by Ibn Khaldun, where the Beoudian (nomadic) groups adopted to the sedentary life and became bases for the development of the new societies, which further flourish in cities, civilizations, so on and so forth.

⁴⁶ Tod, *Annals and Antiquities of Rajasthan*, vol. 1, pp. 21-2.

⁴⁷ See plate 4: Map of Rajasthan.

According to the aforesaid explanations, the location, territory and terrains of Thar Desert can be fixed, which is an extensive area with scanty production of food-grains and water supplies. The inhabitants and ruling dynasties of this desert were surviving on their own managements. But rarely any source acknowledges their efforts and skills. Some states tried and made some arrangements for the water-harvesting. The sources documenting these efforts of the states are rich in terms of the acknowledgements and praise of rulers who took steps for conserving this irreplaceable source, but are completely silent on the technology, and skills involved in these conservation activities. Besides water-harvesting, no visible organized efforts were made to make situations conducive for the life. It can also be inferred from the sources that the ruling houses of Thar were not docile to the dynasties who ruled from the imperial capitals (Delhi, or Agra) till the mid-16th century. This could be an impact exerted by the dry region and its geographical constraints on the psychology of the ruling elites. The aridity limited the scope of conducive agricultural conditions and the lack of water resources has marked the area as undesirable for the agriculture-based societies. The agricultural revenue that was available in abundance in the Ganga-Yamuna Doab formed the major share of the states (Delhi sultanate, Mughal Empire and John Company) incomes. Thus, the region of the Thar was not aspired by these states for the collection of agricultural revenue. The expeditions, penetrations, and expansions in the region of Thar were mainly and primarily to control the trade routes (crossing through this region) that were connecting the Indian landmass with the Central Asian cities and Arabia. The control over these trade networks was crucial as these routes and the dunes of Thar were the main lands for the import of horses and other luxury items into the medieval kingdoms of India. Majority of exports were also channelizing through these routes. Even after the extension of imperial authority in these territories, the central (core) state never directly came out on ground to manage this region. For organizing various activities in the region, the state employed the native Rais and Ranas, as the intermediaries (representatives) of the imperial power and left the region under their autonomous guidance. Till the end of the 16th

century various ruling dynasties had autonomy and control over their respective regions. The interference of the imperial state in the desert region set in only after the acceptance of the Mughal sovereignty by the states (who were in interiors of desert). That too, was limited to the economic and political motives.

Prior to the Mughals, the slaves and the Lodhis didn't have much interest in this dense desert. Their concentration was more towards the regions of east which were booming with the revenue opportunities. The central states never interfered with the social life and the cultural set-ups of the desert region due to its nomadic element. The exclusive treatment extended by the imperial states to the trade routes and the revenue resources clearly indicate their single objective of securing their economic interest in the region.

Nearly all the medieval states kept their forces active even during the times of peace. Albeit, the Mughals were making many exceptions from the medieval kingdoms but in this matter they also didn't extend any privilege to their standing army. This was in order to keep the army and soldiers in practice and form. The state organized constant drills of the war skills which were the need of time. The forests were considered as the areas of foe, wilderness and full of surprises. These specifications made forests fit to be the most 'perfect grounds/fields' to refine and sharpen the skills of war, to train soldiers and the fields to display the acts of bravery. The constant engagement of Akbar in forests (hunting), while he is on the move, serve as remarkable examples of the army training. Similarly, Jahangir was also very regular with his hunting expeditions. The control and power exerted over the animal was always defined as a synonym of controlling the rebellions and the acts to curb the wilderness.⁴⁸ The absence of forest cover and more specifically the limited presence of the sporting activities in the sands of desert didn't allow the imperial forces to exchange frequently with this area of scanty production. Though the Persian sources do point at hunting expeditions in the regions of Ajmer,

⁴⁸ Manisha Choudhary, 'Setting the Game of Ferocity and Innocence: Hunts of Jahangir', *American Research Journal of History and Culture*, Vol. 4, Issue-1, pp. 1-18.

Nagaur etc. but those were limited to the shooting of *nilgais*, gazelles, deer, some small animals and variety of birds. The rationale that guided the movements of imperial forces was the abundance of wildlife in the forests specially the ones which surrounded the capital cities and the various *sarkar* headquarters (such as Mandu, Gujarat, Delhi, Silkot, Rohtas etc.). Further, the fighting armies were always kept on the routes which were well supplied with the diverse resources that were required by large number of soldiers and animals, accompanying the *laskar*. Therefore, the forests around the inhabited areas (clusters of villages) became obvious choice and the villages appearing on the regular intervals came up as the favourite halting stations of the imperial army. The other necessity that made the imperial troops stick to the inhabited routes was the requirement of military labour, for carrying out the mundane activities related to soldiers and military animals. The hunting was a way to spend time in thrill, which became a hobby, surrounded with the sense of refinement of the military skills, assessment of valor and courage and display of bravery. Throughout the human history the necessities were always on the higher pedestal than the hobbies. The latter was practiced only when the resources were available above the benchmark of survival and subsistence. The environmental conditions of the Thar Desert acted as natural deterrent against the movement of the imperial forces in this dry region due to the package of hardships offered by it.

Here, a description provided by Ibn Khladun will be of great help to understand the texture of the desert and the negotiations set in (or employed) by the groups who moved into it. 'Al-Mas'udi also mentioned that one of the Himyar kings after Afriqus, Dhul-Adh'ar, who lived in the time of Solomon, raided the Maghrib (a desert of North Africa) and forced it into submission. Something similar is mentioned by al-Mas'udi concerning his son and successor, Yasir. He is said to have reached the Sand River in the Maghrib and to have been unable to find passage through it because of the great mass of sand. Therefore, he returned.... Soldiers traveling in regions other than their own have to requisition grain and livestock and to plunder the countries they pass through. As a rule, such a procedure does not yield enough food and fodder. On

the other hand, if they attempted to take along enough provisions from their own region, they would not have enough animals for transportation. So, their whole line of march necessarily takes them through regions they must take possession of and force into submission in order to obtain provisions from them. Again, it would be at most unlikely and impossible assumption that such an army could pass through all those nations without disturbing them, obtaining its provisions by peaceful negotiation....Although Maghrib has often been crossed and its roads have been explored by travelers and raiders at all times and in every direction'.⁴⁹ This narrative defines the problems and the managements that were required to be put in place by the traders and raiders before setting out for travel and while travelling, through any intense desert. For the Mughals, the Desert of Thar was a region to be left with its own inhabitants for the management and apparently, the situation of law and order in the desert didn't bother them much. Therefore, the desert was left with the Rajput rulers whose dynasties were housing in Thar. As mentioned above, the desert of Thar for the Mughals of India (those who were no more in their exile⁵⁰, literally emperors who reigned Akbar onwards) was the synonym of decline and a region for ending, and concluding various unpleasant events and ill-assorted personas of the state. The confusions, challenges, and illusions posed by this desert were used for burying various unaccepted events, and disapproving and deifying personalities of the state. The execution and expulsion of Baihram Khan is the most appropriate example to prove it. The desert accommodated and justified the professional approach of the imperial state!

The desert of Thar holds a very different approach towards the life than various other deserts that are spread over a large

⁴⁹ Ibn Khaldun, *The Muqaddimah: An Introduction to History*, (tr.) Franz Rosenthal, pp. 62-3.

⁵⁰ *Akbarnama*, vol. 2, pp. 371-72. Humayun was expelled from Agra by Sher Shah Sur (Sher Afghan Khan). During his exile he lived in the desert of Thar (Bikaner, Jodhpur, salt ranges of Sambhar Lake, Jaisalmer, Phalodi and Nagaur) and requested the safety and asylum from Maldeo, the ruler of Jodhpur against the Afghan Khan.

part of the world. With the introduction of Islam in this region during the medieval centuries, this approach got altered to another degree. Arrival of Moinuddin Chisti in this region around the end of the 12th century also caused a direct disparity. Now, Ajmer was directly connected to Delhi and the exchanges between both the regions became regular. Earlier, Ajmer, being an alternate capital of the Chauhan Rajputs was tapped occasionally. The sultanate interacted with this region only for the collection of revenue and at times to assert the political victory of Islam, which was celebrated by building the *Adhai din ka Jhopra*. Today, it is a popular historical site mainly for all those who visit the *dargah* of Mohinuddin Chisti, as it stands a few paces away from the grave of saint. Besides the hordes of the visitors who hit the *dargah* of Garib Nawaz, hardly any intriguing mind reaches this remarkable monument. The regular visitors who reach this site and mark the exceptions are the enthusiast love-birds, children looking for cricket pitches, and grazing goats and cows. Except minor violent engagements and altercations, all these three constant share-holders mark their presence in and around this monument without any real struggles. The direct links of Delhi *sultanates* with Ajmer were well established by the end of the 12th century, but the regions beyond were untouched and unexplored. The ruling class of *sultanate* was occupied with the politics of central India and the lucrative revenues of the eastern provinces. Few efforts were made to control and regulate the regions of southern Rajasthan mainly for controlling the invincible forts of Ranthambor and Chittor, as both were crucial locations to penetrate in the central India and to gain access to the western coast. Later, with expansion of the 'religious frontier'⁵¹ of Islam, the *Chisttis* established one shrine at Nagaur and Chisti Hamiduddin Nagauri was declared its leader. Later, both became leading centres of Sufism. Since medieval times, the tradition of both the shrines were carried forward and gradually, this led to the expansion of Sufism in different parts of the Indian subcontinent. The desert of Thar was not oblivious to

⁵¹ Richard M. Eaton, *The Rise of Islam and Bengal Frontier: 1204-1760*, University of California Press, Berkeley, 1993.

this expansion of Sufism but was not affected much because the element of religion doesn't bother the natural conditions (Nature and ecological environment). The inherent exploitation of the natural surroundings is an obvious character of humans irrespective of religious and sectarian affiliations. With these changes and new introduction in the regions of Nagaur and Ajmer, the interaction with this region changed for both political and religious reasons. The Sufi centre of Ajmer was emerging as a popular centre of religious and Islamic educational activities. Due to it, this shrine was attracting both the politically ambitious personalities and the aspiring Islamic theologians and jurists. All these interactions accelerated the movements of humans and animals in this region which exerted an immense effect on its geography. The demands of the visiting armies along with the regular inhabitants created a pressure on the local resources and ensured the forced diagnosis of its natural surroundings, to suit and meet the human needs.

As stated above the regular interaction of the centre did not extend beyond Ajmer. The Mughal imperial forces entered the desert occasionally. Open struggles between the centre and the dynasties of Thar were rare. The highly structured tension between the imperial centre and this peripheral region came to the platform only in the middle of the 16th century. Later, the centre left these desert states as autonomous bodies who had accepted the sovereignty of the Mughals. In order to mark these dynasties as special associates of empire, the nature of the land assignments that were granted to the dynasts' of Thar Desert were kept twin (in nature), as *watan-jagir* and *tankhwa-jagir*. This arrangement helped the Mughals to control this area better, without getting in the troubles and facing the challenges, posed by the desert. As mentioned earlier, the aim of this work is not to attempt a political history. However, the above discussion is required to highlight the expansions of imperial activities in this region that made significant contributions to its history. The imperial interactions helped in exploring the voluminous potentials that were either not recognized, or less attempted. Further, this led to the collection of ample data about the region and its natural reservoirs.

The archaeology has been the most successful science for

exploring the past, especially to gather the material remains from the human settlement and the habitations, as humans do leave material and tangible proofs behind. In the Indian subcontinent, the identification of the hunter-gatherers of the Stone Age, the excavation and explorations of Neolithic Age settlements and the Harappan culture are true marvels of archeology, a rational science. The growth of physical sciences has further contributed to the investigative potentials of archaeology, in terms of locating proofs and interpreting data. This work is limited to the use of geo-archeological findings, manuscripts, reports compiled by officials and archival documents, therefore an inquiry through the field archeology will be a miss. Some ethnographical and anthropological data have been collected while travelling in distant parts of the Thar Desert in order to understand its social organizations and varied mechanisms of living. Through the study of geo-archaeological reports, an attempt will be made to explore the trio between the Thar Desert, its habituating groups and the diverse components of its environment.

The desert of Thar forms a rectangular territory and the noteworthy cities of Rajasthan namely Barmer, Jodhpur, Jaisalmer and Bikaner lie within its vast dunes. Hanumangarh, Ganganagar Jaipur, Ajmer, Sikar, and Churu are the chief cities of the arid zone and are carriers of the desert effect. Thus, to fix the area of study it can be said that the work will be fixed into the present territories of the Barmer, Jodhpur, Jaisalmer, Bikaner, Sikar, Jaipur, Ajmer and Churu. The peripheries will be explored in relation with the main cities of the desert. The foundations of all these cities are attributed to the long span medieval centuries. Amongst the above mentioned cities/states, the foundation of Jaisalmer (Tanot) dates earliest. Since the *thikana* of Sikar was found in the late 18th century, it can be counted as the last. The most significant of these states was Jodhpur (better known as Marwar). Its foundation was laid down by Rao Jodha in VS 1515/1459 AD.⁵² As per

⁵² Captain P.W. Powlett, *Gazetteer of the Bikaner State*, Introduction, (Office of Superintendent of Government Printing, Calcutta, 1874), Book Treasures, Jodhpur, second edition 2017, p. i.

Col. Malleson, the Bhatias of Jaisalmer were the descendants of the Yadu tribe and they formed their capital in the Great Indian Desert by building a fortress called Tanot and made it their capital in AD 731.⁵³ The Kachwahha Rajputs were ruling over the Amber kingdom, which was a very small territory. Fortune arrived to them only after formation of alliance with the Mughals in 1560s. The Bikaner kingdom was found by Rao Bika. He was the sixth son of Rao Jodha of Marwar. Bika left Jodhpur in 1465 AD and laid down the foundation of Bikaner city in 1489 AD.⁵⁴ So, it can be asserted that the foundation of all these cities in the Thar Desert began in the 8th century and by the 18th century, all these cities were able to secure their respective arenas.

Writings of Tod also testify for the towns and the cities that existed in the 14th century. While describing the attack of Alauddin Khilji's attack on Chittor, he notes that 'Jaisalmer, Gagraun, Bundi, the abodes of the Bhatti, the Khichi and the Har, with many of minor importance, suffered all the horrors of assault from this foe of the race, though destined again to raise their heads. The Rathors of Marwar and the Kachhwahas of Amber were yet in a state of insignificance: the former were slowly creeping into notice as the vassals of the Pariharas, while the latter could scarcely withstand the attack of the original Mina population'.⁵⁵ The Jaipur kingdom gained prominence only in the 16th century after forming alliance with the Mughals through a marriage that was celebrated at Sambhar in March of 1562 AD.⁵⁶ After it, Kachwahha house constantly rose to eminence and its members held high offices in the Mughal state. Looking at the sporadic rise of the Amber kingdom, the kingdom of Jodhpur⁵⁷,

⁵³ Malleson, *An Historical Sketch of The Native States of India*, p. 118.

⁵⁴ Powlett, *Gazetteer of the Bikaner State*, pp. 1-3.

⁵⁵ Tod, *Annals and Antiquities of Rajasthan*, vol. 1, p. 312.

⁵⁶ *Akbarnama*, H. Beveridge (tr.), vol. 2, p. 241-43 and R. N. Prasad, *Raja Man Singh of Amber*, The World Press Pvt. Ltd., Calcutta, 1966, p. 8.

⁵⁷ Norman P. Zigler, 'Some Notes on Rajput Loyalties during the Mughal Period', in J. F. Richards, (ed.) *Kingship and Authority in South Asia*, Maidson, *South Asia Studies*, 1978, pp. 215-250 & 'Marwari Historical Chronicles: Sources for the Social and Cultural History of

Jaisalmer⁵⁸ and the Bikaner state⁵⁹ also entered into the matrimonial alliance with the Mughals to secure their future fortunes. All these efforts were crucial for the political settlements and to secure the important positions.

It would be interesting to know why, when and how these ruling houses landed in the desert. The earliest ruling house was of Tanot (Jaisalmer). They arrived in this area due to the expulsion encountered by them at the hands of Gahzni in the 8th century. For the settlement of Rathors in the Thar, Col. James Tod provides that 'the splendor of this monarchy...weakened by its contest with the Chauhans of Delhi, it fell a pray to the invaders, and how, 'in sambat 1268 (AD 1212), eighteen years subsequent to the overthrow of Kanauj, Seoji and Sait Ram, grandsons of its last monarch, abandoned the land of their birth, and with two hundred retainers, the wreck of their vassalage, journeyed westward to the desert with the intent, according to some of the chronicles, of making a pilgrimage to the shrine of Dwarka, but according to others and with more probability, to carve their fortunes in fresh fields unscathed by the luxuries in which they had been tried, and proud in their poverty and sole heritage, the glory of Kanauj'.⁶⁰ Thus, the Rathors under the leadership of Seoji reached the wilds (desert) of Marwar and nearly after two hundred years of migration into the desert, the capital of Marwar was established by Rao Jodha in 1459 AD. As civilization and cultures evolve gradually, while slowly penetrating its rooting progress in the regions where it can survive and prosper, they don't sustain in the places where they are not owned or have not been allowed to flourish at a regular pace. The exit of any civilization is assured, when it is constantly pushed into shock, thrashed, and not provided some time to sustain on

Rajasthan', *The Indian Economic and Social History Review*, 13(2), 1976, pp. 219-250 & 'The Seventeenth Century Chronicles of Marvara: A Study in the Evolution and use of oral Traditions in Western India', *History in Africa*, vol. 3, 1976, pp. 127-153.

⁵⁸ *Akbarnama*, vol. 2, p. 518. This was in the year 1570.

⁵⁹ *Akbarnama*, vol. 2, p. 518.

⁶⁰ Powlett, *Gazetteer of the Bikaner State*, p. i.

its own. The Rathors have been able to sustain themselves in the desert of Thar for nearly two hundred years and gradually it formed the base for the foundation of their capital, which culminated as Marwar. The preposition propounded by Khaldun, 'Only tribes held together by group feeling can live in the desert'⁶¹, too proves true in this case of Thar Desert. The political economy of community feeling and their interaction came out loud with the formation of the Marwar state (Jodhpur).

History is witness to the fact that the possible absence of an effective leader, and the community affiliations did work as factors of disintegration which culminated the collapse of many dynasties. In Thar, the scarcity of direct resources, lack of defense, and constant exposure to the tough life were sufficient reasons for the communities to come together and aspire jointly. 'The restraining influence among Bedouin tribes comes from their *shaykhs* and leaders. It results from the great respect and veneration they generally enjoy among the people. The hamlets of the Bedouins are defended against outside enemies by a tribal militia composed of noble youths of the tribe who are known for their courage. Their defense and protection are successful only if they are a closely-knit group of common descent. This strengthens their stamina and makes them feared, since everybody's affection for his family and his group is more important (than anything else). Compassion and affection for one's blood relations and relatives exist in human nature as something (that) God (has) put into the hearts of men. It makes for mutual support and aid, and increases the fear felt by the enemy. Those who have no one of their own lineage (to care for) rarely felt affection for their fellows. If danger is in the air on the day of battle, such a ones links away and seeks to save himself, because he is afraid of being left without support and dreads (that prospect). Such people, therefore, cannot live in the desert, because they would fall prey to any nation that might want to swallow them up. If this is true with regard to the place where one lives, which is in constant need of defense and military protection, it is equally true with regard to every other human activity, such as

⁶¹ Ibn Khaldun, *The Muqaddimah: An introduction to History*, p. 170.

prophecy, the establishment of royal authority, or propaganda (for a cause). Nothing can be achieved in these matters without fighting for it, since man has the natural urge to offer resistance. And for fighting, one cannot do without group feeling, as we mentioned at the beginning. This should be taken as the guiding principle of our later exposition'.⁶² In the Sand Ocean of Thar, the Rathors stayed for a long period and their consistency of stay in the region, along with the community feeling, led to the foundation of a capital city and that too in the heart of intense desert. Later, the developments around the capital paved path for the cultural invocations and assimilations. In the tracts of deserts where many tribes and groups inhabit, no dynasty would have been ever successful to establish itself firmly. Thus, in the deserts, it is rare or impossible to see a state not based on kinship and clan associations. It is evident from various studies that the social and political organization of all the desert states such as Jaipur, Jodhpur, Jaisalmer and Bikaner depended heavily on the kin and clan relationships and the clout of power was a shared entity amongst the active members.

All the situations and associations that were required to push-up the state formation in a desert were present in the Thar Desert. The network of the clan relationships worked favourably for the Rathors. So, it is evident that the physiology of desert is no barrier to the developments of the human society. The sedentary lifestyle adopted by the immigrant Rathors paved way for the civilizational and cultural developments. Egypt and Syria in the 14th century were 'free from tribes and group feelings; indeed, one would never suspect that Syria had once been a mine of them...Royal authority in Egypt is most peaceful and firmly rooted, because Egypt has few dissidents or people who represent tribal groups. Egypt has a sultan and subjects. (Egypt's) ruling dynasty consists of the Turkish rulers and their groups. They succeed each other in power, and the rule circulates among them, passing from one branch to another'.⁶³ Both the cities are located in the heart of vast deserts.

⁶² Ibid., pp. 170-1.

⁶³ Ibn Khaldun, *The Muqaddimah: An Introduction to History*, pp. 220-1.

A similar kind of picture is visible in the desert of Thar, which is an opera of many nomadic groups but none of them aspired to become a dominant force and therefore, the political power continued amongst the off-shots of Rathors and Bhattis.

All the instances mentioned here prove that Thar Desert was never devoid of the human activities and over the centuries, being a base of multi-layered exchanges, it has allowed many cultures to flourish in its undulating womb. The archaeological evidences located around the course of river Ghaggar are solid proofs to establish this contention of the Thar Desert from the upper Paleolithic age onwards. The efforts for locating the foundation and significance of the states and the sites have been made in the approaching chapter in order to carve a presentable environmental history of the region. The formation of the medieval states has expanded the ambit of sources available for re-constructing the history of this region, due to the shift caused by the popular trend of the history writing during the contemporary times. The revenue records were created to keep a tract of the economic health of the state which ultimately provided stability to the ruling apparatus. Various types of archival records will be used for this work in order to harness the relevant information required for creating a history of this landscape. The limbs of the states were multi-layers which became base for the cultural developments and in long run inspired many other dynasties. Even today they continue to motivate the different dimensions of life in Thar.

The reports of the British officials have defined this region as the north-western part of India, marked with famous desert of Thar Desert. Geologists and geographers prefer to call it the Great Indian Desert and the literary personas aspire to call it the Great Ocean of Sand. All these nomenclatures were ultimately employed to define the features of the Thar Desert which is housing many sites of the most acclaimed and admired civilization of the world, i.e. the Indus Valley Civilization. To mark the territorial extent and features of the Dry Thar, it has been noted that 'the "great desert" forming the whole of the Rajputana-Sindh frontier, extends from the edge of Rann of Cutch beyond the Luni river northward; and between it and what has been called as the 'little desert' on the

east is a zone of less absolutely sterile country, consisting of rocky land cut up by limestone ridges, which to some degree protect it from the desert sands. The 'little desert' runs up from the Luni river between Jaisalmer and Jodhpur into the northern wastes. The character of this region is same everywhere. It is covered by sand-hills, shaped generally in long straight ridges, which seldom meet, but run in parallel lines, separated by short and fairly regular intervals, resembling the ripple-marks on a sea-shore upon a magnified scale. Some of these ridges might be two miles long, varying from 50 to 100 ft, or even more, in height; their sides are cored by water and at a distance they look like substantial low hills. Their summits are blown into wave-like curves by the action of the periodical westerly winds; they are sparsely clothed with stunted shrubs and tufts of coarse grass in the dry season, while the light rains cover them with vegetation. The villages within the desert, though always known by local names, cannot be reckoned as fixed habitations, for their performance depends entirely on the supply of water in the wells, which is constantly falling or turning brackish; and as soon as the water gives out, the village must shift. A little water is collected in tanks or pools, which become dry before the stress of heat begins, and in places there are long marshes impregnated with salt. This is the character, with more or less variation, of the whole north and north-west of Rajputana. The cultivation everywhere is poor and precarious, though certain parts have better soil than others, and some tracts are comparatively productive. Along the base of Aravalli range from Abu north-east towards Ajmer, the submontane region, lying immediately under the abrupt northern slopes and absorbing their drainage, is well cultivated, where it is not covered by jungle, up to the Luni; but north-west of this river the surface streams are mere rain gutters, the water in the wells sinks lower and lower, and the cultivation becomes more patchy and poorer as the scanty loam shades off into the shady waste. As the Aravalli approach Ajmer, the continuous chain breaks up into separate hills and sets of hills. Here is the midland country of Rajputana, with the city of Ajmer standing among the scattered hills upon the highest level

of an open table-land, which separates east towards Jaipur and slopes by degrees to all points of the compass. From Ajmer the Arvalli trend (please read turns) north-eastward, never reuniting in a chain but still serving a divide roughly, though less distinctly, the sandy country on the north and the west from the kindlier soil on the south and east'.⁶⁴ This description helps to identify the geography, terrain, and weather of Thar as it was known to the compilers. Nearly, a century ago the desert has been defined with all the specifications that were identified by the imperial masters to know the areas better so it can be administered in a better way.

The aspirations around the desert have been reflected more through the literary expressions. The difficulties and the challenges of the dry and semi-arid region that have shaped the psychology of the inhabitants, and the travellers over a period have led to the development of a peculiar kind of philosophy amongst the inhabitants. Their philosophy includes 'dependence on at hand skills' and 'hands on' and most significantly, to be 'connecting with' and 'caring for' all the surroundings. The development of these features have not been treated well in the historical records, except a few casual mentions here and there, that too for highlighting the hardy conditions only, such as 'saved a painful journey over the *Tabl*' and 'region of death',⁶⁵ etc. The absence of such information in the records is a pull-back factor for the historians. Rather than sitting back with this situation, researchers shall exert effectively and engage creatively to extract some alternate sources which shall be able to reflect upon the distinctions of the region and be helpful to gain an insight into the various dimensions of the desert.

Scholars engaging in critical studies consider absurdity inherent in the literal meaning of the literary accounts. Therefore, the historical informations and interpretations of past, that flows through the creative imaginations, are treated as 'not acceptable to the intellect'. It is due to description of certain things and events in a

⁶⁴ *Imperial Gazetteer of India, Provincial Series: Rajputana*, 1908, pp. 2-3.

⁶⁵ Tod, *Annals and Antiquities of Rajasthan*, vol. 1, p. 19.

particular style that makes such information an object of suspicion. The normative method for distinguishing right from wrong in historical information on the grounds of (inherent) possibility or absurdity is aimed to investigate human social organization, which gets identical with civilization. The conditions that attach themselves to the essence of civilization as required by its very nature, shall be distinguished from the things that are accidental (to civilization) and uncountable. In historical information, in order to distinguishing the authentic from the unauthentic and factual truth from falsehood by means of a logical demonstration admits (without doubts) that there is need of a normative method. Lorenz notices that historians do argue about the interpretation of past but have little to say about the significance of their arguments.⁶⁶ It is true that historians argue, they argue about their description, interpretation and explanations of the past. But all these processes have to travel through the standards of justification which are to be arrived after careful analysis. So, now the question is what can be argued and proven! The historians will say 'Anything and Everything', that have left the possible remains and is surrounded with some credible and fairly 'comprehensive account' and some 'constructive explanations' of a casual process around it will make it provable. The historians simply and only pick out the cause of interest and tries to pin the case with arguments that channelize through the credible historical account and develops with the evidences available. Thus, clearly history is no matter of opinion it has to be rationally justified as credible and not necessarily fair always. Another issue of debate that bothers the historians and anthropologists is labelling of the events, thought and action as the Big and Little. 'Or perhaps it is about High and Low, Dead and Living, Written and Oral, Particular and General, Description

⁶⁶ Chris Lorenz, 'Historical Knowledge and Historical Reality: A Plea for Internal Realism', in *History and Theory; Contemporary Readings*, Brian Fay, Philip Pomper and Richard T. Vann (eds), Blackwell, Malden Mass, 1998, p. 350.

and Explanation or Art and Science'.⁶⁷ Whatever it is, it has to be accessed and proven through the appropriate methodological tools by thrashings around the events of past. This ultimately leads to the understanding about certain conditions occurring in a civilization or a culture, and further to sort on 'what to accept' and 'what to declare spurious'. Methodology around the discipline is the only sound yardstick and with its help historians can mark the authenticity, process of events happened in past and their significance. In connection with the explanation that history holds it can be purposed that the purpose of this discipline is to serve. But as jurists say that adultery confuses pedigrees and destroys the (human) species, murder too destroys the human species. In a similar manner the injustice in the history writings will invite the destruction of civilizations with the necessary consequences, under which the (human) species will be destroyed!

Thus, the history of Thar and its contributions to the subcontinent need to be harnessed by thrashing the scattered evidences. The huge gap in the history writing needs to be dealt in light of the sources. Gradual exploration of evidences and the geographical setting along with the collections of folklores (by acknowledging the role and contribution of memory) in the history writing will lead to larger deliberations which will surely help to churn out connecting links in the region of our study that has been ignored in history writings for long. This chapter was mainly an effort to understand the formation and fixation of different contours of Thar Desert as understood by different dynasties, and the events that has transformed this valley of sand. The following chapter will look into the Thar and its various components that kept on adding, appearing, disappearing, and declining while working as the guiding forces, which ultimately formed the basis of survival and subsistence for all the beings, living in and moving through this sand ocean since time immemorial. Further, it will

⁶⁷ Clifford Geertz, 'History and Anthropology', in *Historiography: Critical Concepts in Historical Studies*, Robert M Burns (ed.), vol. IV (Culture), p. 104.

note the extensive details about the sand varieties, water sources along with flora and fauna which will help the readers to have a living experience with the wonder of Thar Desert. While travelling through the Thar one might not get to experience a vast variety of surprises, information, and bewitching glimpses that await a probing reader in following chapter with the surety to offer various moments of stonker.

CHAPTER 2



The Carnival of Thar

*Jitno gharo pane, uta ghare manas**

Desert is not an unusual occurrence. Many deserts are spread all around the globe. So, it is a constantly occurring feature but the reactions and understanding around the deserts have been always terrifying and shaking. The simple cause for the same is the absence of sensitivity towards the desert and a feeling of uselessness attached to the dry terrain, which is not necessarily always dry. It is significant to highlight that many deserts have served as the base for the various illustrious cultures or civilizations. The most explored and active deserts in terms of the cultural and civilizational contributions are the deserts of Thar (India) and Cairo (Egypt). Both the deserts have guided and have in their womb the most astonishing wonders of the world, namely the Indus Valley Civilization and the Great Pyramids. Both these deserts keep on appearing in various medieval texts for varied reasons. Ample historical information about the desert of Egypt is available due to its exchanges and encounters with the Central Asian world, which further proliferated due to the expansion of Islam and interaction of the forces. The encounters of Islamic forces with various tribes of Cairo desert converted this geographical territory into a political zone that was constantly struggling.¹ The struggles

* The remoteness of underground water defines the profoundness of people.

¹ Abd Ar Rahman bin Muhammed Ibn Khaldun, *The Muqaddimah: An Introduction to History*, translated from Arabic by Franz Rosenthal,

were mainly between the tribes and majority of them became adherents of Islam. The deserts of other parts of the world have also been studied in terms of their contributions and limitations.² A similar kind of work has also explored the desert of Kuwait in terms of invention of oil and introduction of automobiles. It depicts the effect of these discoveries and inventions on the surroundings of the desert and its inhabiting shareholders.³ The city of Mecca is located in the heart of the desert and this city is central to the belief of every Muslim. Being the city of Islamic pilgrimage throughout the year, this city caters to large number of hordes, who come for *Hajj* and *Umra*. Besides these temporary inflows there is always a regular and permanent population. The introduction of modern technology (aircraft and high speed cars) in the region have drastically increased the pressure on the city, which has facilitated the speedy inflow of pilgrims, who were previously hitting these holy centres in small groups on the camel backs, after a reasonable travel and that was helping in balancing and regulating the population of the believers between the two cities of Mecca and Medina.⁴ The various speedy means of transports throw the throngs of believers in both the cities and therefore both the cities are pushed in a complete state of dismay. Generally, an immense and instant pressure looms to manage these cities with limited resources. All the aforementioned are continuing as the major deserts that have influenced the societies. Due to their consistency of continuity these deserts have been able to lead the foundations of civilizations and cultures, and in long run influenced many layers of various societies.

3 Vols, Bollingen Foundation, Princeton University Press, Princeton New Jersey, second print of second edition, 1980.

² Michael F. Logan, *Desert Cities: The Environmental History of Phoenix and Tucson*, University of Pittsburgh Press, Pittsburgh, 2006.

³ Marian Kent, *Oil and Empire: British Policy and Mesopotamian Oil, 1900-1920*, Macmillan, London, 1976 and Jill Crystal, *Oil and the Politics in the Gulf: Rulers and Merchants in Kuwait and Qatar*, Cambridge University Press, Cambridge, 1990.

⁴ Ziauddin Sardar, *Mecca: The Sacred City*, Bloomsbury Publishing Plc. London, 2014.

A similar type of influence sustains the Thar Desert which is an arena in close vicinity of the world's most flourished and advanced Indus Valley Civilization. The geographical frontiers and territorial limits of the Thar Desert along with its significance have been highlighted in the preceding chapter. The purpose of the previous chapter was to fix a territorial understanding about the region so that the readers can have a sense of the fact that even being a dry desert this landscape was never treated as a wasteland. Contrarily, all the dynasties, irrespective of their imperial significance, were aspiring to regulate and control it. The reasons for not considering the region as 'a wasteland' will be explained in detail at a relevant place. Being a region with rich deposits of diverse natural minerals and stone reservoirs, it attained significance. Besides these, the networks of trade routes and the trade-web coming through this region into the main land of India (up to Delhi and beyond) and taking out the business traffic into far and distantly placed cities of Central Asian, further enhanced its stature. The connectivity with various other principle centres of trade grew more and more, under the stable reigns of various dynasties that ruled over the vast land stretches, expanding from Amber (Jaipur) onwards into the regions of Bikaner and Jaisalmer and beyond.

The naturally available components in this region made it eligible for control coming in from aspiring minds wanting to get a direct access to its natural wealth. With the foundation of Delhi Sultante various new inventions were introduced in India. The chief amongst those were paper, water-proof cement, liquor distillation techniques and the use of lime mortar to fix the bricks in the rectangular and circular set-ups. The introduction of lime mortar facilitated to expand the thickness of walls and setting up of the circular tops over the wide square bases of buildings. So, the *gumbads* (domes) became possible. The specifications of aesthetic arrangements, inside and over a variety of buildings became attainable only through mortar. The stones of different shades and colours were also used to develop contrasts and decorate the buildings. The grandeur and aesthetic excellence attained by the medieval architecture became possible only with lime mortar. The medieval age of Indian history was given to extensive and huge

constructions. Thus, demand for various types of stones and other construction material was always in abundance. The belt of Aravalli was a sturdy and regular region for supply of these. For example, more than 80 percent of the building grade marble produced in India comes from Rajasthan. Nearly 10 different varieties of commercially extractable marble—*sangmarmar*—are available and these are differentiated on basis of their colour—white, pink, yellow, grey, rosette, grey striped, patterns of greens and browns. These are such because of the effects of volcanic actions, cook, traces, and solutions of metals that leach into them. Those who are in search of pure white marble stone generally go for the Makrana marble (instead of white marble), as it is the best marble. Makrana is a village in Nagaur district (Rajasthan) after which the white marble of India attained its name and a worldwide fame. Thus, it is after the name of village, Makrana, that the world knows this stone without really knowing-why it is called so! There are many other varieties of the marble available along with the large catalogue of the granite stones. The large varieties of stone and sand have helped the region to gain some of its economic significance. Most of Thar (*Thul*) desert have some or other deposits which are mostly available in form of minerals under the earth crust. The extractions of these have served the life blood for many dynasties. Thus, to appreciate the diverse economic significances of this region and to get a sense of associated environment, it is essential to gather some information about its ecology, natural surroundings (mainly the a-biotic and biotic), and social components.

E. Haeckel states, 'Ecology is the science treating of reciprocal relations of organism and the external world'⁵. Thus, the reactions and exchanges between the diverse elements which compete in any given environment make the environmental studies a branch of the rational studies. The study of environmental history is considered as a branch of intellectual history-writing, as if all the other types of history-writing are progressions of the stupid's, or in

⁵ G. S. Puri, *Indian Forest Ecology: A Comprehensive Survey of Vegetation and its Environment in the Indian Subcontinent*, 2 Vols., vol. 1, Oxford Books and Stationary Co., New Delhi, 1960, opening Page.

sophisticate terms, simple minded people. In light of this everyone related to history, directly, or distinctly is required to think for the ranking of economic history!

For an overall understanding of any natural region, it is essential to classify its components. The components of Thar Desert have been classified as Natural and Social, in order to pull out and lay together the different independent actions that were happening in this desert and see the close and distant relationships, exchanges amongst them. Under the classification of natural components, the living organisms, birds, animals, and different types of vegetations along with the mineral resources available on and under the earth crust will be discussed. In the category of social components effort will be to highlight the nature of human activities in the desert. An attempt will also be made to understand the effects of human activities on the Great Indian Sand Ocean.

Prof. Champion did the primary classification of the Indian vegetation and it was 'for first time properly arranged in ecologically distinct, climatic, edaphic and biotic types. It has been assumed that the original vegetation of India is a forest of some kind or the other and all other types have been considered as natural and artificial variations of the forest climax'.⁶ G. S. Puri was the pioneer in the India to work in this field, with his book entitled *Indian Forest Ecology*. This inspiring work has motivated many scholars to use this research as the 'model framework' for carrying out model works in the ecological studies. The book contains a chapter called 'The Botanical Regions of India' and surprisingly, the Thar Desert is a miss there! Later the vegetation of the desert found its space in 'The Biotic Forests of India'. Subsequently, it mentions that the vegetation has been classified as per the moistures received by their respective regions. The climatic zones were also determined by the fluctuations of moisture received, on account of monsoon. It is difficult to give an accurate definition of any ecological environment in absence of tangible evidences, gaps in climatologically data, sudden environmental changes, and lack of sufficient data at hand. All this leads to disagreement amongst the

⁶ Ibid., *Preface*.

scholars. It is clearly visible through the different definitions of the different desert that have been extended by scholars. Paramanik, Hariharan and Ghosh have defined desert as an area having rainfall of 25 cm or less and mean annual diurnal range of 18°F or more, semi-deserts as having rainfall between 25 to 50 cm, and mean annual of diurnal temperatures 18°F or more.⁷ Boyko defines dry desert as an area with a waterless surface as a result of poor and erratic rainfall.⁸ Davis states that a desert formation in Australia is in an area where the rainfall is less than 8 inches.⁹ Emberger considers the true desert to be restricted to a climate characterized by precipitation without seasonal rhythm and period of more than a year without precipitation.¹⁰ As per all these benchmarks, the Great Indian Desert qualifies to be an intense desert as it fits well in nearly all the above parameters. This elevation of Thar and its enrolment in the ranks of pure desert on basis of annual rainfall received and the level of dryness is not surprising. In order to avoid the confusion around the geographical extent of the Thar Desert, it is demarcated by its natural boundaries for this work. Its eastern boundary is marked from the western slope of Aravalli hills and the western frontier ranges up to the plains of Indus or more appropriately up to the dry Ghagghar plains. The southern boundary is marked by the salt marsh of Kutch and the northern territory is limited to a few districts of Haryana. All the surrounding elements of Nature (hills, swamps and rivers) have influenced the structure and composition of the vegetation, which continue to differ as per the reorientation of the climatic zones. It is noticed that diverse edaphic and biotic factors do play a significant

⁷ S. K. Pramanik, S. P. Hariharan and S. K. Ghosh, 'Analysis of the Climate of the Rajasthan desert and its extension', *Indian Journal of Met. Geophys.*, vol. 3, 1925, pp. 131-140.

⁸ H. Boyko, 'Iran, Israel and Turkey', in *Plant Ecology: Reviews of Research*, UNESCO, Paris, Arid Zone Research, vol. 6, 1955, pp. 40-76.

⁹ J. G. Davis, 'Australia' in *Plant Ecology: Reviews of Research*, UNESCO, Paris, Arid Zone Research, vol. 6, 1955, pp. 114-134.

¹⁰ L. Emberger, 'Afrique du nord ouest' in *Plant Ecology: Reviews of Research*, UNESCO, Paris, Arid Zone Research, vol. 6, 1955, pp. 219-249.

role besides temperature and rainfall. The natural vegetation of the Thar is composition of various shrubs and trees with few plants and some scattered grasses. Mostly the thorny bushes qualify to form the group of the most widely spread-out vegetation. Over the centuries, both humans and animals have been consuming the products that have been made available by shrubs. The equal dependence of animals and humans on the twinges, tiny leaves, beans and roots of shrubs has fixed many in wonder.

Physiographic division of the Sind-Rajputana desert was attempted. But the natural factors keep changing the natural boundaries, thus they don't permit the fixation of geographical territories as attempted by various sciences. For the purpose of studies, the Sindh-Rajputana desert was classified as follows¹¹:

- a. *Thar*: sea of sand in direction of north-west and south-east monsoon
- b. *Pat*: lower sand hills with north south orientation
- c. Ghaggar plains
- d. Steppe deserts: uplands of Rajasthan more or less rocky along the north and western fringes.

All the above categories only help to understand the geomorphology of the entire desert. Thus, the classification of the resources that make Thar rich and diverse can be initiated from its sand which is the primary component of its existence. The abundance of sand has served enough illusions for this desert as a place of bewilderment, dismay and finally, death (*Marusthali*) which is the most fearful to hold. The sand dunes are not uniform throughout the Thar desert; their nature, design, flow, sand, etc. are significantly diverse. The dunes in the part of Jaisalmer district (India) which run across the border to Pakistan are mobile in nature and roughly cover 3,200 sq. km. These dunes are called as *dra-in*, *dherna* or *kochar*. The popular *kochars* are *Rangiwalo Kochar*, *Karo Kochar*, *Bhirhanro Kochar* and *Paniri Kochar*. The dunes that are more or less permanent and stable in nature are called *bhiti*

¹¹ M. B. Pithawalla, *Physical and Economic Geography of Sind*, Karachi, 1959.

or *tibbas*. The desert of Jaisalmer can be classified in two parts on basis of the nature of sand dunes. Mallani region constitutes the southern part of Jaisalmer desert and here the sand dunes are more or less fixed, while the northern desert is marked with constant shifts.

The geographers have tried to understand the nature of dunes and types of soils, in order to get an idea about the fertility and agricultural scope. Scholar, C.S. Breed¹² and Kar¹³ have mapped the dunes of Jaisalmer and called them barchanoids and McKee¹⁴ compounded them as megabarchanoids on basis of their barchans, barchanoids, height and size. The various nomenclatures imported to define the structure of these dunes are longitudinal, parabolic and transverse dunes. The hottest months launch around March and continue to serve till end of July and along with the dryness the temperature ranges between 35°C-50°C. The velocity of wind is also highest during the months of May, June and July which causes maximum movement of sand. The major sand moving winds flow from south-west and are called south-western winds and they elongate the field of the dunes. The nature of dunes around Jaisalmer have been defined as, 'on average the compound megabarchanoid chains within the fields are 35-45 meters high and are closely spaced, although the peaks of over 50 meters are also numerous. Each of these multi-arch chains is a complex of several crescent-shaped giant dunes which are arranged in a fish-scale pattern...the wavelength of the compound megabarchanoids varies from 250-300 meters, while that of the fringing simple barchanoids varies from 100-150 meters'.¹⁵ This description

¹² C. S. Breed, S. C. Bryberger, S. Andrews, C. McCauley, F. Lennertz, D. Gebel and K. Horstman, 'Regional Studies of Sand Seas using Landsat (ERTS) imagery', in E.D. McKee *A Study of Global Sand Seas*, Tunbridge Wells, Castle House Publications, Kent, 1980.

¹³ Amal Kar, 'Origin and Transformation of longitudinal Sand dunes in the Indian Desert', *Z. Geomorph*, Vol. 31, pp. 311-37.

¹⁴ E. D. McKee (ed.), *A Study of Global Sand Seas*, Tunbridge Wells, Castle House Publications, Kent, 1980.

¹⁵ Amal Kar, 'Megabarchanoids of the Thar: Their Environment, Morphology and Relationship with Longitudinal Dunes', *The*

depicts the density of the sand and indicates to the massiveness of the closely webbed dunes which do sends shiver down the spine!

The value of sorting, kurtosis and skewness of the sand and dunes has been plotted against the mean grain diameter (of sand) and it facilitates to classify in the following four clusters:¹⁶

- a. Barchans and simple barchanoids (low wind formations);
- b. Megabarchanoids (the crescent arch is usually between 40 to 50 feet's);
- c. Barchanoids crest of longitudinal dunes and
- d. Stable longitudinal dunes and inter-dunes.

According to Glennie, the barchans and barchanoids develop with lower wind velocities and longitudinal dunes get formed due to the higher velocities of winds which occur constantly.¹⁷ The above clusters do reflect their respective environmental differences along with the role of local winds that allows the intermixing of sediments from both the sides. The value of kurtosis will be high in the stable longitudinal dunes. Bharadwaj classified the dunes in three types as per wind drifts— longitudinal, transverse and barkhan.¹⁸ An increase in biotic activities on a stable dune loosens the sand up to a depth of one metre and more. The satellite images distinctly indicate to the feeder zones of megabarchanoids 'as the elongated funnels of smudged sandy areas from the longitudinal upwind of any such field. The remnants of stable longitudinals within the fields indicate that the megabarchanoid chains themselves have developed at the expense of the longitudinals, which were formed in an earlier phase of dune building. This could be one reason why the peaks of equal height along the successive megabarchanoids chains tend to be oriented in general direction

Geographical Journal, Vol. 156, No. 1, March, 1990, pp. 51-61. For better understanding of the dune arrangements please see Plate- 5.

¹⁶ *Ibid.*, pp. 54-5.

¹⁷ K. W. Glennie, *Desert Sedimentary Environments*, Elsevier, Essex, 1970.

¹⁸ O. P. Bharadwaj, 'The Arid Zone of India and Pakistan', in *A History of Landuse in arid regions*, UNESCO, Paris, 1961, pp. 143-174.

of the surrounding longitudinals'.¹⁹ Similar peaks and linear arrangements have also been noticed in isolated, 8 to 10 meter high barchanoid fields (far to the north of the megabarchanoids), along the rocky margins of the desert at Bandah ka Tibba and Borela ka Tibba, both near Ramgarh. This is an indication that the sand is collected, processed and then released along the strips which form the longitudinal dunes.

A general look from one side of the desert will give a panoramic view in which some dunes will be vegetated (stable longitudinal dunes) and others will be the barren slopes (barchanoids). In the extreme western part of Jaisalmer, the concentric dunes are visible which are composed of fresh sand deposits. These are locally known as *okhali*. The dunes in Jaisalmer will be mostly without vegetation cover. If any vegetation is available in the deserts of Jaisalmer it will be only shrubs grown on semi rocky surface and the roots of these shrubs are held to ground by the rocky granules. No trees or rarely a tree can be seen and that too of *Neem* and *khejri* which are scattered in long distances. Counting of these trees is near null. A few of these trees are visible around the temple of Tanot Mata due to the efforts of the Border Security Forces, who manage this shrine. Tanot Mata temple is the last limit near Indo-Pak border until which the visitors are allowed. The battle site of 1971 Indo-Pak War (Longewala) is in close proximity to Tanot. The desert terrain of Jaisalmer is very different from the desert that extends into Jodhpur and Bikaner forming the western extent of the desert. The local reworking of these dunes has led to the formation of a flat to hummocky sand sheet as found to the south east of Jalore.

Whenever there is a limited supply of loose sand and the velocity of wind is moderate, the barchans dunes get formed. Such dunes are common in Bikaner especially between Nawa to Borana, Nokh to Pabu and Bajju to Ronasar. Usually, their height is around 8 metres and sief type patterns are formed over them. The mineralogical analysis of the sand indicates that it is formed by the weathering of rocks. The presence of Mica is high in this sand

¹⁹ Amal Kar, 'Megabarchanoids of the Thar', pp. 51-61.

in comparison of other minerals. Most of the rocks on the eastern part of desert contain Mica deposits. Thus, the rich availability of mica in these sands is a clear indicator that weathering of rocks also is contributing to this desert. Generally, mica is not available in the western desert, but the locally available rocks are contributing to its mineral composition. These sandy plains extend up to Jaisalmer, Bikaner (some parts), and Barmer and these landforms are mainly alluvial and young alluvial plains.

The sand regions are not completely devoid of the underground water. There are many wells in these regions, locally called *bera*. They yield sufficient water and are usually replenished by the rains. A movement in north-west direction of the desert takes to the Indus plains. This is mainly the dry water course of Ghaggar which had water until the 8th century. The old flood plains of now dead Ghagghar river system are in the Ganganagar and Bikaner districts of the Indian desert. These sandy banks attain some height and form hummocks and their horizons are mainly treeless. The vast sand stretches do contain various salt playas. The saline depressions or lakes are scattered throughout the Thar Desert. The four large and most important playas are Sambhar lake (26°.55' and 75°.11'), Pachpadra lake (25°.50' and 72°.10'), Lunkaransar lake and Didwana lake. There are small playa lakes near Khatu and Kuchaman, Pokhran, Sujangarh (between Jaisalmer and Ramgarh-Mithaka ran and Kharia ran), That, Lawan, Khutani and Khandowala, etc. Most of these salt basins are extensions of the Luni river system. The surface of these basins is very saline and it ceases the crop production and vegetation. In the Luni basin or in alignment with it, most of these salt lakes occur while others are along the periphery of Barmer-Bikaner dune in free country sides such as at Pokhran, Phalodi, Bap and Lunkaransar. At times these enclosed basins become dry in summers and the evaporative deposits show presence of gypsum and other salts along with clayey soil. The sand dunes and hilly tracts do have enclosed basins and in these locals collect the run-off.²⁰ Most of these water bodies dry up in the intense heat of the summers

²⁰ See Plate- 6.

and refill during the monsoon. The localized depressions have clay loam and heavy texture saline soils. The upper sand cover of these depressions is calcareous and non-saline which permits and supports the plantation activity. These plantations are exploited by the shepherds for grazing their goats and sheep mainly during the rainy seasons. A few depressions are under protected reserves such as Talchhapar Game Sanctuary (Churu district). Literally, Talchhapar means a cottage with grass top (*chhapar*) located near a water body (*tal*). The name of the sanctuary indicates that it was a reserve for the gaming activities to sort trophies which were very much in form of intact animal bodies that were stuffed with the grass after clearing off the flesh in order to retain their natural shape and size. Gaming (hunting) and adventure shooting was a big sport activity during the nineteenth century. The princely states were not only the safe havens but were also well managed zones for passing time in the aforesaid engagement. It was only in 1966 AD that the Government of Rajasthan awoke and dropped the 'game' from the list of activities to be undertaken at the sanctuary. Now, this sanctuary is famous for bird-watching, spotting black-bucks and salt-making.

The studies in geo-archaeology, Palaeo botanical remains, and Palaeo zoological evidences will be effective to reconstruct the successive environmental phases of the present arid region. Under the vast expanse of Thar Desert, extensive segments of rock formations are concealed. Yet, archaeology has not expanded well in this region. Therefore, the fossil records and their knowledge in context of Thar Desert continue to be poor. Three broad categories on basis of the timeline have been classified to understand the historical developments of this desert:

- a. Pre-Quaternary Record
- b. Quaternary Records
- c. Archaeological Sites

For understanding the historical process, the first two categories are deliberately called records and the last as site. These categorizations are made as per the availability of the sources that are helpful in reconstructing the past of Thar Desert.

The pre-quaternary records contain many formations, sands, clay, sandstone and lignite. This group mainly comprises the geological components. The earliest record of the fossil plant belongs to Lathi formation. Lathi is a village between Pokharan and Jaisalmer. Its formation comprised of petrified woods that were discovered by Dr Impey and were reported by Carter.²¹ Later Blanford compared the sandstone beds of Lathi with Barmer sandstone and correlated them further with similar type of sandstone beds occurring beneath the marine Jurassic beds of Jaisalmer, which also contains fragments of silicified woods.²² In his recent work, Pranay Lal notes, 'Around 120 million years ago, Greater India would have looked like a very large island with just Madagascar beside it...mountain ranges that mark its northern boundary today, the northern limit of island India at this time would have been a long, crescent shaped beach where dinosaurs roamed. This beach extended all the way from Rajasthan in the west...Fossils of shells and sea creatures from this period can still be found in large numbers in Jaisalmer and Bhuj...the beaches would have had few trees but further inland there were tropical forests with tall conifers, tree ferns and cycads. The fossilized remains of tree trunks from these forests can be found in Akal in Rajasthan...present-day Jaisalmer and Barmer in Rajasthan were under shallow waters at this point, but the table-top mountains of Jodhpur were likely to have raised their heads a little above the waters'.²³ Srivastava have drawn conclusions about the Palaeo ecology and depositional conditions of the Lathi and Jaisalmer formation on basis of the *Classopollis* pollen (an evergreen conifer

²¹ H. J. Carter, 'Summary of the Geology of India between the Ganges, the Indus and Cape Comorin', *Journal of Bombay Branch of Royal Asiatic Society*, vol. 6, p. 161.

²² W.T. Blanford, 'Geological Notes on the Great Indian Desert between Sindh and Rajputana', *Record Geological Survey of India*, vol. 10 (1), pp. 1-21.

²³ Pranay Lal, *Indica: A Deep Natural History of the Indian Subcontinent*, Allen Lane, Haryana, 2016, p. 153.

with stiff sharp leaves: they occupy well drained soils of upland slopes and lowlands near coastal areas, preferring a warm climate of transgressive seas), which like grain do not get transported to long distances by wind and it gives the possibility that this plant grew near sedimentation.²⁴ Other scholars also suggest the costal environment.²⁵ Thus, Jaisalmer was a costal and deltaic region under the dry climatic condition, though it is bit difficult for the geologist to accept both (deltaic and dry) at the same time. Presently, the Rann of Kuch is having a similar kind of ecological set-up. It is not within the limits of the history to relate as to why the geologists are finding it difficult to believe in a dry and deltaic region, even with a living example at hand.

At Lunu (Barmer), there are exposures of sand stone. A few badly damaged fragments of dicotyledonous leaves and stem impressions have been recorded²⁶ and this indicated that it could not be older than Cretaceous age (the age when first flowering plant appeared and by end of this age dinosaurs disappeared). The Cretaceous (German, *creta*: chalk) period lasted from 146 to 65 million years ago and it was named so because this was the time when gigantic chalk cliffs and beaches were getting formed in some places. 'In the seas, microscopic shelled creatures were absorbing a lot of carbon dioxide to transform calcium into chalk. When chalk is 'cooked' by volcanic heat, it becomes marble. The giant sea way that stretches from western Rajasthan to eastern Madhya Pradesh, from where the Narmada flows today, contained a large variety of these microscopic shelled creatures, which explains why we find marble along this juncture today'.²⁷ In a well near the foot of the Barmer hills, the lowest bed was found to be

²⁴ S. K. Srivastava, 'Jurassic Microflora from Rajasthan, India', *Micropaleontology*, vol. 12 (1), 1966, pp. 87-103.

²⁵ S. A. J. R. Pocock and J. Jansonius, 'The Pollen Genus *Classopollis* Pflug', *Micropaleontology*, vol. 7 (4), 1953, pp. 439-449.

²⁶ M. N. Bose, 'Plant Remains from Barmer', *Journal Scient. Ind. Res.*, Vol. 11B (5), 1952, pp. 185-190.

²⁷ Lal, *Indica: A Deep Natural History of the Indian Subcontinent*, pp. 153-4.

made of dark carbonaceous clay bearing unidentifiable pieces of dicotyledonous leaf impressions. Bose did a marcescent survey of the clay and found rich assemblage of angiosperms (Greek-*angeion*: vessel, *sperms*: seed) pollen besides fungal and other spores and fragments of wood and cuticle.²⁸ This work indicated clearly that the carbonaceous clay bed occurring nearly 33 metres below the ground level near Barmer is of Tertiary age (first phase of Cenozoic era-between Cretaceous and Quaternary period, about 65 to 1.64 million years ago). In the decade of 1970s, scholars investigated it again and confirmed through the microfossil assemblage (dominated by angiospermic pollen grains and poor presence of pteridophytic spores) and common occurrence of *proxapertites trudopollis* and *polycolpites* that this horizon belongs to Palaeocene age.²⁹ Rich plant deposits are entombed in the lignite bed at Palana (Bikaner). The occurrence of *Botryococcus brauni* (like alga)³⁰, various microfossils³¹ and wood that have undergone decay and disintegration and have been preserved as thin continuous bands and finely divided tissues.³² Another important site to look for the paleo history of the Thar is village Kapurdi, 20 km from Barmer. It is the bed of fuller earth covering nearly an area of 6 sq. km. The fuller earth is popularly known as *multani mitti*. The presence of various leaves, fruits and stems, fishes and arthropods in bed of fuller earth have supported that this bed belongs to the Tertiary age.³³ The paleobotanical evidences provide significant

²⁸ M. N. Bose, 'Plant Remains from Barmer', *Journal Scient. Ind. Res.*, Vol. 11B (5), 1952, pp. 185-190.

²⁹ K. P. Jain, R. K. Kar and S.C.D. Sah, 'A Palynological assemblage from Barmer, Rajasthan', *Geophytology*, Vol. 3 (2), 1973, pp. 150-165.

³⁰ S. R. N. Rao & S. S. Misra, 'An Oil bearing alga from the Palana lignite (? Eocene) of Rajputana', *Current Science*, vol. 18 (10), 1949, pp. 380-381.

³¹ A. R. Rao & K. P. Vimal, 'Plant Microfossils from Palana lignite (? Eocene), Bikaner', *Current Science*, vol. 19 (3), 1950, pp. 82-84.

³² H. S. Pareek, 'Microscopic Study of Palana Lignite', Record Geological Survey of India, vol. 87 (4), 1960, pp. 823-830.

³³ M. N. Bose, 'Fossil Plants from Kapurdi, Jodhpur', *Journal of Indian Botany Society*, vol. 29 (1), 1950, p. 34; K. N. Kaul, 'A palm Fruit

data about the presence of *Mesua ferrea*. Presently, it is found in the evergreen forests of the eastern Indo-Malayan region and some places of south India. The most natural habitat of it is in Assam, where the soil and the climate are ideally suitable for its profuse growth. The climate of these areas is warm, moist, and equable with rainfall varying between 200-500 cm. The presence of the *cocos* remains (coconuts) along with the echinoderms and sea fishes in this region again suggests the vicinity of sea. Thus, in the early Tertiary times the western Rajasthan (Thar) was a well watered area and had a moist tropical climate resembling that of the present Assam, with a sea shore which was not very far from Kapurdi village and the presence of the plants and the mammals in the same area was high.

In a local mine of fuller earth (clay rich in calcium), remnants of a massive lake rich in calcareous sediments, can be found at village Bothia (a village on the route of Barmer from Jaisalmer nearly 10 kms short of Bramer town). Fuller earth is calcareous sediment found at the erstwhile Tethys lake. As per the paleontologists the best and interesting fact about the *Multani-mitti* (skin-exfoliating cosmetic) is that it entombs and preserves the life forms and specimens of living beings beautifully due to low oxygen, because it retard the process of decay without deforming it. The complete fossils of coconut, flowers, fruits, snakes, bats and fishes do provide an insight into the flora and fauna that existed around the Tethys Sea. Most interesting fossil from this village is of the custard apple (*Anona squamosa* or *sitaphal*) or a family very close to it. The presence of this 46 million-year-old custard apple suggests that this tropical plant did exist in the region of our study and it might have vanished due to the climatic changes.³⁴ Its exit (or being extinct) led to its introduction (or re-introduction)

from Kapurdi (Jodhpur, Rajasthan Desert)', *Current Science*, vol. 20, 1951, p. 138; R. N. Lakhanpal, 'Specific Identification of the Guttiferous Leaves from the Territory of Rajasthan', *Palaeobotanist*, vol. 12 (3), 1964, pp. 265-266.

³⁴ Lal, *Indica: A Deep Natural History of the Indian Subcontinent*, p. 259.

to the Indian subcontinent by the Portuguese in the seventeenth century along with many other vegetables and fruits such as chilli, potatoes, tomatoes, pine apple, papaya, guava, cashew-nut, etc.³⁵ Another village (Thaiat, six km short of Jaisalmer) along the Jodhpur-Jaisalmer highway have recently become famous. In January 2014, the paleontologists explored a hillock (crest of ochre and red sandstone) with different types of footprints and fine layers of shells. Among the footprints, one is distinct and a few others are smudged. These tracks were created by two small dinosaurs about 170 to 160 million years ago. Thus, all the above evidence indicates that the areas of Jaisalmer and Barmer were once the shoreline of a sea, which extended up to the present Kashmir. The slow exit of the sea made many animals and plants to freeze in the soil and rock beds. The constant and joint engagement of the geologists and the archaeologists is required to explore more about the north-western frontier of present India.

The pollen analysis and C-14 dating of the lake sediments at Sambhar, Lunkaransar and Didwana indicates that the sedimentation in these basins probably started with a sudden change in climate. The stratigraphical and geo-morphological evidences have shown that the period immediately preceding the Holocene in Western Rajasthan was marked by severe aridity and that the strong dry winds caused the formation of sand-hills.³⁶ It can be said that in some cases it led to the chocking of the valleys and paved for the formation of inland basins. Four zones have been marked to study the vegetational history as per the chronological order³⁷:

- a. Zone-A (10,000-9500 BP)
- b. Zone-B (9500-5000 BP)

³⁵ Irfan Habib, *The Agrarian System of Mughal India*, Oxford University Press, New Delhi, pp. 49-53.

³⁶ G. Singh, 'History of Post-Glacial Vegetation and Climate of the Western Rajasthan Desert', final report of research conducted in collaboration with University of Wisconsin at B. Sahni Institute of Palaeobotany, Lucknow, 1970.

³⁷ Ibid.

- c. Zone-C (5000-3000 BP)
- d. Zone-D (1000 BC-300 AD)

The trees and shrub vegetation increased all over Rajasthan only during the Zone-C. The evidences gathered from Pushkar Lake indicate that it was occupied by the mesophytic (plant needing only moderate amount of water) vegetation. The lakes of Thar started drying-up around 1900 BC. However, the lakes in the east at Didwana and Sambhar dried around 1000 BC. Thus, the desiccation of Rajasthan in general is suggested to date back around 1800 BC which continued to deteriorate until 300 AD. Naturally well preserved nucules of *Chara* along with fresh water Ostracoda are located from the bed of gypsum at Jamsar (near Bikaner). Shells of *Vivipara bengalensis* along with nucules of *Chara* were also recovered from Siasara, a locality lying 112 km west of Jamsar.³⁸ As both were fresh water habitats so it can be said that these zones, which are now marked by the saline and brackish water, were containers of fresh potable water.

The archaeological site of Kalibanga (in district Ganganagar) is closest to Thar which is ascribed to Pre-Harappan and Harappan period. The evidences of hulled as well as naked barley have been recorded from this site and are dated to 2090-2075 BC by studying the radio-carbons.³⁹ The high frequency of *Cerealis* type pollen suggests that plantation of cereals was most active at Kalibanga during the pre-Harappan times, which is indicative of fairly moist conditions.

Throughout the above discussion, the Palaeo botanical and zoological evidences, available in the Thar Desert, have been discussed and efforts have been made to understand the onset of the sand-formation due to the winds and to explore the process

³⁸ K. Jacob, M. V. A. Sastry and V. V. Sastri, 'A Note on the Microfossils of the Impure Gypsum from the Jamsar Mine, Bikaner as on the Possible Origin of the Gypsum', Proceedings of the Symposium on the Rajputana desert, *Bulletin National Institute of Science of India*, vol. 1, pp. 68-69.

³⁹ Vishanu Mittre, 'Protohistoric Records of Agriculture in India', *Trans. Bose Research Institute*, vol. 31 (3), 1968, pp. 87-106.

of desertification. The fossils indicate a coastal and near-shore environment. The first phase (Pre-Quaternary) embraces fossil records from Early Mesozoic to Early Tertiary age. The second phase (Quaternary) consists of only the post-glacial epoch and it is crucial to reconstruct the environmental conditions that prevailed in this region during the last 10,000 years (approximately), which led to the present arid state. Between both the phases, there is a long gap of more than 50 million years. During this, two important events (uplift of Himalayas and the great Pleistocene glaciations) took place and these events had profound effect on the physiography and climate of northern India. The Himalayas acted as natural embankment for the monsoonal winds and the Pleistocene glaciations intimately connected with the aridity in north-western India.⁴⁰ The effect of the glacial event in the Thar Desert is visible at village Phalodi (on the road from Jodhpur to Jaisalmer), where the landscape changes slightly. Geologists call it 'peneplain', as per geological history, it is created by water erosion. All around this area, rounded red, orange and purple pebbles are found. Many of these have formed due to the corrosive blast of the desert sand which disintegrated under the hot and cold of the desert. Along with these, the columns of Jodhpur red stone (called rhyolite), red sand stone and orange siltstone can also be found. All these were formed from the brown volcanic rock. Large varieties of rocks that form the volcanic crust of the Jodhpur region are laid out beautifully in the Rao Jodha Desert Park. The natural distribution and spread of these rocks can be viewed in and around the villages scattered between Kheerwa to Nokha and from Baap to Phalodi. Apparently, it is significant to note that post-glacial climatic events reflect a general pattern in the western Rajasthan (slight rainfall) and there are no evidences to suggest that the Thar Desert is a man-made phenomenon.

The inexorably, northward movement of the land masses (South East Asia, India, Arabia and Africa) led to a break up of the Tethys

⁴⁰ D. N. Wadia, 'Desert of Asia-their Origin and Growth in the late Pleistocene Time', Second Sir A. C. Seward Memorial Lecture, Sahni Institute of Palaeobotany, Lucknow, 1955.

sea into a string of salty lakes after pushing it westward. These lakes became the incubators for the evolution of many ancestors of a variety of modern mammals, fish, crocodile, snakes, and turtles. The whales also emerged along the banks of the Tethys Sea.⁴¹ The same sea dried out slowly and paved way for the sand and soils to take over. Many lakes formed due to the confinement of water in the shallow digs which became the source of water for the region. The slow drying up of water resources led to the emergence of the intense desert that have many forms of lives seized and buried in its soil crust. The geological records indicate that the Thar contains many types of the dune-fields and these have been classified on basis of the soil grain, its chemical and mineral compositions. The intense dunes are a recent feature which has come-up only after the drying up of the Ghagghar river system around the sixth and seventh century.

The process of aridification initiated in the erstwhile Tethys Sea and the complete drying of its water resources led to the emergence of the Thar Desert. The historians who overemphasize the significance of the river Saraswati (leaving aside the training of subject which trains to see all the causes together and then assess the effects) do not desist from calling the disappearance of river Saraswati as a cause for the origin of Thar. The usage of term 'origin' for labelling any geological process is very problematic, as every geological and environmental happening takes long time to process and no two geological procedures are similar and none of them are ever stable. The constant change is a mandatory obligation of nature and its components. Amit Panday Indras has propounded that 'the Thar desert owes its origin to the disappearance of Saraswati and withdrawal of the marine conditions from the Rann of Kachchh, whose presence tempered the climatic conditions which attracted more monsoon rains to fall on the Indus basin'.⁴²

⁴¹ Lal, *Indica: A Deep Natural History of the Indian Subcontinent*, p. 259.

⁴² Amit Panday Indras, *Lost Saraswati*, a typed monograph catalogued in the Library of Indian Institute of Advanced Study, Rashtrapati Nivas, Shimla.

The clear absence of the pre and post-effects in this study makes it a sabotaged attempt and the proposal of arguments with complete absence of the evidences is another major hurdle for any rational mind to appreciate this work!

In the historical studies, the time is divided into two phases as per the nature of sources: (a) Pre-History, and (b) Proto-History. The pre-history phase is the one where the nature of sources is tangible but there are scattered evidences of the human activities. The studies in prehistoric and Pleistocene age of the Thar became possible with the geo-archaeology. The pioneering discovery of stone tools by British geologist R. B. Foote in 1863 has highlighted the study of Paleolithic sites in India. The antiquity of early human in central Thar goes back to the Terminal Early Pleistocene epoch, technically this is known as Acheulian culture/stone technology. The dating of a few sites (namely Attirampakkam in Tamil Nadu, Isampur in Karnataka and Morgaon in Maharashtra) indicates that the antiquity of Indian Acheulian is as old as Africa but the chronology of Indian Acheulian is not yet of very high resolution. The dating of the Paleolithic sites has been provided by Rajaguru and his team.⁴³ A few sites in the Thar Desert have been jointly excavated by the geologists and the archaeologists. The geo-archaeology was initiated in USA in mid-20th century and it developed in India around the end of same century. Geo-archaeology is a useful discipline to study the environmental aspects of the archaeological sites that are preserved in various geo-morphological settings such as river, valley, lake shores, sand dunes, etc. Various other technological innovations have aided the dating of the objects, soil, sand and the fossils. Human fossils around the pleistocene phase are rare in India but a large number of animal fossils (elephants, hippo, turtle and deer) have been identified along with the stone tools. The major sites of excavation

⁴³ S. N. Rajaguru, Sushama G. Deo and Claire Gaillard, 'Pleistocene Geoarchaeology of Thar Desert', *Annals of Arid Zone*, Vol. 53 (2), 2014, pp. 63-76. The dating provided by him are Lower Palaeolithic culture (125 ka), Middle Palaeolithic (120 ka to 40 Ka B.P.) and Upper Palaeolithic and Microlithic Cultures (40 ka to 10 ka B.P.).

are around the Luni basin. Misra was the pioneer to explore the Upper catchment of Luni basin and its tributaries.⁴⁴ A number of sites of prehistoric times in the Thar were reported by Allchin⁴⁵ and later Misra in 1980s, identified some concentrates in the Didwana area. In the last two decades, some more prehistoric sites have been located in the Thar.⁴⁶ An interesting feature to note here is the prominence of the Middle Palaeolithic sites and the absence of Upper Palaeolithic sites. The lower Palaeolithic are also unknown but have been mostly identified from quarries. Mesolithic, Microlithic and Chalcolithic settlements of early and middle Holocene age are also known in the regions of the Thar Desert.

Presently, Luni is the only river in the desert of Thar (western Rajasthan) and it derives its source from the foothills of the Aravalli Mountains. At Balotra, the river gets stabilized by the dunes on both the sides and the local run off don't reach the main stream. From here the river drains only into a depression on the south and on north, it flows into the Pachpadra salt lake. The river sustains only on the monsoon rains. The river takes a sharp turn near Tilwara village. Between Karna and Sindari village, the river have a very shallow gorge. Informally, a geologist has divided this belt into three types on basis of alluvial stratigraphy and these have been as per the changing climates during the Quaternary period.⁴⁷ The findings such as channel gravel and overbank floodplain facies, a flake and a fragment of ostrich eggshell at Karna village, flakes

⁴⁴ V. N. Misra, 'Palaeolithic Culture of Western Rajaputana', *Bulletin of the Deccan College Post-Graduate and Research Institute*, vol. 21, 1962, pp. 85-156.

⁴⁵ B. Allchin, A. S. Goudie and K. T. M. Hegde, *The Palaeogeography of the Great Indian Desert*, Academic Press, London, 1976.

⁴⁶ S. Misra, S. N. Rajguru and S. Ghate, 'Stone Age Jaisalmer: Implications for Human Adaptation to Deserts', *Bulletin of the Deccan College Post-Graduate and Research Institute*, vol. 53, 1993, pp. 260-268.

⁴⁷ Sheila Mishra, M. Jain, S. K. Tandon, A. K. Singhvi, P. P. Joglekar, S. C. Bhatt, A. A. Kshirsagar, Sonali Naik and Arti Deshpande, 'Prehistoric Culture and Late Quaternary Environments in Luni Basin around Balotra', *Man and Environment*, vol. 24 (1), 1999, pp. 39-49.

and Ostrich eggshell fragments at Bhukan village, and number of flakes along with four potsherds, bones, pottery and three ostrich eggshell fragments at Manawra do help to mark and diagnose a period which was marked by the human interactions. The Palaeo channel present on the left bank of Luni, between village Karna and Lohida, indicates to a major phase of fluvial (river) activities. The findings (such as pottery and animal bones) at Manawara indicate that this Palaeo channel was occupied by humans. The dating of the site has been attained by assessing gravel through IRSL (infrared simulated luminescence) and it has been dated to 11.4 kyr. The TL (Thermo luminescence) of pottery dates to mid 3.4 kyr. The time period between which the dating of the sites of Luni ranges, starts from 400 kyr and comes till 80 kyr and the climate ranges from the presence of high humid to the flood (and spread of gravel) and finally aridity. The Aeolian cover in the locality comes to mid 2.8 kyr and it can be asserted that the 'continued relatively humid climate prevented the encroachment of Aeolian sand over this unit until around 2.8 kyr'.⁴⁸ The tools from Tilwara are mainly made of fine-grained rhyolite. Whereas the tools excavated at Manawara are made of short quartz microblade core. Rhyolite of different colours was in use, such as purple, grey, and grey-green. The acquaintance with the stone has helped the palaeo humans to use both the stones effectively for making tools. The assemblage of the faunal bones is dominated by the domestic species especially sheep, goat and buffalo. The presence of *Equus sp* bone is interesting as this can be compared with the modern horse and ass. Yet, it has not been established with clarity what species was it, but this definitely confirms the harnessing of the animal power for increased mobility. The bones identified at Manawara are of *Gazella bennetti*, *Bos indicus*, *Bubalius bubalis*, *Capra hircus*, *Equus sp* and the human activities with and over the animals is visible through zoological archaeology (of the bones) which indicates at the cut marks, holes, abrade (-ge) and chewing by carnivore. At Manawara, the assemblages of mollusk⁴⁹

⁴⁸ Ibid., p. 41.

⁴⁹ Ibid., The species of gastropods belong to the families of

in the freshwater gastropods are also excavated which highlight the continuity and consistency of the shells ranging from adult to juvenile specimen. The overall preservation and assemblage is good and the shell size ranges between 1 cm to 0.5 cm, which can be dated around 5.6-5.9 kyr. The presence of these gastropods indicates to the localized water bodies and absence of the flowing water. These localized bodies of water were mainly filled by rain water and sediments reflect that there were short dry periods also.

The complete absence of the camel bones and its remains in the region highlights a lot about the environment of the region in prehistoric times. The radiocarbon dating from Karna and Manawara reflects that the two localities were close to each other and the gravel of both the sites was attained from same channel system. The study of the Palaeo environment indicates to the different climatic regimes and helps to understand the human adaptations in the region. The different Palaeo phase of river Luni indicate that around 80 kyr and 11.4 kyr the fluvial (river) system was more dynamic in western Rajasthan. The gastropods were active in the localized water bodies (as mentioned above). They are relatively younger than the other archaeo-evidences found in the Luni basin and it indicates that the aridity in Thar desert began around the 5.6-5.9 kyr. Geologist has asserted, 'The gravel surface was free of Aeolian cover until 3.4 kyr when humans occupied it. Sometimes between 3.4 kyr and 2.8 kyr, the Aeolian cover advanced over the gravel in Manawara locality'.⁵⁰ Many paleolithic arte-facts have been recovered from Didwana, at the sites of Singi-Talav, Amarpura Quarry, 16 R (dune site), Indola-ki-Dhani, Jayal ridge, Chhajoli and Katoati. The Amarpura Formation was part of shallow water aggraded alluvial plain dominated by low energy floods and disorganized drainage and periodically fluctuating carbonate-rich ground water.⁵¹ The Singi-Talav is a rework

Planorbidae (*Indoplanorbis Exustus*), Viviparidae (*Viviparus bengalensis*) and Thiariidae (*Thiara sp.*).

⁵⁰ Ibid.

⁵¹ S. N. Rajaguru, Sushama G. Deo and Claire Gaillard, 'Pleistocene Geoarchaeology of Thar Desert', *Annals of Arid Zone*, Vol. 53 (2), 2014,

of yellowish aeolian sand with abraded arte-facts of Middle Palaeolithic tradition, calcrete nodules, hand-axes, cleavers, large number of flakes, debitage chips, choppers and polyhedrons and all these are made of locally available metamorphic rock like quartzite. This material doesn't appear as much disturbed after the departure of the prehistoric dwellers. Six pieces of mono-pyramidal quartz crystal are also located. These are rare objects to be found but these hint to the intention and aesthetic sense of the early humans, who occupied this part of the Thar. At Amarpura Quarry, 40 specimens of choppers, hand-axes, flakes and polyhedrons have been collected and it compares well with the Singhi-Talav. The Indola-ki-Dhani is a clayey loam and is a big assemblage of choppers, scrapers, discoids, denticulates and knives.

Jayal ridge is situated in area of boulder gravel ridge locally known as *magra*. This is rich in quartzite, quartzitic sandstone and silt sand. The surface is rich in lower Palaeolithic artefacts. The small excavation carried out in Katoati village yielded ostrich eggshells along with large and highly cortical cores and flakes due to which it has been classified as Middle Palaeolithic phase. Lordia is presently blocked by modern dune sand and has been marked as Palaeolithic site after the identification of artefacts. The divers dating methods employed by the geologists indicate that none of these activities happened at the same time but all these findings do provide an insight in the Palaeo-environment of this region.

The existence of the proto-historic sites and early historic sites along the Palaeo-channels of river Ghaggar in the northern part of desert made many to believe that Thar is a young desert. Geologists have suggested different time spans for the onset of aridity in Thar. Some suggested that the Thar was not older than the mid-Holocene.⁵² Some put forward that the aridity in the Thar was very old, as an accumulation of the thick cover of sand over

pp. 63-76.

⁵² D. N. Wadia, *Geology of India*, Macmillan and co., London, 1960 & M.S. Krishnan, 'Geological History of Rajasthan and its relation to present-day conditions', *Proceedings of the Symposium on the Rajputana Desert*, 1952, pp. 19-31.

a vast area of Thar might have taken a long time to form.⁵³ The multidisciplinary studies and investigations in the Thar conducted by earth scientists, geologists, archaeologists, Palaeo botanists and geo-archaeologists during the late 20th century have 'convincingly established that the arid/semi-arid climate of the Thar Desert dates back to the late Neogene and antiquity of early man is much earlier than 200 ka B.P.'⁵⁴ The presence of various Lower Palaeolithic sites indicates to the conducive climatic conditions of the Thar which made the early humans to settle in this region. Highlighting the environmental history of the south central Thar, geologists have noted: 'Over Shumar beds of fluvio-marine origin along western margins of the Thar in Jaisalmer basin and over boulder gravels of Jayal ridge along eastern margins of the Thar in Nagaur District, indicates humid tropical climate during the Neogene. Erosional features such as knick points, rocky gorges which are totally dry today in many parts of the Thar probably belong to this period... the early Neogene witnessed humid climate, which turned to the semi-arid in Pliocene (?) or early Pleistocene...the terminal Middle Pleistocene was drier than the early Middle Pleistocene as indicated by the presence of Aeolian sand sheets altering with gravels of ephemeral channels...and the middle Luni valley indicate that this phase of semi-arid/arid environment ultimately shifted to arid climate with interludes of semi aridity during the late Pleistocene (130 ka B.P to 13 ka B.P). The Luni River was ephemeral and the region north of it turned into the landscape without drainage, but with prolific development of varieties of dunes. Thus the optimum development of dunes was not during the peak of aridity, but during the early phase of strengthening of south-west monsoon...the south-west monsoon was almost weak, fluvial and even Aeolian processes were dormant between 22ka and 13-14 ka B.P. As a result of these conditions the climate

⁵³ Ahmed, 'Origin and the Geomorphology of the Thar Desert', *Annals of Arid Zone*, Vol. 7 (2). pp. 170-180.

⁵⁴ S. N. Rajaguru, Sushama G. Deo and Claire Gaillard, 'Pleistocene Geoarchaeology of Thar Desert', *Annals of Arid Zone*, Vol. 53 (2), 2014, pp. 63-76.

became arid with dwindling water sources...compelled the stone age hunter-gatherer to migrate from this region...re-appeared in the Thar during the Early Holocene'.⁵⁵ These were also known as the Soanian industries (while the artefacts found over much of the rest of India were known as Acheulian or 'Madrasian') and were dominated by pebble or core tools and characterized as a predominantly chopper/chopping tools. The Acheulian industries was characterized by bifacially flaked artefacts – hand axes and cleavers – along with denticulates, scrapers, spheroids, and picks amongst other tools. The Acheulian arte-facts were made principally on hard and durable quartzites. The use of the locally available stone for making tools was a dominant feature of the lower Palaeolithic times.

Middle Palaeolithic industries are characterized by smaller and lighter tools based upon flakes struck from cores, which in some cases were carefully shaped and quite advanced in their efficiency. There was an increase in the discoidal core techniques. In most of the region, the use of quartzites continued and in such cases, the elements of Lower Palaeolithic continued into the Middle Palaeolithic. However, fine-grained siliceous rocks, such as chert and jasper, were now preferred for tool-making, and for it raw material was often transported over several kilometres. Largely, Middle Palaeolithic hominids continued to occupy areas that were inhabited by their ancestors during the Lower Palaeolithic. The Wagaon and Kadamali rivers in Mewar are rich in Middle Palaeolithic sites. A variety of scrapers, borers and points have been discovered in this area. By and large, open air sites along the streams on hill slopes, stable dune surfaces, and rock-shelters continued to be used as is evident from the findings of Sanghao cave (Modern Pakistan), Luni river basin in Rajasthan and the sand-dunes of Didwana. Dates for this period range from 1,50,000 to 30,000 before present (BP), a period characterized by aridity in general. Thus, even the profound aridity was not forcing

⁵⁵ S. N. Rajaguru, Sushama G. Deo and Claire Gaillard, 'Pleistocene Geoarchaeology of Thar Desert', *Annals of Arid Zone*, Vol. 53 (2), 2014, pp. 63-76.

the hominids out of this region. The water depressions were the centres for survival and settlements till the middle Palaeolithic. The Middle Palaeolithic occupation in Thar Desert during the upper Pleistocene has been examined in terms of modern human exit, out of Africa.⁵⁶ The coastal corridor is generally suggested as the path of hominin dispersal from Africa into Asia. A recent research had highlighted that the population expanded along the continental corridors during the periods of enhanced humidity. The archaeological evidences explored at Katoati (Nagaur, north-eastern Thar) indicate the repeated occupation of Thar by hominin during the enhanced humidity. This time frame also coincides with the suggestions of the genetic studies that suggest ca 60 ka as the phase for the arrival of *H. Sapiens* in South Asia. Towards the end of the Pleistocene (around 30,000 years ago) there was a distinct change in tool types and technology that could be related to either changes in hunting methods, or to a general shift in the utilization of resources. It can also be characterized as a response to environmental change. The technique of making parallel-sided blades from a carefully prepared core is an essential basic element of all Upper Palaeolithic industries of the Indian subcontinent, which were contemporary with the final phase of aridity. Artefacts of Upper Palaeolithic include a wide range of scrapers, backed blades, points, choppers, and burins. The Upper Palaeolithic sites have been located throughout the Indian subcontinent in abundance but the aridity restricted these settlements in the interior dunes of Rajasthan. The presence of Upper Palaeolithic artefacts has been reported in the Thar regions (though they are more sparsely distributed than those of the Middle Palaeolithic) at Sanghao caves in the North-West Frontier Province and in the Potwar plateau of the northern Punjab (both in Pakistan). The other prominent sites are in south India, central Gujarat and north-western Kathiawar.

⁵⁶ James Blinkhorn, Hema Achyuthan, Michael Petragila and Peter Ditchfield, 'Middle Palaeolithic occupation in the Thar Desert during the Upper Pleistocene: the signature of a modern human exit out of Africa?', *Quaternary Science Reviews*, vol. 30, 2013, pp. 1-6.

The next in the sequence is the Mesolithic age. The Mesolithic age marks its entry during the Holocene (c. 9000 B.C.). The stone industries of the Holocene in the subcontinent represent a further addition to the developmental process of the Palaeolithic. Changes in climate (which became warm and rainy) resulted to changes in flora and fauna. Rapidly, the hunter-gatherer communities spread over India. Microlithic industries associated with the cultures of hunting, fishing, and pastoralism or people practicing some form of agriculture, have been found widely throughout the subcontinent. The Microlithic or small stone tools (length ranging from 1 to 8 cm) comprised tools made on blades and bladelets and do include burins, lunettes, crescents, triangles, points, trapeze, etc. which were subsequently hafted onto bone or wooden handles to form composite tools. Many Mesolithic sites have been identified at Bagor, Tilwara, in the Thar desert of Rajasthan. Faunal remains of cattle, sheep, goat, buffalo, pig, boar, bison, elephant, deer, jackal, wolf and a number of aquatic animals have been found. The Mesolithic age is a transitional phase, between the Palaeolithic age and the Neolithic age, and it was in this age that first tentative steps towards domestication occurred. Till date, Bagor is the largest Mesolithic habitation site discovered in India. It is located in the centre of Mewar plains. This site was discovered in 1967 by L. S. Leshnik of the University of Heidelberg. The rainfall of the region varies between 60 and 75 cm, per annum. A large depression is formed by river Kothari on the north-west edge of a village and it retains water throughout the year. It must have been the major source of water for prehistoric population. The site lies on a large and prominent sand dune, locally known as Maha-sati. The dunes are composed of the wind-blown sand and the habitation material occurs throughout the sandy deposit. It also attests that the dunes were under active formation when prehistoric man inhabited it. On the basis of material cultural sequence the site has been classified into three phases (Phase I- c. 5000-2800 BC; Phase II- c. 2800-600 BC; Phase III- c. 600 BC- 200 AD).⁵⁷ The features

⁵⁷ V. N. Misra, 'Bagor-A Late Mesolithic Settlement in North-West India', *World Archaeology*, Vol.5, No.1, Colonization (Jun. 1973),

that marked phase one were the use of microliths, profuse animal remains, hunting, herding and gathering activities, the huts were stone paved and the dead were buried in east-west position. Phase two followed it, in which the numbers of microliths and animal bone tools was declining, and tools of copper and bronze were coming up. The hand-made pottery was in inception. The graves were furnished with offerings (like, pots, tools, ornaments, and food), which indicates to an increase in the material prosperity. The reliance on the agriculture and animal domestication was certainly greater. During phase three, the microlith industry declined and the use of animal bone became scarce. The iron tools started appearing and now, the pottery was entirely wheel-made. The burial pattern altered a bit extending in north-south orientation. The pottery and ornaments (beads made of banded agate, carnelian or garnet) along with copper and iron tools were very sophisticated.⁵⁸ Nearly all the techniques and knowledge to deal with copper, bronze, and hand-made pottery occurred to them around mid of third millennium BC and by first millennium BC, iron along with the wheel-made pottery were fully introduced.

An examination of bones that were excavated from the site has been carried out by D. R. Shah of Baroda University and it reveals that the fauna was completely wild. It included hog deer (*Axis porcinus*), barasingha (*Cervus duvauceli*), wild-boar (*Sus scrofa cristatus*), jackal (*Canis aures*), rat (*Rattus rattus*), monitor lizard (*Varanus flavescens*) and river turtle (*Lissemys punctata*).⁵⁹ Bones of domesticated sheep, goat and cattle are dated around the 5th century BC. These developments are clear indications to the increasing dependence of the settlers on the pastoral activities and animal husbandry. Overall, it was a phase which slowly moved from hunting-gathering and stone using culture, into, a metal-using and food producing economy through acculturation. Other important Mesolithic settlements in Rajasthan are Bairat (Jaipur)

pp. 92-110.

⁵⁸ Ibid.

⁵⁹ V. N. Misra, 'Two Microlithic Sites in Rajasthan: A Preliminary Investigation', *Eastern Anthropologist*, Vol. 24, 1971, pp. 237-90.

and Tilwara (in tehsil Pachpadra of Barmer District). The above description of the Mesolithic site of Bagor indicates the presence of large wild life in the region and the constant engagement of these humans with their surrounding nature. The presence and use of a large number of animals for different purposes is indicative of the facts that humans were exploiting the surroundings for better survival. The aridity didn't affect them. The Mesolithic culture paved way for the Neolithic. In Neolithic age, pastoralism and agriculture supplemented hunting-gathering as the prevalent mode of subsistence. In the Indian context, a broad overlap emerges in the chronology of the Mesolithic cultures and the earliest agricultural settlements. Some of these are now coming to light in the Indus flood basin. Overall it can be suggested that the Mesolithic culture continued to be important roughly from 9000 to 4000 B.C. A majority of classic Indus sites of the same time were in riverine lowlands and the manner in which settlements and subsistence patterns had evolved in these areas (over a span of more than a thousand years prior to the efflorescence of the Harappan civilization) is central for understanding its evolution. In several lowland areas, there was a long period of antecedence. At the beginning of the 4th millennium BC, the Cholistan tract saw a well-defined phase of occupation, known as the 'Hakra ware' culture, named after the river around which its distinctive ceramic assemblage was first discovered. Stable system of agriculture, supplemented by animal husbandry, hunting, and plant gathering provided economic sustenance to the urban networks. In view of the widely differing ecological conditions in the distribution area of this civilization, its very unlikely to believe that the subsistence strategy was single or uniform.

The Porto-history allows the engagement of the scholars on basis of the strong archaeological evidences that are vocal enough to establish a process and time of its occurrence. Coming to the historical phase from the Pleistocene period, the archaeologists have contributed significantly through the fieldworks and have uncovered more than 700 sites of the Indus Civilization, extending

on either side of the Thar Desert.⁶⁰ The catchment area of the sites is very extensive ranging from Punjab and Haryana in the east to hinterlands of Maharashtra in the west. Prior to the Harappan civilization a lot of human activities were going on in the Thar Desert. The excavations have highlighted the thick presence of the Mesolithic sites in the territories of the present desert. A major site of Mesolithic settlement is excavated at Ganeshwar (tehsil Neem Ka Thana, District-Sikar). The site has been marked as 4000 years old by the archaeologists and it was on the banks of river Kantali. Now, this river is dead. Often, during the monsoon, the water runs through the bed and streams of the erstwhile Kantali. The satellite images indicate that long ago it use to join river Drishadvati, near Soni-Bhadra in the north. The only historic site of Thar that has been excavated so far is Kalibanga in northern Rajasthan. 'Assumption of the archaeological research is that human societies and inhabitants leave behind them a material and tangible proofs of their existence by way of remains'.⁶¹ The evidences available at the Kalibanga indicate to well-settled establishments with food-storage and cooking as the central features, with the pits and *chullas* in the houses. The earthen pots were extensively in use for storage and cooking purposes. Chronologically, the Harappans followed the lithics phases of history. The terracotta ploughs have been found at Indus sites of Cholistan and Banawali. Excavations revealed a ploughed field at Kalibangan. All these findings indicate to the acquaintance of Harappans with the plough and it prominently hints at the conducive environmental conditions of the area that were suitable for cultivation. The use of terracotta plough also indicates that the soil was porous and soft enough. Though it belonged to the early Harappan period, there is no reason to doubt that the pattern continued even during the mature Harappan period. The Kalibangan field contained two sets of furrows, crossing each other at right angles, thus forming a grid

⁶⁰ B. K. Thapar, *Recent Archaeological Discoveries in India*, UNESCO and the Centre for East Asian Cultural Studies, 1986.

⁶¹ M. S. Mate, 'The Clay Feet?', *Bulletin of the Deccan College Research Institute*, vol. 49 (1990), pp. 243-249.

pattern. It is likely that two crops were raised in the same field. Present pattern of crop plantation in this area shows, that mustard is grown in one of the furrows and horse-gram in the other. Mixed cropping is suggested at other sites also. For instance, some of the Indus sites have mixed plantation of wheat and barley. Even today, this practice of mixed cropping is at work in many parts of north-west India. Especially it is popular in the geographically dry zones. This pattern is an insurance against weather hazards. Unfortunately, if the wheat fails to ripen, the hardier barley is sure to yield and it will supply the necessary grain that helps to survive through the scarcity that has been caused due to the famine conditions.

Interesting insights in the desert were attained through the consecutive excavations that were carried out in 1940s and 1950s and these excavations confirmed the pre-Harappan and Harappan deposits. The pre-Harappan culture of Kalibanga has peculiar characteristics as it is clear from the deposits that include fortification wall, houses, and wheel-thrown pottery, beads and many other objects. The presence of backed bricks mostly measuring 30x20x10 cm indicates to a well developed housing industry. Many other items explored during the excavations are hinting towards an exchange of culture, and mutual contact, between various pre-Harappan towns/Harappan towns and Kalibanga.⁶² A definite system of town planning like Harappa and Mohenjo-Daro was also followed at Kalibanga. The terracotta figurines indicate the presence of sophisticated art. Full excavations on the other sites might provide a clear picture of the life and culture that was unfolding in the regions of Thar Desert during the historical period. Even after locating the immensely rich data at the site, even today the region is awaiting the crack of rigorous archaeological excavations. Thar Desert is a critical region to evaluate the relationship between climate change, hominin demography and cultural evolutions that marked the development of survival mechanism in the dry and arid desert. On basis of the

⁶² K. C. Jain, *Ancient Cities and Towns of Rajasthan*, Book Treasure, Jodhpur, p. 82.

archaeological data collected so far, it can be asserted that this desert was quiet vibrant throughout the prehistoric times except occasional minor dips!

Based on the above discussions, it can be forwarded that the Indian Desert was humid up to the time of the Harappan civilization (2500-1500 BC). The analysis by Allchin suggests that the Thar Desert is essentially a 'natural desert'. As everyone believes that anything natural is good, a similar approach should be upheld for the Thar Desert. But with this, the impact of the human activities on its ecology cannot be ruled out. In 1982, while reviewing the literature around the desert, Dhir concluded that 'after traversing the length and breadth of the western arid zone of Rajasthan I have not come across any soil formation characteristic of a humid environment...it appears, therefore, that the humidity of the late Pleistocene and Holocene could not have been a high as has been made out'.⁶³ Jodha has regarded the 'march of the Rajasthan desert' as an unsettled question but supports the fact that the environmental conditions in the desert are getting worse.⁶⁴ The factors listed to demonstrate the declining conditions are as follows:

1. Growth of wasteland due to covering of soil by sand dunes and loss of top soil.
2. Increasing salinity of water.
3. Reduced crop productivity.
4. Drying up of wells.

So, overall it can be proposed that geologists have two different positions about the desert. Some believe that the region was arid for a long time while the others assert that the desert of Thar is a 'natural' evolution due to the shift of tectonic plates and

⁶³ R. P. Dhir, 'The Human Factor in Ecological History' in Brian Spooner and H.S. Mann (eds.) *Desertification and Development: Dryland Ecology in Social Perspective*, Academic Press, London, 1982, p. 315.

⁶⁴ N. S. Jodha, 'The Operating Mechanism of Desertification and Choice of Interventions' in H. S. Mann (ed.) *Arid Zone Research and Development*, Scientific Publishers, Jodhpur, 1980.

the environmental fluctuations. Overall, the formation of the Thar Desert cannot be attributed to human activities.

The continuing studies by noted archaeologists and historians Tessitori, Aurel Stein, Hermann Goetz and A. Ghosh have concluded that at least before the 7th century, it was a region of extensive and prosperous culture.⁶⁵ After the decline of the Harappan civilization, the Ghaggar valley was not considered as a rich settlement (or at the most after the disappearance of the Painted Grey Ware). However, it had witnessed the rise and fall of several cultures from the Mauryan period onwards. The literary evidences suggest that between the 5th and 7th centuries, new clans like Panwars, Bhatias and Varhas inhabited northern Rajasthan. The fort of Bhatner (now more popular as Hanumangarh fort) was founded in the 5th century by a prince Bhati of the Jadam Clan. While the Chauhanas were becoming popular in the region of Ajmer-Sambhar, the Bhatias and Varhas moved away and settled in the southern sandy parts of Rajasthan and Sindh. Recent excavations have drawn attention towards the fully developed figurines that are associated with Hindu mythology (like image of Uma-Mahesvara, Krishn-Gopala and *Mahisasuramardini* and a beautiful goddess made of red clay plaque from Bhadarkali Ther) which belong to the later Kushan and early Gupta period.⁶⁶ The Kushan and Indo-Sythians embraced Buddhism. The Bhadarkali was originally a Buddhist *stupa* and carries all the features of the Chaityas of the early Buddhist period. Heiun T-siang, the famous traveller of the 7th century has noted a large number of Buddhist monasteries and centres that existed in India. The description of Heiun T-siang about kingdom of Satardru is very interesting and the antiquity of the temple and the description, direction and distances recorded in his account goes in favour of identifying it with the Bhadarkali *Ther*. The location of this *Chaitya* was on the

⁶⁵ G. S. L. Devra, 'Orientlists and Historians on the Early Settlements Patterns and History of the Ghaggar Region of Rajasthan', in Rakesh Hooja, Rima Hooja and Rakshat Hooja (eds.) *Constructing Rajpootana-Rajasthan*, Rawat Publications, Jaipur, 2010, p. 82 (82-98).

⁶⁶ *Ibid.*

eastern side of *Ther*, and at the same location where the fort of Bhatner was made. Looking into this, it is possible to say that many such religious structures might have existed in the region of *Ther*. The constant engagement of the humans with the Thar is clearly visible through the exchanges held between the ruling clans, and the presence of religious structures and figurines. Apparently, it is interesting to note that even with the expansion of the state set-ups in the fertile lands of the river basins, the desert continued to be lucrative and was sustaining the human beings. It was never completely abandoned!

The water was a scarcity in desert. Therefore, in order to understand the occupancy of the region and to date the zones of activities, the archaeologists have explored the surroundings of the lakes and playas. It also aimed to see the relative dependence of the humans and animals on the water sources. The settlements near the small water bodies, on the raised platform and dunes, further highlights the innovation of the humans who were guided by the thought of living in safe arena, that too near the source of water. Housing of settlements on the raised levels provided a natural safeguard against the free-flowing water, which had the capacity to swipe away the houses during floods. But no evidences are available to hint at the efforts of water conservation that might have been made till the 10th century. The care of water resources, awareness for conserving and harvesting the water comes out explicitly during the medieval centuries that are evident through the presence of various water reservoirs and tanks that were used to collect the annual fill from the monsoonal rains. Many *kharins/rela/sewanj/bahla* (seasonally inundated areas), wells (*kuin/chanch, kosita, dhimra, dhibra, kohar, kuwa, bera*⁶⁷), *seja* (spring well), *kunds* (tanks for collection of rain water for drinking purpose), *barwadi/baori* (step-wells), *khadeens* (small tanks for irrigation), *gor* (landmass to collect water), *sarovars* (water storage area), *talab* (the land dig to collect water), *dhund* (shallow lakes) and *jhalaras* were made for harvesting the rain water and to save the water

⁶⁷ Mahnto Nainsi, *Marwar ra Pargana ri Vigat*, Badri Prasad Sakaria (ed.), vol. 3, Rajasthan Oriental Research Institute, Jodhpur, 1964, p. 132.

for use in future. Vijadasar Tank, Maldesar Tank, Kasmiradesar Tank, Ranisar Tank, Dhandh Tank, Temadrai-Jogalia Tank, Khatri Tank, Ghasisar Tank, Vaisakhi Kund, Tansur, Vijayarayasar, Devasar, Dedansar, Mohtasar, Khetasar, Sudasar and Govindsar were important tanks for water harvesting and water supply to Jaisalmer. The trading community of Maheshwaris also contributed for the excavation (digging) of tank. The economic and political importance of tanks for Jaisalmer has been highlighted well by many scholars. The Asnikot Inscription indicates that water tanks were popularizing the political establishment of the Bhattis, in and around Jaisalmer. The Jain traders flourished in the Jaisalmer during the 13th century and constructed many temples within the fort of Jaisalmer between c. 1463 and 1500 AD. The introduction of the trading communities (Maheshwaris and Jains) led to the patronization of the religious festivals and annual fairs throughout the year and this made Jaisalmer prominent on the trading map of India. Further, the trading communities engaged in commercial and trading activities across the desert on the western side and served as inter-linkage between the Gujarat and Central India. The presence of the traders and merchants helped Jaisalmer to develop as a prominent city located on the crossroads of many trade routes. Due to it, the treasury of medieval Jaisalmer received a large part of prosperity and revenue in the form of transit duties. A similar kind of importance for the wells and tanks was enshrining in the region of Marwar (Jodhpur) and its political authority. On basis of the details provided by Nainsi, it can be said that the distribution of wells and tanks in the region of Marwar during the 17th century (between c. 1650-1660 AD) was very wide and impressive.⁶⁸

⁶⁸ B.L. Bhadani, *Peasants, Artisans and Entrepreneurs*, Rawat Publications, Jaipur, 1999, pp. 43-53.

Table 1: Distribution of Wells, Tanks and Shallow wells in Marwar during the seventeenth century

S.No.	Name of <i>pargana</i> and <i>tappa</i>	Total wells	Tanks	Shallow wells
1.	Jodhpur (<i>Haveli</i>)	800-804		263
2.	Pipar	471-481		148
3.	Bilara	113		74
4.	Bahlo	152		79
5.	Kherwa	101		47
6.	Pali	299		105
7.	Rohat	373		153
8.	Gundoch	87		55
9.	Bhadrajan	501-511		63
10.	Dunara	581		133
11.	Kodhana	65		20
12.	Bahelwa	48		-
13.	Shetrawa	30		-
14.	Ketu	7		-
15.	Dechhu	17		-
16.	Osiyan	72		-
17.	Lavera Kalan	68		-
18.	Asop	16		-
19.	Khinwsar	12		-
20.	Mahewah	245-255		-
21.	Jaitaran	1789-1833	94	199-209
22.	Sojhat	1441-1522	172	707-752
23.	Siwana	500-544	96	67-73
24.	Phalodi	390-490	43	-
25.	Pokaran	148	57	-
26.	Jalor	693	76	-
27.	Sanchor	276	69	-
28.	Merta Haveli	53-61	-	28-31
29.	Anandpur	2023	-	220
30.	Mokala	318-331	-	60
31.	Kalru	155-156	-	60
32.	Ren	145-153	-	5
33.	Modra	620-705	-	150

34.	Altawa	555-609	-	70
35.	Degana	936-983	-	140
36.	Riyan	2405-2690	-	10
37.	Jodhpur	4031-4065	36	-
38.	Merta	6947-7782	16	-

The rulers and nobles of Marwar, likewise Jaisalmer, have constructed numerous tanks among which Sur Sagar, Farasat Sagar and Vasant Sagar are prominent and even today these tanks serve as the bloodline in the desert city of Jodhpur. Sur Sagar (Jodhpur) and Garsisar (Jaisalmer) have special significance for both the states as these were main sources for drinking water in their respective vicinities. The Padamsar Lake at the base of the Mehrangarh fort is a prominent water body in which birds of different species flock in peace. The 700 million year old volcanic rock surrounds the Jodhpur fort and it provides a smooth base for the monsoon rain water to flow down the gully and reach different small water bodies which are located in low-lying areas of the Rao Jodha Desert Rock Park and around the Mehrangarh fort. The environmental importance of tanks marked the historical process of state formation in Jaisalmer, which was not dependent on the 'peasantization of the tribes' and 'participation of tribes' as was the case in southern (the Bhils in Udaipur state) and eastern Rajasthan (the Meenas for the Amber-Jaipur state) as well as western state of Bikaner (the Godara Jats). Both Jodhpur and Jaisalmer state are located in the interiors of the Thar desert and have been depending upon the agro-pastoral activities along with the duties collected from the traders. The requirements of dry environment have pushed both the states to engage in the water harvesting and conserving mechanisms. Along with it, the excavation of novel water sources was also crucial to ensure the potable water. Gradually, the water and exploration of its resources along with the constructions dedicated for the water harvesting became the significant political acts and apparently ensured popularity, loyalty, legitimacy and finally the political authority for the Bhatti and Rathore clans.

The abundance of the fauna in the desert can be harnessed

from a variety of sources. The animals of Thar in the lithic ages were located from the evidences of the fossils and bones found at the sites. In order to build up the details and the interactions of humans and animals for medieval times, one has to depend upon the details available in literary sources. The animals continued to be the central feature in the life of the inhabitants of the desert since middle Palaeolithic times, as evident from the remains. The herding and stock-raising became a technique for survival. The sheep, goat, camel, and bovines became the cattle of subsistence that not only served the purpose of food but were also helpful to ensure a quarter in the economic activities. All the body parts of animals had some economic value and it was extracted until their body exhausts. The exchanges of the early human with the animals have been highlighted above and it ensures that domestication, herding and hunting were the regular features.

The cattle continued to be the real wealth for the people of desert and the inhabiting humans constantly made efforts to maintain their herds. The stone inscriptions of Jaisalmer highlights the struggle through which the Bhatti state was able to maintain its herds. The recurrent cattle raids in the dominion of Bhatti rulers are evident from Goverdhana and Sati Memorial stone inscription. A few records come from Lodrava, which was the political seat of Bhattis before the construction of new fort in 1156 AD. The Goverdhana inscription specifically commemorates the death of heroes who died while defending the cows. The Gogatalai inscription of 1309 AD defines the death of Cahuina Dhuna of Vatsa gotra who fell while protecting the cows. Another inscription from Gogatalai records the death of a Chauhan hero of Vatsa gotra who died defending the cows and honour of women.⁶⁹ One more inscription, dated 1309 AD puts light on death of another Chauhan hero (Palania Ukadia), while protecting the cows.⁷⁰ All

⁶⁹ *Indian Historical Quarterly*, vol. 35, no. 3, p. 229. *Samvat bhatike 685...guruvachchhasya gotre sahu hemasuta mumjaldeva gograhe strigraha divamgata.*

⁷⁰ Nandini Sinha Kapur, *Reconstructing Identities: Tribes, Agro-Pastoralists and Environment in Western India (Seventh-Twentieth Centuries)*, Manohar, New Delhi, 2008, p. 147.

these inscriptions are dated between early 13th and 15th centuries and do indicate that during the medieval centuries, the cattle was the primary wealth for the Jaisalmer state and its localities. Similar kind of attitude towards the cattle is visible in the regions of Jodhpur and Bikaner. The bullocks of Nagaur are noted for their massive horns and humps. The cows of the sandy tracts, especially Mallani, Sanchor (Jodhpur) and Pugal (Bikaner), are held in high esteem. Similarly, the horses of Mallani and Jalor (both in Marwar) are renowned for their hardiness, ease of pace. Though they are light-boned but still they grow to good height and have ability to carry heavy loads and cover long distances without water and food.⁷¹ The districts of Sanchor and Mallani were considered excellent for procuring the breeds of milching cows and horses.⁷² Even today, the Thar bullocks (mainly *Sanchori* and *Naguri*), the bovines of the *Rathi* breed and the horses of Marwari breed are well-known and highly demanded in the agricultural and pastoral circles.

The bullocks of Sanchori and Naguri breed, the camels (Bikaneri and Jaisalmeri) and the cows were most desired by the agricultural communities not only in Thar but even in other parts of India. This led to the organization of many famous cattle fairs in the interiors of the Thar desert. Even now, the cattle fairs are organized at Pushkar, Parbatsar (Tejaji cattle fair), Mallinath (on dry bed of river Luni near Tilwara, tehsil Pachpadra, Barmer), Nagaur, Ramgarh and Sanchor. These were the venues to fetch the best of cattle as the records from different states indicate. Hordes of cattle traders arrived at these fairs from eastern, northern and central India. The Rathi breed cow is another significant animal of sale due to its milk yielding capacity. The dairy products secured from bovines were the only regularly available source of nutrition for various communities. Ghee was a significant product and immediate needs of cash were met through its sale. Thus, the bovine cattle were central for existence in the desert. The much

⁷¹ Major K. D. Erskine (comp.), *Imperial Gazetteer of India, Provincial Series: Rajputana*, 1908 (Superintendent of Government Printing, Calcutta), Books Treasure, Jodhpur, reprint 2007, p. 47.

⁷² *Ibid.*, p. 183.

dependence on the cattle for dairy products and economic activities made the desert inhabitants to actively participate in rearing and protecting animals. This further motivated the inhabitants to engage in animal husbandry and pastoralism for multiplying this resource. The entire body of the animals was a fiscal deposit that can be en-cashed as and when the need arose.

A *charan* named Virdas Rohdiyo alias Rangrelo Vithu (c. 1520-1608) composed *Jaisalmer ro Jas* in the 16th century. He describes the landscape of Jaisalmer as, 'The queen consort is like a beast of burden. She has no company while fetching water from the pond. Peacocks are conspicuous by their absence throughout the country (Jaisalmer). But there are creatures like *jarahb*, *seh* and *goli* in abundance'.⁷³ Further he notes, 'if the land is full of rich and dense mango groves, rivers abound in sweet water, cuckoos greet one with their melodious notes, know ye O traveler, you have set foot on the land of Godwar', while defining this territory of southern Marwar.⁷⁴ His descriptions are indicating to the natural environment and landscapes.

Besides presence of large cattle herds, the wildlife of the desert was also an attraction that was accessible to a select group, who were mainly the members of royal family, nobility and the officials. The *shikar* diaries of the Bikaner kings are overflowing with extensive details about the animals that were available in the *jangal desh* (Bikaner Desert). The interaction of the imperial government with the princely states culminated into the visits of many officials, in the interiors of the Rajput states of the Thar. The abundance of the royal sport (hunting of big cats) served a lucrative initiative for the seeker of the adventure sporting. The southern and eastern states (Mewar and Jaipur) were rich in the sport due to the mixed terrains of hills, grasslands and rivers and various small streams. Bikaner was distinguished as a land without tigers. As per the British officials, there was absence of dangerous game in the state. Erskine notes about the wildlife in Bikaner around the turn of the 20th century, 'the ravine deer (*chinkara*) is fairly

⁷³ Nandini Sinha Kapur, *Reconstructing Identities*, p. 140-41.

⁷⁴ *Ibid.*, p. 141.

common everywhere, and hyenas and wolves are not altogether rare; there are fine herds of blackbuck in the north, where in eastern districts, the *nilgai*...is...wild hogs are plentiful...among small game may be mentioned the hare; the partridge; the florican; the great Indian bustard or *gurahn*; wild ducks and teal; and several species of sand-grouse'.⁷⁵ Thus, he confirms the various species of birds along with the varieties of deer. The quality and volume of these select species made-up for the absence of the big game in the Bikaner state. 'The local blackbuck and chinkara achieved record size, and excellent stocks of wildfowl made Ganga Singh's annual sand grouse and duck shoots world famous'.⁷⁶ Erskine confirms that in the 20th century, Jodhpur had some 345 sq. miles of forest, and a smattering of ravines, rivers, and seasonal marshes, along with numerous reservoirs and several lakes.⁷⁷ The availability of the water resources made Jodhpur a conducive terrain for the boars. Jodhpur could boast of smooth and treeless plains that offered horse and rider few obstacles and minimum danger while pig-sticking. Marwar had a more suitable landscape for pig-sticking as per a huntsman.⁷⁸ The Bikaner state also held its boar in high esteem and once Ganga Singh claimed that boars are very plucky, and fight bravely to the end, as a rule, often charging before they are speared. An anthropological investigation has demonstrated wild boar as 'emblems of royal power and nature's abundance'.⁷⁹ Till the 1930s, the boars were very common in the vicinity of the Bikaner and Jodhpur. So much so that after dusk it was dangerous

⁷⁵ Erskine, *The Western Rajputana States Residency and The Bikaner Agency*, vol. 1, 1908, reprint Vintage Books, Gurgaon, 1992, pp. 311-12.

⁷⁶ Julie E. Hughes, *Animal Kingdoms: Hunting, the Environment, and Power in the Indian Princely States*, Permanent Black, Ranikhet, 2013, p. 35.

⁷⁷ Erskine, *The Western Rajputana States Residency and The Bikaner Agency*, vol. 1, 1908, pp. 50 & 113. *Nansi ri Vigat* also confirms the same.

⁷⁸ Dhaibhai Tulsinath Singh Tanwar, *Shikari aur Shikar*, Privately Printed, Udaipur, pp. 184, 271, 299 & 304.

⁷⁹ Ann Grodzins Gold and Bhoj Raj Gujar, 'Wild Pigs and Kings: Remembered Landscapes in Rajasthan', *American Anthropologist*, vol. 99 (1), 1997, pp. 70-84.

to go out towards the outskirts of the town. The Jodhpur state kept strict vigilance on the hunting of the boars and did provide food for them. This generosity was extended to the boar for securing a healthy and huge hunt.

The Asiatic lion (*Panthera leo persica*) was found in the arid plains of Sindh and Rajputana. Blanford categorically stated 'and a few more in the wildest part of Rajputana (Rajasthan) specially southern Jodhpur...'.⁸⁰ The last trophies of lions aimed by the British officials were shot at Anadra (Sirohi) and Jaswantpura (Jalor).⁸¹ Both the localities are located in the intense desert. A British official notes that cheetah/hunting leopard (*Acinonyx jubatus venaticus*) was 'most common' at 'Jeypur in Upper India'.⁸² The wide availability of cheetah throughout the continent might have been due to its 'ability for adaptation' that might have made it an extensive wanderer. The *Arzdash*t documents have number of evidences reflecting the requests put forward by the villagers to the state, in order to clear their lands of the foe (*cheetah*) as they were constantly a challenge to the people working in the field and their cattle. The leopard/panther (*panthera pardus*) was a native of the dry region and has been located in many areas around the hilly locks of the Aravalli, heading into Thar. The Caracal (*Felis caracal*) is one more carnivorous species that adapted to the environs of desert⁸³, now it is extinct in Thar of India. The sloth bear (*Melursuu ursinus*) has suffered a lot at the hands of the hunters and now it is rarely seen. In the hilly regions, the ruminants such as *sambhar* (*Cervus unicolor*), *chital*/spotted deer (*Axis axis*) and *chausingha*

⁸⁰ W. T. Blanford, *The Fauna of British India including Ceylon and Burma*, 2 Vols., vol. 1(*Mammalia*), Taylor and Francis, London, 1888, p. 57.

⁸¹ Rajkumar Gupta and Ishwar Prakash (eds.), *Environmental Analysis of the Thar Desert*, English Book Depot, Dehradun, 1975, p. 470.

⁸² R. Sterndale, *Natural History of the Mammalia of India and Ceylon*, Thacker, Spink, and Co., Calcutta, 1884, p. 200.

⁸³ Ishwar Parkash, 'Extinct and Vanishing mammals from the desert of Rajasthan and the problems of their preservation', *India For*, vol. 88, 1958, pp. 642-645 and 'The Present Status of Caracal', *Journal of Bombay Natural History Society*, vol. 58, 1961, p. 791.

(*Tetracerus quadricornis*) were commonly reported at the beginning of the 20th century.

Writing in the end of the 19th century, Lt. Col. Adams has reported separately about the games⁸⁴, big games and feathered games. He mentions that lions, tigers, panthers, crocodiles, bear, snake etc. were popular for big-game.⁸⁵ Presently, even in the sanctuaries and parks, a lot of effort is required to locate them. The constant depletion in the number of these mammals can be attributed to the interventions of humans in their habitats that had led to the depletion of the natural conditions, which are a must to keep the re-production cycle in place.

Noted environmental historian puts 'our obsession with big game of the four-footed kind blinds us to how much of *shikar* consisted of tracking and shooting birds and small game'.⁸⁶ The birds and the smaller animals, which form the flocks, are often missed by the historians due to the absence of these minors in the imperial documents. Some effort has been made here to harness the data and understand the presence of birds in the desert ecology. The birds that have adapted to the rigorous arid conditions of the sandy and rocky desert have been discussed here for understanding 'the adaptive' and 'protective nature' of the desert birds. The ability to withstand the extreme dryness of the atmosphere and to survive in absence of water by eking out their moisture requirement from dew and from a diet that consist of dehydrated seeds and hard-bodied insects (beetles) are their paramount qualities. Crested lark is a sand coloured representative who inhabits arid desert. Typical desert bird, like, stone curlew, hubara bustard and sand grouse have camouflage as their defence mechanisms. Anyone can see

⁸⁴ Lt. Col. A. Adams, *The Western Rajputana States: A Medico-Topographical Account of Marwar, Sirohi and Jaisalmer*, Junior Army and Navy Stores Ltd., London, 1899, pp. 163-67. See Plate- 12.

⁸⁵ *Ibid.*, pp. 168-76. See Plate- 13.

⁸⁶ Mahesh Rangarajan, preface to J. H. Baldwin, 'Hunting the Houbara' in *Oxford Anthology of Indian Wildlife: Hunting and Shooting*, Mahesh Rangarajan (ed.), vol. 1, Oxford University Press, New York, 1999, p. 61.

that as the danger approaches, they will immediately squat flat on the soil, stretching out their neck in front and lying doggo. The black and grey partridges find favourable conditions on the fringes of desert and don't enter the arid desert beyond the zones of canal irrigation. They mainly survive on the grins and weed-seeds and do supplement their diet with insects and termites. The sand grouse are typical dwellers of the arid country and afford perfect camouflage in the sandy surroundings. They live in flocks of 10-15 and do survive on the abundant weed-seeds left by the monsoon vegetation. These birds drink water regularly and for availing water their parties and flocks fly-out long distances, and drink from a perennial surface spring or rain puddle. Six species of sandgrouse are found in Thar Desert, and commonest of them are Indian (*petrocles exustus erlangeri*), the spotted (*p. senegallus*) and the imperial or black bellied (*orientalis*). The imperial sand grouse comes mostly from Russian Turkestan, Transcaspia. The Thar Desert of Bikaner is the best wintering ground for these birds. The peacocks (*Pavo cristatus*) are quite conspicuous and have been making the avifauna of the state richer. Amongst the birds, the peacock has been held in high esteem by the royal families due to its beauty and unique feather arrangement. The reverence for the bird can be inferred from the royal apartments. Nearly all the Rajput royal forts and palaces of the medieval centuries have Mayur Dawars that lead into the apartments of royal women (*Zenani Deodhi*).⁸⁷ The intricate and beautiful arrangement of colourful feathers over the body and wings of the bird has been an inspiration to attach it to the female apartments, as there the pleasure awaits the king in different independent but guarded female bodies. One more unique feature of the bird is its dance, by holding the feathers high and wide. This feature marked this bird distinctly from the other birds, and confirmed its acceptance in the symbols of royalty. The bird, its unique features and food-habit, that has been presented as nature (the one who hunts the venomous and dangerous snakes), made it a fit representative of the royalty. The feathers of the peacock have a huge market. Due

⁸⁷ See Plate 7: Mayur Dwar.

to it, the poaching for the collection of the feathers increased drastically since the 19th century. Earlier, the bird was only a representative of beauty and royalty. Hence, it never became an open target. Occasional killings were organized by the royals to celebrate the lavish luxury of savour meat.

The endangered species of great Indian Bustard is another tropical bird who normally keeps single. It inhabits in the semi-arid, stony or sandy desert zones which have scattered scrubs of *Zizyphus*, *Butea*, *Leptadenia*, *Capparis*, *Euphorbia* and at times seeps into the cultivated fields of mustard and cotton. It is largely omnivorous and its diet comprises grains, shoots, berries, locusts, grasshoppers, lizards and large variety of insects. Normally, its breeding season is between March and September and it lays single egg (rarely two) in a shallow scrapes on ground usually in undulating grass and scrubs, which is often exposed to the hoofs of the grazing cattle. A fully grown bird usually falls as a target of poacher due to quantity and savouriness of its meat. The *Houbara* or *Macqueen's Bustard* is a winter visitor to Thar, coming in from Transcaucasia, Transcaspia, Eastern Iran. This bird is much sought after by hunters due to its palatable flesh. Stone crulew, desert courser, large desert lark, crested lark, Indian desert finch lark, short-toed lark, isabelline chat, desert wheatear chat and red-tailed chat are other birds who flock in the arid environment of the Thar due to their effective adaptability and defence skills. Besides these intense desert inhabiting birds, there are many other species of birds who approach the desert of Thar temporarily, as the monsoon visitors, passage migrants, residents, vagrants or winter visitors. The sites of their activities are Sambhar Lake, Kaylana Lake, Balsamand Lake, Sardarsamand Lake (Jodhpur), Jawai Lake (Pali) and various other water bodies in the Thar. The other two satellites sites for watching the activities of these birds are Ratan Talav and Kopchia ki Dhani.

The Sambhar Lake and its birds have been recorded well due to the presence of saline water and its economic potential. The Sambhar Lake is situated in the Nagaur, Jaipur and Ajmer districts of Rajasthan with a surface area ranging between 190 to 230 sq. km. and its catchment area spreads over 5,700 sq. kilometres. This

is India's largest inland saline wetland. Its importance has secured it an entry in the list of Ramsar sites. The Convention on Wetlands is known as the Ramsar Convention and it is an intergovernmental environmental treaty established in 1971 by UNESCO. It came in force in 1975. It provides for national action and international cooperation regarding the conservation of wetlands, and wise sustainable use of their resources. Ramsar identifies wetlands of international importance, especially those providing waterfowl habitat. Sambhar was to be a perennial lake till about 1000 BC and after it, this gradually became seasonal.⁸⁸ Historically, the lake has been exploited for the salt production that became regularized only during the reign of Akbar. A settle system of employment and salt-production at Sambhar Lake started only during sixteenth century and in the same century the income from the lake was Rs 2,50,000 per annum which gradually reached to Rs 1.5 million when Aurangzeb ascended the throne of the Mughal empire. The sharp rise in the revenues from the lake, due to salt manufacturing, has made it a much sought after zone (as land assignment). The disintegration of the Mughal empire declined the income from the lake. Later, Jaipur and Jodhpur state appropriated the lake. The upheavals of the 18th century also affected the lake and its control oscillated between the Marathas and the Rajput states. The revenue realized from the lake during the 18th century is a miss in history, until the British took it over in 1835 AD. A joint government of Jaipur and Jodhpur state called *Shamlat*, and through it they jointly worked the lake from 1844 onwards.⁸⁹ The two nearby insignificant hamlets of Nawa and Gudha also attained prominence due to the salt production activities and emerged as salt markets. Jodhpur state started salt manufacturing in both the villages, which made Jaipur envious. Many small frictions erupted between both the states for controlling the salt production of both the villages. The events of frictions continued

⁸⁸ Nayanjot Lahri, *The Decline and Fall of the Indus Civilisation*, Permanent Black, Ranikhet, 2000.

⁸⁹ B. Gopal and K. P. Sharma, *Sambhar Lake, Rajasthan*, WWF-India, New Delhi, 1994.

with minor interventions from the Marathas also; mainly, Holkars and Sindias.⁹⁰ These events ceased when the British finally took over both the villages along with the lake in 1870s and continued to work on it till 1947.⁹¹ The significance of lake was not limited to production and collection of revenue. It attracted attention of many besides these activities. It has been a centre for various species of birds, who depend on its saline water for their survival and on its surroundings for their subsistence. R. M. Adam was appointed Assistant Commissioner at Sambhar and did a pioneering work on the birds of the Sambhar lake. His ornithological record of lake, its surroundings, including the areas of Kuchaman and Nawa, is 'the only authentic source of information and provides an invaluable benchmark against which change in population size and bird diversity can be compared today'.⁹² A scholar has provided a long list of the Sambhar Lake waterfowls (eighty-three in number) by classifying them into seven categories as per their habitation periods and nature. Similarly, Adam has provided details about the desert birds.⁹³ He has described the featured game birds separately.⁹⁴ He also gives the reasons that motivated people for killing the birds. During a short visit to the desert states, Hugh Whistler has listed three hundred species of birds while surveying the avifauna.⁹⁵ It is important to mention here that the imperial records from the princely states of Rajputana are either silent or do provide very meek information about the birds. Because much of the imperial hunts were about 'exaggeration of the four-legged

⁹⁰ S. C. Aggarwal, *Sambhar Lake Salt Source*, Government of India Publication, New Delhi, 1951.

⁹¹ J. Sarkar, *A History of Jaipur*, Orient Longman, New Delhi, 1984.

⁹² Harkirat Singh Sangha, 'The Birds of Sambhar Lake and its Environs', *Indian Birds*, Vol. 4, No. 03 (May-June 2008), pp. 82-97. (p. 84). http://indianbirds.in/pdfs/IB4.3_Sangha_SambharLake.pdf

⁹³ See Appendix – 3.

⁹⁴ Lt. Col. A. Adams, *The Western Rajputana States*, pp. 177-185.

⁹⁵ S. C. Bhatt and G. K. Bhargava (eds.), *Land and People of Indian States & Union Territories*, 36 vols., vol. 23, Kalpaz Publications, Delhi, 2005, p. 354.

fauna' and 'it's taking' as the four legged games were the symbols for demonstration of the valour and bravery.

The presence of the Indian gazelle/chinkara (*Gazella g. bennetti*)⁹⁶, desert fox/red fox (*Vulpes v. pusilla*), white footed fox, bengal fox, asiatic cat, the mongoose (*Herpestes spp.*), the desert cat (*Felis libyca ornata*), the desert hare (*Lepus nigricollis dayanus*) and onager (*Indian Wild Ass*) is visible in the sandy desert of Jaisalmer but not very prominently! The *nilgai* (*Boselaphus tragocamelus*)⁹⁷ has adapted to the changing situations (man-made factors and environmental changes) well and has simultaneously acquainted effectively in sandy tracks, hillocks and the rocky terrains. They live in hordes and were seen frequently around Sambhar Lake, in the surroundings of Jaisalmer, deserts of Bikaner, Jodhpur, Nagaur, Jhunjhunu and Sikar till the last decade. Now their number has drastically reduced and the herds of these community grazers are no more visible, except some lone survivors in and around some forest tract or the cultivated fields. Locally, it is called *roj*. The desert is rich in the population of flying foxes, rat-tailed bat and tomb bat. The black buck (*Antelope cervicapra rajputanae*) had a substantial population in the desert region till the end of 1920s. Recently, the number of this deer has reduced considerably and now they are only found in the Vishnoi/Bisnoi villages around Jodhpur.

A negligent attitude towards the rodents and the reptiles is evident from the *shikar* diaries and reports from the officials of empire. They completely ignored the minor members of this vast desert. Vast varieties of species from both the families (reptiles and rodents) have immensely influenced the Thar and its living style. The rodents, especially mouse, do appear in some of the archival records as a destroyer of the crop and *anna-vinashak musa/musaq*

⁹⁶ Mainly found in the western parts of Jaisalmer and it prefers to live in open grasslands with thick cover of bushes and browses on shrubs.

⁹⁷ Large numbers of *nilgais* were killed under the Crop Protection Act. In Shekhawati region, near Sikar, a herd of 11 cows (neelgai) consumed 6 mds (=about 2.50 quintal) of harvested carrot during one night.

(grain-damager mouse). Besides it, no other rodent is credited. The rodents being the minor components of the nature usually don't figure in the data. But to take stock of the available ecological diversity of the region, it is crucial to report about these species. The sandy tracts of Pali, Nagaur, northern Sirohi are forming the inhabiting areas for the two gerbils namely *Gerbillus gleadowi* and *G. nanus* along with the other rodents such as *Rattus meltada pallidior*, *Golunda ellioti gujerati*, *rattus gleadowi* and *Mus platythrix sadhu*. The five striped squirrel (*Funamabulus pennanti*) is found the entire Thar in abundance. The jackals (*Canis aureus*), striped hyaenas, wolves and ruddy mangoose (*Herpestes smithi*) habited in the rocky tracks for shelter and food. They have adapted well to the hillocks habitations. They come out of the hills (in the open field and pastures) only to lift the sheep and goats. At times, small children were also attacked. The inhabitants of villages located around the Aravalli ranges which fangs through the Jaipur region do complain occasionally about the lifting of the smaller animals (sheep and goats) and kids by these small sized carnivorous members of ecology.

The geographical distribution of the reptiles in the desert is wide and many species of snakes have been recorded and noticed in the region. The black cobra, the krait and the viper are most popular in the imaginations of the inhabitants due to their potential to kill and frequent presence. The reptiles of the Thar Desert can be distributed in four categories as per their habitats. The major habitats are aquatic, sandy, rocky and human settlements. The large lakes and small water catchments are scattered throughout the Thar Desert and they do house the turtles, who shift to the wells in the months of May and June. Many of the pond turtles can be seen buried under the cracking mud of the lake beds. Lately, *muggar* (*Crocodylus palustris*) has been found in the Sardarsamand Lake (Jodhpur) and some can be located in Jawai Dam catchment area (tehsil Sumerpur in district Pali). After 1970s, *muggar* are not seen; however, the villagers narrate these tales with a nostalgic feeling. The skink (*Mabuya dissimilis*), the Indian monitor (*Varanus bengalensis*) and dhaman (*ptyas mucosus*) do live on the banks of the lakes and ponds. They readily visit the water body to search for

food and shelter. The sandy plains provide conducive habitat for the sand geckos (*Stenodactylus orientalis* and *Cyrtodactylus*), brilliant agama (*Agama agilis*), bronze glass skink (*Mabuya macularia*), Indian sandfish (*Ophiomorus tridactylus*), Indian fringe-toed sand lizard (*Acanthodactylus c. cantoris*), desert monitor (*Varanus griseus*), brahminy blind snake (*Typhlops braminus*), thread snake (*Leptotyphlops macrorhynchus*), the sand boa (*Eryx johnii* and *E. conicus*), racers (*Coluber* spp.), diadem snakes (*Sphaerosophis* spp), dhaman, striped snake (*Psammophis* spp), Rajasthan saw scaled viper (*Echis carinatus*) and the Indian krait (*Bungarus caeruleus*). The Indian spiny tailed lizard (*Uromastix hardwickii*) inhabits the burrows which have a bed of the clayey soil. It is commonly found in Bikaner and Jaisalmer tracts. Desert monitors are very common in Bikaner. The striped snake and racer are found in appreciable number in the regions of Barmer, Pokran and Phalodi. The poisonous krait is found in the Barmer, Jaisalmer and Bikaner tract. The inhabitants of the rocky tracts are fat-tailed gecko (*Eublepharis macularis*), rock gecko (*Cyrtodactylus kachhensis*), three striped skink (*Eumeces taeniolatus*), Indian Monitor and Indian Desert cat-snake (*Telescopus rhinopoma*). Geckos like *Hemidactylus flaviviridis*, *H. brooki*, *H. persicus* are usually found in villages and mainly around ruined and deserted buildings. Bark gecko (*H. leschenaultia*) is found in the barks of the large trees like mango, *ficus* around the human settlements. The wild harriers of Thar are Great Indian Desert eagle, Indian vultures, falcons and buzzard.

The desert locust in India is strictly confined to the arid and semi-arid regions of the Thar Desert. It is a short-horned grasshopper capable of changing habitat and behaviour. When they get the suitable environment they multiply in big way. Locally these are called *tiddi*. These locusts come in swarms and the recorded data shows that Locust invasions have done significant damage to the crops. The detailed research of Rao⁹⁸ and Roonwal⁹⁹

⁹⁸ Y. Ramchandra Rao, *The Desert Locust in India*, I.C.A.R., New Delhi, 1960.

⁹⁹ M. L. Roonwal, 'Food Preference Experiments on the Desert Locust', *Schistocerca gregaria* (Forsk.) in its permanent breeding grounds

brings out a large data about the locust invasions. Interesting observations have been provided by many zoo scientists on the feeding patterns of the locust.¹⁰⁰ The recent locust attack (May-June 2020) had created havoc and environment of fear, as it went till Telengana after hitting many villages of Uttar Pradesh and Bihar en route. The western part of Rajasthan was severely hit by their attack. The earliest reference for the Thar termites was found in the travel book of Adams.¹⁰¹ So far, seventeen types of termites have been found in Thar.¹⁰²

In the recent past, the governments have taken a few initiatives and have come up with many wildlife sanctuaries in the desert of Thar. This has helped to conserve the drastically targeted fauna to some extent. The popular sanctuaries located in the Great Indian Desert are Tal Chappar Sanctuary (Churu district), Gajner Sanctuary (Bikaner), and the ones which were proposed in 1970s were Khadla wildlife sanctuary (Jawai lake-Pali district), Lathi Gazelle sanctuary (Jaisalmer) and Ramdeora Bustard sanctuary (Pokran). A few of these could not see the daylight. Presently, the functional sanctuaries of the Thar desert are Desert National Park (Jaisalmer), Gajner Wildlife Sanctuary (Bikaner), Kaila Devi Sanctuary (Karauli), Machiya Safari Park (Jodhpur), Tal Chhappar, Jorbeed (Bikaner), Jhalana Safari Park (Jaipur), Sariska (Alwar) and Nahargarh Biological Park (Jaipur). These sanctuaries are the centres for the visitors and the wildlife lovers, to get a sight of these beautiful creations of the nature and watch their social behaviour.

A large variety of the flora along with the crop cultivation continued to dominate the landscape of the desert even after the onset of aridity. Till the 17th century the cultivation was a chief activity even in the regions of Marwar. As the survival only on

in Mekran, *Journal of Zoological Society of India*, Calcutta, Vol. 5 (1), 1953, pp. 44-58.

¹⁰⁰ Rajkumar Gupta and Ishwar Prakash (eds.), *Environmental Analysis of the Thar Desert*, p. 372.

¹⁰¹ Lt. Col. Archibald Adams, *The Western Rajputana States*, p. 387.

¹⁰² Rajkumar Gupta and Ishwar Prakash (eds.), *Environmental Analysis of the Thar Desert*, pp. 393-4.

the agriculture was not possible, therefore, the pastoral activities were clubbed with agricultural activities and gradually, the agro-pastoral groups dominated the region, economically and culturally. Mahnto Nainsi compiled a *khyat* in the 17th century (between c. 1658 and 1662 AD) and noted that select villages in the Phalodi area had cultivated land, averaging up to 1.5ha per household. This size is very small to be fit as a field and it indicates that Agro-pastoralism was the order of the day for effective survival in the harsh weather conditions of the desert. The main crops of Jaisalmer were wheat, *chana*, *bajra*, *til*, *moong* and *moth*. The cotton was discontinued due to its unprofitability during the droughts.¹⁰³ In Jaisalmer, the Paliwal Brahmanas specialized in the agricultural operations. Thus, the assessment and collection of revenue for the state primarily depended upon these contributors. They also made many *khadeens* (small tanks) mainly for cultivating wheat. In the early 1800s, Tod stated that the distinctions between the Marwar and Mewar are deep rooted, besides the natural barriers which coincide with the difference in customs and manners, and anyone who will approach 'into the sandy flats of Marwar, the abode of the Rathors, would feel the force of this remark'.¹⁰⁴ Further he notes that 'God Almighty never intended that the region on this side the mountains should belong to Mewar; nature's own hand has placed the limit between you'.¹⁰⁵ He learnt from an envoy (of Maharana Bhim Singh) that the plants too marked the territorial divide, sometimes more accurately than the hills. The envoy has invoked the principal of nature in order to claim the region of Godwar for the Mewar, which was given to the Marwar region. To make his case he said, 'even on principle Godwar is ours, for nature has marked our limit by stronger features than mountains. Observe, as you advance, and you will find to the further limit of the province every shrub and flower common to Mewar; pass that

¹⁰³ Ram Vallabh Somani, *History of Jaisalmer*, Jaipur, 1990, p. 184.

¹⁰⁴ Col. James Tod, *Annals and Antiquities of Rajasthan or the Central and Western Rajput States in India*, William Crooke (ed.) 3 vols., vol. 2, Humphrey Milford-Oxford University Press, London, 1920, p. 708.

¹⁰⁵ *Ibid.*, p. 803.

limit but a few yards, and they are lost: *Anwal* (*aonla-Phyllanthus emblica*), *anwal Mewar*; *Bawal* (*babul-Acacia arabica*), *barwal Marwar*. Wherever the anwal puts forth its yellow blossoms, the land is of right ours...let them enjoy their stunted *babul*, their *karil* (*Capparis aphylla*) and the *ak* (*Calotropis gigantea*); but give us back our sacred *pipal* (*Ficus religiosa*), and *anwal* of the border'.¹⁰⁶ The true grain of the fact was highlighted by Col. Tod as, 'the transition is beyond credence marked: cross but a shallow brook, and you leave all that is magnificent in vegetation; the papal, bar (*Ficus bengalensis*) and that species of the mimosa resembling the cypress, peculiar to Godwar, are exchanged for the prickly shrubs, as the wild caper, *jawas* (*Hedysarum albagi*) and many others, more useful than ornamental, on which the camel browses'.¹⁰⁷

The change of vegetation has been recorded by many other scholars and some have heightened the change of flora with the change of desert layers. K. S. Sankhala puts that 'the vegetation changes from the tropical semi-evergreen..., the tropical dry deciduous teak (*Tectona grandis*) forest of Banswara, and the tropical dry deciduous *Anogeissus pendula* forests of Aravalli to tropical dry deciduous thorn forests of the desert zone. In the extreme north, there are only shifting sand dunes and scrub of *Calligonum polygonoides*, *Leptadenia spartium*, and *Calotropis procera*'.¹⁰⁸ 'The vegetation hailed as most conducive to wildlife in the state were desert flora like those associated with Jodhpur. It was not Mewar's broad-leafed pipals and banyan trees, but its woody scrub that sheltered and fed the local fauna. One such plant was the so-called "leaf-less" spurge or thuar, a thorny cactus-like shrub found in the drier portions of Mewar and throughout Rajasthan, especially Jodhpur'.¹⁰⁹ The *thor/thuar* (*Euphorbia caducifolia*) flourishes in the extreme conditions of water scarcity and its seeds fail to germinate in the moist atmosphere. The ideal habitat for

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

¹⁰⁸ K. S. Sankhala 'Wildlife Sanctuaries of Rajasthan', *Journal, Bombay Natural History Society*, vol. 61 (1), pp. 27-34.

¹⁰⁹ Hughes, *Animal Kingdoms*, p. 106.

this thorny shrub is the rocky steep hill slopes of Aravalli which extend into Jodhpur also making it a mixed terrain of rocks and sand. The slopes of hills become ideal as they don't allow the excess water to stay. Its stem ranges from dark green to deep yellow in colour with the seasonal blooms of deep-red and fausia-pink, which poke out along with its sharp spiny thorns around the months of February and March. The Rao Jodha Desert Rock Park is an entity of Mehrangarh Fort Trust and Museum. Recently, a lot of efforts have been put in by the fort trust to re-grow and revive this native flora of the desert. 'The sensitive restoration of the Rao Jodha Desert Rock park (72 hectare land mass), around the mid fifteenth century fort recognises that arid lands and scrub are natural ecosystems in their own right and this is how a desert was saved from trees (*Prosopis juliflora*), a invasive species introduced from Central America. The restoration team included the environmentalists and tree aficionado (Pradip Krishen) and local Khandwalias'.¹¹⁰ The people of Khandwalias community are expert in detecting cracks and crevices in rocks and have worked hard for seven years to remove the invasive plant species from the rocks of this park. The ecological restoration of the desert rock park has led to the revival of the other species of flora. The species which cover the landscape and the rocky hills and mounts of the park are wispy inflorescences, the dark pink missi or cowpea witchweed (*strigagesnerioides*), herbs like *Tephrosia*, *Indigofera* and creeping *Launaea* which sprinkle small, attractive purple, red and yellow blossoms; shrubs like kair (*Capparis decidua*) with dangling red flowers, kheer kheemp (*Srcostemma acidum*) holding white cluster of flowers and kheep (*Leptadenia pyrotechnica*) with velvety yellow flowers. The small trees like peeloo (*Salvadora persica*), the Gum Arabica/Kumatiyo (*Acacia Senegal*), desert date/hingoto (*Balanites roxburghii*) with spiky thrones and the bordi/jujube tree (*Ziziphus nummularia*) with twigs bearing rows of paired thorns which look like spear, do make the park a bird friendly place and a lot of quills, grey francolins, and laughing doves can be seen and

¹¹⁰ T. R. Shankar Raman, 'How a Desert was Saved from Trees', *The Hindu*, November 26, 2017.

this makes one feel a fountain of life in deep rocks and sands of the Jodhpur desert.

The forest around the Aravalli ranges mainly consists of Dhok (*Anogeissus pendula*) and Salar (*Boswellia serrata*) on the hill slopes. The Dhak (*Butae monosperma*), *Zizyphus spp.* and Khair/Khairi (*Acacia catechu*) supports the bottom lands. The trees that are visible throughout the different tracks of Thar Desert are Khejri (*Prosopis cineraria*), Rohira (*Tecomela undulata*), Ber (*Zizyphus Mauritania*), Badh (*Ficus benghalensis*), Kair and Neem. The desert rose is another special plant, which blooms with red flower and the flower sustains for nearly 15 to 18 days. Many types of cactus which are usually identified by their shapes are widely spread. For locals, all the cactuses are same. The nag-fani is a variety of the cactus specie mostly found on the top of sand dunes. Some of its plants have survived for more than a century, as highlighted through the studies of root system. The roots of this plant are safe heavens for a large variety of insects. The above mentioned are some of the major trees and shrubs that have helped in formation of the 'principles of sharing, survival and subsistence' in the Thar Desert along with conservation.

E.M. Forster in his *A Passage to India* has recorded his understanding of the Indian landscape as: 'Unfortunately India has few important towns. India is the country, fields, fields, then hills, jungle, hills and more fields'.¹¹¹ Due to his limited understanding of the Indian territory he had not mentioned anything about the vibrant desert of Thar, and its components that were shaping this dynamic space of nature. On the contrary, an appreciation for the entire desert of Thar can be taken from Elphinstone who said, 'The raja of Jodhpur (or Marwar), with his kinsman the raja of Bikaner, the raja of Jesalmer, and some smaller rajas, were protected by the desert, with which the fertile parts of their territories are interspersed or surrounded'.¹¹² These two juxtaposed positions do

¹¹¹ Seymour Fresh, *India and South Asia*, The Macmillan Company, New York, 1965, p. 15.

¹¹² Mountstuart Elphinstone, *History of India*, 2. vols., First Published 1841, vol. II, Atlantic Publishers and Distributors (P) Ltd., New Delhi, 2016, pp. 123-4.

highlight that this area was either, completely ignored or, if at all it was appreciated it was only in context of the ruling dynasties. The desert of the Thar has been seen by many. However, only a few motivated compilers have really done an appreciable job by recording extensively and at times even the minute happenings. The states of Thar have also shown consciousness for maintaining the wildlife and the forest cover that was available, though they had different motives for their preservation and conservation attempts.

The water was central component to the planning of nearly all the cities that were executed during the medieval India. The famous medieval cities are Delhi, Agra, Vijaynagara, Aurangabad, Faizabad, Rampur, Lucknow, Bharatpur etc. All these cities were either; located on bank of some perennial river or, around some major water body, which ensured supply of water throughout the year, if at all it was dependent up on the monsoon rains. Interestingly and more surprising is the fact that none of the Thar cities (Jaisalmer, Jodhpur and Bikaner) is located on any water body. Yes, they do have many provisions in place to harvest the monsoonal downpour. As water was a central feature for development of the cities but these turns became visible only in the medieval centuries. The cities of Thar do reflect a changed perspective about 'the concept of city'. These medieval cities (Jodhpur, Jaipur, Jaisalmer, Pali and Bikaner) were known for their extensive trade activities and cultural mosaic. The sovereign city of Shahjahanabad is the most prolific example of medieval city. The large riches of Shahjahanabad did lure the invaders for applying a get-set and go trajectory, to target and raid this city and destroy it to the dust. Apparently, the cities of Jodhpur, Pali, Jaisalmer¹¹³, Jaipur¹¹⁴ and Bikaner attained the status of cities that were more appropriate as the centres of trade (trade-marts) and later in the 19th century these cities became zones for adventure

¹¹³ Kapur, *Reconstructing Identities*, 2008.

¹¹⁴ Manisha Choudhary, *The Eternal Dastur Craft: A History of Mannerism, Social Groups and Formation of Amber-Jaipur State*, Primus Books, Delhi, 2020.

sport and tourism. Due to the natural guard (dry intense desert) these cities never became victims to external raids, which was a constant feature of the 18th century India.

The traders and the nomads became prominent forces of the state and were always crucial for carrying out the trade and economic activities. The scanty agricultural activities due to the harsh weather conditions and limited availability of water pushed most of the society into the agro-pastoral activities. The groups and communities who reared the draught animals became the transporters for the traders and carried-out long distance trade by employing the animals (mainly ox and camel).¹¹⁵ The use of camel for transportation activities became popular only in medieval centuries. The trade and transportation activities became central to these capital cities of states and the rulers made efforts to lure the traders, in order to keep them attached with the state, and its economic endeavours. Whenever the requirements arose, the social groups were also mollified in favour of the state.¹¹⁶ Today, the anthropological effect of the historically paved path is clearly visible in nearly every major Indian city. As the small groups of *Marwari baniyas* (Birla, Dalmia, Singhaniya, Goenka, Modi, Murarka, Bajaj, Poddar, Bagad, Somani, Mittal, etc.) dominate the commercial world and control the flow of fiscal resources. Most of these business houses located in different metropolitan cities are continuing in these fiscal engagements since the medieval times. The most essential and crucial social components that have been shaped by the Thar are 'the ethics of conservation and respect for life of animals and humans', and they vary as per the density of the desert.

¹¹⁵ Irfan Habib, 'Merchant Communities in Pre-colonial India' in James D. Tracy (ed.) *The Rise of Merchant Empire c. 1350-1750*, Cambridge University Press, Cambridge, 1990, and Manisha Choudhary, *Trade, Transport and Tanda: Shifting Identities of the Banjaras*, Manohar, New Delhi, 2018.

¹¹⁶ Manisha Choudhary, 'The Court Protocol and Social Ordering in Jaipur State' *International Journal of History and Cultural Studies (IJHCS)*, Volume 1, Issue 1, pp. 14-26.

The approach and treatment of the desert by the dynasties, and the city leaders have varied considerably. This is evident in the cities of Thar as well. Jaisalmer is a city where the desert has not been admired much but (minus admiration) the people have continued to 'move in' the desert and have 'incorporated it well' into their city planning. Juxtapose, to it, the cities of Jodhpur and Bikaner has 'moved the desert out' of the city planning and have been able to 'fix it on to the city outskirts'. Presently, the region of Bikaner is acquiring world fame for holding the famous annual desert fair in midst of the intense sand dunes. The fair runs for twenty days, in which diverse social groups of the desert come out to perform various art forms in order to earn a living, by displaying and demonstrating the culture of the intense desert inhabitants. The hope for life in the desert is reflected through folklores, dances and variety of songs and instruments. Similarly, the museum trust of Jodhpur Fort holds two annual world fairs of sufi nights (music festivals), where the artists from distant parts of world participate and send vibes for the longevity of this desert and its culture of diversity in which all natural members are living in cohesiveness. Hence, both the counterparts (cities) are maintaining the cultural vibrancy prolifically but in different and independent styles. This vast and diverse desert of Thar and its limited resources have guided the formation of all the four city-states in dynamic ways. Even today, the Thar is cherishing the (this) umbilical cord between man and nature!



Making of the Environmental Ideology

What is behind their eyes: Nature or Culture?

Establishing reality about a region¹ that is inhabited by millions of people and covers hundred and thousands of miles is an enduring task. The creation of the history about any region depends heavily on the variety of evidences, and then only it becomes reliable and more essentially rational. The popular notion of a desert as an arid, poorly populated wasteland needs to be reconsidered in context of the Great Indian Desert. The only evident element in the descriptions of nearly all the deserts is aridity. The aridity as a feature has been well defined and has allowed the early humans to adopt this very same desert as their settlement zone. This same element has motivated McGinnies to say that 'the Thar Desert as (is) part of the Afro-Asiatic desert belt which stretches from the Sahara to the Thar'.² Further he described the desert as '...a transition zone between major wind belts...the monsoon movement of moist air terminates in Western India, resulting in a small and irregular rainfall in the Thar'.³ The Palaeo botanical,

¹ The total area of Thar desert on the North-Western Frontier of India is 3, 42, 290 sq. km. and the desert area that lies in the state of Rajasthan is 1,96,150 sq. km. Almost 77% of the Indian desert is rural and the rest 33% is urban.

² R. J. Fisher, *If Rain Doesn't Come: An Anthropological Study of Drought and Human Ecology in Western Rajasthan*, Sydney Studies, Manohar, New Delhi, 1997, p. 19.

³ W. G. McGinnies, 'General Description of Desert Areas' in D. W. Goodall and R.A. Perry (eds) *Arid-land Ecosystems: Structure,*

geological, archaeological evidences can be harnessed to define the natural state of the environment and the ways of living. The settlements can be excavated and explored for the remains through which the history and the ways of life can be determined. In order to understand the effect of the environment and the natural surroundings on the culture and the human beings of a given area, one has to go back to the stories in which the inhabitants have been believing, and depending upon the memory have been passing on the same tales to the next generations as a remarkable treasure from their ancestors. They do fail to give the date of this property (memory, myths and oral traditions). Even they are unable to approximate the when and how about the acquaintances of the desert, but uniformly all of them have a strong association with struggle that is attached with them for many centuries. So, for shaping and pulling up the ideology of a society that inhabits a tedious terrain (Thar desert) while constantly struggling even to manage bare minimum water for the purpose of drinking, requires pulling up of many strings together. Therefore, the foremost task is to rely on the words and the lived experiences of the inhabitants who firmly believe in their experiences and struggles.

The encounters of travellers are also reliable sources to access the hardships and the surrounding of the desert. But most travellers are not affected or shaped and groomed by the desert, as it carves the convention and conduct of its inhabitants. The belief that makes them to depend on the oral transmission rather than putting their ideology in black and white is: 'The words are the best, rather than unreliable carriers of meanings, but must be chosen carefully. Consider such words as right, wrong, underdeveloped, progressive, backward, democratic, hot and cold, whatever. What matters is how personal are their meanings! ONLY'. This expression by an elderly shepherd in the desert of Jaisalmer made me to stay back for a while and think: How personal are the meanings? Dictionaries carry meanings but people carry connotations. Association of connotations rules the thinking

and influences behaviour. Generally, people react to the pictures in their heads rather than what they look at. A Chinese proverb 'they see "what is behind their eyes"' confirms it. This proves true for the Thar Desert also, as people (outsiders) see it through their heads rather than experiencing and sensing it. They completely fail to see this desert from the perspective of the humans, living here. The processes of learning and 'unlearning' (incorrect) are as essential as new learning. Following his first around-the-world trip, in 1926, Aldous Huxley wrote, 'so the journey is over and I am back again, ...richer by much experience and poorer by many exploded convictions are too often the concomitants of ignorance... I set out on my travels knowing or thinking I knew how men should live, how be governed, how educated, what they should believe...I had my views on every activity of life. Now, on my return, I find myself without any of these pleasing certainties...the better you understand the significance of any question, the more difficult it becomes to answer it. Those who like to feel that they are always right and who attach a high importance to their own opinions should stay at home. When one is travelling, convictions are mislaid as easily as spectacles, but unlike spectacles, they are not easily replaced'. I am sure that he motivated many to take up new ventures. Similarly, I am also inspired to explore the Thar Desert mainly through stories, memories, myths and the anecdotes that has been collected while travelling across this vast sand ocean lying within the borders of India. I limited myself to respect the international borders of India and Pakistan.

This chapter is the first step to understand a major culture which have a revealing journey of discovering 'self' and locating, how the 'other' has been understood in history. Further, it will explore: what constitutes or disintegrates the 'other' in the Thar Desert due to intense environmental conditions that are dry and arid with minimum sources of water. Here, the 'self' will be large enough to incorporate all the living organisms and components of nature that possess life. After limiting the 'self', it will be difficult to locate the 'other'. The 'other' will not appear unless the survival is challenged and the shared resource is near exhaustion. In reality, the philosophical map that surrounds the Thar and constitutes its

ideology is a strong faith in the principle of 'believe firmly that nothing is useless'. In general, this is the model at work with the people of Thar Desert. The local versions of the stories will offer a variety and will be helpful to understand the different contours of the desert life and its complexities. The 'physical features of Rajasthan have exercised a profound influence over the character of its people and political destiny...who imbibed indomitable character and love for freedom...'.⁴ The effect of the surrounding natural conditions on the behaviour of humans and the formation of the settlements and societies is well established through the contributions made by the Annals school. Further, the development of the environmental history as a branch of the intellectual history helped a lot to understand the role of the natural surroundings, human and environmental interactions and the positive and negative contributions made to the environment by various activities which were extended under the disguise of making the human life better (extension of the agriculture along with the use of the pesticides, preservatives and fertilizers), prosperous (lavish animal trophies, fur stoles, skin coats etc.) and more comfortable (expansion of the railways, metros, aerostations, various signal towers for mobiles, DTH, etc.). However, the environmental history first took shape in United States of America. The evolution of the same has been observed by J. R. McNeill with an assessment of the active arenas.⁵ The prominence and influence of the American scholars in the environmental history writings is a sign of its robust health and maturity attained by this branch. Slowly, this branch of history writing started attracting the other continents and a few scholars made terrific contributions to the field.

The effect of the human activities on the natural surroundings becomes evident only after a prolonged time. Most of the

⁴ K. C. Jain, *Ancient Cities and Towns of Rajasthan: A Study of Culture and Civilization*, Books Treasure, Jodhpur, 1974, third edition 2016, p. 22.

⁵ J. R. McNeill, 'Observations on Nature and Culture of Environmental History' *History and Theory*, 42, 2003, pp. 5-43.

natural environments are such that one blanket fit all formula of conservation and preservation cannot be applied uniformly to all of them. So, each terrain and its conditions shall be defined and studied uniquely. The environmental historians have to engage in the inter-disciplinary studies to explore and prove any process of the nature. The bio-archives and geo-archives are the most crucial information containers for moving ahead in order to explore the environmental conditions of any area. The constant engagement with the sources will help to cull out nuanced information. A stalwart historian preferred to define the environmental history as 'the history of the relationship between human societies and rest of nature'.⁶ The three chief areas for its inquiry are:

1. Material environmental history (human involvement with nature, recognizes humans as one of the many actors in the larger story).
2. Political and policy related environmental history (self-conscious human effort to regulate relationship between society and nature).
3. A subset of cultural and intellectual history (it concerns how humans have thought, believed, written, painted, sang, danced, behaved about their relationship between society and nature).

With all these classifications, the understanding about the environment and its components emerged more complex along with the contestations and negotiations. Gradually, a constant engagement with the discipline recognized the likelihood and essential requirement to push environmentalism as a popular movement around the globe. Many branches within the environmental history proliferated and addressed ecology, wildlife, urban environment, forces that enhanced human power to alter environment, degradation, loss and the political exploitation of nature, etc. To address these issues, the micro studies became an

⁶ McNeil, 'The Historiography of Environmental History', in Axel Schneider and Daniel Woolf (eds.), *The Oxford History of Historical Writing: Historical Writing since 1945*, vol.5, pp. 159-176.

essential requirement. For the micro studies, the local interactions with the popular environment become an essential sort of focus, which helps a lot to understand the cultural movements that were shaped by the natural surroundings. In the present situation, it is well established that the cultural and environmental trends influenced the human views and continued to migrate. Thus, to understand the relationships that existed between the man and the Nature, it became essential for the researchers to depend upon the popular culture and activities. Consistent engagement with the popular culture helped to filter down that the society at large and its experiences are the most crucial links to explore out the environmental conditions. Thus, even being a branch of the intellectual history most of the self-conscious undertakings in the environmental history drew their energy from the society at large. Eventually, the environmental history institutionalized as a self-conscious enterprise with the most popular book of the 20th century by a professional historian.⁷ Later being motivated by this pursuit, Roderick Nash became the first historian to employ the term 'environmental history'.⁸ Apparently, by the 1980s, it rose to prominence as a most crucial branch of history across the globe.

In context of India, the environmental historians have mainly focused on the forests in terms of the colonial policies; land use and access to forest, water manipulation by the canal and dam building, and most recently the fate of wildlife have become an iconic study. Here, the major miss is the urbanization, hills (specially North-eastern India) and the desert area. Through this chapter, an effort has been initiated to fill this gap by understanding the interactions that were happening between the natural surroundings (flora and fauna) and the humans of Thar. Here, the aim is to understand: how the social environment and the natural surroundings of the Thar have been shaping its individuals and what were the processes

⁷ Fernand Braudel, *La mediterranee*, Translated as *The Mediterranean and the Mediterranean World in the Age of Philip II*, (tr. Sian Reynolds), 2. vols., New York, 1972.

⁸ Roderick Nash, *Wilderness and the American Mind*, Yale University Press, 1967.

and methods that have been employed by the Thar society to transmit their wealth of wisdom to the future generations. In order to explore this relationship, a scholar is required to exchange with the popular culture. As the documents of state contain very few instances that can reflect on the popular culture, therefore, the methodology employed is the ethnographical study conducted personally by me. Thus, the ethnographical data will be culled out from the information collected during fieldworks and literary pieces that were available.

The drying up of this region has been attributed to the geological changes. The shifts in the tectonic plates and the emergence of the Himalayas have been simultaneous. With the rise of the land mass the sea coast of the Jaisalmer receded. The small captures of the water formed the lakes and the presence of the volcanic rock serves as bottom for many lakes. Today, these lakes are fulfilling the water requirement in Rajasthan. The change in the flow of monsoonal winds (south-west) made this region drier and gradually the dunes were formed which today, beautifully captures the human imaginations, and aspirations in astonishment and fear, simultaneously. This has made the officials to state that 'the whole of Jaisalmer, Bikaner and Shekhawati and most of Jodhpur is a vast sandy track'.⁹ It is important to note that the sand of the Thar Desert is of smooth texture with the fine grains which contains the remains of minerals and metals that are available in the adjoining areas. The soil contents in different regions of desert are also as per the geological presence of the minerals and metals. The presence of the metals and minerals do provides the special appearance to the look and feel of the sand. Due to the presence of diverse and different geo-conditions, the vast stretch of the desert sand is unable to get a uniform look. The diversity gifted by the nature is continuing even in the present century. The sand of Jaisalmer is yellowish in appearance and composes very fine grain. The yellow stone made up of the volcanic lava is widely available in abundance

⁹ *Imperial Gazetteer of India Provincial Series Rajputana*, Book Treasure, Jodhpur, 1908 (Superintendent of Government Printing, Calcutta), reprint 2007, p. 42.

in this region. The wide range of colours in yellow stone offers different shades of brown and hits up to the extent of pale yellow. Many patterns of the molten lava and the geological fossils also appear in these rocks that are readily obtained from quarries. The shops located inside the wall of Sonar Fort (Jaisalmer) sell many fossils that are obtained from the nearby regions. Many times in a day, mine workers bring sacks full of fossils to the market to sell. This abundance of marine fossils has facilitated the artists to make different types of artefacts out of these fossils, and they make a living by selling them.

Moving towards the west, one gets to see the desert of Bikaner, which is a massive ocean of sand without presence of any stones/rock. The desert of Bikaner is dry and its mineral wealth is limited to the fuller earth. The sand of desert that is around the district of Churu contains micro grains of the copper, mica and magnesium. It is due to the proximity with the mines of the respective metals and minerals. The region of Jodhpur is another stretch of the desert along with a similar topography that extends up to the Nagaur. It is also referred as central desert. These areas are very rich in the stone deposits and have been exporting a large variety of stones such as red stone, various types of marble stones, and many kinds of volcanic rocks. This region is the major supplier of marble rock to entire India. Most of India's marble exports are also fed by the mining exercises conducted in the region of Nagaur (mainly around the village Makrana).

The eastern extent of the desert lies in the districts of Sikar, Jhunjhunu and Jaipur. The effect of the aridity in the regions of Thar (Barmer, Jaisalmer, Jodhpur, Bikaner, Nagaur, Sikar, Churu and Jhunjhunu) is most visible from March onwards and continues till the end of October. During these months the western winds carry large amount of sand, and forms dense sand storms which continue for days altogether. A local saying about the sand winds is popular in the entire region of Thar: '*opra elaka ka log jito namak nahi khawai! uoh tai zada rait ethai roz kharwa*' (the amount of daily sand intake in this region by each individuals is much more than the amount of salt that is consumed by the people of other regions!). This proverb basically depicts the consistency of the sand winds

and the effect of sand flow over the humans. Even after facing the serious difficulties that are caused by the sand storms, the peasants, and the nomads of this region don't complain about this natural phenomenon and don't even curse this tough and troubling feature of Thar Desert. This shows their intense association with the sandy surroundings, sand and its diverse temperaments.

The requirement of these winds is more for the peasants. The kharif/*sawanu/sailu/sialu* crop usually ripens with these hot winds. The coarse grains like *bajra* (*Pennisetum typhoideum*/spiked millet), *jawar* (*Sorghum vulgare*/ great millet), maize/Indian corn, gains the mass of its grain content with the influence of these winds. The heat waves carried by these winds protects the crop from the predators like locust and termites. The effective defense becomes possible only with the combined effect of sand and heat that are carried by the western winds. The prolonged stay of moisture in these grains leads to the development of a sticky blackish-brownish glue, on their fruits (*bhuttas*), which makes the grain unpalatable and poisonous. These grains become sour and foul in taste if they do not dry-up completely, thus, become unfit for human consumption. These spoilt grains are dangerous for the animals too. Thus, the arrival of the heat waves (*loo*) is essential for these crops. Hence, the inhabiting agriculturists eagerly await the onset of this difficult phase.

With these winds the sand flows and travels across many kilometres carrying fine particles even beyond the Aravalli ranges. The arrival of the fresh sand is awaited by the farmers as it helps to negate the effect of erosions that have happened due to multiple factors (not necessarily human interventions always). The flow of sand is not static and the amount of sand to be carried is determined by the velocity of western winds that flows during the months of May and June. Usually, the sand storms are hated by the people who live in the distant cities like Delhi, Lucknow, Patna, etc. who get to sense and feel the last effect of these sandy winds. Many regions in between also have similar feelings towards these sand storms because these winds do pause their regular activities. This situation proves the preposition of Ibn Khaldun and Montesquieu as true. Long ago both have mentioned that

the climate is a key to human behaviour and their reactions to the natural happenings. The surroundings of humans do shape their behaviours and the desires. The collection of resources from nature promotes them to appreciate certain features of the ecology. The non-utility of the winds for the city population and the absence of understanding and sensibility in the city-dwellers regarding the role of these winds allows them (distantly placed) to demine this natural phenomenon of the desert. However, these winds sustain and nurture the prominent human actions of survival. Many geological studies have proved the significance of these winds and the utility of sand storms that come in effect with these winds.

The region of Thar is not only limited to the western winds. The northern winds also make a significant effect to this dry landmass. From November onwards till the end of January, the northern winds coming down from the Himalayas freeze this desert. Many times these winds push mercury down up to -5°C . The inhabitants face severe cold winters with chilly winds that spread the freezing effect rapidly. In the recent past, the freezing of dew has led to the formation of snow (ice) deposits as reported from the regions of Fatehpur and Ramgarh (Sikar).¹⁰ However, this feature is prevalent for last 40 years. The wide range of temperature and sharp intensity of both heat and cold winds has acquainted the inhabitants to adapt to a very big range of weather conditions, with temperatures ranging between 50°C to -5°C . These diverse weather conditions and wide ranges of temperature are appreciated by the inhabitants in the name of essential conditions to keep the life going. When I interacted with the inhabitants to find out about their grievances regarding the harsh weather conditions offered by the Thar Desert, I could not locate anyone with any kind of complaint. Most of the people admire this weather as *Ramji ki kripa su pashu aur dhan panpa* (by the grace of god, (the weather conditions) have allowed the cattle and wealth to survive and prosper).

Nearly, all the agricultural activities in the Thar are dependent on the rain. Therefore, sowing of seed around the rains (both

¹⁰ https://m.timesofindia.com/city/jaipur/cold-wave-freezes-tap-water-in-fatehpur/amp_articles/72987007.cms

monsoon and retreating monsoon) within the prescribed time is an essential requirement. It is very crucial for getting the correct kind of crop, which will get its requirement of moisture only from the water that will pour down during the brief and scanty monsoons. As the majority of the cultivation is monsoon dependent, therefore, the correct time for sowing of seeds has been defined for both, rabi and kharif seasons. This is due to the general absence of the regular water supply in the region, as it is devoid of any perennial water source. The wetness attained by soil in the months of monsoon serves as the moist bed for obtaining the best qualities of *mung* and *moth*. These are the most drought resistant crops of India. The timely sowing helps the seeds to germinate in time.

Similarly, the showers of the retreating monsoon (September-November) are the alarm for sowing the *rabi* (*unalu*) crops such as wheat, barley, mustard, *rai*, taramira, gram/*chana*, poppy, tobacco, *san* (Indian hemp), indigo, rape-seed (*Brassica napus*), *til* (*Sesamum indicum*), linseed, castor, etc. This is the season for obtaining large number of grains and cash crops. Therefore, in the historical process, maxims have been developed by the inhabitants in order to stress on the need of sowing at the correct time so as not to repent later. The saying is: *Atiyō Pōsh, kunkō dōsh!* (You have arrived in the posh, a month of Hindu calendar, whom to blame now!). The birth of this maxim is not known, but people date it in distant past. This also provides a fascinating insight into the culture of remembering things that has been made possible through these small and crisp capsules of literary punches, which are set perfect on the creative parameters of meters and rhymes, thus, making them easy to hold in memory. Another popular proverb that depicts the significance of timely sowing is: *daal ko chukyo banro, aashadh ko chukyo karso* (the peasant who fails to sow seed in the month of *aashadh* is like monkey, whose hands have slipped off the branch of a tree). Both these sayings indicate that the timing is very crucial for cultivation in the desert and those who miss these deadlines are subject to mockery. These locally devised and versified proverbs were a medium to impart knowledge and the conventional wisdom about the surrounding climatic features, as visible to the inhabitants of Thar. The purpose of all these actions was just to ensure the best

possible out of the available environmental conditions. Generally, after collecting the rabi crop, the climbers of water melons, melons, *kakadi*, *torai*, *loki* and many other such heat-repelling, watery fruits are grown to make some money before sowing of the kharif crops.

The agricultural patterns and activities have been explored well due to the intense researches in the economic history that were oriented to prove the exploitative nature of the state. India is predominantly an agricultural country. Therefore, the dissections in the economic history are primarily around agriculture as most of the states emerged and consolidated on basis of the agricultural revenue. The knowledge and its territories created through the ideas and hands-on of the farmers has been acknowledged by the historians. An eminent economic historian notes that 'knowledge is critical element in farming and brings all elements together. Many texts therefore implicitly describe territories of social power in agriculture. Ideas moving among farmers create territories of knowledge. An elusive geography of ideas surrounds farmers who need to know how to make the best (or even safest and simplest) gamble with the rains. Each farmer needs to know about the soil preparation, seed selection, planting, watering, manuring and weeding for the specific combination of water, crops, soil, and labour condition on each farm. Ways of knowing come from generations of learning in wide regions'.¹¹ The essence of the correct time for sowing, number of water cycles required by a particular crop and many other things like number of *bah-jot* (ploughing and levelling), the kind of sowing, etc. were passed on to the new generations in the Thar Desert only through oral transmissions. All these activities, like stress on correct timings of sowing, proverbs highlighting the importance of weather and season for cultivation, etc. indicate that the environmental conditions have tuned the behaviour of humans throughout the history. Thus, time-keeping, calendar-making and accurate calendar-keeping were essential for the dry region and these operations of time, counting and

¹¹ David Ludden, *An Agrarian History of South Asia: The New Cambridge History of India*, Vol. IV. 4, Cambridge University Press, Cambridge, 1999, p. 38.

scientific measuring were generally performed by the elderly in the society or some priest attached to the region. It is remarkable to notice that similar to the Greeks and Romans, the inhabitants of Thar were 'able to solve their drinking water problem without inspiration from the outside; but the form of their answer strongly suggests the influence of Oriental engineering'.¹²

The anxieties around the agricultural production are reflecting well in the contemporary sources. In an *Arzdasht*, Vakil Amar Chand and Sahib Ram have informed that due to meagre and delayed rains, only *moth* could be sown in kharif season.¹³ In 1694 AD, Ajitdas and Manram have informed that due to drought even *moth* cannot be sown.¹⁴ In another document, it is stated that rain measuring 10 fingers (*dus ungal*) fell in *qasba* Aaveri, so the ploughing has to be done within forty-five days.¹⁵ The little rains and the strong winds in the month of *sawan* in *pargana* Amber didn't allow the ploughing and it was reported by *purohit* Harshram to the state.¹⁶ All these instances depict that the constant eye on the rain for sowing the seed in time was a compulsory requirement to secure a better harvest. The peasants also looked towards the monsoon as observed by the state in above instance. 'men is deeply concerned about the swing of the seasons under all forms of extractive economy and throughout the agrarian world....In semi-arid areas receiving a limited or uneven rainfall an accurate calendar is similarly important'.¹⁷ Here it is evident that the scarcity of rain and water resources pushed the resident agriculturists to act in time. The scarcity of the water and its constant need in the homes have also been codified in context of the arriving guests and even today it is popular. The saying is *pa-vaniya to awaniya, pa-ane*

¹² Karl A. Wittfogel, *Oriental Despotism: A Comparative Study of Total Power*, Yale University Press, London, 1957 (ninth print 1976), p. 31.

¹³ *Arzdasht, Sawan sudi* 9 VS 1752/1695 AD and *Arzdasht, Bhadva vadi* 7 VS 1774/1717 AD

¹⁴ *Arzdasht, Fagun sudi* 11 VS 1751/1694 AD.

¹⁵ *Arzdasht, Sawan sudi* 11 VS 1659/1602 AD.

¹⁶ *Arzdasht, Sawan sudi* 1 VS 1762/1705 AD.

¹⁷ Karl A. Wittfogel, *Oriental Despotism*, p. 29.

kun kai darwaniya (the guests are arriving but who is having the water under the feet). The 'water under feet' refers to the stored or regular supply of water. The need of rain for the arid region has been immense as it was the only source for collecting water, to be used in the year lying ahead, until next monsoon showers arrive. The perception, request and the sacrifice of resources for securing good rains can be sensed from the following verses, which are a part of the popular culture:

*So shand so karhal, put neput hoai;
mewadla bhuta bhala, honi so hoai.*

(hundred female camels can be sacrificed, may sons die; whatever may happen but the rain must arrive).

And,

*Moriyo to mehu mehu karai,
barsno to inder haat hai.*

(The peacock is crying for rains, but the rain is at the disposal of the Indra, the king of rain).

And,

Meh to tya bars-se, jad raji hosee ram.

(The rain will pour when the god will be pleased).

And,

*Meh ne pa-awana kitka din ra,
Raja manya so manwee, mehiya manee dharti.*

(the rain occur for a short duration, so it is a guest for short duration. the king is happy when the subjects follow him blindly, but the soil gets happy only with the rain pours).

And,

*Jin din huwai garbhado, then thake che mas,
Upar panra deh-dae, barsae meh sujaan.*

(An increase in the days of conception, brings the delivery of child closer; similarly if the clouds stay in the sky for longer, the good rains will surely pour).

All the above instances and the sayings point that the rains were crucial to determine many things of the inhabitants. And the failure of rains was an early warning for the onset of the temporary migrations towards the region of Malwa and Gujarat along with the cattle. The *sanad parwana babi* of the Jodhpur state have many instances indicating that the drought or infliction of crops, scarcity of fodder and dry ponds have made cattle vulnerable affecting the pastoral communities of the region immensely.¹⁸ These migrations were actions of peasants to minimize the impact of drought and to reduce the losses. It is interesting to note that the state was collecting a tax on the prediction of rain called *Meub-ka-souda*¹⁹, that too in the region where it was a scarce.

The intense belief of inhabitants in the desert and its environment reflects very explicitly in the sayings that are popular in the empire of the Thar Desert. Some of the proverbs around the seasons and the time of sowing seeds have been mentioned above. In a similar way the knowledge required around the animals was also codified, versified and transmitted for benefit of the future generations. Thus, the mechanisms for versifying knowledge to make it easy for memory to remember, calendar-making and astronomy became important functions of the arid society and formed essential component of their culture.

The importance of the cattle-wealth for the agro-pastoral communities has been highlighted significantly in the preceding chapter. Various official records and the popular literatures hold many evidences that symbolize and depict it. In terms of the zoological studies, most of the animals that are employed in the desert are energy-conservers. Most of the animals such as camel, goat, sheep, cow, buffalo, donkey, etc. can withstand the irregular supply and scarcity of water. Much of their water requirement is fulfilled through the grass, twigs, roots, fruits and varied branches which these animals pick while graze-walk. The most astonishing

¹⁸ *Sanad Parwana Babi, Fagun vadi* 10 VS 1672/1615 AD, Jodhpur Records.

¹⁹ *The Rajputana Gazetteer*, vol. 1, Office of the Superintendent of Government Printing, Calcutta, 1879, p. 192.

example of survival in the desert is the camel. They have a capacity to withstand the shortage of water supply, consecutively, for large number of days, without getting any effect on health and lactation. The capacity of the camel, sheep and goat to survive even in the conditions of famine and drought is codified as, *kaal kusmmee na marai, Baman Bakri unt; woh mangai ko firai charai, jo sukha chaan thuth* (in season of drought Brahman, goat and camel don't die; as he survives on the begging, goat roams and grazes and the camel can live by eating the dry branches). This saying testifies for and justifies the absence of these animals in the rolls of early migrations.

The migrations of the *Raikas*²⁰ (sheep and goat shepherds) and *Rabris/Rebari* (camel herders) become visible only in the severe drought conditions. The significance of these robust survivors for the agro-pastoral communities can be traced from many sources. The significance and habitat zone of the goats around the Thar has been highlighted by Dashrath Sharma who gazes that the nomenclature of the town Ajmer is from Sanskrit word Aj which means goat.²¹ The goats in the Mediterranean ecology have faced ban and restrictions as they were considered *bête noire*. The representation of the goat in a mix of iconography, mythology, and rumour was used by church to control the majority before the age of reason.²² Many powerful cultural associations came forward with the goat and led to the myth of goatism, dangerous manifestation of male sexuality and unpredictability. 'For the Jews and the early Christians the goat was the repository of sin—the "scapegoat"—a creature to be cast into outer darkness, a representative of evil to be divided from the lambs of God, and the Bible is rich in reference

²⁰ www.lpps.org/wp-content/uploads/2013/07/sheep_workshop.pdf. The other sheep raring communities of Rajasthan are Ahirs, Gaddi, Gayri, Ghosi, Sindhi sipahi and Sindhi musalman. These are Agro-pastoral communities.

²¹ Dashrath Sharma, *Rajasthan through the Ages*, Rajasthan State Archives, Bikaner, 1966, p. 33.

²² G. R. Cragg, *The Church in the Age of Reason 1648-1749*, Penguin Books, Harmondsworth, 1961.

of goats and their symbolic association with sinfulness'.²³ The association of Goat-Man-Beast-Devil was widely evident in the classical literature and in this discourse goat became a powerful symbol. The picture of Satan was forming in the popular minds just before the Black Death and the animal-form he took was of the goat (sic!). In the 16th and the 17th centuries, the purge of witchcraft was eventually on rise in Europe. Here, the natural agility of goat associated them with the behaviour of witches and their acts (flying and reaching the most difficult corners). Overall, in Christianity the goat became a symbol of devil, fear, repository of sin, danger and savages. In Islam, the goat was associated with the *sumnat* and the sacrifice of Ibrahim's son in the service of almighty was reverted only after sacrifice of a goat. The popular festival of Bakr-id (Id-ul Zuha) is celebrated around the globe and rejoicing happens on the sacrifice of millions of goats. The opposite position attained by this animal in both the religions is interesting in terms of historical developments that happened. Luckily, no such associations and considerations with this animal are visible in the region of our study. Here, the goat is only a main source for the survival due to its docile, shy nature and more significantly the ability to sustain in the harsh and hot weather conditions of the Thar Desert. The subsistence economy around the goat has popularly characterized it as 'the poor man's cow'.²⁴ The goats were not only valuable subsistence asset, but they were also the perfect adapters and adjusters in the vulnerable environments. On the contrary, the sheep are the creatures of merchant capitalism due to the wool hanging over it. This feature has led to the introduction of the Marino sheep in Australia and it proved havoc on the

²³ David Siddle, 'Goats, Marginality and 'Dangerous Other'', *Environment and History*, vol. XV, no. 4, November 2009, p. 528 (pp. 521-36).

²⁴ J. Boyazoglu, I. Hatiziminaoglou and P. Morand-Fehr, 'The role of the goat in the Society: Past, Present and Perspectives of the future', *Small Ruminant Research*, 60 (1-2), pp. 13-23 and C. Delano Smith, *Western Mediterranean Europe: An historical Geography of Italy, Spain and Southern France*, Academic Press, London, 1979.

natural environment.²⁵ The ability of goat to survive in the arid conditions is considerable and its importance for the marginal areas is highlighted by Siddle in the following words:

‘Goats represent a source not only of meat, milk and high protein cheese but also a wide range of other uses. These varied from purely practical such as safe transport of liquids (water, wine, oil) in their skins to the recreational and ceremonial uses of skins and horns for bagpipes and for drums and horns. For a subsistence pastoral form of economy in a dry upland environment, the food-tolerant goat may be seen as much more valuable than sheep and certainly than the demanding bovines. Indeed as a recent NGO campaign testified, a goat represents the best possible investment for a poor family. For a very small outlay a goat could yield between fifteen and thirty percent more value than a sheep. With no break in fertility after gestation, one can produce a hundred offspring in five years...goats are much better adapted to eating the woody forage of the margins of the used spaces of a community and needs less to sustain life...they are also able to eat almost anything and have the agility to cope with the most sever slopes’.²⁶

This indicates that it was easy to maintain goats and raring it didn't require any special efforts. Its economic value was also performing well and sustaining goat herd was not making a hole in the pocket of the agro-pastoralists. So, the goats became first choice for all the inhabitants who lived on the margins and especially the deserts, where goat also serves as a lactating animal. The milching of goat have a special feature. As per it the goat can be milched multiple times in a day. Interestingly, these multiple milches in a day don't affect its milk production which is regularly collected at dawn and dusk. This unique feature is not visible in any other animal. Due to this, goats are most preferred in poor homes,

²⁵ William Beinart and Lotte Hughes, *Environment and Empire: Oxford History of the British Empire*, Oxford University Press, New York, 2007 (reprint 2010), pp. 93-110.

²⁶ David Siddle, ‘Goats, Marginality and ‘Dangerous Other’, *Environment and History*, vol. XV, no. 4, November 2009, p. 524 (pp. 521-36).

where the children are young. The milk of goat is the only source of nutrition available to them. The docile nature of the animal also makes its milching an easy task. On an average, anyone who would maintain a herd of three goats will be able to enjoy a moderate supply of milk throughout the year without any break from the animal side. Nearly nine breeds of goats are available in the desert of Thar and most of these breeds get their names from the region of their habitation.²⁷ These breeds are continuing in these regions for long.

The raring of camel in the dry areas is self-explanatory and a few researches indicate that the single humped camel or dromedaries were introduced in the Thar Desert only during the medieval ages. This doesn't mean that there was complete absence of camel in the present territory of India. The Bactrian camel (double humped) was integral to this desert. The Bactrian camel and Rhinoceros were contemporaries in the north-western desert region as have been highlighted by the burial of former at Mohenjodharo and the presence of the later on the seals of the Indus valley. In his recent work, Pranay Lal have depicted the largest land mammal, *Paraceratherium*²⁸ (a family of rhino), which looks like camel in appearance. The discovery of the same was made in 1908 in the Bugti Hills of Baluchistan and due to the tribal clashes it was not taken forward.²⁹ The overall appearance of this mammal is very close to the present day camel and the slopes of the body are even indicative of a close relative. The similarity of the padded feet and its triangular shape also hints to the close families. The study of the fossils will only help to establish the missing links. This mammal is also close to nilgai in resemblance specially the

²⁷ R. M. Acharya, *Sheep and Goat Breeds in India*, FAO Animal Production and Health Paper 30, FAO, Rome, 1982. <http://www.fao.org/docrep/004/x6532e/X6532E01.htm#ch2>. The nine breeds of goats are Sirohi, Marwari, Beetal, Jhakrana, Barbari, Jamunapuri, Mehsana, Gohilwadi, Zalawadi, Kutchi and Surti.

²⁸ See Plate-8.

²⁹ Pranay Lal, *Indica: A Deep Natural History of the Indian Subcontinent*, Allen Lane, Haryana, 2016, p. 291.

shape of tail, back, caudal, dorsal and the neck. Even after such a close resemblance, the close proximity between *nilgai* and camel can't be drawn as both of them come from separate families. The attempts for further associations and the task of drawing parallels are left to the imagination and inquisitive mind of the researchers and readers.

The role of the camel for the desert of Rajasthan can't be undermined as this beast of burden has been serving as the base of economic and social life. The presence of the camel in the North-Western Frontier is well established by the archaeological findings conducted at Mohenjo-daro. Richard H. Meadow has dealt with the full skeleton and successfully identified it as a domesticated Bactrian variety. 'The domestic camels of South Asia today are dromedaries. This may not have been the case in the past, however. Camel bones have been recovered from beds in Siwalik group formations dating perhaps to the Middle Pleistocene'.³⁰ The two forms of camels identified so far from the Middle Pleistocene are *Camelus antiquus* and *Camelus sivalensis*. Might the descendents of these aboriginal forms have survived in the Holocene, in arid areas of the subcontinent. They might have survived, however at present there is no fossil or sub-fossil to prove it. The next camel remains known to us from South Asia are those of Harappan period. The zoological remains specimens are namely reported by Sewll, Prasad and Nath from Harappa and by Thapar and Lal from Kalibanga. Particularly on basis of the evidence from Kalibanga, it is no longer possible to doubt the presence of camel/Bactrian camel around the Indus Valley during Harappan period. The detailed use of the *Camelus bactrianus* (two humped species) to the west of Indus valley was present from fourth millennium BC and in Iranian Seistan from mid-3rd millennium as known through the details of bone morphology, bones, dung, and hairs found in the archaeological

³⁰ R. H. Meadow, 'A Camel Skeleton from Mohenjo-daro', published in *Frontiers of the Indus Civilization*, B.B. Lal and S.P. Gupta (eds.), Books and Books on behalf of Indian Archaeological Society jointly with Indian History and Culture Society, New Delhi, 1984, pp. 135-6 (pp. 133-39).

excavations. The continuity of the two-humped camel is visible at Pirak (a site closer to Indus valley) as per the figurines recovered from the second and first millennium BC deposits. 'Some of these figurines are painted in such fashion as to suggest use of textile coverings over the humps, body and neck or perhaps even saddles. Some specimens have transverse holes through their noses and lower legs presumably for the attachment of a nose peg or a string and wheels. Such modification may indicate that the people of Pirak were familiar with camels used for hauling loads, pulling carts and perhaps even riding'.³¹ Many different findings of the faunal remains at various sites around the Indus Civilization indicate to the presence of two-humped camel.³² The bone remains found at Mohenjo-daro, Kalibanga, Shortugai and Harappa indicates to the fact that camels were known to the inhabitants of the Harappan period. But it is difficult to say whether they were single humped or double humped. Equally, it is difficult to say that the camels were reared and domesticated by the Harappans. It is very probable that the camels used in the Indus Valley were mainly the two-humped camels as the double-humped camels were very much in use in Afghanistan, Iran and other Central Asian areas during contemporary times. The trade exchanges with the Central Asian settlements and Arabian countries might have led to the introduction of this animal in the Indus valley. The camels are not depicted on the Harappan seals and are a complete miss in the terracotta figurines (so far) as well. Thus, it can be proposed that for the inhabitants of the Indus Valley, camels had a different cultural and economic importance. Contrarily, the presence of the

³¹ Idid. p. 136.

³² J. F. Jarrige and R. H. Meadow, 'The Antecedents of Civilization in the Indus Valley' *Scientific America*, no. 243 (2), 1980; M. Lechevallier and G. Quivron 'The Neolithic in Baluchistan: New Evidence from Mehrgarh' in *South Asian Archaeology*, H. Hertel (ed.), Berlin, 1979; J. F. Jarrige and M. Lechevallier, 'Excavations at Mehrgarh, Baluchistan: Their Significance in the Prehistorical Context of the Indo-Pakistani Borderlands' in *South Asian Archaeology 1977*, M. Teddie (ed.), vol. 1, Istituto Universitario Orientale, Seminario di Studi Asiatici, Naples, pp. 463-535.

detailed figurines of camel in certain parts of Central Asia clearly indicate to the use of this animal for the transportation activities in those areas.

The physiological differences between both the culturally claimed cousin animals (Bactrian camel and dromedaries) clearly indicate to two distinct species. The most crucial distinction between them is about, the role and the size of the hump that has helped to identify both. The humps of the Bactrian camel flop over in a flaccid manner when it depletes by starvation. Whereas, the elastic skin of the dromedary causes a steady diminution in the size of the hump without flaccidity under the starving conditions. This forms the principle of corroboration. 'Experimentation with camel has been confined for the most part to the one-humped species, and this is unfortunate since there is no sure evidence of the degree to which the two-humped animal shares with its cousin specific adaptation for combating dehydration and high temperature. Yet circumstantial evidence in the form of the traditional beliefs of camel breeders and users that the one-humped camel can't flourish in cold or moist climates nor the two-humped camel in extremely hot climates strongly suggests that there is a degree of physiological difference between the two species, large enough to have affected their geographical distribution'.³³ This argument looks like an over generalization of the environmental conditions as air-tight compartments. The dromedaries of the Indian desert do face extreme of both cold and hot weather as the temperature in this desert ranges between -5°C and 50°C . The ill effect of the humidity on dromedaries is acceptable as it is clearly visible in the camels that are employed for tourists at the beaches of Mumbai and Andhra Pradesh. The capacity of Indian dromedaries to adjust to this vast range of temperature is remarkable. The local herders and owners do insist on the body features of the animal for this unique adaptation. The camel is able to combat the dehydration by minimizing the perspiration due to the layer of fur over its body along with the unique capacity to rejuvenate the water in

³³ R. W. Bulliet, *The Camel and the Wheel*, Harvard University Press, Cambridge, 1975, p. 30.

kidneys. Due to this unique feature, the camels continue to go for longer periods without regular intake of water. The padded feet with coarse surface are the organs that provide a shield against the hot sand. A thick pad of tissue over the sternum, called pedestal, keeps the body raised from the ground while the dromedary's sit-down in a sterna recumbent position allowing the air to pass under the body. Similarly, during intense cold waves, the thick wool over the body provides protection to the animal. A thick leathery lining in the mouth allows them to chew the thorny desert plants. The long hairs over the eyes give protection against the sand. Thus, the dromedary is well acquainted to adapt both the weather conditions and survives well in the desert. The camels have a remarkable ability to consume the desert vegetation, and transform it into meat protein and other vital nutrients that are essential for its survival.

In his work, Richard Bulliet has pointed out that until the end of the 1st millennium AD, the dromedaries (single-humped camel) in South-Asian continent were of no significance.³⁴ The camel is indigenous of South Africa and there only it adapted to survive on the sparsely vegetated desert. It first appeared in South Arabia, from here it eventually spread into North Africa and subsequently it expanded to the other parts of Middle Eastern world (beginning somewhere between 3000 and 2500 BC). The migration and spread of camel has been treated methodologically by Bulliet. The assumption that the camel became extinct in the Arabia due to the threat caused by the only predator (man) is again an overarching statement that has not been substantiated.³⁵ The interesting developments around the Arabian camel were visible in the Somalia, where it is not used for the riding. The availability of different types of saddles made for riding camels in Sudan and Sahara regions is a clear indication that in these regions camel was used as a vehicle. Thus, the different treatments extended to this animal in the similar kind of topographies are indicative of the different belief systems that were at work in contemporary times.

³⁴ Ibid., p. 188.

³⁵ Ibid. p. 35.

Here, the contentions served in *Mecca: The Sacred City*³⁶ regarding the use of camel, in the deserts of Saudi Arabia by the Bedouins appears convincing. The flow of the large traffic for performing the pilgrimage to the holy cities of Mecca and Medina, have created a demand for the use of animal as a vehicle. Further, the Bedouin pastoralists-cum-transporters took up the profession of pilgrimage transport well due to the consistently rising number of believers. Being an efficient and only mode of transport (till 1920s) for the Arabian deserts, camel was preferred by traders and caravans as well. The camels were sold and rented to travellers and the Bedouins worked as guides and suppliers of food and fodder, to the hordes of Hajj pilgrims.³⁷ The Bedouin groups moved regularly between the ports, markets and desert maintaining the camel flocks, selling wild fruits and other consumable items. The highly specialized desert animal (camel) was displaced due to the discovery of oil in Kuwait. By mid-1950s, the motorized transport and the highways started replacing the only mode of transport because the 40-day pilgrimage to Mecca by camel took only six days by car.³⁸ An interesting work has contributed immensely for understanding 'the impact of oil on Bedouin pastoralists in Kuwait, their use of the desert, and its environmental implications'.³⁹ The discovery of oil and the introduction of the automobiles have definitely made intrusions in the lives of the fauna as well. The efficiency attained by the motorized vehicles made hunting an easy take and took a heavy toll on the wildlife⁴⁰ and the birdlife. In 1950s, the Anizah people owned about one million camels

³⁶ Ziauddin Sardar, *Mecca: The Sacred City*, Bloomsbury Publishing Plc. London, 2014.

³⁷ R. H. Sanger, *The Arabian Peninsula*, Cornell University Press, New York, 1954, p. 164.

³⁸ H. R. P. Dickson, *Kuwait and her Neighbours*, George Allen & Unwin, London, 1956, p. 571.

³⁹ William Beinart and Lotte Hughes, *Environment and Empire: Oxford History of the British Empire*, Oxford University Press, New York, 2007 (reprint 2010), p. 251.

⁴⁰ S. B. Miles, *The Countries and the Tribes of Persian Gulf*, Frank Cass, London, 1919 (2nd edition 1966).

and in 1998 only 9000 camels were left in whole of the Kuwait.⁴¹ This drastic fall in the number of animal is worrying. It explicitly brings out the crisis that has been faced by the inhabitants and the fauna, due to introduction of new discoveries. Here, the immense pressure that was created over the environment can be reckoned.

The physiological difference between the two-humped camel and the dromedaries are strikingly sharp that has made them suitable for the cold-moist climates, and the hot-dry weather conditions, respectively. These distinctions have helped to identify both the animals separately and it crowns the camel (dromedary) as the most highly specialized desert animal. Beyond it the camel also became a symbol of status, sheer wealth and prestige. The modest forage needs made it an economically affordable animal. The unique ability to survive on little amount of water, to convert brackish water, the sparse pastures, and desert vegetation into the nutritious milk is again remarkable and it marks camel well beyond any other domesticated animal. 'Finally on the physiological side, the reproductive cycle of camel is governed by a male rutting period of two to three months duration once a year during the best grazing seasons and a twelve to thirteen month gestation period which causes mating and calving to coincide. What triggers the period of rut is not known, but since it always takes place during the rainy season, whatever part of the year that is in a given locale and since camel do not seem to reproduce well in wet climates, some connection with the level of humidity is indicated. Whatever the exact cause of onset of rut may be, however animal that are moved from one area of seasonal rainfall to another area where the rainfall occurs in a different season ceases almost entirely to reproduce'.⁴² These specifications around the reproduction of camels have also been recorded from the observations made by the camel herders-cum-breeders of the Thar Desert. In rut, the *dulla* (a large inflatable sac) in throat extrudes from mouth. Locally, it is called *unt-masti-aana* (camel is in inebriation) or *tafada-bagana* (throwing the sac out). Both these terms indicate to rut. In nutshell, it can be said

⁴¹ William Beinart and Lotte Hughes, *op.cit.*, p. 261.

⁴² Bulliet, *The Camel and the Wheel*, p. 41.

that the reproduction of a camel-calf is a unique event that needs support of many physical conditions and environmental factors. Camel breeders narrate about the specification of the matting times and the coincidence of calving which unanimously highlight that the reproduction in the camels is not a regular event. Thus, the birth of camel-calf is a special happening that is rejoiced through a series of celebrations, based around the she-camel.

In the desert of Thar, there are many ceremonies around the physical event of child-birth. As mentioned earlier, the ceremonies extended to the she-camel around the gestation period and reproduction marks the birth of camel-calf as an event which is not ordinary. The ceremonies performed around she-camel put her on a pedestal that is equal to an expecting woman. The gestation period of dromedary is 15 months whereas for Bactrian camel it is 13 months. This again puts both the animals in two separate classifications. In Rajasthan, the ceremonies around the pregnancy of women and child-birth are *gaud-bharai*, *maso*, *awal-gadi*, *nahwan*, *kurwa-pujabo*, *japaa maah* and *geet*. Of these both *gaud-bharai*, and *maso* are the pre-birth ceremonies, in which the expecting mother receives gifts from her maternal family and the in-laws. Generally, prayers are done on these occasions for invoking the blessings. In this event, the would-be mother is adorned with *chunari* and many other special foods. The *awal-gadi*, *sutak*, *nahwan*, *kurwa-pujabo*, *mehandi-bini*, *japaa maah* and *geet* are post-birth rituals and celebrations. The *awal-gadai* is a set of many rituals around the disposal of the umbilical cord. The *nahwan* is the ritualistic bath after seven days of child-birth. It is followed by *mehandi-bini* and *kurwa-pujabo* respectively. On the preceding night of *kurwa-pujan*, *heena* is applied for concluding the ceremony of *mehandi-bini*, where women sing folk songs while the *heena* is applied. Following it on the next day for *kurwa-pujan*, women reach to the nearest well and come back with the freshly filled pots to nurture the new life and ensuring new-born's share in the resource. The *japaa maah* is followed for a month from the day of child-birth. During this the new mother is fixed indoor for complete rest and revitalization of her body, supplemented with special meals. The special meals constitute of *ghee*, *sonth*,

ajwain, maithi, lod and supari. The preparations made out of these ingredients are mainly meant for the natural cleansing of the uterus, to improve the quality and enhance the quantity of milk, simultaneously. All these ceremonies are considered sacrosanct and followed religiously around the reproduction-cycle of the she-camel. The she-camel also gets these special meals as she lactates for 11 to 18 months, which is much longer than most animals. Such a humane treatment for an expecting she-camel says a lot about the significance attached to this animal and its reproduction cycle. This clearly indicates to a strong emotion bond of love and care that is shared between this animal and its owner. Definitely it is due to the necessity and economic significance of this animal in the harsh environmental conditions of Thar Desert. The intimate and unique relationship between the men and their animals often gets reflected through the stories and poems that are popular in the traditional societies.

The desert of Thar is full of unique folklores, tales and the stories. Even today most of these are prevalent due to the efforts that have been made to keep the oral traditions alive. In the region of Thar the inhabitants were not adhering to a uniform religion, sect, and cults. They cut across the Hindu-Muslim religious boundaries and freely draw elements from each other. Due to it, in the course of history, many minor deities and cults appeared around them and the inhabiting communities adopted them liberally. The main component that is visible and led to the emergence of nearly all the minor deities was the objective of protecting the cattle wealth. Pabuji, Gogaji pir, Tejaji, Ramdevji pir, Mallinathji, Devnarayanji, Harbhuji, Mangaliya Mehaji, Mamdevji, Iloji, Tillinathji, Bhomiyaji etc are the popular deities of the Thar desert. Out of these Pabuji, Harbuji, Mangaliya Mehaji, Ramdevji pir and Gogaji pir are more popular as *panch pir* (the five masters). *Pabu, hadbu, ramde, mangaliya meha; pancho peer padharjo, gogaji jeha* is a local saying that confirms this association. Interestingly, all these *pirs* existed between 1100-1500 centuries and established as deities in the medieval centuries only.⁴³ They are basically epic-heroes.

⁴³ Dominique-Sila Khan, *Conversion and Shifting Identities: Ramdev*

Agro-pastoral communities from both the cultures; Hinduism and Islam, are the followers of these sects. Some of these deities are mainly worshipped for their curing power and all of them are the cattle protectors. 'Reciting the name of Gugaji/Guga Pir became an important ceremony amongst the peasants at the time of the beginning of the agricultural season and ploughing'.⁴⁴ Interesting features to note about these deities are the vehicles they ride. Except Harbuji who commutes on a Desert Fox, all the earlier mentioned folk deities ride their respective horses.⁴⁵ Here, a visible contrast is about the employment of horse in the intense desert and the complete absence of camel (an efficient and desert acquainted animal) from the lines of the local deities is worth mentioning. What could have motivated them to employ only the horses? Or did the engagement with horse sufficed for the social statements? So far none of the Rajput rulers have been depicted as camel-riders. The complete absence of the camel as a vehicle (from native environment) is a situation that invites serious thoughts. Was it because of the fact that the camel was considered an animal of the nomads? Or was it due to the absence of representational elegance (colour/shape/style) with the camel as those were crucial element to depict the royalty and spirituality.

The folklores and tales around these deities are also silent about the engagements of camel. The only exception that comes across is the tale of Dhola-Maru. In this, the protagonist (Dhola) rode the fastest camel to meet his beloved-Maru, who lived in Puggal (a region near Biakner). The *khyal* (play) of Dhola-Maru represents the camel as a repository of intelligence, valour, faith, calmness, peace and tranquility. In the Chhattisgarh version of Dhola-Maru

Pir and Ismailis in Rajasthan, Manohar, Delhi, 2003, pp. 68-9 and John D. Smith, *The Epic of Pabuji: A Study of Transcription and Translation*, Cambridge University Press, Cambridge, 1991, pp. 6-7.

⁴⁴ R. P. Rana, *Rebels to Rulers: The Rise of Jat Power in Medieval India c. 1665-1735*, Manohar, Delhi, 2006, p. 134.

⁴⁵ Col. James Tod, *Annals and Antiquities of Rajasthan*, William Crooke (ed.), 3. Vols., vol. 2, Humphrey Milford-Oxford University Press, London, 1920, p. 843.

story, a camel named Karhaa, was presented as a wedding gift and it acted as a messenger between the lovers. The sincerity and the intelligence granted to the camel is getting reflected in both the versions of this story and is praise worthy. A similar kind of observation was made by the Mughal Emperor Akbar when he was sent-off to the city of Kabul with an expectation 'that he might there practise the methods of spiritual and temporal sovereignty'.⁴⁶ During these times, Akbar was also constantly observing and contemplating about the camel. His interaction and observations about the animal were recorded by his historian friend as 'wondrous creature the camel...he used to observe and contemplate the strange make and ways of camels, which were the biggest animals in that region and, under the guise of amusement and metaphor, made serious reflections on the *darvish*-like constitution of those beasts-their endurance and patience; submission and resignation, their passive obedience even should the leading cord be in the hand of a child, their being satisfied to eat thorns, and their endurance of thirst'.⁴⁷ Later, the milk of a Persian camel was used to treat Jahangir who fell sick due to consumption of excess alcohol and opium. He defines his experience as 'contrary to the milk of other camels, which is not devoid of saltness, it appeared to my taste sweet and delicious, and now for a month past I have been drinking every day a cup of it equal in quantity to half a water-cup, and it is clearly advantageous, for it quenches my thirst'.⁴⁸ The intriguing spirit of the Emperor made him to extend his experiments with the diet of other female camels. But for some unknown reason the result of the experiments are not mentioned. The engagement of the Mughals with the camels was multi-dimensional and very regular. The ability of camel to draw the tongue to the branches of *babul*, *khair* and *jarwas* which possessed long, hard and sharp thorns, and harness them with clarity, astonished Col. Tod and

⁴⁶ Abul Fazal, *Akbarnama*, vol. 1, p. 587.

⁴⁷ *Ibid.*, p. 589.

⁴⁸ Jahangir, *Tuzuk-i Jahangiri*, 2 vols. Alexander Rogers (tr.), Henry Beveridge (ed.), vol. 2, Low Price Publication, Delhi, 1909 (reprint 2006), p. 46.

he called camel 'the Supreme Artist'.⁴⁹ Thus, it can be asserted that the love and reverence held for the camel by the owners, riders, and the inhabitants of the desert was immense and this creature had a special position well beyond the other animals of the Thar Desert. This status was attained by camel due to its efficiency as beast of burden and a source of the nutrition (milk) in the deserts (devoid of regular food). All these qualities of this animal allowed and supported the royal bloods, agro-pastoralists and the nomads to explore desert beyond the limits.

The economic and political role of the camel have not been highlighted well in the tales. Most of the stress in the exceptional tale of Dhola-Maru was on the non-measurable qualities of the animal. It is suggested that the dromedary was introduced in the area of Thar around the 7th century and the 8th century. This was also the time when regular settlements were growing in the region of our study. S. P. Gupta suggests that introduction of 'dromedaries, or camel...could have given a new economic profile to the Thar just on the eve of the middle-ages'.⁵⁰ This doesn't seem to be a generalization. The literary texts of the early medieval centuries don't say anything about this animal and this relative silence continues till the mid of the 13th century. According to a traditional belief, Pabuji was born in vs 1299/ 1242 AD⁵¹ and 'is worshipped by his rural devotees as a savior of mankind and pastoral wealth'.⁵² The folklores depict that Pabuji was pro-founder of a local sect. He was identified as the camel-protector. He is also credited as someone 'who first brought the camel into use'⁵³ and he not only brought the 'reddish-brown she-camel to Marwar,

⁴⁹ Tod, vol. 3, p. 1305.

⁵⁰ S. P. Gupta, 'Reconstructing the Political and Economic Profile of Rajasthan', *Proceedings of Indian History Congress*, 55th session, Aligarh, 1994, pp. 159-72 (p.161).

⁵¹ Mahipal Singh Rathor, 'lok devta Pabuji Rathor' in Vikram Singh Bhatti (ed.), *Rajasthan ke lok devta*, Rajasthani Sodh Sansthan in collaboration of Mehrangarh Museum Trust, 2017, p. 35 (pp. 32-43).

⁵² G. N. Sharma, *Social Life in Medieval Rajasthan*, Lakshmi Narain Agarwal Educational Publishers, Agra, 1968, p. 227.

⁵³ Tod, *Annals and Antiquities of Rajasthan*, vol. 2, p. 843.

but also assigned this *Raikas*, a caste, the duty to breed and graze them. According to this story, the origin of *Raikas* is traced from that day'.⁵⁴ The *Raikas* and the *Rebaris* both specialize in camel-raring and have been in this profession since the medieval times. From the 14th century onwards, the camel started appearing in the local sayings and got an entry in the literature. The camel herds are called *tola*. A few local saying around the camel are mentioned below:

*Kaal Kusmmee na mare, Baman bakri ount,
Woh mangai who frai charai, ko sukha chanee dbunt.*⁵⁵

(Brahman, goat and camel don't die during drought, Brahman survives on alms, goat roams and feed and the camel sustains by eating the dry twigs.)

*Ye ount sa-rai lay yiyaa baakra, kesar sa-rai bhag
Ye chandi sa-rai lay tiya banba, sonao sa-rai larvo tang.*⁵⁶

(These camels looks like gold amongst the goat, this entire silver [goat] will be tied up, just collect and carry the entire gold [camel].)

*Aisa tha padma kawar, karne ka latka
Hik hik kavi ko, sampiya, kathala katka.*⁵⁷

(Oh! Padma Kawar, you have done such a marvellous movement of your waist [dance], that each poet got a beautiful brown camel of high quality which is like a lotus.) Here, the camel is represented as the most precious gift that was bestowed from the court for the outstanding performance.

The 17th century poet Munhot Nainsi has confirmed the use of camel in the warfare by recording several fatal fights that were

⁵⁴ Vinay Kumar Srivastava, 'The Rathore Rajput Heroes of Rajasthan: Some Reflections on John Smith's *The Epic of Pabuji*', *Modern Asian Studies*, vol. XXVIII, no. 3, 1994, pp. 597-9.

⁵⁵ Govind Agarwal 'Rajasthan ke jan-jeevan aur Lok Sahitya mein Oont' *Maru Bharti*, vol. XII, 1965-6, pp. 11-29 (p.20).

⁵⁶ *Ibid.*, p. 22.

⁵⁷ *Ibid.*, p. 23.

fought to take possession of the camels.⁵⁸ Further the utility of the animal and its economic significance is highlighted beautifully in the verse *Shand dage jate hai, mare nahi* (the camels are branded, not killed!).⁵⁹ The massive culture that evolved around the camel reflects its social and economic significance. Its immense utility and efficiency to negotiate in desert has made it a special and priced commodity.

In India, the environmental history has explored well around the exotic animals such as tiger, lion, elephant, *cheetah*, etc. The fauna, which were classified as draught, has yet not received their due in the history. The camel was used as a mode of swift transport during the medieval times as horse was for speed. The texts of the Sultanate are silent about the employment of camel. However, the Mughal court literature is rich about the use of camel as a means of transport. The books of Humayun that were lost in the battle of Qibcaq were retrieved successfully as booty after takeover of Qandhar and were found on back of two camels, in boxes in perfect condition. The court historian Abul Fazal notes, 'At this joyous time two camels loaded with boxes and without drivers were seen on the field of battle. His Majesty said, "everyone is having his plunder, let mine be these two camels!" He went himself and taking their nose-strings, ordered that they should be made to kneel and that the boxes should be opened, so that he might see what was inside. By a beautiful coincidence it was found that the special, royal books which were lost at the battle of Qibcaq were in these boxes and in perfect condition'.⁶⁰ This instance indicates that the engagement with the camel during the Mughal period has extended immensely. So much so that even the Emperor (Akbar) travelled on the back of this docile and swift animal even when the cavalry was in its heyday! The interaction of Akbar with dromedary was on multiple levels. On 23 August 1573 AD, the

⁵⁸ Munhot Nainsi, *Munhot Nainsi ri Khyat*, Badri Prasad Sakaria (ed.), vol. II, Rajasthan Oriental Research Institute, Jodhpur, 1962, pp. 94, 159 and 175.

⁵⁹ *Ibid.*, p. 223.

⁶⁰ Abul Fazal, *Akbarnama*, vol. 1, p. 571.

Mughal Emperor left capital to proceed for Gujarat and 'mounted on a swift and softly-going she-camel'.⁶¹ The admiration for the animal and its swift movements made the author to note 'A camel swifter than an arrow'⁶², in-order to acknowledge her quality. The name of this she-camel was Jamaza and she was called *Kamangardani* (bow necked one).⁶³ After three centuries, even the British officials acknowledged the swiftness of the camel.⁶⁴ Hence, the effective employment of camel in the imperial armies is evident from the above instances. The camel was mainly integrated for the load-carrying activities, and was specially engaged for ensuring the swift and fast movements in the dry and sandy areas.

The utility of the camel in the desert and the absence of foe around the animal had made the company to admire it. The catastrophe of the hunting and shooting which was faced by the big cats, huge animals, small carnivorous herds and the venomous reptiles during the 19th century⁶⁵ didn't encounter the camel due to its calmness, effective utility and its employment as a mode of transport. The employment of bullocks by the Banjaras also saved the former.⁶⁶ In *The Rajputana Gazetteer*, the camels of desert states have been classified as per their features, endurance, and the abilities. The company officials who were visiting this Great Indian Desert had a lot of admiration for these beasts of burden and their abilities. The use of camel for ploughing the sandy hills has also been confirmed.⁶⁷ The tradition of camel raring in western Rajasthan has been highlighted in the *Gazetteer* as 'Camels are kept

⁶¹ Abul Fazal, *Ain-i Akbari*, vol. 3, p. 62.

⁶² Ibid.

⁶³ Ibid.

⁶⁴ *The Rajputana Gazetteer*, vol. 1, Office of the Superintendent of Government Printing, Calcutta, 1879, pp. 96-7.

⁶⁵ Mahesh Rangarajan, 'The Raj and the Natural World: The War against 'Dangerous Beasts' in Colonial India', *Studies in History*, vol. 14 (2), 1998, pp. 265-99.

⁶⁶ Manisha Choudhary, *Trade, Transport and Tanda: Shifting Identities of the Banjaras*, Manohar, Delhi, 2018.

⁶⁷ *The Rajputana Gazetteer*, vol. 1, Office of the Superintendent of Government Printing, Calcutta, 1879, p. 96.

in large quantities in Western Rajputana, and, besides being ridden and used as beasts of burden, they are employed in agriculture. The Bikaner camel is the finest, swiftest, and handsomest in India. The Marwar camel is more enduring, but not the equal of the former in speed. The Jesulmer camel is a dark, small, and ugly animal, but very docile and the easiest of any in his paces'.⁶⁸ Further, 'the Bikaner camels are celebrated for their breeding and power of endurance and owing to the good pastures and congenial climate the cattle are of an excellent description'.⁶⁹ Nearly after three decades in the *Imperial Gazetteer of India*, the dromedaries has been defined as 'camel are looked as member of the family than as dumb animals; they plough and harrow the ground, bring home the harvest, carry wood and water, and are both ridden and driven. Their milk is used both as an article of diet and medicine; a fair profit is made from the sale of their wool, and when they die, their skin is made into jars for holding *ghi* and oil. The riding camel breed in these parts are probably superior to any other in India, and the best of them will cover from 80 to 100 miles in a night when emergency demands speed. The price varies from Rs. 150 to Rs. 300. The Jaisalmer camels are famed for their easy paces and hardiness, and can go long distances without food and water, subsisting for days on a little unrefined sugar and alum, which are carried in saddle bags. The best of these breeds are smaller and finer in the head and neck than the ordinary camel. The camels of Jodhpur and Bikaner are larger and stronger than those of Jaisalmer, and are often very swift'.⁷⁰ Further, it is mentioned that 'the best riding camel of Marwar breed come from Sheo in the west and are known as Rama Thalia; they are said to cover 80 or even 100 miles in a night. Mallani, Phalodi, Shergarh, and Sankra also supply good riding camels'.⁷¹ 'The camels are famous for their easy paces, speed and hardiness; they plough and harrow the ground,

⁶⁸ Ibid., p. 97.

⁶⁹ Ibid., p. 186.

⁷⁰ *Imperial Gazetteer of India Provincial Series Rajputana*, Office of the Superintendent of Government Printing, Calcutta, 1908, pp. 46-7.

⁷¹ Ibid. p. 183.

bringing home the harvests, carry food and water, and are both ridden and driven'.⁷² The tax levied around the camel cart loads was *Rahdari* which ranged from 2-9 per cent. *Rupata* was another tax levied on the sale of camels and certain goods in the city along with *Afim-ka-souda* and *Meub-ka-souda* (the tax on the prediction of rain).⁷³ The turbulence amongst the *Thakurs* of the desert was a constantly occurring feature, and often it, expanded in dacoity and cattle lifting. Here, the camel and their burdens usually formed the booty.⁷⁴ All the above events and episodes help us to identify the significance of camel in the region of Rajasthan and facilitate to understand the nature and the distinctions between the various breeds of this animal as per the regions. The unbroken continuity in the engagements with the animal from the medieval times onwards up to the nineteenth century also comes-out explicitly.

The employment of the camel in the military set-up was well defined by the John Company. The camel corps was raised between 1889 and 1893, for the defense of the empire. It was called the Ganga Risala. The name of the regiment was attributed to the chief who organized this corps. The use of the camel for the military purpose has been defined as 'it served in China in 1900-1 as an infantry regiment, and a detachment of about 250 men mounted on camel did particularly well in Somaliland in 1903-4. The state now contributes to no local corps or contingent, though formally (1836-42) it paid Rs. 22,000 a year towards the cost of the Shekhawati Brigade'.⁷⁵

The change in the condition and status of animal erupted in the end of the 20th century. Within two decades (1997 to 2016), an alarming decline in the number of animal became visible. A survey report of 1997 mentioned that the number of camel in

⁷² *Ibid.*, p. 211.

⁷³ *The Rajputana Gazetteer*, vol. 1, Office of the Superintendent of Government Printing, Calcutta, 1879, p. 192.

⁷⁴ *Ibid.*, p. 196.

⁷⁵ *Imperial Gazetteer of India Provincial Series Rajputana*, Office of the Superintendent of Government Printing, Calcutta, 1908, pp. 414-15.

Rajasthan during that year was seven lakh. The constant decline in the numbers of animal is visible from the following data⁷⁶:

S. No.	Year	No. of camel
1.	1997	7,00,000
2.	2003	4,98,000
3.	2007	4,30,000
4.	2012	4,21,836
5.	2014	2,00,000
6.	2016	50,000

This trend of constant decline in the population of the animal is a cause of worry for many environmentalists and breeders as well. A survey conducted by the *Lokhit Pasu-Palak Sansthan* (LPPS) from August 2006 to April 2007, in the villages of Jaisalmer (core camel area) indicated a decline of 40.6 per cent in the population of camel. A similar 'downfall was more elsewhere with Barmer district reporting 44.3 per cent decline and Shergarh tehsil (Jodhpur) and Kolayat tehsil (Bikaner) showing 46 per cent and 45 per cent respectively'.⁷⁷ Due to constant decline 'the camel has become expensive and rare with less than 50,000 animals has been declared as endangered species by the International Union for Conservation of Nature and Natural resources (IUCN)'.⁷⁸

⁷⁶ <http://www.bwcindia.org/Web/Awareness/LearnAbout/Camels.html> and 'Camel price on the rise; numbers on the decline', *The Hindu*, April 29, 2008, <https://www.thehindu.com/todays-paper/tp-national/tp-otherstates/Camel-prices-on-the-rise-numbers-on-the-decline/article15211975.ece> and Rohit Parihar, *India Today*, May 30, 2005, <https://www.indiatoday.in/magazine/environment/story/19700101-camel-population-declining-drop-in-birth-rate-of-camel-in-india-787548-2005-05-30>

⁷⁷ 'Camel price on the rise; numbers on the decline', *The Hindu*, April 29th 2008. <https://www.thehindu.com/todays-paper/tp-national/tp-otherstates/Camel-prices-on-the-rise-numbers-on-the-decline/article15211975.ece>

⁷⁸ Maneka Gandhi, 'The sinking ship of the desert', *The Hindu*,

Another report mentions 'where 20 years ago camel milled around the village, today there is only one. A hundred kilometres north, in Tejjala village close to the Indo-Pakistan border, there are only six camels'.⁷⁹ This drastic decline in the number of camel has scrolled India to the fifth position, earlier which had the world's third largest population of camel. The shift in the approach of inhabitants towards the native animal of desert is also worrying. A native says that Camel are no longer part of the landscape in the desert and when they show up, children come running for joyrides, 'For them it is like encountering a tiger'.⁸⁰ The *Raikas* who were the sole community to rare and breed the camel no more associates with the animal as they use to do in the past. 'Raika youth don't revere the animal anymore'⁸¹ and are more interested in urban jobs. The change in the attitude of the community is reflecting through the nature of the sales also. Earlier, the she-camels were never sold but now the community members are not keeping this sacrosanct distinction at work.

The transport of the camel to the humid areas of Lonavala, Pune, Khandala, Agra, Panchagani, Mahableshwar, Alibaug Bombay, Hyderabad, Kerala, Karnataka, Tamil Nadu, Jharkhand, etc. is also taking a heavy toll on the life of animal. The animal is mainly exported to these areas by pulling them out of the dry zone of Thar (a conducive climate for camel). In the new lands camels are used for the joyrides and acrobatics activities. As humid conditions are not suitable for camel, it has been found that most of the camels that have been shifted out to the dry desert into humid areas suffer from the infectious disease of Anthrax. Other major reason for the export of camel is its demand for slaughter that

September 21, 2015, <https://www.thehindu.com/opinion/op-ed/the-sinking-ship-of-the-desert/article7671220.ece>

⁷⁹ Rohit Parihar, *India Today*, May 30, 2005, <https://www.indiatoday.in/magazine/environment/story/19700101-camel-population-declining-drop-in-birth-rate-of-camel-in-india-787548-2005-05-30>

⁸⁰ Ibid.

⁸¹ Maseeh Rahman, *The Guardian*, January 24, 2014, <https://www.theguardian.com/world/2014/jun/24/rajasthan-save-camel-population-legal-protection-india>

comes-up around the festive seasons. The bans were introduced by the Karnataka High court, Tamil Nadu High Court, and Kerala High Court on the slaughter of the camel, which indicates that the camel was also made a target for its meat.⁸² Besides the meat, the demand of camel hide is also very high as the Usta Artists use it for making the different items like *mojris/mojadi* (traditional shoe), *kupis* (bottles decorated by paints and embossing for keeping perfumes, oil and water, etc.) and many other items such as bags, furniture, lampshades, bowls and the drum covers etc. The bones of camel are a replacement of the ivory. Thus, it is widely used for making many items of jewellery and intricate beautiful containers.

The Rajasthan Government awoke to this calamity in 2014 and passed an Act declaring camel the state animal (sic!). A year later, the Act was followed by the Rajasthan Camel (Prohibition of Slaughter and Regulation of Temporary Migration or Export) Bill of 2015, which banned the slaughter, trading and unauthorized transportation of camel. It is important to mention here that the treatment extended to the camel in the desert of Thar was based on compassion and love felt for this animal. The philosophy behind this treatment was to maintain the animals that form the base of their survival. The idea that guided the pastoral communities was their admiration and belief in the potential of this walking and growing capital and resources—the camel, who is also an energy saver. The respect for the animal was also guided by minimum requirements of fodder and water, which this animal is able to procure on its own, due to the different styles and patterns of grazing. It is pertinent to mention here that even with independent grazing capacity this animal takes bare minimum from the surrounding flora and do returns maximum in form of dairy products, off-springs, and hides.

As explained above the natural surroundings do orient the humans, the flora, and fauna of the region. The psychological effect of the dry environment over the inhabitants is evident through the lifestyle and behaviour of the humans of Thar Desert.

⁸² <http://www.bwcindia.org/Web/Awareness/LearnAbout/Camels.html>

Physically, the people of Thar are well built, hardworking, and generally adamant in nature that is ready to hit any extent. Most of the times, the peasants of this desert depend on the *ek-fasla* production due to the scarcity of water for irrigation. This *ek-fasla* crop is usually procured in the kharif season. The productions of this season are stored well after intense cleaning and sorting. And, at final stage the classification of the products for human and animal consumption is done. The plants, shoots, leaves, and the bean-covers of the lentils are dried and crushed, to be stored as fodder, for usage during the forthcoming winters. These fodders are nutritious for the animals like goat, cow, ox, and camel and they also help to maintain good health and good quality of milk in animals. Usually this fodder is denied to the sheep as they are left free in the fields, to pick from the shrubs and variety of other plants. The habit of constant grazing in sheep is the sole factor for denial of this premium service. The requirement of the milk (from goat and cow) and the robust animal (camel) is a prime factor for facilitating these animals with fodder. The development around these lines (what to be offered to whom) is immense. The camel and ox get this fodder only as nutritional supplement, not as a fodder supply. The fodder for all these animals is obtained from the plants of *gawar*, *jau*, wheat, *bajra* and *jawar*, etc. which is dried and chopped. The fodder for goat mainly consists of tiny leaves that are obtained from trees of *acacia/tikar*, *khejri* and *jati*. The plants of *mung* and *moth* along with their bean-covers are also fodder for camel and goats. The beans of *acacia* and *jati* are locally known as *bichya* and *sangari-khokha* respectively. The word *bichiya* for the bean of *acacia* was coined because when the seeds inside the bean get dry they give a ringing sound when they hit the outer bean cover due to its hard surface. Secondly, the shape of the bean is also very much like stripe with swollen nodules which occur on regular intervals. So, it makes it more close to the anklet design. While travelling in villages, very frequently, one is able to see many young girls with these beans tied around their ankle. It is due to the sound it gives out. These beans are a rich source of nutrition for goats and camels that are generally found grazing heavily on these during the summer months. Its salty and sour taste with hard

surface and the presence of gully and sticky substance makes it unfit for human consumption. However, the gum that is obtained from the stem of *acacia* tree is consumed by the humans due to its medical properties that is helpful in treating the orthopaedic conditions and diabetes. The women of *Gawariya* community are often seen roaming in the hamlets with the baskets over their heads that are full of the gum, obtained from the *acacia* tree. They roam from village to village to sell this naturally obtained commodity. They depend on its sale for securing some tender.

The beans of the *jati* tree are known as *sangari* and on ripening they are called *kho-kha*. The *kho-kha* is one of the wild fruits that are available to the kids of Thar Desert. The happiness on the face of kids on seeing a tree with *kho-khas* hanging down is immeasurable. Destroyed and spoilt beans are kept for the animals. *Sangari* is the raw bean which is taken off from the tree and after the process of sorting and chopping, it is dried and stored for the coming seasons. The dried *sangria* are used for making vegetable. The popular tree of *khejri* is the main source for obtaining the wood. The roots of the tree form a very complicated network of the hair roots that penetrate extensively through soil in all the directions to catch water. This root system also helps to control the soil erosion. The immense utility of this tree has led to creation of rituals around it. Geographically, the *khejri* is limited to the region of Jodhpur and Nagaur. Some scattered plantations are also visible in the region of Bikaner and Jaisalmer. The ecological support system has kept *jati* limited into the region of Shekhawati (Sikar, Jhunjhunu and Churu) and some extensions towards the Jaipur are also visible. Thus, it is evident that the trees of *khejri* are available in the central desert and the eastern extent of the desert is marked by both, *jati* and *khejri*. The *acacia* (popularly known as *tikar/babul*) is available throughout the desert, ranging from Barmer to Bikaner, and from Jaisalmer up to the western side of the Aravalli mountains. The tree of *neem* is considered as the *kul-vraksh* (family tree) by the Rathors of Jodhpur. The employees of Mehrangarh Fort try to highlight its importance again and again. They say that people in Jodhpur abstain from cutting tree of neem and a few even worship it. Generally, in Hindu mythology the tree of *pipal* is worshipped.

The absence of *pipal* in the desert region might have pushed the royal family to choose for an alternative, and declare it important for the region. Novelty of this invocation can't be doubted as sources are completely silent on it. The sacredness of the *pipal* for the Mewar was stressed by Kishandas (envoy from Mewar) to Col Tod.⁸³ The envoy didn't extend any such information about the trees (*babul*, *karil* and *ak*) of Marwar. Even the slightest mention of the *neem* is not present in the description of flora. Therefore, with some certainty it can be said that this custom was not present until the late 19th century as is evident from the absence of rituals around the *neem* tree.

The shrubs of *kair*, *khari* and *kheep* are important in the struggle for survival. The tree-cum-shrubs (at times plants rise in height and the roots come-up out of the ground, giving a feel of steam, but defiantly not a log) of *kair* blooms with red flowers which become fruit (starting from eruption of small green granules which travels through the yellow being semi-ripe and finally attains a beautiful red). This fruit of *kair* is used as vegetable (tangy in taste) and most of its yield is dried and stored for consumption in the months of winter. The locals also make pickle with *kair* fruit. The months of May and June are seasons for its bloom and the onset of rain washes off the fruit completely. This shrub doesn't have leaves. Its plant looks like a bunch of many sleek sticks growing out in all direction, making a round looking plant. The goats, sheep, and camels being constant grazers and chewers pluck off its soft ends without even tempering the fruit. Another floral wonder of Thar Desert is *kheep*. This is a pure shrub that spans out on the top of huge sand dunes. Naturally, a lot of distant prevails between two plants, as each plant comes-up on a separate dune. Normally, only one plant is seen on one dune. This feature is very contrary to *kair* that usually flourishes on the flat sandy surfaces along with many other plants of its own species around, giving a feel of *kair* orchid. The plant of *kheep* also looks like a huge growing-out bunch of dark green twigs. In this also the leaves are a miss. The sleek little beans (called *kheepoli*) shoot off on the soft surface of the little

⁸³ Tod, *Annals and Antiquities of Rajasthan*, vol. 2, p. 803.

strengthened fibre of the twigs. These beans are used as fresh vegetable and are not suitable for purpose of drying and storing for later consumptions. Its bloom time is from July onwards, till the end of October. An astonishing feature of this plant is the stencil strength of its twigs. The strength of the fibre present in its grassy strings (twigs) is immense due to which people use it for making ropes just by colliding a few strings together in a pattern of plait. The rope made of *kheep* grass is much strong then the stripe of leather (called *colai-lo*) which is used by the locals to tie and carry the green fodder. Its single strings are used for making beams of grass, and to tie together the beams of grass that are used as support base for the thatched roofs. Both these shrubs grow in wilds and are never taken for field plantation. These shrubs are remarkable examples of the Thar vegetation that supports the base of life extensively. The segregation as per the consumption pattern and nutritional requirements also indicates to the philosophy that works in Thar and it continues to develop on the principle of proportionate sharing. Sharing proportionately has made both human and cattle capable of surviving in this intense desert.

The other shrubs like *khre-te*, *kuncha* (a grass), *kha-ri* (*khree*), *ghokaru* are also serving the desert inhabitants since many centuries. The *khre-te* plant is dotted with small leaves on which the constant small grazer feed and its fruits—small blackish granules—are used as food supplement. The *kuncha* is a tall wild grass with some thick sticks and sharp grass blades all around. Its roots are circular in shape and hardly go deep in the soil. Its sticks are used for making roofs and the grass is utilized for making brooms. These brooms are known as *panni ki bhuari*. The *kha-ri* is usually planted on the sand walls (locally called *do-le*) to create an embankment for the invading cattle hordes. Thick and hard thorns on the plant work as natural defense against the invading sheep and goats. This shrub is popular in the areas of Shekhawati and Dhundhar. The plant of *ghokaru* is like carpet spread with small leaves. The outer cover of its fruit is dotted with many symmetrically arranged small thorns. These thorns protect the fruit which is used for meeting nutritional requirements and to treat medicinal conditions. The classification of parts of plants, for both humans and animals, is bewitching,

but it ensures a share for all the members of the desert. These distributions indicate that the humans of desert have been valuing their cattle. Historically, they have been sharing their resources with their animals in order to ensure well-being and good health in tote. The principal of sharing from each plant and resource is beautifully seen nearly in all the aspects and activities of life. The inhabitants have also developed various dishes which are made out of the wild products that grow in the desert and have been using them to meet the nutritional requirements in order to lead a healthy life. Thus, the ideology that is shaping the lifestyle and the culture of the inhabitants, and their cattle is a well thought vision, and ability to develop various combinations and permutations from the available flora and fauna. The intense scarcity of resources, both biotic compounds (flora and fauna) in the natural setting and their usages have paved way for the conservation, preservation, and extension of respect and love towards the nature.

Anupam Mishra⁸⁴ has worked on the *talabs* of India. He forwarded that the philosophy that was guiding the people is no more in place. In the past, people had *dharam karne ka bhav* (aspired for welfare). He says that the people in past were clear headed, due to which they were able to understand the need for larger welfares. Examples picked up by him to prove his propositions are around the making of the *talabs*, annual cleaning of the *talabs* and the self-motivated people who use to come forward for repairing these (*talabs*) immensely significant sources of water. The soil that flows in the *talab* along with the water is called *sa-nd*. It was annually pulled out to keep the bowl of the pond intact. While the *talab* was cleaned, the inhabitants of the village use to wait around the pond for collecting the *sa-nd* (soil that has been pulled out). Then they carried the *sa-nd* home as *prasad* (auspicious food). Some took it to their fields. This carrying away of soil was an act to clear off the surroundings of the pond, as it was a common property. He calls these collaborating societies '*saf mathe ka samaj* (clean head societies)' and propounds that many regions are facing the shortage

⁸⁴ Anupam Mishra, *Aaj bhi khare hai talab*, Vani Parkashan, Delhi, 2014.

of water, and the level of ground water is declining because the heads of the present society are filled with the *sa-nd* and there is no one to clean it! Thus, the twin failure of the society is visible in the discontinuation of pond diggings (making of the ponds) and the inability to keep the ponds clean. And these are the reasons for the shortage of water in the different parts of India.

The manure is a crucial thing for the agricultural activities. Coming to the intense desert, the use of manure has a different applicability as it is not an item of regular utility. A note from *Gazetteer* mentions that 'manure is hardly used at all in the desert tracts in west and north'.⁸⁵ The reason for this major miss is the uneven surface of the dunes and the presence of the constantly moving cattle herds that keep walking from one place to another for grazing. The release of excrete by herds animals (sheep, goat, cow, camel etc.) while walking and grazing suffices for the need of dung manure. The absence of water for irrigation is another de-motivating factor to engage in the regular use of dung manure. As the dung manure requires a lot of water to dilute before its absorption by the plant. Most prominent factor that dissuades the use of dung manure is the presence of fine new soil layer that comes-in and deposits with each wind, holding a lot of minerals which are sufficient to supply the nutrition to the crops. To small extent, bone manure is used in Kishangarh (near Ajmer). The practice of sheep and goat penning in fields for a few days is another very common practice in the dry regions. A very interesting process is followed for carrying out the penning activity. For the penning the shepherds make contracts with the field owners for a free-stay on their lands for duration of thirty to forty days. During the period of stay the sheep continue to graze in the field and their excreta gets evenly distributed on the land area which fulfils the supply of manure for the field. The brilliant use of animal's natural mechanism shows amazing ability of the inhabitants to relate with their environment. During these stays, the sheep are generally fed

⁸⁵ *Imperial Gazetteer of India Provincial Series Rajputana*, Book Treasure, Jodhpur, 1908 (Superintendent of Government Printing, Calcutta), reprint 2007, p. 44.

from the trees and the grass available on the land. Shepherds are responsible for pruning the trees in order to feed their herds. Land owners generally don't charge for the fodder that has been made available to the herds by pruning the branches from trees. But they don't pay the pruning charges. The arrangements of water are made as per the availability. Even today this tradition continues in the same manner. Usually, the annual and bi-annual slots of penning are arranged around the time of sheep shearing. The cutting-off of woollen fleece (of sheep) during these stays helps the nomad herdsmen to save the cost of feeding and housing the small but constant grazers. The penning is usually worked in the areas where the product (sheep wool) can be sold-off easily without the hassle of transporting the same. In return, the owner of the field gets evenly manured field without the efforts of acquiring manure, spreading it and finally watering the same for even distribution. What a remarkable arrangement! Here it can be said that the Nature has allowed both the parties to come in mutual agreement in which both try to take the best possible deals. In Thar Desert, there are eight popular breeds of sheep.⁸⁶ Besides these, there are many others breeds as well that help in making the arrangements of subsistence and food. Hence, it can be said that the men of the Thar Desert have developed a fine co-ordination with the nature and have learnt to walk with the nature.

⁸⁶ R. M. Acharya, *Sheep and Goat Breeds in India*, FAO Animal Production and Health Paper 30, FAO, Rome, 1982. <http://www.fao.org/docrep/004/x6532e/X6532E01.htm#ch2>. The eight breeds mentioned are: 1. Chokla also known as Chapper/Shekhawati (found in Sikar, Churu and Jhunjhunu. They are also available in Bikaner and Jaipur). 2. Nali (reared in Ganganagar, Churu and Jhunjhunu). 3. Marwari (in the regions of Jodhpur, Jalore, Pali, Barmer, Ajmer and Udaipur). 4. Magra, is also known as Bikaneri/Bikaneri Chokhla and Chakri (it is a popular breed in Nagaur, Bikaner, Jaisalmer and Churu). 5. Jaisalmeri (popular with the inhabitants of Jaisalmer, Barmer and Jodhpur). 6. Pugal is a village in Bikaner district and this breed is available in the north-west of Bikaner and Jaisalmer. 7. Malpura is found mainly in Jaipur, Tonk and Sawai Madhopur. 8. Sonadi is popular in the southern Rajasthan and mainly their habitation is in Udaipur, Dungarpur and Chittor.

The prosperity of the green (thick vegetation) lures and attracts the entire Thar. The miss of green in regular life have helped the green grasses, leaves, etc. or for that sake even the green pulses to attain a superior status, along with the respect that is associated with auspiciousness. As per the local custom whenever someone is setting out for some work and gets to see anyone coming with green grass, stick, leaves, twigs (commonly called *hariyo/haro/hari-badi*), then it is considered as a good omen. They believe that the sight of green grass ensures success in the endeavour for which the respective person was going out. Thus, on seeing a carrier or bearer of green vegetation, the one who has set-out for work will request the former to give some small token out of the green stock (leaves, twigs, grass etc.). In return, the carrier of green gets some *neg*. This entire process is called *su-un hoga* (auspicious time has set-in). The immense reverence for the green vegetation and the belief in its auspiciousness and power gets reflected through this belief that is evident throughout the Thar Desert.

Another interesting observation to share is the belief that works around the earthen pots. Most of the people use earthen baked pots in all the parts of Rajasthan, which is obviously due to the intense hot weather conditions. The pores of the baked pot allow the air to seep in and cools down the water. Thus, it is working like a natural refrigerator in the desert, where the electric fridge fails due to many reasons like power cuts, low income, etc. Fresh pots are introduced biannually, once on the day of Diwali, and the next on Holi celebration. This calendar is followed by nearly all the communities, cults and sects irrespective of their religious adherence. Muslim inhabitants also do it on *basant-panchami (vasant)*. The rituals around the introduction of the fresh pot are: washing of the pot without putting hand inside it, then filling it with water will be followed by a small ritual in which *tilak* is applied on the belly of pot and four straight marks of vermilion (*kum-kum*) are put on the brink of the pot by placing them opposite to each other, then a sacred thread (*kalawa*) will be tied around the neck of pot and finally some strings of green grass will be put in the pot along with few grains of *mung* (green) pulse. Both these rituals are part of popular culture and clearly depict the beliefs

that run across the faiths. Here, the pot is signifier of the mother-earth and by filling it with water and putting some strings of grass and grains, a request is put forward to the Nature for keeping the landscape safe, prosperous, sufficiently watered, and fertile for the respective productions (pulses and grass). This is prolific example that indicates to contented inhabitants who are philosophically convinced that they don't have to pray for the improvement in environmental conditions. However, they wish only to retain and maintain that has been made available by the nature. The close affinity with the green and the ritual around water pot (that too with the green pulses) indicate that the inhabitants have immense faith in the power of their surrounding vegetation and they try to respect them by integrating them, in their daily rituals. Apparently, these rituals help to pass on the age-old traditions (respect for the vegetation) to the next generations, silently and eloquently.

In a nutshell, it can be proposed that the philosophy which is working in the Thar Desert is all about surviving in close association with all the living-beings, respecting the environmental surroundings and most significantly to be contented in life as per the availabilities provided by the nature. The reverence and respect for the natural surroundings is visible in their daily rituals, literature, and the proverbs that are constantly used by the inhabitants in their day-to-day conversations. The dryness of Thar Desert has not pushed the inhabitants to curse/exploit their surroundings, but it has helped them to develop the philosophy of love, care, respect and nurture while sharing, conserving, and passing on selflessly. To put it appropriately as a Tharian (inhabitant of Thar), I can say here the beauty exhibited by the mind is nurtured in the heart.

To maintain its intellectual vibrancy, the environmental history needs more integration both; within itself and, with other disciplines. Scholars need to work on different regions, different problems, and shall expand the base to include more species. This work has looked at the present environmental conditions of the Thar that have been guiding the inhabitants for centuries. The expectation with this research is to address the gap that exists in the environmental history, especially in terms of the desert studies. This work is a pioneering effort to explore the contours of the

environmental history that were churning in the Great Indian Desert. With all limitations, the aim of this work is to acknowledge the presence of a distinguished environment that has been guiding the inhabitants since centuries. In no way this work will be able to answer all the questions. But, it will surely offer a connecting link, which will be a tantalizing invitation to all those who aspire to write the history of an environmentally difficult zone. I hope the readers of this work will be able to appreciate this distinct mood of Nature!



The Economy of Environment

‘In Nature, the part appears before the Whole!’

All the worldly activities are full of materialistic reality. It also reflects in the human actions of conservation and preservation. It has guided the living cultures while laying foundation of the new settlements in different geographical terrains. Examples of it are available in history since pre-historic times when the humans were the hunters and gatherers. Similar attitude has been working behind the various mechanisms of tax collections that became one of the major means for the survival and continuation of different imperialistic kingdoms. The assimilation of various communities and groups in the ambit of the states was also an attempt to achieve a better shade of the materialistic approach. In the long run, they all contributed to the economy of the states and overall, it led to the creation of different economic circles in various geographical terrains. These smaller circles touched each other and some overlapped while a few formed the concentric zones where the exchanges of the different arenas took place. This not only facilitated the exchanges, but they helped to create markets for the supply of surplus productions, into the areas where it was deficit. Indirectly, it helped to develop and improve certain aspects of the deficit zones, which were till then either unexplored or underutilized. The nomad-pastoralism and animal husbandry industry of the Thar desert is the most interesting and significant example of it. In the Thar Desert, the association of the state, society, and animals has harnessed remarkable and bewitching results.

The effort of this section will be to bring out various aspects of the economy of the Thar desert that have made this desert a rich zone that has helped many clans, groups and kingdoms to settle in this intensely dry and arid zone that is marked by the massive extents of the confusing dunes and dry winds, loaded with sand. Owing to strong variations in climatic, edaphic, physiographic, topographic, and geological characteristics, the inhabitants of this desert have a wide diversity of habits. Indeed, the historical continuity of these habits is evident from the information available in the various documents and records, and still prevalently continuing practices. The documents and manuscripts pertaining to desert states do indicate rich faunal and floral resources. Now, many of the erstwhile princely states are trying to conserve their resources which they were exploiting crazily in the late 18th and the 19th centuries. Over time, however, the ever increasing anthropogenic activities have been accompanied by changes in the traditional pattern of land use, resulting in substantial alterations of habitats which have taken a toll on the floral and the faunal diversity of desert. Desert is historical in nature and therefore it is an antiquity. 'Time has destroyed many (antiquities), but man more'.¹ This proves apt for the destruction that has been set-in in the Thar Desert.

The historical records that can be trolled to cull out the information pertaining to the economic activities of the Thar Desert are not many. A few records that were prepared by the state for facilitation of the tax-collections and to valorize the acts of the rulers do serve a broad base to understand the economic activities of the desert and are immensely helpful to connect back into the past. The intention of the state for maintaining the revenue records was not at all to provide some data to the future generations. Its sole aim was to keep account of the flowing-in money and track the payments from the subjects. The most illustrious records of Marwar that are neither revenue records, nor *eulogia* are *Mahnot*

¹ Tod, Col. James, *Annals and Antiquities of Rajasthan*, William Crooke (ed.), 3. Vols., Vol.1, Humphrey Milford-Oxford University Press, London, 1920, p. 158.

Nainsi ri Khyat and *Marward ra pargana ri vigat*. Besides these two records of the 17th century (written by a state official—Mahanto Nainsi) another prominent source for weaving the history of Thar Desert is the voluminous work of Col. James Tod.² Along with these, many other records of the state that get classified under the revenue documents (various types of *Babis*) and literary creativities of the times will be perused to get an insight in the ecology, eco-system, environmental conditions and pressures of the Thar Desert. The *Tawarikh Jaisalmer*³ is also a prominent source to get an insight in the desert of India. The folklores, oral narrations, tales and the vernacular literatures will also be referred in order to reach the most rational description about the processes and events.

Various states (Jaisalmer, Bhatti-Nagar, Jodhpur and Bikaner) were formed in Thar Desert, between the 9th and 15th centuries. 'By Arabian travelers we have a confused picture of these states, but all these states (now in west) emerged when the feudalism was attaining maturity in France and England'.⁴ With the foundation of the kingship ties and clan associations, these states soon became ruling units and in order to control more and more land which was a source for enrolling the *chakars* (serviceman by granting *pattas*)⁵ the territorial expansion drives were carried out. The constant struggles (battles which were fought) for controlling different landmasses from the 12th century to the 17th century are witness to it. The desert of Thar was a dry and difficult terrain but the natural constrains typical to a desert (scarcity of potable water, drought, scanty irrigation facilities and low grain production dependent and regulated by many factors) were never a demotivating factors for the aspiring rulers and the servicemen. The availability of the various materials (minerals, stones etc.), the closely webbed trade

² Tod, *Annals and Antiquities of Rajasthan*.

³ Lakhmi Chand & Mehta Nathmal, *Tawarikh Jaisalmer*, Rajputana Gazette Office, Chirag, Ajmer, 1948, p. 200.

⁴ Tod, *op.cit.*, vol. 1, p. 161.

⁵ Hukum Singh Bhatti (ed.), 'Marward ra thikana ri vigat', *Parampara*, Rajasthan Sansthan, Chaupasani, Jodhpur, p. 37. Many references of *patta* grants appear in variety of sources.

routes passing through the desert, the dependence of the nomads on desert and the abundance of pastoral wealth along with the conducive environment for animal husbandry has compensated for the scarcity of agricultural revenues. The state also invented a lot in order to make up the losses of agricultural revenue. For example, the desert states regularly collected money in the form of *dhuna* (hearth tax), *dand* (punishment), *thali* (table tax) and *anga* (body tax charged on animals and humans). Thus, it is clear that the economy of the desert was not at all dry, as its landscape! Many innovative ways were cobbled together to generate income for the states, as the states depended heavily on the income from taxes to run the machinery of state effectively.

The state has depended on its social groups and the products that were available either as primary products or were manufactured (secondarily) through the efforts of the artisans and skill-owners. The agriculture was not ample but wheat, *jau*, gram, mustard, *methi* (fenugreek), *ban* (cotton), *kapas* (cotton), *guwar*, *mung*, *moth*, *bajara*, *jowar*, etc. were regularly cultivated. Generally, the yield depended upon the rains. Water has always been central to the history of communities. It can be proposed that without the rivers, and riparian system supported by the rivers, no permanent, sedentary human society would have developed in the dry regions. The drought did have an impact on the cultivation. But most of the crops in the Thar Desert are either rain-fed, needing little irrigation or don't need any irrigation. So, obviously these became the chief crops for the inhabitants to depend upon for survival. Similarly, the plants, leaves, and shoots of the legume plants and hard grains (millets) like *bajra* and *jowra* produced ample fodders which are sufficient to meet the nutritional requirements of camel and goats and the milching animals.

Fitful streams were the means of irrigation in deserts. The river and river streams hardly trickled in the summer seasons but rose in floods during the occasional monsoon showers. This was an important environmental factor which contributed to the production of food, survival and maintenance of cattle. The crop-production/crop-patterns in the Thar Desert can be classified under eight categories depending upon the reach, depth and availability

of ground water, supply from the river and their tributaries, and rain water harvesting:

1. *sewaj*⁶: this term is used for referring the *rabi* crop. The crops produced in *sewaj* were mainly *chana*⁷ followed by wheat⁸ and mustard (*sarso*)⁹. The quantity of *sewaj* crop was generally good.¹⁰ A special variety of wheat known as *katha gehu* was also grown in the *sewaj*. Jasol was producing *sewaj* in 500 *bighas*.¹¹ The *sewaj* production was dependent upon river water, collection of rain water and at times with irrigation. *Dhora band sewaj huai* (production of *sewaj* in dunes) was popular.¹² Village Jagaswaas had big fields in the midst of dunes (*bada khet dhora band*).¹³ *Sewaj* with the help of river water was also planted. Village Bohrawaas has '*nadi su sewaj* (crop with the help of river)'.¹⁴ In village Sobhawaas, on the banks of river Luni, *sewaj* was produced upto 30 *kos*.¹⁵ 2000 bigha land of village Chipiyo Khusiyalpur was under *rel*.¹⁶
2. *rel*: is the flood water of river. During the monsoons with sufficient rains some rivers use to flow beyond their beds.

⁶ Mahnot Nainsi, *Marward Ra Pargana Ri Vigat*, 3 vols., (ed.) Narayan Singh Bhatti, Rajasthan Oriental Research Institute, Jodhpur, 1969, vol. 1, p. 310, 320 (fields of *sewaj* 37 to 40), pp. 341, 342, 345 (four fields of Kujnav khurd were in *sewaj*. Village Aasarnado had 10 fields of *sewaj* which produces wheat and chana), 350 (Asop khaas had production of wheat and gram through *sewaj*). Hereafter, *MRPRV*.

⁷ *MRPRV*, vol. 1, p. 352. Village Rampuro had wheat, *chana* and *sarso* as *sewaj*.

⁸ *Ibid.*, *MRPRV*, vol. 1, p. 355 (Bedarlai and Bijawaas had crop of wheat) & p. 426.

⁹ *Ibid.*, p. 426.

¹⁰ *Ibid.*, pp. 351-352.

¹¹ *Ibid.*, p. 354.

¹² *Ibid.*, p. 354 & p. 363.

¹³ *Ibid.*, p. 360.

¹⁴ *Ibid.*, p. 353.

¹⁵ *Ibid.*, p. 359.

¹⁶ *Ibid.*, p. 510.

The flowing water use to reach the distant fields. The moist attained by the soil due to these flood waters was used by the peasants of Thar Desert for plantation of the *rabi* crop. It was generally for the villages that didn't have water. Village Senali was big village '*ndi su relije saari sewa mai gehu hurwai...sejho thodo* (gets flood-water of river which produces wheat in the entire territory of village...ground water is little)'.¹⁷ Similarly, village Bohrawaas had '*nadi su sewaj* (*rabi* production with help of river water)'.¹⁸ 2000 bigha land of village Atbado was under *rel* (flood water) and it helped in production of large amount of wheat but mustard production was not much.¹⁹ '*Rel sewaj gehu chana hurwai* (*sewaj* of wheat and gram was produced in *rel* area) in village Gagurdo.²⁰ Gram was produced in the bed of perennial river Barusaan.²¹ Gram was produced in 1000 bigha of *rel*.²² The *babalo* of Singhlawati river formed *rel* and provided moist for *sewaj* (*rabi* crop).²³

3. *sejo*: refers to the ground water. The generous supply of ground water was known as '*sejo ghano*'.²⁴ '*saari sewa mai sejho ghano* (entire territory have ample ground water)'.²⁵
4. *barsi nahi*: the areas where the cultivation was not possible due to scanty rains were referred to as *barsi nahi*. It stands for representing the absence of cultivation that was to be processed after the monsoon rains.
5. *unhali*: indicates the *rabi* crop. The *unhali* crop for Sojat has been classified as *aawadan awal unhali*, *daum unhali*, *sehal unhali* and *kharchiya unhali*.²⁶ These terms have been

¹⁷ Ibid., p. 353.

¹⁸ Ibid., p. 353.

¹⁹ Ibid., p. 426.

²⁰ Ibid., p. 431.

²¹ Ibid., p. 438.

²² Ibid., p. 513.

²³ Ibid., vol. 2, p. 241.

²⁴ Ibid., vol. 1, p. 359 (Village Talwado and Khed)

²⁵ Ibid., p. 510.

²⁶ Ibid., pp. 402-5.

innovated as per the amount of the crop production where *aawadan awal unhali* represents the richest production amongst these classifications. The other categories follow it in descending order. Village Kadhliyo of Sojat *pargana* had '*khet kawla bajro, moth, mung, ban huawai. Unhali peel huwai...sewaj chana ghana* (soft fields which produces bajro, moth, mung and cotton. In *rabi* mustard was produced...*sewaj* produces gram)'.²⁷ '*nai sarsati ri naal unhali huwai* (*unhali* is produced on the banks of river Sarsati).²⁸

6. *barsaali*: are the fields where crops are produced with rain water. Village Shivraad had '*barsali bada khet jowar, bajri, china, gehu ghana huwa* (big fields which produced jowar, bajra, chana and wheat in abundance with the help of rain water)'.²⁹ '*barsali khet kawla unhali...ban nahi* (soft fields which produce *rabi* through rain water...but there was no cotton production).³⁰ River Setari channelized rain water (*barsaali*), it was the source of *rabi* crop for village Dhenawaas.³¹ Village Sehwaaj had '*barsali khet sakhra* (good number of fields that receive rain water)'.³²
7. *piwal*: were the fields where crops production was possible through irrigation, mainly *rabi* crop.
8. *dhora pani chodho*: represent the dunes that have submerged in the flood waters.³³

The water was a scarcity so most of the cultivation was dependent on the scattered rain showers, collection of rain water in the low lining areas of dunes and the flow of river water through tributaries and *rel* (flood water of rivers which entered the fields).

²⁷ Ibid., p. 430.

²⁸ Ibid., p. 511.

²⁹ Ibid., p. 425.

³⁰ Ibid., p. 426.

³¹ Ibid., p. 428.

³² Ibid., p. 431.

³³ Ibid., vol. 2, p. 153. Village Sarsadi dunes got submerged in flood waters.

Pargana Nawad was a big centre near Sambhar lake and it use to get *rel* of river Saabi, which flows in the village. This *rel* flooded half the village surroundings and it fulfils the irrigation requirements of the *rabi* crop in advance. Therefore, *rabi sewaj ghani huwai* (a lot of agricultural production of *rabi* was facilitated through the naturally accumulated river water).³⁴ In vs 1709/1652 AD, in an increment *pargana* Malrana (of sarkar Ranthambor, suba Ajmer) was allotted to Jaswant Singh of Jodhpur kingdom. Nainsi defines this *pargana* as '*nipat badi thod gav lagai. Khulasa pargana ri dharti kawali, baajri, jowar, mung, moth, til, kapaas, waad ghano huwai. Unhali ghane meh saarai pargane jau, china, gehu huwai. Kuwa pargana mahi ghana ko nahi. Nadi ek nigoh aarwai chai. Tein gav 20 ththa 25 rel chai* (this looks like a big famous village. Lands are large and open with soft soil that are suitable for production of pearl millet, sorghum, green lentil, moth, sesame, cotton, and mustard, in ample quantity. Subject to rain a lot of *rabi* (*unhali*) crops; barley, chickpeas, wheat are produced in *pargana*. There are not many wells in *pargana*. One unguided river comes in and 20 to 25 villages are under its flood waters)'.³⁵ After two years in vs 1711/1654 AD emperor Shah Jahan removed Badhnor near Chainpur from land assignment of Rana Raj Singh and gave it to Rathor Jaswant Singh. This landmass produced two crops annually, had lot of shrubs on the hill and had good production of rice and wheat.³⁶ In village Lambo, '*nadi ri saat su unhali huwai (rabi crop is produced in the lands which gets wet due to river water)*'.³⁷ All these instances and reports help us to understand that a large variety of the crops that were produced in the dry belt were mainly through intelligent use of water. The inhabitants used the water as it was made available by the nature and whatever quantity received in the natural flow as per the inundations and contours of the soil and landmass was disturbed judiciously.

Jaisalmer was also a region of scarce rain. In order to measure

³⁴ Ibid., vol. 1, p. 126.

³⁵ Ibid., p. 127.

³⁶ Ibid., p. 128.

³⁷ Ibid., p. 245.

the rainfall in the region of Jaisalmer, the Resident placed rain gauge and a record of its readings was maintained which was sent to the main office. The total rain received in six years was 37 inches and 15 centimeters.³⁸ During good rainy seasons, the region received 10 or 12 inches of rain and that proves sufficient for yielding good crops. Better quantity of *bajra*, *mung*, and *gurwar* were produced than earlier times. But still *bajra* was imported from Malani and Sindh, whereas *mung* was brought from Nale. Production of *jowar* and rice was less.³⁹

After the irregular and unpredictable rains, the *talabs* were the most reliable and authentic source of water. The rain water was harvested by the people of desert in-order to meet the requirements until next rains. Thus, *talabs* were mainly for conserving water. Nearly all the villages made tanks in order to be self-sufficient in terms of water. As rains are exceptions. The patterns of *talabs* don't show any uniform patronages and designs. The state definitely financed and facilitated the constructions of *talabs*. However, there are ample evidences to prove that the inhabitants were more active in excavating and building the tanks own their own rather than awaiting the support from state. The fort of Jodhpur was built by Rao Jodha in 1458 AD. It is located on a hill-top called *Chidiya Tunk ra Bhakar*.⁴⁰ Rani Talab (queen's reservoir) and Gulab Sagar (rose-water sea) were located inside the fort walls along with many other wells and reservoir.⁴¹ In village Sawarij, there were four *talabs* and all were made by the Paliwal Brahmans, who were demographically a dominant group in the village with 150 houses.⁴² Village Jambhlaavo had one *talab* which was patronized by Jambhelav Bisnoi.⁴³ The small size *talabs* were called *talai*. Both, limited finances and scanty rainfall were reasons for constructing more *talais* instead of *talabs*. Village

³⁸ *Tawarikh Jaisalmer*, p. 211.

³⁹ *Ibid*, p. 212

⁴⁰ *MRPRV*, vol. 1, p. 38 & *Tod*, vol. 2, p. 820

⁴¹ *Tod*, vol. 2, p. 821.

⁴² *MRPRV*, vol. 2, p. 15.

⁴³ *Ibid.*, p. 23.

Hopali had one *talai* patronized by Brahman Hopal.⁴⁴ Digging of one *talai* in village Baniya at pargana Pokhran was financed by Brahman Rupa.⁴⁵ Some people financed the digging of wells. Kohar Bhvaasar in village Bhivaasar was patronized by Bhiva.⁴⁶ Digging of the single well (of salty water) in Bawadi Baas was facilitated by *Khati* Dharma.⁴⁷ Thus, all these instances signify that the inhabitants were more conscious for harvesting water at any cost, rather than depending on, and waiting for, the help of state. The people with resources financed the construction of *talabs* as *puniya kirat* (*kariya*) as water conservation is a pious act in arid and dry areas. At times the aspiration of attaining immortality pushed many to invest in this pious act. Their purpose is attained because even today the history is treating them kindly!

In most of the desert and semi-desert areas the water is brackish. In order to meet the requirements of drinking water the inhabitants completely depended upon the *talab* (tank) and when the water in *talab* was exhausted, the villagers depended on the *kohar* (well). There are rare instances of *talab* being able to supply water for a year. Village Virampur was located in the hills and had one *talab* that had the capacity to supply water throughout the year.⁴⁸ The *talabs* that could supply water for one entire year were called *barsodiyo*.⁴⁹ Water in *talab* Raghelav sufficed for a year.⁵⁰ Both the *talabs* of village Mado were *barsodiya*.⁵¹ The *talabs* of village Dhnao⁵², Chulelai⁵³ and *talab* Chohtelav⁵⁴ were *barsondiyo*. Water of *talab* Sujasar was sufficient for a year.⁵⁵ Few

⁴⁴ Ibid., p. 16.

⁴⁵ Ibid., p. 328.

⁴⁶ Ibid., p. 17.

⁴⁷ Ibid., p. 29.

⁴⁸ Ibid., vol. 1, p. 353.

⁴⁹ Ibid., p. 426.

⁵⁰ Ibid., p. 428.

⁵¹ Ibid., p. 430.

⁵² Ibid., p. 433.

⁵³ Ibid., p. 450.

⁵⁴ Ibid., p. 438.

⁵⁵ Ibid., p. 513.

villages had the *talabs* which could maintain the supply of water for nearly 8 to 10 months. The *talabs* of village Gopavasani⁵⁶ and Palasano Bado⁵⁷ had water which was sufficient for ten months. The water harvested in *talab* Ramelav was sufficient for 10 months.⁵⁸ Water in the *talab* of village Vapri was sufficient for eight months.⁵⁹ *Talab* Awadesi water sufficed for nine months.⁶⁰ Water in *talab* Chundasar and *talab* Tibarkaya was used for seven and 10 months respectively.⁶¹ *Talab* Abdelav was patronized by wife of Shiv Rao Jodhawat and its water suffices for seven months.⁶² As many as 140 ploughs were depending on Baghelav *talab*.⁶³ Water of *talab* Gadhelav was sufficient for eight months.⁶⁴ *Talab* Chihananee and *nadi* Kacholadi (water for four months) were sources of water for village Surayeto.⁶⁵ Village Bagadi had six *talabs* and Rs. 1000 was earned of *talabant*.⁶⁶ At Seh waj the water in *talab* was sufficient for six months.⁶⁷ The *talab* water in both the villages Sisarwado and Bhetnado was sufficient for eight months whereas *talab* of Chandawal supplied for 10 months.⁶⁸ *Talabs* Jhalravo and Dhvlelav had water which was sufficient for nine and 10 months respectively.⁶⁹ *Talab* Dudhelav's water could meet the requirements for seven months.⁷⁰ *Talab* Lololav⁷¹ and

⁵⁶ Ibid., p. 422.

⁵⁷ Ibid., p. 448.

⁵⁸ Ibid., p. 427.

⁵⁹ Ibid., p. 432.

⁶⁰ Ibid., p. 432.

⁶¹ Ibid., p. 433.

⁶² Ibid., p. 458.

⁶³ Ibid., p. 428.

⁶⁴ Ibid., p. 448.

⁶⁵ Ibid., p. 428.

⁶⁶ Ibid., p. 430.

⁶⁷ Ibid., p. 431.

⁶⁸ Ibid., pp. 436-7.

⁶⁹ Ibid., p. 449.

⁷⁰ Ibid., p. 450.

⁷¹ Ibid., p. 452.

talab Apanadi⁷² could supply water for eight and nine months, respectively. Village Sanpo had *talab* Sapelaav and its water was sufficient for six months. Its *kund* (Sehas Ling) had *antut pani* (unbroken discharge of water) and it was surrounded by snake brows.⁷³ Perhaps, both—*talab* and village—were named after the snakes (*saanp*). The only exception was *talab* Kisnelv as its water collection was sufficient for two years.⁷⁴

Some villages didn't have the wells so after exhausting their reservoirs (*talabs*) they were depending on the neighbouring villages for drinking water. For instance, village Jalali Khurd had '*kohar ek kharo, Kakalav piwai* (one well which is salty, so they depend on village Kakalav for drinking water)'.⁷⁵ Similar was the case with village Binayakiyo, '*kohar ek kharo, Basni piwai*'.⁷⁶ Aasaychan ri Waasne and Jogiya Waasne were drinking at village Malingo and Lunwaas respectively.⁷⁷ Village Sunthalo was '*Kaynlanai ri khaavai ro piwai* (drinking at the *khaavai* of Kaynlanai)'.⁷⁸ The villages of Bhadawasiyo and Dighadi Khurd were '*pani bahuji rai talab piwai* (drinking water at Bahuji's talab)⁷⁹ and village Trisgadi was drinking at Bijailav.⁸⁰ Village Baniyawaas had no well so they were drinking at Khejadali.⁸¹ Village Kukadnado was depending on Dantewado for drinking water.⁸² Village Surya Basani was near Kumbhlav *talab*.⁸³ *Talab* Gopilav and *talab* Manu were sources of water for villages of Jesabaas and Mehabadu.⁸⁴ Village Trismariyo was on the top of high dunes (*kheda uncho thal maathai*) so there

⁷² Ibid., p. 456.

⁷³ Ibid., p. 460.

⁷⁴ Ibid., p. 483.

⁷⁵ Ibid., p. 205.

⁷⁶ Ibid.

⁷⁷ Ibid., p. 234.

⁷⁸ Ibid., p. 210.

⁷⁹ Ibid., pp. 205 & 206.

⁸⁰ Ibid., p. 211.

⁸¹ Ibid., p. 220.

⁸² Ibid., p. 217.

⁸³ Ibid., p. 419.

⁸⁴ Ibid., p. 421.

was no water. Therefore, they were drinking the water that was collected in dunes (*thal pivta*).⁸⁵ ‘*Dhora chai, talab barsondiyo paani*’ (a talab was located in dunes which had capacity to meet water requirement for a year).⁸⁶ The *pargana* of Pokhran had 10 *talabs*, 26 *bawadis*.⁸⁷ Many such instances appear in the *MRPRV* which are sufficient to propose that the necessity of water was keeping the communities, groups, and villages together. The various efforts of the water collection at village level were necessary to reduce the dependence on the other villages. However, some villages didn’t had any *talabs* and other sources of water were also not available, thus, they were completely dependent on the neighbouring villages. The residents of village Rlawase were drinking at the *talab* of village Kadwade.⁸⁸

Besides, the *talabs*, the other popular means to harness water were *arhat, chanch* and *kosita*. *Arhats*⁸⁹ (Persian wheel) were generally placed on the *kosita*.⁹⁰ The *chanch*⁹¹ was basically a mechanism to pick water from low lying area with help of a long stick which was fixed on a wooden stand to lift the water while working on principle of see-saw. A bucket was tied at one end of the stick and at other end some weight is fixed which helps to pull up the bucket.⁹² *Chanch* was also fixed on *kosita* or *dhibra*.

⁸⁵ Ibid., p. 422.

⁸⁶ Ibid., p. 514.

⁸⁷ Ibid., vol. 2, pp. 311-5. The *talabs* were Dungan-sar, Nara-sar, Maherlaai, Rukhi ri talai, Sudahadhi, Sangharlaai, Mokha-sar, Ramde-sar, Dharni-sar, Linga-sar. The *bawadis* were Kumbharwaai, Mohanwaai, Nibali, Sarangwaai, Mehawaai, Viswaai, Madagan, Bhakarwaai, Hirawaai, Kohariyo, Khadiwaai, Vachesar, Balibawadi, Thadiwav, Satavay, Dehauvag vay, Khakhi ri bav, Mokhasar and Bhalwaai. Some *bawadis* were not given any specific name, these were referred as *bawadi* only.

⁸⁸ Ibid., vol. 1, p. 242.

⁸⁹ Ibid., pp. 213, 214, 215, 216, 237 & 242.

⁹⁰ Ibid., pp. 213, 214, 216, 217 (12 *kosita* at village Thabukado) & 237.

⁹¹ Ibid., pp. 209, 213, 214, 216, 217 (70 *chanch* at village Thabukado) & 237.

⁹² See plate-9.

Dantewado had 20 *arhats* and this village also had good number of *chanch* and *kosita*, which produces *sewaj* (*rabi* crops depending on rain water).⁹³ Some villages had good number of *arbat*, *kosita* and *chanch*, which indicates to the good availability of ground water. In *pargana* Jodhpur, villages of Dantewado⁹⁴, Bedhan⁹⁵ Saatsain⁹⁶, Lohari⁹⁷, Badlo⁹⁸, Malawas⁹⁹, Madsiy¹⁰⁰, Thabukado¹⁰¹, Artiyo-bado, Vinaawas-bado, Kuwadi¹⁰², Wankuli¹⁰³, Jhuladi¹⁰⁴, Balundo, Ghodaradi, Ravir¹⁰⁵, Aolvi, Kherwo khass¹⁰⁶, Tighro¹⁰⁷, Sanjhi¹⁰⁸, Tafai Dunado¹⁰⁹ had a large number of the above mentioned irrigation facilities. Village Chavandwa had 16 *kositas*.¹¹⁰ Village Majal had 20 *arhats* and 30 *kositas*. The village Khiratiyo had 110 *kositas* which is an exceptional number and 40 *chanchs*.¹¹¹ Village Lakhan Chund had hundred *kositas*.¹¹² In year 1654, Kasba

⁹³ *MRPRV*, vol. 1, p. 218.

⁹⁴ *Ibid.*, p. 218.

⁹⁵ *Ibid.*, p. 219.

⁹⁶ *MRPRV*, vol. 1. p. 244.

⁹⁷ *Ibid.*, p. 246. 10-*arbat* and 25-*kosita*.

⁹⁸ *Ibid.*, p. 247. 30 to 40 *kosita*.

⁹⁹ *Ibid.*, 20-*kosita* and 12-*arbat*.

¹⁰⁰ *Ibid.*, p. 248. 12-*kosita* and 15-*arbat*.

¹⁰¹ *Ibid.*, p. 217.

¹⁰² *Ibid.*, p. 250. 13-*kosita* and 20-*chanch*. 10-*kosita* and 30-*chanch* in Vinaawas bado. Kuwadi had 10-*kosita* and 20-*chanch*.

¹⁰³ *Ibid.*, p. 251. 10-*arbat* and 20-*chanch*.

¹⁰⁴ *Ibid.*, p. 252. 10-*arbat* and 15-*kosita*.

¹⁰⁵ *Ibid.*, p. 259. Balundo had 15-*arbat* and 20-*kosita*. 10-*arbat*, 40-*kosita* were counted in Ghodaradi. The number of *dhimda*, *chanch* were counted 10 and 15 in Ravir.

¹⁰⁶ *Ibid.*, p. 260. Aolvi had 15 *arbat* and 20 *chanch*. There were 18 *arhats*, 10 *kositas* and 40 *chanchs* in Kherwo khass.

¹⁰⁷ *Ibid.*, p. 269. 20-*kosita* and 40-*chanch*

¹⁰⁸ *Ibid.*, p. 271. Village Sanjhi had 2-*arhats*, 20-*kosita* and 20-*chanch*.

¹⁰⁹ *Ibid.*, p. 287. Village Tafai Dunado had 50-*kosita*, 10-*arbat* and 40-*chanch*.

¹¹⁰ *Ibid.*, p. 237.

¹¹¹ *Ibid.*, p. 288.

¹¹² *Ibid.*, p. 293.

Jaitairna had 100 *arbats* and 150 *chanchs* on various *kositas*.¹¹³ The *gasba* Jaitairna had rich availability of underground water as evident from notes of Nainsi. He notes that, as many desired *chanchs* (on *kosita*) can be made in *gasba* Jaitairna'.¹¹⁴

In most of the regions of Thar, the water was/is salty or brackish. Therefore, it was not fit for drinking. The quality of water has been constantly recorded in *MRPRV* which highlights the attitude of inhabitants towards the water. A close study of *MRPRV* indicates that the water was utilized as per its quality. The markers of water were *metho*¹¹⁵ (sweet), *bhalbhalo*¹¹⁶ (little salty), *kharo*¹¹⁷ (salty), *piwan laayak nahi*¹¹⁸ (not potable), and *paani moto* (water heavy to digest). Water was identified on these parameters in-order to fix its utilization. Underground water was rarely used for irrigation. It was religiously meant for drinking purposes of both human and animal. The water procured from wells has also been identified by Nainsi as per its qualities. It can be classified into three categories, namely, *metho* (sweet), *kharo* (salty) and *bhalbhalo* (little salty or brackish). Villages Finch, Surpura, Kaswariya, Jalaili and Khdi had one well each and all these wells had salty water.¹¹⁹ The wells of village Dahipado and Mahlwo were salty.¹²⁰ Village Jawnadesar had '*kohar ek kharo*' (one well that too with salty water).¹²¹ The single well of village Kharo Luhnaho had *meetho* (potable sweet water).¹²² Single *kohar* in village Khardo had sweet water.¹²³ In village Rohecho (of Patels), there was one well that was harnessed on both sides (*dunado*). Villagers took drinking water

¹¹³ Ibid., p. 509.

¹¹⁴ Ibid., p. 510.

¹¹⁵ Ibid., p. 226 (Chainpuro).

¹¹⁶ Ibid., p. 233.

¹¹⁷ Ibid., pp. 221 & 223.

¹¹⁸ Ibid.

¹¹⁹ Ibid., pp. 223, 230 & 233.

¹²⁰ Ibid., p. 229.

¹²¹ Ibid., p. 293.

¹²² Ibid., p. 225.

¹²³ Ibid., p. 233.

from Jaita *kohar* as its water was very sweet.¹²⁴ All the three wells of Setrawo Baas had sweet water.¹²⁵ The well of village Katardo was *bhal-bhalo*.¹²⁶ The quality of water in the well of village Karani was *bhal-bhalo*.¹²⁷ The water was *bhal-bhalo* in the wells of village Pilwo¹²⁸ and Bhungro Bado as well.¹²⁹ The water in all three wells of village Khadawaas was called '*panni moto*'.¹³⁰ The salty water of village Vikrampur (Jaisalmer) was equated to poison. The *pargana* Nokha had scarcity of water. The two wells they had were not sufficient to meet the water requirements of village, so the *talabs* were excavated to collect and store the rain water.¹³¹ Same instructions and advices were also extended to other villages, so that good crops can be yielded with the intelligent use of available water, as per its qualities.¹³² As most of the villages had *talabs* and these were sufficient to provide the drinking water (for four to ten months) to the villagers. Therefore, the wells were explored only after the utilization of rain water that was collected in *talabs*. In Hunavaas Khurd, '*talab jakhan nadi maas char paani* (the water of talab jakhan was sufficient for four months)'.¹³³ The scarcity of water and the desire to use this limited source effectively, has motivated these specific kinds of notes that are available to us in the form of records.

In context of wells it is evident that along with the quality of water, nature of water flow, construction type (*kachha/pakka*) and even the contemporary status (functional/non-functional) of the well was recorded. The inhabitants of Dhandhaniyo baas were drinking water from village Rajwai because '*kohar buriyo chai*

¹²⁴ Ibid., p. 288.

¹²⁵ Ibid., p. 312.

¹²⁶ Ibid., p. 233.

¹²⁷ Ibid., p. 303.

¹²⁸ Ibid., p. 314.

¹²⁹ Ibid., p. 316.

¹³⁰ Ibid., p. 240.

¹³¹ Lakhmi Chand & Mehta Nathmal, *Tawarikh Jaisalmer*, Chirag, Rajputana Gazette Office, Ajmer, 1948, p. 200.

¹³² Ibid.

¹³³ *MRPRV*, vol. 1, p. 243.

(well filled with sand)'.¹³⁴ Village Chandrohi was depending on Dehariyo as the village well was filled with sand (*buriyo chai*).¹³⁵ Out of five wells in village Mithado of *pargana* Siwan four wells were covered by sand (*buriya padiya chai*).¹³⁶ Many such instances constantly appear in our records.¹³⁷ As there was no mechanism to control the flowing sand and its uncontrolled flow gradually filled the wells. A general absence of defence on the wells, against sand was the cause for *buriyo chai*.

There were '*kohars aath paani gabno* (eight well with lot of water)' in village Osian.¹³⁸ Out of 33 villages of *tafai* Khiwsar, nearly a dozen villages were drinking from the main Khiwsar (Khiwsar Khaas).¹³⁹ It is interesting to note, in Badawaas of village Bhalu ra waas, there was one well that discharged water only in night (*raat baho*).¹⁴⁰ Village Lonla ra baas had single well and it had *meetho betano* (unbroken supply/flow of sweet water).¹⁴¹ Village Dechu Khaas had 10 wells, out of them only five were functional (*panch babe*).¹⁴² One more category of *saagri kohar* is mentioned by Nainsi to mark the ancient wells.¹⁴³ This categorization was based on the legend that these wells were made by Raja Sagar and his sons. Mostly, sweet water oozed out of these wells. *Naal* was a well with small circumference, which made the well appear like a tube or a narrow pipe. *Naal* wells were not many. In village Pdiyaal, there were 100 *naal* well and all were filled with sand (*buri padi*

¹³⁴ Ibid., p. 296.

¹³⁵ Ibid., p. 300.

¹³⁶ *MRPRV*, vol. 2, p. 253. The one functional well is *sagari*.

¹³⁷ *MRPRV*, vol. 1, p. 338

¹³⁸ Ibid., p. 319.

¹³⁹ Ibid., pp. 336-40.

¹⁴⁰ Ibid., p. 306.

¹⁴¹ Ibid., p. 313.

¹⁴² Ibid., p. 318.

¹⁴³ Ibid., p. 312 (In village Buthikiyo and Nathdau the wells are categorized as *saagri*), pp. 315 & 316 (Sekhalo bado baas). Vol. 2: p. 13 (village Bhed had a *saagri* well with excessively sweet water that oozed at 40 purs), p. 14 (one *saagri* well with sweet water that is available on 60 purs).

chai).¹⁴⁴ These vivid descriptions of aforementioned information became possible, due to the coherent and intelligent efforts, put-in by Nainsi while composing the *MRPRV*. All the above mentioned details about the parganas of Jodhpur, Sojat, Jaitaaran, Medta, Phalodi, Siwan and Pokhran were compiled in this *vigat*. The first mention about the level (depth) at which the underground water was available comes in context of the well of village Akhiya ro Baas, in which sweet water was available at 20 *purs*.¹⁴⁵ One small well was located inside a *talab* in which sweet water was available on 14 *purs*.¹⁴⁶ All these specifications indicate that the limited quantity of water was made available by nature and lot of efforts were collaborated to harvest it in order to make the best use of the same. All these efforts were sufficient to keep the inhabitants in their respective settlements. Thus, it is evident that the set-on of migrations was consecutive to sever droughts, in order to manage the resources at hand during intense climatic conditions.

Even in dry regions, the rains were not always causing happiness. At times a little excess of rain (in comparison of the parameters of regular pour) caused a lot of distress. The excess rain in and around *pargana* Fagau in year 1684 caused loss of land (the sand drained away) therefore, the Patels were instructed to make arrangements for digging up 150 new wells and to get three-fold cultivation.¹⁴⁷ The quality (soft and porous) of soil was the reason for loss of land. In this year, all the *parganas* of Amber kingdom received constant heavy rains that led to the decomposition of crops.¹⁴⁸

Besides the *talabs* and wells, the other sources for harnessing

¹⁴⁴ Ibid., vol. 2, p. 26.

¹⁴⁵ Ibid., vol. 1, p. 314. One *purs* equals to three hands.

¹⁴⁶ Ibid., p. 511.

¹⁴⁷ *Arzdasht* written by Bhawani Shankar Bablu. Dated *Sarwan sudi* 3 VS 1741/1684 AD.

¹⁴⁸ *Arzdasht* written by Rai Chand and Rup Chand. Dated *Bhadwa budi* 3 VS 1741/1684 AD.

the underground water and rain pour were *talab beri*¹⁴⁹, *bera*¹⁵⁰, *barwadi*¹⁵¹, *dhibra/dhibda*¹⁵², *dhibadi*¹⁵³, *dhimda*¹⁵⁴, *dhimadi*¹⁵⁵, *nadi*¹⁵⁶, *talai*¹⁵⁷, *wabalo*¹⁵⁸, *bahalo*¹⁵⁹ and *dbandh*.¹⁶⁰ Village Nibaaz had sixty *arhats* and 100 to 105 *dhibda*.¹⁶¹ The water in *nadi* of village Atbado was sufficient for four months.¹⁶² The collection of water in dunes was also a popular means to harvest flood waters and it was used for drinking and irrigation purposes. Village Vighae-kuwo was depending on the *barwadi* of Osain for drinking water.¹⁶³ The remains at Nadol indicate that once the Jain faith was predominant and its art was widely scattered in the region. The reservoir of Nadol was called *chana ki baoli*, as its cost of construction was paid by a single grain of gram (chana).¹⁶⁴ The *barwadi* in the fort of Sojat city was at back of Sanghi Harchand's

¹⁴⁹ MRPRV, vol. 1, pp. 216, 231 (villagers drink at *beri* of talab), p. 238 (Baas chotho and Panchmo bass, both were depending on the *bera* of talabs for drinking purposes), pp. 264 (Village of Gurlai was depending on *beri* of talab for drinking water), pp. 277, 280 (villagers of Vinan were drinking from talab *beri*), p. 290 (Village Dhabhli was drinking at *beri* of talab), pp. 293, 295 (village Rabadiyo), p. 296 (village Rabadi), p. 300 (village Bakki Baho), p. 457 (Mahive had *bera* in talab).

¹⁵⁰ Ibid., p. 231 (The *beras* of Badowaas were salty), p. 285 (Nehravo bado).

¹⁵¹ Ibid., pp. 231 & 234.

¹⁵² Ibid., pp. 269 & 270.

¹⁵³ Ibid., p. 227 (Chankhwaas had 15 *dhibadis* of sweet water).

¹⁵⁴ Ibid., pp. 212, 221, 237, 240, 242, 264.

¹⁵⁵ Ibid., p. 213.

¹⁵⁶ Ibid., p. 420 (*nadi* khejadnadi), pp. 426, 440 (*nadi* of village Dhadhiyo Dhanehadi had water for four months).

¹⁵⁷ Ibid., p. 435 (water of *talai* Sadelaai was sufficient for six months).

¹⁵⁸ Ibid., pp. 461, 466 (village Rasad, Khodiyo and Gajanai badi), p. 467 (Degodh), p. 469 (Paladi, Borimado and Gigawadi)

¹⁵⁹ MRPRV, vol. 2, p. 12. *Bahalo* stands for *nala*.

¹⁶⁰ Ibid., p. 241.

¹⁶¹ Ibid., vol. 1, p. 510.

¹⁶² Ibid., p. 426.

¹⁶³ Ibid., p. 334.

¹⁶⁴ Tod, vol. 2, p. 809.

house, which was not in use as it was filled with sand.¹⁶⁵ Some villages received water from perennial rivers which was only sufficient for drinking.¹⁶⁶ In some areas, the *beri* of river was the source of drinking water. The village of Kudali¹⁶⁷, Vanbhorm, Jasti¹⁶⁸ and Dumaro¹⁶⁹ were drinking at *beri* of river. Similarly, village Ghano was depending on *beri* of river Kharchiya.¹⁷⁰ The close proximity to the rivers made the villages directly dependent upon the rivers. The river Luni was at a distance of one *kos* from Village Chardiyo, therefore, the inhabitants were taking drinking water from river Luni.¹⁷¹ In the village Lelawaasni, there was only one well that too salty, therefore, the inhabitants were depending on the river for drinking water.¹⁷² The river of Sojat was flowing near village Ghatiyali Suranita mahe.¹⁷³ Village Sindhari is on river Luni so '*nadi luni upar arbat kare, jitra burwai* (as many desired *arbats* can be made on river luni)'.¹⁷⁴ Village Temawaas was located near river Luni and had twenty *kositas*.¹⁷⁵ Abjhar had ten *kosita* near river.¹⁷⁶ The water quality of *arbats* and *kositas* was also a matter of concern. All the 10 *arbats* in the village of Badowaas were salty.¹⁷⁷ The four *kositas* of village Lunavas of karnotas' had salty water, therefore, were used occasionally.¹⁷⁸ *Beras* were small digs that were equivalent to well. For purpose of drinking, the water from *beras* was used even during the *kaal* (a draught count

¹⁶⁵ *MRPRV*, vol. 1, p. 361.

¹⁶⁶ *Ibid.*, p. 361 (Village Lohardi), p. 362 (Village Samisari), p. 363 (Village Kamthai, Dotadiyo and Nakodo), p. 367 (Village Gudali).

¹⁶⁷ *Ibid.*, p. 279.

¹⁶⁸ *Ibid.*, p. 294.

¹⁶⁹ *Ibid.*, p. 282.

¹⁷⁰ *Ibid.*, p. 279.

¹⁷¹ *Ibid.*, p. 291.

¹⁷² *Ibid.*, p. 293.

¹⁷³ *Ibid.*, p. 419.

¹⁷⁴ *Ibid.*, p. 357.

¹⁷⁵ *Ibid.*, p. 360.

¹⁷⁶ *Ibid.*, p. 362.

¹⁷⁷ *Ibid.*, p. 229.

¹⁷⁸ *Ibid.*, p. 226.

due to absence of rain) and *dukaal* (when both water and grains are not available).¹⁷⁹ The *sukaal* ensured good revenues. In *sukaal*, Pokhran produced revenue upto rupees fifteen thousand.¹⁸⁰

The crop patterns have been termed as *do-sakhiyo* (two terms of crop in a year)¹⁸¹ and *ek-sakhiyo* (one term in a year).¹⁸² It mainly depended upon the availability of rain water. The areas that didn't harvest the rain water were generally *ek-sakhiyo*. Only the *kharif* crops (*bajra* and *jowar*) were possible in those fields as they required little shower to come up.

At times, the suffix of *thali* was attached to the name of villages that were located in the intense desert, such as Vusiyathali.¹⁸³ Due identification was given to the villages that were located in the dense deserts. Many times, due to migration, the villages were abandoned. Even those villages have been given their due in the *vigat*. Village of Sukmatiyo has been defined as '*suno, thal mai kathai chai tin re khabar nahi* (abandoned (village), its where about (location) in desert are not known)',¹⁸⁴

Soil is also a representative of the environmental conditions. The quality of soil has also been constantly mentioned in the *MRPRV*. Village Jairlav has been defined as '*thal ro gav khet kawla*' (village in desert with beautiful (good) fields).¹⁸⁵ Various instances from *vigat* clearly indicate that the Thar Desert was not devoid of human activities and agriculture. Midst of the desert there were many active villages and productive fields. The presence of big fields in the desert is also confirmed.¹⁸⁶ Village Candsaro was 10 *kos* away from the border of Barmer and had good fertile fields

¹⁷⁹ Ibid., vol. 2, p. 238.

¹⁸⁰ Ibid., p. 308.

¹⁸¹ Ibid., vol. 1, pp. 208, 210, 212, 214, 216.

¹⁸² Ibid., vol. 1, pp. 208, 210, 211, 212, 214. Vol. 2, p. 242 (village Kalano, Surpuro and Chahali). All the three villages were *ek-sakhiyo* which produced *bajra*, *moong*, *moth*, *til* and cotton which are *kharif* crops. So absence of *unhali* (*rabi* or winter crop).

¹⁸³ Ibid., vol.1, p. 281.

¹⁸⁴ Ibid., p. 318.

¹⁸⁵ Ibid., p. 354.

¹⁸⁶ Ibid., p. 355 [*thal ra bada khet* (big desert fields)].

in midst of desert.¹⁸⁷ The fields of village Kolar were in desert.¹⁸⁸ The fields of village Jhund were mainly composed of sand.¹⁸⁹ The fertile fields of village Joro kuwo were in midst of desert.¹⁹⁰ The fields of village Anabhadi, near river Luni were sandy.¹⁹¹ Village Sintaro had large territory with 10 *beras* of sweet water (reachable on four hands) in the midst of desert.¹⁹² Talwado and Khed were big villages on the river Luni. In territories of both the villages *sejo* (underground water) was in abundance.¹⁹³ The soil of six villages (Chabo, Deraniyo, Luni, Sewaliyo, Dasaliyo and Lolta ro baas) of *tafai* Setrawo was salty due to the presence of alkaline components, therefore, it was unfit for cultivation. So the fields were lying unploughed and had no crops.¹⁹⁴

The fields of Marwar were classified as follows:

1. *thal ra khet* were the fields located in the desert.¹⁹⁵
2. *thali ra sakhra* means fertile fields in desert. Village Ninaav had fertile fields in the desert.¹⁹⁶
3. *thali ra bada khet* stands for big fields of the desert.¹⁹⁷
4. *khet kawla thal ra* were fields of soft soil located in midst of the desert. Village Barnau had 100 *halaw* which were functioning in the soft fields of desert.¹⁹⁸
5. *badi nepai ra khet* were fields with large measures and good amount of production. Jaalwadi had the soft fields in desert and the quality of soil helped to produce large amount of produce.¹⁹⁹

¹⁸⁷ Ibid., p. 356.

¹⁸⁸ Ibid., p. 360.

¹⁸⁹ Ibid., p. 358.

¹⁹⁰ Ibid., p. 356.

¹⁹¹ Ibid., p. 357.

¹⁹² Ibid., p. 356.

¹⁹³ Ibid., p. 359.

¹⁹⁴ Ibid., p. 315.

¹⁹⁵ Ibid., p. 360.

¹⁹⁶ Ibid., vol. 2, p. 13.

¹⁹⁷ Ibid., p. 16.

¹⁹⁸ Ibid., p. 15.

¹⁹⁹ Ibid., p. 14.

6. *khet dhora band* were the fields that were enclosed with the dunes. *Dhora band* means that the dunes formed the boundary of fields. Most of the fields in the dunes have been categorized as *bada khet* (big fields).²⁰⁰
7. *khet patla* were the fields with lesser fertility. The fields of Rampura²⁰¹, Melaawaas²⁰² and Rajlawo bado²⁰³ were *patla*. In the *patla* fields of village Godhelav, *bajri* and *moth* was produced.²⁰⁴ Fields of village Hamirwas were also *patla*.²⁰⁵
8. *kawla khet* represented the soft fields. Fields of village Muhaliyo were classified as '*barsali kawla khet, bajri, ban huwai. Unbali piwal sewaj ghani* (soft fields in which yield of *bajri* and cotton was attained through rain. The *rabi* crop was produced through irrigation)'.²⁰⁶
9. *khet sakhra* stood for fields with good fertility. The fields of village Mehrawaas and Mehlaap (produces *sewaj* of gehu and chana) were *sakhra*.²⁰⁷
10. *khet kawla sakhra* represents the fields with soft soil of good fertility. Fields of village Dehiyo Kohar were marked as soft and fertile.²⁰⁸ At times it was also noted as *khet sakhra kawla*. The fields of Sangawaas had 120 *halavs* because the soil was soft and fertile.²⁰⁹
11. *khet katha matiyaala* means the fields with hard soil (generally due to presence of hard clay in the crust, which doesn't allow the water to seep in). The name of village Kumpa khedo was changed to Galniyo (the one which

²⁰⁰ Ibid., vol. 1, p. 360 & p. 363.

²⁰¹ Ibid., p. 420.

²⁰² Ibid., p. 438.

²⁰³ Ibid., p. 443.

²⁰⁴ Ibid., p. 448.

²⁰⁵ Ibid., p. 458.

²⁰⁶ Ibid., p. 426.

²⁰⁷ Ibid., p. 454.

²⁰⁸ Ibid., vol. 2, p. 13.

²⁰⁹ Ibid., vol. 1, p. 512.

- decomposes) because the crops of this village generally decomposed due to overstay of *rel* water.²¹⁰
12. *khet thali ra ruda* identified the good fields of sand. Village Khichwand had one *talab* and 20 *bera* of little salty water located in the river bed and the fertile fields of this village were located in the desert.²¹¹
 13. *barsali khet katha, dhora band* represented the fields that were embanked by the desert and produced good crops on receiving rains.²¹² Generally the *barsali* field had the *sewaj* (*rabi* crop). The crops of *sewaj* were wheat, gram and mustard.

The area of dense dry dunes was 'not desired area'. The region of Jalor, Sanchor, Pugal and Barmer were difficult areas and had no regular crop production. Therefore, while getting their land assignments, most of the assignees were putting in efforts to avert services in these regions. At times, they also pleaded to avert the appointments in these areas. The region of Jalor happens to have the most interesting instances of denial as a revenue assignment allotted in lieu of service. It was denied by Rathor Ratan Maheshdasot and later by Rathor Jaswant Singh on the grounds of '*bhuka marai* (recipient will die of hunger)' and '*uthai upajai kubi nahi* (nothing grows there)', respectively.²¹³

The Thar Desert was a dry and arid area with scanty production. Even today it is same. Therefore, for survival, the groups who lived in this desert were mainly performing agro-pastoralists activities. They were carrying out both the activities (agriculture and pastoralism) with full efforts. All the activities that were executed by the subjects were taxed. The taxes were levied as per the value of crop and on the number of animals that were grazing.²¹⁴ The taxes were generally fixed by the state but at times some irregular collections were also made. An event indicates that Mala Jajmal

²¹⁰ Ibid., p. 512.

²¹¹ Ibid., vol. 2, p. 21.

²¹² Ibid., p. 117.

²¹³ Ibid., vol. 1, p. 129.

²¹⁴ Ibid., editorial, p.10.

wanted to take away all the 200 carts of Depal Johiya's carvan in lieu of the *khad charai* (the grazing tax of a particular territory).²¹⁵ A careful study of the *vigat*²¹⁶ highlights that the state was trying to shift maximum (as much as possible) of its financial burden on to the populace. Another interesting instance to indicate at this attitude of state is the revolt of Jats in Marwar, against the rise in agricultural tax, which was later evaded by Aurangzeb.²¹⁷ It is evident that the *khichade ki rakam*²¹⁸ (expenses for military services) and *ghughhari kiwi*²¹⁹ (agreeing to give expenses) was also collected from the villages in order to reduce the burden of state. Many types of taxes were collected. The tax collection in the *pargana* Jodhpur was specifically limited to the agricultural produce and the products made available from nature. The taxes levied were *kadabghass* (tax on fodder obtained from plant of bajra), *paan-charai* (tax taken on grazing of leaves), *ghoda-kabal*, *khichado*, *ghass-maari*, *barsaali*, *unhali*, *gbeeai*, *balra*, *dumalo*, *arhat-maadli*.²²⁰ The detail of tax collection (from Sojat) highlights the plantation of mango, *beena*, lemon, vegetables, *guli* (sunflower), etc in the region.²²¹ The richness of information, compiled in the *vigat*, indicates that the author was a vigilant observer who intended to create a wholesome document pertaining to the various aspects of the Marwar region.

The sources of direct fiscal revenue for Marwar have been broadly classified as *khalisa* (crown-land), the salt lakes, transit and impost duties and miscellaneous taxes (*basil*).²²² The taxes levied on the travelling routes were contributing a significantly big share to the income of Thar states. Therefore, the toll taxes always find mention in a separate head. The collection of transit duties/dues from the advance gate of Anhilwara by Rao Lakha during the

²¹⁵ Ibid., p. 17.

²¹⁶ Ibid., vol. 1, editorial, p.10.

²¹⁷ Ibid., p. 12.

²¹⁸ Ibid., editorial, p. 10.

²¹⁹ Ibid., p. 11.

²²⁰ Ibid., pp. 156-70.

²²¹ Ibid., pp. 397-9.

²²² Tod, vol. 2, p. 1114.

10th century have been praised by the bards in lofty terms.²²³ The income collected from *rahdari* in *pargana* Pokhran was Rs. 5000.²²⁴ Depal Johiya and his 10 brothers were making a lot of money (as *Rahdari*) being on the western side of the village Waderan of Bikaner kingdom as this village had a high demography of Mahajans (money-lender). *Tein dina johiya rai daan ro baasal bado maarag ro baktiyaan (rahgir) ra parpakhai aarwai* (in those days the large share of income for the Johiyas came from the *rahgir's* (travelers) of big route).²²⁵ The Johiyas were agro-pastoralists community. This incident of their control over the trade routes is unique. This was prior to the rise of consolidated kingdom of Jodhpur under the Rathors. Thus, it indicates that the formation of state under a clan leadership led to the elimination of the smaller groups from the economic resources. By taking possession of the natural and man-made resources, the state was able to divert and distribute the resources to its own *chakars*, in order to maintain a working relationship and to create a pedestal for the ruling clan above the regular masses and to carve a space for the kins above the clan. The *dana mahe ek hiso* (a share in the income) or *bhai-bato* (share ensured in assets of family being a brother) were the expression to indicate the distribution amongst the brothers.

The treasury of Bikaner was enriched with the transit duties levied on the commercial carvans which frequently passed through the region.²²⁶ Similar kind of tax was levied by the Amber kingdom. Here, the local authorities constantly wrote to the king to open up the roads for traffic.²²⁷ A request for continuing the *rahdari* of *pargana* Chatsu was submitted to Mirza Raja Jai Singh.²²⁸ In year 1694, Amber had an *akaal*, so the traders were

²²³ Tod, vol. 2, p. 808.

²²⁴ *MRPRV*, vol. 2, p. 308. *Maarag bakti-vaan su* (from the ones who go through this territory).

²²⁵ *MRPRV*, vol. 1, p. 19.

²²⁶ Tod, vol. 2, pp. 1146 & 1155.

²²⁷ *A Descriptive List of the Khatoot Abalkaran (Rajasthani)*, Rajasthan State Archives, Bikaner, p. 118.

²²⁸ *Arzdasht*, dated *Kartik budi* 14 VS 1698/1641 AD.

called to the *darbar* and instructed to keep the prices of grains stable. The state exempted traders from *rahdari* in order to keep the grains available.²²⁹ Dandhal Durgdas was carrying salt on camel and selling it in Mewar, and on return journey brought edible grains. As he got the much-needed grains, the orders were given from the court to calculate his *rahdari* as per the rates paid by him earlier. Officials were instructed not to get in the brawl over the rate of *rahdari*.²³⁰ On Jalore route, one-fourth exemption in the rate of *raksi* (*rahdari*) was given to those traders, who exited through route of Jalore after making purchases from Pali.²³¹ This exemption was mainly to attract the traders, who were coming to Pali from Gujarat.

Besides the regular taxes on agricultural and pastoralist activities, some innovative mechanisms of taxation were also invoked in the desert, in the form of security fee and protection tax/charges. In the early medieval times, Pali was a rich area, where many '*laskbesuri kodidhaj dhanwant log rahe cha*' (*lakh-patis* and *karor-patis* possessing a lot of money lived there).²³² The times when Paliwal Brahmans were living in the village of Pali, every now and then, the Mers were resorting to thefts and raids in the village (*tien samai mer Pali ro bigad ghano kare chai*). The extent of their terror can be well defined in the words of villagers: '*aapna gaav chora aagae ra-andhi handi rah sake nahi* (even the protection of cooked food vessel, from the thieves is difficult in our village)'.²³³ During this time, three sons of Rajput Solankani (of the western desert) namely Aasthan, Sonag and Aj were passing through Pali. On reaching the borders of village-Pali, at sunset, en-route to Gujarat (for business purpose), they left their carts outside the village and released their camels and horses from carts, (*so in aan*

²²⁹ *Arzdasht* written by Kisordas, dated *Asoj sudi 2 & 12 VS 1751/1694 AD*.

²³⁰ *Sanad Parwana Bahi, Fagun sud 12 VS 1821/1764 AD*.

²³¹ *Sanad Parwana Bhai, Mah Sud 4 Shukar-waar VS 1821/1764 AD*.

²³² *MRPRV*, vol. 1, p. 9.

²³³ *Ibid.*, p. 10.

gav baare gada chodiya, utbai puhun dbaliyo chai).²³⁴ On this night, the Mers attacked the *gudha* (village Pali). Aasthan defended the village and killed 40 Mers. The villagers were astonished. Thus, they inquired about the background of Aasthan, and finding out that he is a Rajput, they agreed to keep him in the territory of Pali for the purpose of security (*meh raaj ro rojgaar karnae athai hi raakh-saan*). The services in security were considered as *raj ro rojgaar* (service of state). Hence, it is evident that for seeking protection against the nomadic and wandering groups, the villagers were depending upon the state.

Col. Tod notes that the Paliwal Brahmans were following mercantile pursuits. They sent a deputation to Siahji (AD 1156) requesting for protection from the two great enemies, namely, Minas and the lions.²³⁵ This version of Tod is a variant from the recording of Mahnto Nainsi. Primarily, he claims that Siahji laid the foundation of Rathor standards in the 'land of Kher', amidst the sand hills of the Luni after expelling the Gohils and later states that 'it was Asvatthama, the successor of Siahji, who conquered "the lands of Kher" from Gohils'.²³⁶ After some time, Aasthan earned a lot of praise and respect due to the efficient security system that was put in place by him at Pali. Subsequently many surrounding villages approached him for the security services and *sara gav ghughari kiwi* (all the villages agreed to pay him the expenses).²³⁷ The constant expansion of the security services helped Aasthan to gain 50 to 60 villages and secure a cavalry contingent of 400 fine-breed horses along with some land with irrigation facilities. His brothers Sonag and Aj were also absorbed for the security services at Idar and Sakhodhar respectively. Thus, the taxes and allowances collected by providing the security services became a major source for collection of wealth and gaining political influence.

Pali has been recorded as 'the great commercial mart of western Rajwara', holding the marks of rapine and an emporium

²³⁴ Ibid., p. 9.

²³⁵ Tod, vol. 2, p. 812.

²³⁶ Tod, vol. 2, pp. 942-3.

²³⁷ *MRPRV*, vol. 1, pp. 10-11.

of reputation since ancient times.²³⁸ Jaisalmer's position as a transit between valley of Indus and gangatic provinces and Punjab made it a great commercial mart.²³⁹ Many other taxes were levied but the transit duties formed the most prolific branch of fiscal income.²⁴⁰

Ample evidences are available that indicate to the recklessness of the nomadic groups. They looted the caravans to secure some resources. Kehar Rao laid the foundation of Tanot fortress (Jaisalmer). He became renowned in the deserts due to his exploits. On hearing that a caravan of five hundred horses was going from Arot to Multan, he persuaded them with a chosen band being in disguise as camel merchants. Then, across the Panchnad he attacked them and took possession of the entire consignment.²⁴¹ Ghazi Khan, a Pathan chief, came to Lodorva (Jaisalmer) with a caravan of superior breed horses. His studs were carried away.²⁴² The five hundred camels of Parihar prince Jaganath (Mandor) were carried away in *thal* of Jaisalmer.²⁴³ Shekho, the Bhatti Rao of Pugal was a great robber and he raided Multan during the 15th century.²⁴⁴ The Bhatti chief, Tilaksi (son of Jaisar), was famous for exploits and extended his raids up to Ajmer. From the lake of Anasagar, he carried off the horses of Firoz Shah Tughlaq, the Delhi Sultan.²⁴⁵ Plunder was called the chief pursuit in the Indian desert.²⁴⁶ These nomadic groups or their leaders were not only raiders, but at times they also provided the security services to the seekers. Rathor Viram Salkhawat was an untamed Rajput who looted the imperial routes.²⁴⁷ At Titra, while camouflaging

²³⁸ Tod, vol. 2, pp. 811-12.

²³⁹ Ibid., p. 1249.

²⁴⁰ See Appendix-4.

²⁴¹ Tod, vol. 2, pp. 1186-7.

²⁴² Ibid., p. 1201.

²⁴³ Ibid., p. 1201.

²⁴⁴ P.W. Powlett, *Gazetteer of the Bikaner State*, Book Treasure, Jodhpur, second edition 2017, p. 2.

²⁴⁵ Tod, vol. 2, p. 1215.

²⁴⁶ Tod, vol. 3, p. 1279.

²⁴⁷ *MRPRV*, vol. 1, p. 16. The description of Viram Salkhawat is '*Patshahi maarag mare cha. Viram sansaar ra maal loot khay cha. Maal nai*

in the hills, Viram hijacked a large consignment of horses which was destined for Agra from Gujrat.²⁴⁸ During an intense *dukaal* (shortage of fodder and water) Depal Johiya came with 200 carts of salt, in order to collect fodder for his animals (horses, oxen and cows). While he was around Siwan, the news reached him that Jagmal has decided to raid his convoy, as it will ensure a lot of wealth. On hearing this, Depal Johiya got anxious and inquired for the security arrangements. After inquiry he decided to approach Viram Salkhawat. Leaving his carts in *baas* (territory of influence) of Viram, Depal went ahead and narrated his worries to *prdban* Doliya, an in-service of Viram. Viram responded by appointing 10 men for security and watch-keeping and consoled Depal. He also gave exemption from *khad-charai* as charged by Jagmal. Looking at the intensity of the tension with Jagmal, Depal decide to leave and requested Viram to accompany his caravan up to the first entry point of Phalodi. Under-guard, he was escorted till the borders of Bikaner.²⁴⁹ Thus, this raider (Viram) was also acting as a protector to the trader. During mid-15th century, Rawal Chachakdeo was ruling from Marot. While en route to Jaisalmer for meeting his brother Lachhman, 'he was accosted by a Janjua Rajput, pasturing an immense flock of goats'. Janjua presented best of his flock and demanded protection from Rawal against the raids of Birjang Rathor.²⁵⁰ *Ghass-charai* and *paan-charai* were popular taxes and were good sources of income for the state. The contentions between the state and the thikanedars for securing a share in these taxes are significant indicators to realize their economic value.²⁵¹ Exemption of Rs. 40 was granted to the village Bhagu in *paan-*

Viram ghani aapnaut cha (loots the imperial route, Viram eats by looting others assets. Viram have great love for the goods)'.
²⁴⁸ Ibid., p. 18.
²⁴⁹ *MRPRV*, vol. 1, pp. 17-18.
²⁵⁰ Tod, vol. 2, pp. 1220-1.
²⁵¹ *Arzdasht* written by Lal Chand and Dalaram to Bishan Singh, dated *Posh budi* 9 VS 1755/1698 AD.

charai tax.²⁵² These exceptions were means to display generosity of the state.

The animal wealth was one of the most crucial asset for all the communities living in Thar Desert. This made the communities to rare a large variety of animals such as goat, sheep, horses, camel and bovines of diverse breed. In order to expand the animal wealth, the nomadic groups waged raids and wars on each other that gave them control over the herds of others. In these *waads* (fights), many died and their deaths were not treated as regular killings. These losses of lives were equated to *veergati* (martyrdom).²⁵³ While Rathor Satal Suja (eldest son of Rao Jodha) was on the throne of Jodhpur, he adopted Naro Sujatwat as his heir, because he didn't had any son. Village Khiya of Pokaran was taken from Lunka after ensuring a victory in battle. Lunka escaped towards Barmer, en route he took possession of Satalmer's cows. While saving the cows of Satalmer, Rao Naro *vanse aapad murwo* (attained martyrdom).²⁵⁴ In another instance, the enmity of Rao Maldeo with Rajput Suja of Nadul was famous. To kill Suja, Maldeo hired Rao Nagaa. To execute this assignment (killing of Suja), Nagaa made a strategy and under it appointed 20 to 25 of his cavalry men and ordered them '*thai jaai nai Nadul rai falsai aagae, panihare pan bhare chai tinaa ra behada phodo, nai uchratoo chonpau le aawo* (you people shall go to the entrance of Nadul, there women will be fetching water, you shall demolish and destroy their pots, and chase away the cow-herds that will be out of the village for grazing and then, take them in possession)'.²⁵⁵ The villagers were in panic due to this sudden attack. Suja consoled the villagers by saying '*is di kin ri chati chai, jiko bees aswaara su Nadul ro chonpau levai* (this day who have the guts to take away the cows of Nadul with just twenty horse riders)'.²⁵⁶ Considering it a trap, Suja (second son of Jodha)

²⁵² *Sanad Parwana Babi, Miti Bhadwa Sud 10 budh* (Wednesday) VS 1821/1764 AD.

²⁵³ *MRPRV*, vol. 1, p. 41.

²⁵⁴ *Ibid.*, p. 41.

²⁵⁵ *Ibid.*, p. 50. *Chonpau* (cow herds out for grazing).

²⁵⁶ *Ibid.*, p. 50.

invited the cavalrymen from nearby villages and 2000 cavalrymen assembled and the possession over *chonpau* was regained.

The fort built by eldest son of Jodha (Satal) after chasing out the Bhattis from the north-west corner of Jodhpur was called Satalmer.²⁵⁷ Khiyo Luko took '*Satalmer ri uchatri gaay livi*' (the cows of Satalmer that were out for grazing). Naro chased him and Suja came with the additional force from Jodhpur to take back the herds. Naro died in this chase, so in compensation his son (Rao Govind) got Pokhran.²⁵⁸ In vs 1607/1550 AD, Maldeo took possession over Pokhran and since then it is with the Jodhpur state.²⁵⁹ In vs 1632/ 1575 AD successor of Maldeo (Rao Chander sen) '*jiv thaleche sohad re gaya livi*' (took the cows of Jiv Thalech Sohad). In this excursion, seven of his fellowmen died and one was injured.²⁶⁰ Viram looted a large horse consignment²⁶¹ that was destined for Agra. All these instances indicate the wealth, and nature and components of economy as perceived in Thar Desert. Once Prince Khurram was going to *dekhban* (South), while en route near Chanda ri Ghatti, 17 camels of his convoy loaded with special treasures (*khase jawahar*) were looted by Chagwor bara Dhinada and were taken to a distant place.²⁶² In this case, the attraction must have been more for the treasures than the animals (camels). Anyhow, this incident highlights the efficiency with which these raiders were acting. The conflict between the Narukas (Macheri-Alwar) and Kachhwahas of Amber ensued after rebellion of Rao Partap Singh Naruka (who laid the foundation of Alwar state after breaking away from the Amber kingdom). During 1704 AD,

²⁵⁷ Tod, vol. 2, p. 950. Satalmer is 85 miles from Jodhpur and five miles from Pokharan (Pokaran). A large Jain temple is located in the premises of the fort.

²⁵⁸ *MRPRV*, vol. 2, p. 2.

²⁵⁹ *Ibid.*, p. 294.

²⁶⁰ *Ibid.*, p. 295.

²⁶¹ *Ibid.*, vol. 1, p. 18.

²⁶² *Ibid.*, p. 112. To carry out inquiry and investigations, prince Khurram appointed his trusted *chakar* (serviceman) Umra Mohmmad Murad Badhnor and sent an advance *farman* to the *Subayat* of Ajmer to facilitate the appointee.

Jorawar Singh Naruka chased away the cattle of *mauja* Pandwani (pargana Chatsu) into *mauja* Ladana.²⁶³ In another instance, two requests were put up to Jai Singh for recovery of cattle, robbed by Dhiraj Singh and Joje Singh Grasia.²⁶⁴ Ransi Tanwar, grandfather of Ramdeo Pir tried to plunder the caravan of Pir Shams, while the latter was wandering in the desert.²⁶⁵ In the year 1697, Marwar was facing intense draught (*maha-kaal*) therefore the inhabitants were migrating to Gujarat. En route, their cattle was looted by the Bhils.²⁶⁶ All the above given incidents clearly highlight that the animals were important for the inhabitants of Thar, as wealth.

The wells were used for procuring drinking water and maintaining the animal wealth. The wells with sweet water were major sources of survival for human settlements. It is significant to highlight that the wells were defined as per the number of cows drinking at that particular well. The details about wells catering capacity in respect of cows are significant indicators to understand the importance of animals, especially cows. In village Paladiwaas, a single well with excessively sweet water (available on 70 *purs*) was used for facilitating 1,500 cows with drinking water.²⁶⁷ Village Palino had one well with sweet water (available on 48 *purs*) and its water was sufficient for 800 cows.²⁶⁸ Similarly, village Ambalo had a well with sweet water (on 41 *purs*), it fulfilled water requirement of 800 cows.²⁶⁹ Eight hundred cows were drinking sweet water from single well (on 49 *purs*) of village Barjaangsar.²⁷⁰ The single

²⁶³ *Arzdasht* written by Lal chand Dalaram, dated *Bhadwa sudi* 5 VS 1761/1704 AD.

²⁶⁴ *Arzdasht* written by Mohd. Ashiq and Mohd. Sayeed, dated 22 *Rabi-ul-Awwal* (3 July) and 26 *Rabi-ul-Awwal* (7 July) AH 1117/1705 AD respectively.

²⁶⁵ Khan, Dominique-Sila, 'The Kamad of Rajasthan-Priests of a Forgotten Tradition', *Journal of Royal Asiatic Society*, Series 3, 6, I (1996), pp. 29-56.

²⁶⁶ *MRPRV*, vol. 2, p. 368.

²⁶⁷ *Ibid.*, p. 14.

²⁶⁸ *Ibid.*, p. 17.

²⁶⁹ *Ibid.*, p. 17.

²⁷⁰ *Ibid.*, p. 18.

wells with sweet water of both the villages, Vanaasar (on 45 *purs*) and Kelansar (on 48 *purs*) were supporting 400 cows each.²⁷¹ Four hundred cows were depending on two sweet water (46 *purs*) wells of village Chomanvo.²⁷² Single well of sweet water at village Rinisar was providing sufficient water for 300 cows.²⁷³ Village Dhadarwaalo had one well of sweet water (47 *purs*) and it supplied water for 300 cows.²⁷⁴ The *kachha* well of village Lunbhasar had sufficient water for 40 cows. Later in vs 1717/1660 AD, one well with salty water (52 *purs*) was allotted to the aforesaid village (from village Luno) and it supported 4000 cows.²⁷⁵ The other well of village Luno with salty water was named Ghighaliyo (45 *purs*) and 400 cows were drinking from it.²⁷⁶ Two wells of salty water (45 *purs*) at village Mithiyo were providing water for 400 cows.²⁷⁷ Three hundred cows were drinking water at one well of Dudasar in village Padiyal. It had scanty water supply. Single well of sweet water at village Mokho was providing water for 400 cows that was available on 48 *purs*. One well made by Jaisanga had scanty supply of water that was sufficient for 200 cows only.²⁷⁸ During his return journey to Udaipur, Col. Tod visited Nandla and notes 'the only supply of water for Nandla is procured from two wells dug on the margins of the stream. The water is abundant, and only four feet from the surface, but brackish'.²⁷⁹ He also noticed the volcanic remains of Nandla. In some regions of Bikaner potable water was available at 60 feet whereas the brackish water fit for cattle was 'found throughout at half its depth or about thirty feet'.²⁸⁰ The states also supported the villagers with finances for digging wells. In 1764 AD, Jat Pemo of village Ratange was digging a well, so

²⁷¹ Ibid., pp. 18-9.

²⁷² Ibid., vol. 2, p. 19.

²⁷³ Ibid., p. 20.

²⁷⁴ Ibid., p. 22.

²⁷⁵ Ibid., p. 22.

²⁷⁶ Ibid.

²⁷⁷ Ibid., p. 23.

²⁷⁸ Ibid., p. 26.

²⁷⁹ Tod, vol. 2, p. 850.

²⁸⁰ Ibid., p. 1153.

Rs. 25 was allotted from court to help him in his venture.²⁸¹ All the above discussion indicates that the Thar was scarce on the availability of water but all the intelligent efforts were made to put water conserving-cum-harvesting mechanism in place. Most of these activities are highlighting to an active life in the midst of Thar desert that became functional due to the intelligent and brave efforts of the inhabitants which they performed while getting acquainted with the hot mood of nature and its wild sand.

Thus, it can be proposed that the scarcity of water in this region motivated diverse innovations of water harvesting that became unique to the respective terrains and regions of Thar desert. The dependence on the varied sources of water also channelized many innovations in the terminology of agriculture industry that are still unique. All these aspects have been highlighted above with illustrations.

Here onwards, the effort is to describe the varieties of flora that were dotting the landscape of the Thar Desert, in order to demolish the upheld belief that the Great Indian Desert is devoid of any kind of plantation and trees. The big green trees are of great importance anywhere. As they are a rarity in desert thus any availability of them becomes a matter for record. Specifications of the recordings made around any flora indicate to their significance. The details recorded about the big trees include the species of trees, their numbers along with their locations. This indicates that the trees and their care was an integral part of the Thari culture. A *bawadi* and one pipal tree have been recorded in village Ruliyo of pargana Sojat.²⁸² On the *nadi* Kerali of village Sutrya Basani, four *pipal* trees have been recorded.²⁸³ Two trees of *neem* and one banyan tree were recorded in village Jodhadawaas.²⁸⁴ Village Patuvas-jodh had two *pipal* trees on a heap of garbage and village Malko had two *pipals* and one *talab*.²⁸⁵ Village Trismariyo had one banayan

²⁸¹ *Sanad Parwana Bahi, Jaith Sud 7 & 8 VS 1821/1764 AD.*

²⁸² *MRPRV*, vol. 1, p. 419.

²⁸³ *Ibid.*, p. 419.

²⁸⁴ *Ibid.*, p. 420.

²⁸⁵ *Ibid.*, p. 420.

tree.²⁸⁶ An old and huge *pipal* tree was called *pipal moto chai*.²⁸⁷ Five *neem* trees and one *pipal* tree were recorded at the *talab* of village Dhuliyō.²⁸⁸ Four *pipal* trees were noticed on the Kerali *nadi* near Kumbhelav *talab*.²⁸⁹ Village Jodhdawaas had two neem trees and one banyan tree, and village Patuwaas had two *pipal* trees and one tree of *akrod*.²⁹⁰ The absence of *khejri* tree in village of Raipuro finds a special mention.²⁹¹ Two *pipal* trees in village Malko, *moto pipal* in Dhanaj ro kheda²⁹², *ambali bud* (banyan tree) in Kotado Surawasti, one banyan tree in Tismariyō²⁹³ were also recorded. Both the villages, Ramawaas²⁹⁴ and Biram ri basani²⁹⁵, had two *pipal* trees each. One *pipal* was recorded in village Jhunjhundo *khurd*.²⁹⁶ Wheat, gram and sweet *kharchiya* (a type of cucumbers) were produced in village Dhenawaas of pargana Sojat.²⁹⁷ In village Sehwaaj, '*chotra moth ban tarkari ghana* (thin yield of moth and ample production of cotton and vegetables). This village also had a *bagh*.²⁹⁸ Gulab Sagar, the *talab* inside the fort of Jodhpur was 'the favourite lounge of the inhabitants, who recreate in its gardens; and, strange to say, the most incomparable pomegranates (*anar*) are produced in it, far superior even to those of Kabul, which they resemble in the peculiarity of being *be-dana*, 'without grain'... The *anar* of the Kagli-ka-bagh, or 'Raven's Garden' are sent to the most remote parts as present. Their beautiful ruby tint affords an abundant resource for metaphor to the Rajput bard, who describes

²⁸⁶ Ibid., p. 422.

²⁸⁷ Ibid., p. 422.

²⁸⁸ Ibid., p. 472.

²⁸⁹ Ibid., p. 472.

²⁹⁰ Ibid., p. 473.

²⁹¹ Ibid., p. 473.

²⁹² Ibid., p. 475.

²⁹³ Ibid., p. 476.

²⁹⁴ Ibid., p. 538.

²⁹⁵ Ibid., p. 540.

²⁹⁶ Ibid., p. 539.

²⁹⁷ Ibid., p. 428.

²⁹⁸ Ibid., p. 431.

it as “sparkling in the ambrosial cup”.²⁹⁹ Village Dewali Amba ri had ‘*gehu chotra kapas ghani* (thin yield of wheat and huge harvest of cotton)’.³⁰⁰ Water of *rel* was coming in entire territory of village Vapri was helpful for plantations of vegetables and orchids.³⁰¹ In the village Dhanlo, good crop of rice was produced.³⁰² Rice, wheat and gram constituted *sewaj* of village Saaran.³⁰³ Village Kiradi had good cotton production and village Warnowass produced *jowar*, *bajra* and cotton.³⁰⁴ Four *dhibadas* were used in village Khodiyo for production of sweet wheat.³⁰⁵ A rose garden was at the entry of village Sekhawaas.³⁰⁶ Specifications of the crop production have also been recorded with details. In village Bhivaliyo ‘*jowar ra khet ghana meh ban hurwai* (lot of fields of *jowar* whereas after rains cotton can be grown)’.³⁰⁷ The lemon and mango plantations were noticed at Sojat. River Luni was helpful for production of wheat, *til*, *mung*, *moth*, *bajra* and other pulses that were sufficient for internal consumption.³⁰⁸ All these above mentioned flora were available around Jodhpur.

In Jaisalmer, trees of *neem*, *pipal*, *bud* (banayan) and *sandesbda* were available only in one village. One village had four *gundi* trees, out of which two were in garden. One tree of each *rai*, *bud*/banayan and *sabri* were in village Aola. The wood *paiydar* is known after Paliwals. It is good in quality but is available in very less quantity. Fruit of *pilu* was useful. Gaund was collected form Sirgu. Wood of *vilayati babul* is of no use. Arna was produced in Hukairi, gagane fruit was produced at Gangiya, gugal was produced at Guglana. Jikane flower were used for perfumes. Garathi, *lankas*, *khir-kheep*, *phog*, *lano*, *lane*, *thohar* (*thor*), and *ak* are available in abundance.

²⁹⁹ Tod, vol. 2, pp. 821-2.

³⁰⁰ MRPRV, vol. 1, p. 432.

³⁰¹ Ibid., p. 432 (in village Vapri).

³⁰² Ibid., p. 433.

³⁰³ Ibid., p. 465.

³⁰⁴ Ibid., p. 433.

³⁰⁵ Ibid., p. 466.

³⁰⁶ Ibid., p. 434.

³⁰⁷ Ibid., p. 441.

³⁰⁸ Tod, vol. 3, p. 1279.

Lawa and Akadi (Akara) are produced in Sakud and Paneer fota. Vegetation in form of *bharut*, *var*, *kard*, *khilai*, *darob*, *makhani*, *bhodasi* and *vobhariya* were available. Good quality of *roh* was available. Its *ark* (extract) helps in doing away the effect of opium. Variety of herbs like *sonela*, *sonal*, *ghudala*, *kalanj*, *dudheli* (used to do away effect of poison), *chapri*, *madhoya*, *noli*, cumin-like seed-*kalijiri*, *kadluth*, *lathiya*, *ravas*, *sapan*, *chamkas* (to treat dysentery in cows), *kalileel* (for teeth), *lolruh*, *dhakado*, *kati*, *fel*, *gebado*, *mamamoli dano*, *kakado*, *santar*, *latar*, *dhamasa*, *khaar*, *drebal*, *ikad-kharsan ujaat*, *kotak balat*, *andhilada*, *kaputan*, *jalbhanga*, *kalabhanga*, *kutak*, *balfuli* (treats aaful), *chunku*, *vabefod* (to treat the burns), *khirioliyo*, *gadha-gathiya*, *kutabhurt*, *sumbi*, *nag-chatar*, *ban-methi*, *ban-tulsi*, *ghodal-josnaay*, *karwadiya*, *gorakh-mundi*, *padal*, *surwa*, *pilvaan*, *goliwada* (fruit-golan mithi), *tusan* (mixing in grains, also given to horses and buffaloes), *hadiya* (to be applied on paipaye), *gadariya*, *aankhfutani*, *karela*, *rigani*, *amarbel*, *katol* (to treat scorpion poison), *giloy* (sour beans), *pisu*, *gulan*, *jal-beladi* (for horses) and *udar-kani* were available in abundance.³⁰⁹ Royal orchids of Jaisalmer had plants of guava, *narangi*, pomegranate, *sitafal*, *rayag*, *kharka*, *bair*, lemon, *jamun*, *jamiri*, *karna*, *dokh*, *sehtut* (mulberry), banana, *saunf*, *karunda*, *gular*, *sjra*, *khakhra*, *mehndi*, *raidodi*, *badam* (almond), *choti rasayal*, *seladi*, *satha* (sugarcane), *sakargand*, *kharrbuja* and *makiya*. A lot of *sag-paat* (vegetables), *ranaar*, and good quality *pyaj* (onion) were produced by *malis* (community who grows vegetables) in *nadis*. Onions grown in *bera* of mauja Ladrwa were considered healthy for consumption.³¹⁰ This long list of vegetational produces (with medicinal and general properties) hints to the abundance of flora that was available in the regions of Jaisalmer.

The prolongation of Aravalli in Ajmer was affirmed as 'lofty barriers on either side, covered with the milky *thor* (cactus) and the "yellow anwla of the border"'.³¹¹ The eastern side of Aravalli had

³⁰⁹ *Tarwarikh Jaisalmer*, pp. 216-7.

³¹⁰ *Ibid.*, p. 227.

³¹¹ *Tod*, vol. 2, p. 894.

abundance of cactus, or prickly pear.³¹² In the *dhibada* of Aadwaniya musk-melon and *trakari* (vegetables) were produced.³¹³ *Palo* (a grass for camel and goats) in good quantity and of quality was produced in village Bahaid.³¹⁴ *Singhda*, wheat and musk-melons were produced in village Bari.³¹⁵ In *sewaj*, gram and rice were produced at village Boraad.³¹⁶ Musk-melons were also produced in village Mero wavadi with the water of river Kalijhar.³¹⁷ The *babalo* of *kasba* Sojat was flowing below the *kot* (small fort) and had 300 to 400 *beras* with *aakhariyo* (average) quality of water that helped in production of *bhaji-tarkari* (vegetables).³¹⁸ Big fields of village Sawarji producing *bajri*, *moth*, *til* and cotton were in the midst of the desert.³¹⁹ The big fields of village Mokheri³²⁰ and Aau³²¹ were also in the desert. Ample production of *bajri*, *moth*, *til* and cotton was secured from these fields. Large fields for cotton production were in village Hopali.³²² In the four field of abandoned village Ghaghri, wheat of good quality was produced.³²³ Besides the production of large number of grains, pargana Medta was also popular for production of *afeem* (opium), *kharbuja* (musk-melon) and vegetables.³²⁴

The production of *kachri* (a tangy cucumber) has been taxed separately. It indicates that this vegetable was crucial in this region.³²⁵ Curry made out of *kachri* was served to Col. Tod and

³¹² Ibid., p. 904.

³¹³ *MRPRV*, vol. 1, p. 511.

³¹⁴ Ibid., p. 515.

³¹⁵ Ibid., p. 528.

³¹⁶ Ibid., p. 537.

³¹⁷ Ibid., p. 543.

³¹⁸ Ibid., vol. 2, p. 12.

³¹⁹ Ibid., p. 15.

³²⁰ Ibid., vol. 1, p. 16.

³²¹ Ibid., vol. 2, p. 16.

³²² Ibid., p. 16.

³²³ Ibid., p. 23.

³²⁴ Ibid., p. 89.

³²⁵ Ibid., p. 96.

he notes 'curries were excellent...kakari...and of a miniature melon no longer than an egg, which grows spontaneously in these regions, and is transported by kasids, or runners, as presents, for many hundred of miles around'.³²⁶ The cultural significance of *kachri* can be understood through a still existing practice. Even today, whenever an aspiring merchant wants to try his fortunes in alien lands, he would generally connect with an already established merchant of his village or community in that particular land. The gift carried by these travelling and aspiring merchants generally consists of dried *kachri*, *sangria* and *teet* (*kair*). Historically, this gift was a means to establish solidarity with the native land, which produces the good that can be consumed throughout the year. *Kachri* were sliced and dried in sun for the purpose of storage in order to meet future needs or to use during famines. It was an item of commerce, which was extremely nourishing and valuable as an anti-scorbutic in sea voyage.³²⁷ Village Motisaro and Amba ro bado in *pargana* Siwan had good fields of *jowar*, *bajra*, *mung*, *moth*, *til* and cotton.³²⁸ The assessment of production can be analysed from the quantity of the wheat received in revenue from Trisingadi Badowass Tobh Ro.³²⁹ Village Silor ra Vaas was *sasan* (charity) to Brahmans. Its crop production was dependent on the rain pour. Its fields were midst of the dunes and all the fields were producing rice. Wheat and gram was produced in *rabi* crops through the flood waters (*rel*) of river Luni.³³⁰ The rain water was used in the sandy fields of *pargana* Pokhran for production of good quality *jowar*, *bajara*, *mung*, *moth*, *til* and cotton, as the collected water stayed for long in the dunes.³³¹ Production of onion, *jiku* and tobacco was reported in deserts of Pokhran.³³² Village Lohvo in Pokhran had

³²⁶ Tod, vol. 2, p. 847.

³²⁷ Ibid., p. 1151.

³²⁸ *MRPRV*, vol. 2, pp. 237 & 240.

³²⁹ Ibid., p. 257. 500 *man* of wheat was received in revenue. 200 *man* wheat was collected in revenue from Kharadi ra baas.

³³⁰ Ibid., p. 267.

³³¹ Ibid., p. 316.

³³² Ibid., p. 326.

the cultivation of *jowar*, *bajra*, *mung*, *til* and cotton and various other grains based on downpour of rain.³³³ Bajra and cotton was produced in the sand hills of Jaisalmer. *Bajra* from Jaisalmer was deemed to be of superior quality.³³⁴ *Jowar* was sowed in low flat lands. The shelter sides of dunes were spaces for *mung*, *moth*, *til*, *gawar*, barley, gram and *kachri*. The soil deposits were spaces for good quality wheat, turmeric and garden-stuff (vegetables).³³⁵ Floods caused due to excess rain helped in the cultivation activities in 30 fields of village Mahwa.³³⁶ *Bajra*, *mung*, *moth*, *guwar* and wheat were produced in the dunes of Jaisalmer. *Kakadi*, *matiri*, *kachri*, *nidso*, etc. of good quality were produced in large quantities. For consumption, within the state, small quantity of *til* were sowed with *bajri*. It was also used as fodder for camel. Later, the export of *til* started therefore the crop yield was enhanced. Thus, in year 1841 ample production of *til* was sought that was sold for next three years. The soil of Jaisalmer was suitable for cultivation of cotton but the peasants didn't grow it due to the following reasons:

1. The seed sowed in first years gives out cotton only in the third year. Thus, the plant shall stay on field for four to five years and it shall get appropriate rains each year, which never happens.
2. The destruction of the crop by the animals.³³⁷

If the *khad* and dams get filled in the month of *bhado* and *kurwar*, then during *unhalu* (rabi) all the 13 *parganas* (Jaisalmer, devikot, Fatehgarh, Lakha, Khambha, Mahajalar, Sam, Khuriyala ramgarh, Deva, Mohangarh, Vay, Sihad and Lathi) of Jaisalmer kingdom can have production of *chana*, wheat, mustard (sarso), *dhano* (coriander) and *ban* (cotton). *Jowar* and *mung* were generally sowed after month of *phagun*. In this soil, nearly 50 to 60 *mann* (at times even 80 *mann*) of wheat and *chana* were produced from one

³³³ Ibid., p. 328.

³³⁴ Tod, vol. 2, p. 1247.

³³⁵ Ibid., p. 1248.

³³⁶ MRPRV, vol. 2, p. 329.

³³⁷ *Tawarikh Jaisalmer*, p. 212.

mann seed.³³⁸ A new variety of *jowar* was introduced in Jaisalmer which produced four to five yields. The only condition for these yields was regular rain. Its first and second yield was called *drohi*, which produces less grain. Third yield was called *bodari* and was not taxed. In fourth yield, *dubis* (milkman) graze their cows but the higher castes desist from this practice. The fifth yield was considered of no use, even the animals feeding on it can die.³³⁹

Col. Tod has provided a vivid description of the vegetation along with their qualities as found in the palace gardens around Mandor fort. The plants and trees grown in this region and reared by hand of nature were golden *champa*, pomegranate, *sitaphala*, *mogra*, *chameli*, *brahamasha*, mango-trees, and tamarind.³⁴⁰

The references of forest in the Thar Desert appears only in the territory of *pargana* Pokhran. The village Dhundhuwaas had a forest which was housing the cultivable fields.³⁴¹ The village of Badhewa and Khiwlano had the forest areas (*jangal kbadiyo chai*), in which the *kbad-chars* (Shepards) and *govalis* (cow grazers) came to graze their cattle respectively. *Charai* was levied from them.³⁴² Amber kingdom gave orders for protection of hills and forest with full caution.³⁴³ Protection and good administration of the forest and hills was constantly reported to the king.³⁴⁴ Various types of forest produces were collected from the desert of Jaisalmer. *Khejri* is most popular in the desert due to its ability to survive in drought and continuous fodder supply. The wood of *karir* (*kair/teet*) was used for making roof, perhaps, due to its lightweight. The fruit came on bush of *kair* during the month of *baisakh*. The raw fruit is sour in taste and on ripening it attains tangy taste. Two types

³³⁸ Ibid., pp. 212-3.

³³⁹ Ibid., p. 213.

³⁴⁰ Tod, vol. 2, pp. 844-5.

³⁴¹ *MRPRV*, vol. 2, p. 331.

³⁴² *MRPRV*, vol. 2, p. 342. *Kaal-dukaal tala jupai, tarai kbad-char log aay basai* (during *kaal* and *dukaal*, they pull water from the well and the shepards came in to settle). *Govali lok drav cha-rai tin re charai aarwai* (Govali's graze their cattle so charai was earned).

³⁴³ *Arzdasht*, dated *Fagun budi* 10 VS 1698/1642 AD.

³⁴⁴ *Arzdasht*, dated *Asbwin budi* 7 VS 1705/1648 AD.

of *bair* were available namely, *kokan* and *bad*. Their fruit comes up in the months of *kartik* and *phagun*, respectively. *Kumbhatiya saag* was collected from plant of *kumbhat*. Good quality *gaund* was also collected from it. Its wood makes good fuel as it inflames fast and burns faster. Rohida tree is valuable due to high quality wood of soft texture. Generally, its blocks are cut when the wood is wet. Its selling price is very high. Kankod is effective to treat poison and wounds, but the locals believe that if the wood of Kankod is kept in house, it will cause quarrels and unrest! So, it is procured only when the need arises. Babul was another useful tree. As its wood is very strong therefore it was used in construction activities. Its bark was used for colouring the leather and liquor industry uses its rang. Its pods, leaves and barks were used in dye industry. The fruit obtained from tree is *babaliya* (*bichiya*/beans) and *guand* (Gum Acacia). The former constituted medicinal fodder for animals. However, the latter was collected and used by humans for its medicinal properties. Lot of *babaliya* was produced in pargana Sam Sahgarh. *Gaund* was also collected from pargana Mohangarh, Barawa, Tanot, Kisangarh and Ramgarh.³⁴⁵

The sands of Dhundhar region were popular for growing vegetables, melons, musk-melons and water-melons. The quality of the *kakadi* (a variety of cucumber) produced was so fine that it was send as gift to the Amber raja along with *sakhar*.³⁴⁶ A demand came from Mirza Raja Jai Singh for *kharbuja* (musk-melon) and *sarda* of Amber and those were dispatched as per the instructions received. The same *arzdast* also reported a good yield of *kharbujas*.³⁴⁷ The rains received in year 1686 were sufficient only for cultivation of *bajra*, *moth*, *mung* and *til*.³⁴⁸ In the same year

³⁴⁵ *Tawarikh Jaisalmer*, pp. 215-6.

³⁴⁶ *Arzdasht* written by Rana Kalyandas, dated *Kartik sudi* 9 VS 1697/1640 AD.

³⁴⁷ *Arzdasht* written by Kalyan and Sadanand, dated *Jaith sudi* 6 VS 1713/1656 AD.

³⁴⁸ *Arzdasht* written by Madhur Nathuram, dated *Bhadwa budi* 11 VS 1743/1686 AD. Another by Budhar and Nathuram dated *Asoj budi* 10 VS 1743/1686 AD.

monsoon floods occurred in river Banas (pargana Malarana).³⁴⁹ The scarcity of rain in c. 1694 led to the drying of crops. With delayed rains in month of *bhadwa* they became a bit green. Apprehensions were expressed about occurrences of *akhaal* that might set-in due to scarcity of rain.³⁵⁰ This initiated the migration of inhabitants along with their cattle towards Mathura.³⁵¹ Manram confirmed *akhaal* in his next *arzdast*.³⁵² Many other *arzdasts* were written to Raja Bisan Singh about the drought conditions in 1694 AD.

Rice was sown during the *rabi* season in Amber.³⁵³ In 1648 AD, mangoes, lemon and *kamal-gatta* were sent for Mirza Raja Jai Singh from Amber.³⁵⁴ Gandhak and Amla were sent for Raja Ram Singh in 1683 AD.³⁵⁵ Even today, *amla* in large quantities is produced in the areas around Jaipur. The region around the Amber-Jaipur kingdom is known as Dhundhar. Ample production of *bajra* and *jurwar* during *kharif* followed by barley and wheat in *rabi* respectively was secured in this region. Large variety of pluses, grains, vegetables and cotton of excellent quality along with the indigo and other dyes were also produced.³⁵⁶ The *sabzi mandi* (wholesale vegetable market of Chomu) is still the largest market for vegetables in the Dhundhar region that supplies to major cities like Delhi and beyond.

Entire principality of Bikaner is full of sand except few isolated spots or oases, scattered here and there. The *tibbas* (sand-hills) are in the centre of territory. The soil from Rajgarh to Nohar and Rawatsar was considered of good quality as it was black soil mixed

³⁴⁹ *Arzdast* dated *Bhadwa budi* 13 VS 1743/1686 AD.

³⁵⁰ *Arzdast* written by Dalaraam Nathmal, dated *Bhadwa sudi* 11 VS 1751/1694 AD.

³⁵¹ *Arzdast* written by Ajitdas manram dated *Asoj budi* 6 VS 1751/1694 AD.

³⁵² *Arzdast* dated *Asoj budi* 7 VS 1751/1694 AD.

³⁵³ *Arzdast* written by Ajitdas manram dated *Kati budi* 3 VS 1750/1693 AD.

³⁵⁴ *Arzdast* written by Mohan, dated *Jaith sudi* 15 VS 1705/1648 AD.

³⁵⁵ *Arzdast*, dated *Posh budi* 7, VS 1740/1683 AD.

³⁵⁶ Tod, vol. 3, p. 1431.

with slight sand, having water near surface which was helpful for irrigation.³⁵⁷ Wheat, gram and rice were produced in considerable quantities. The floods in periodical rains were helpful for production of wheat in abundance. *Bajra*, *moth* and *til* were produced for use of both men and cattle. Gram, wheat and barley were produced in favoured spots that were receiving the rain. Wheat grown areas of last season were preferred in the running year for the cultivation of cotton. Excellent pastures and produce of spontaneous vegetables were bountiful. *Guar*, *kachri*, *kakri* and water melon (of gigantic size) were produced in plenty.³⁵⁸ Generally, in the dry areas of Thar it was believed that famine will hit every seventh year. Therefore, aim was to waste nothing. In pursuance of this objective even the seeds of wild grasses like *bharut*, *baru*, *harara*, *sawan*, etc. were collected and mixed with *bajra* floor that entered the diet of poor classes. *Khair*, *ber* and *karel* berries were saved and stored along with the pods of *khejra* to convert all these in flour. Abundance of shrubs such as *babul*, evergreen *pilu* and *jhal* was visible in sand regions of Bikaner. Woods of *rohira* and *neem* tree were used for building activities. Plant phog was most useful in Bikaner desert as its twigs frame a wicker-work. Its usage around the wells prevented the sand from falling in. *Ak* grows to an immense height and strength in desert. Its fibre was used throughout the region to make ropes which were superior to those of *munj* in substance and durability.³⁵⁹ Besides these naturally available vegetation, some efforts for introducing new plants and crops were also made. In 1705 AD, four flowers bloomed on the plant of *ketgai* and these were sent to Jai Singh.³⁶⁰ Again in 1710, two *ketagi* flowers were sent.³⁶¹ The above description helps to understand that vast

³⁵⁷ Ibid., vol. 2, p. 1149.

³⁵⁸ Ibid., p. 1150.

³⁵⁹ Ibid., p. 1152.

³⁶⁰ *Arzdasht* written by Bhagotidas Chaturbhuj dated *Chait budi* 11 VS 1762/1705 AD.

³⁶¹ *Arzdasht* written by Bhagotidas Manroop dated *Chait budi* 9 VS 1767/1710 AD.

varieties of flora were available in the desert, and inhabitants were trying to make best possible use of the limited resources.

Once upon a time, the landmass of present Thar Desert was a green region, watered by many rivers. Till the mid-6th century, river Ghaghra (channelized by the Himalayan waters) was a major source of water supply. Now, river Luni is the only major source of water. Earlier, river Luni fell in the Rann of Kuchh, but now after flowing westward it gets lost in the desert. Many rivers get channelized in the desert after the monsoon rains. At times they also go in floods.

The Aravalli ranges gave way to many streams 'all proceeding to join the "Salt River," or Luni'.³⁶² Another name for Luni was Sagarmati and its bed is full of quartz rock.³⁶³ Two rivers, namely Rasgir and Luni, were flowing around the village Lauta dhari.³⁶⁴ Similarly, river Luni and Sukadi (coming from Godhwad) were flowing near village Jagisa Kotadi.³⁶⁵ River Luni was also flowing near village Kitnod, Samdi, Banbhsen and Manglo of *pargana* Siwan.³⁶⁶ Mahnto Nainsi used two separate categories (Luni and Badi-Luni) for River Luni.³⁶⁷ Badi Luni was flowing near the territories of village Kumpavaas of *pargana* Siwan.³⁶⁸ Luni is the most marked feature of Thar Desert, as it rises in east at Pushkar and then flows towards west, bisecting the territories of Maru, in fertile and sterile lands. River Kherwa was coming down from a hill located in village Katahado.³⁶⁹ River Kanuja-wali was flowing near village Baghiya-heda, thus the inhabitants of this village were drinking at its *beris*.³⁷⁰ Complete absence of *barwadi*, wells and *talab* in this village indicates that the river water was available to them throughout the year. Village Girri also didn't have any *talab* as the

³⁶² Tod, vol. 2, p. 806.

³⁶³ Ibid., p. 890.

³⁶⁴ *MRPRV*, vol. 1, p. 513.

³⁶⁵ Ibid., vol. 2, p. 235.

³⁶⁶ Ibid., pp. 233-5.

³⁶⁷ Ibid., p. 237.

³⁶⁸ Ibid., p. 240.

³⁶⁹ Ibid., vo. 1, p. 514.

³⁷⁰ Ibid., p. 515.

river was flowing nearby.³⁷¹ River Jhutwali was flowing near village Rampuro. Thus, no efforts of water harvesting were made in this village.³⁷² River Raipur was flowing on the right side of village Raipur.³⁷³ River Luni flowed on north of village Tahkurwaas.³⁷⁴ Village Devali Hulan-ri had no water tank because river Chang was flowing nearby. Thus, the requirements of drinking water were fulfilled from river.³⁷⁵ Similarly, village Khirhati was drinking from river Khukadi.³⁷⁶ Village Mero-wavadi was located between the hills, thus received water from river Kalijhar that was flowing in village.³⁷⁷ Three rivers (Kalanjhar, Chang and Tenai) converged at the village Daglo.³⁷⁸ River Sukadi coming in from Singhlawati was only source of drinking water for village Laliya.³⁷⁹ All these details help to understand that sufficient supply of surface water was naturally available to the regions of Marwar.

The section dedicated to the water resources in *Tawarikh Jaisalmer* starts as '*shashtra-anusaar likhe hai ke is ilake me nadi nala kasam khane ko bhi nahi hai* (as per ancient literary traditions in this region there is no river and *nala*, even to swear upon)'.³⁸⁰ None of the rivers had flow for 12 months. River Kaknae and Lathi ki nadi were famous. Two small rivers (Gogadi and Sukadi) were of average flow. Along these rivers there were many *bahalas* that become functional on receiving rain. The river Kaknae was named after *risbi* Kak, son of Brahma, who meditated in this land.³⁸¹ River Kaknae ran from village Bhopa to Sodha kothi and ran for 14 *kos* while crossing village Gurarar Sata, until it reached Kuldhara. At Kuldhara, it channelized into two tributaries. One of these

³⁷¹ Ibid., p. 518.

³⁷² Ibid., p. 516.

³⁷³ Ibid., p. 517.

³⁷⁴ Ibid., p. 522.

³⁷⁵ Ibid., p. 533.

³⁷⁶ Ibid., p. 537.

³⁷⁷ Ibid., p. 543.

³⁷⁸ Ibid., p. 550.

³⁷⁹ Ibid., vol. 2, p. 240.

³⁸⁰ *Tawarikh Jaisalmer*, p. 205.

³⁸¹ Ibid., p. 206.

tributary went to west and exhausted by the time it reached village Khamba muhar. It helped in producing three crops. But the irony is the Khamba doesn't get filled in scanty rains. Sufficient rains were must to fill it up, and there was no mechanism to pull out its water. So it gives a look of *dariyab* (oceanic look) as it spans out in eight *kos*. The *jarat* (cultivation) becomes possible only when the water dries up. When the Paliwals lived here six thousand *mann* of grain was produced. Another tributary of river Kaknae flows from village Kuldhara into village Kahale Luhav and finally exhausts in *ran* (desert). As the water enters *ran*, it gets salty, in which even *bhaya* grass can't be produced. In order to hold the water for irrigation *bandha bandhate thai* (temporary dams) were made that generally break away soon. The stone in the river bed was cut in order to stop wastage of water. Third tributary was taken out from river on the southern side of city Jaisalmer by constructing a dam with an intention that after filling up Garsisar, Gulab Sagar, Kishanghat, Ramghat, Karah Kalyanghat, consecutively the water will flow through Rann of Kanodh and will finally reach Mohangarh. In this the water ran for 20 *kos* and on both the sides of river *beras* were made which helped in producing crops. This also limited the dispersal of water in *khuji* (water collecting areas), where crops were produced every year. These efforts of Jaisalmer state stopped the water from reaching the desert. Thus, the wastage of water was seized. Under this scheme, a large amount of money was spent to excavate Garsisar, Gulab Sagar and Kishanghat. Ramghat and Kalyan ghat were renovated.³⁸² Lathi river started from village Begati and Madwai in Marwar and after a crossing near village Lathi, it channelized into two tributaries that flowed in south from village Sujayas and in the north from village Aiyeta until it reached the *ran* (desert) of *pargana* Mohangarh. Here the water of river spreads out in a large area. The author of *Tarwarikh Jaisalmer* has not provided the timeline for these parameters. But his note, 'now the river reaches to *ran* occasionally'³⁸³ is sufficient to put forward that the river was declining by the mid of nineteenth

³⁸² Ibid., pp. 205-6.

³⁸³ Ibid., p. 206.

century. He also stated that Khamba waters reached Mohangarh in c.1849, 1852, 1862 and last in 1936. The reasons stated for non-arrival of river water were construction of dams and coming up of dunes in Pokharan.

River Gogadi initiated in village Chodiya of *pargana* Devikot and passed from villages Sawant, Mulana Badegav, Sgra, Agadi, Cahngghan (in khadin rachay) respectively before reaching village Maligada (of Haibhar). From here after running for 20 *kos*, it merges in River Lathi on north.³⁸⁴ River Sukhadi flowed from village Mahasar, Nedan, Duwado, Dhaysar, Jaband and one *kos* ahead of village Bharwa it dropped into river Gogadi. River Nadi started in village Mahrere and flowed near village Aoladas. It reached till village Kashmir of Marwar kingdom.³⁸⁵ The water of Bakiya *bahalo* flows in east up to a distance of three *kos* from village Akal (*pargana* Jaisalmer) before reaching village Jeralab, where wheat production has started in late 19th century due to construction of dam. After filling dam it runs for 15 *kos* and finally merges with river Lathi at village Redujesu-rana.³⁸⁶ Many other *bahalas* were also functional.³⁸⁷ There were no perennial rivers around Jaisalmer. The streams flowed around the Jaisalmer town only in the month of rains. Kak, the principal river, originated from *kotri* and while passing through Rupsi and Lodrava it formed several meanders and lakes that were suitable for irrigation. Besides these there were several low-lying areas called *khadeen* (a small pound) wherein, rain water collected. The drying up of rain water made fields suitable for raising *jurwar*, wheat and gram. The *masori khadeen* near village Dedha was very significant. Although the tanks were few but were major source of water. They were dug around Pokaran and Jaisalmer, and the water collected during rains provided subsistence to the people for several months. Small tanks (*kund*) were other effective vessel for collecting rain water within the house, in-order to meet the domestic requirements.

³⁸⁴ Ibid.

³⁸⁵ Ibid., p. 207.

³⁸⁶ Ibid.

³⁸⁷ Ibid.

Here, it can be purposed that until the 19th century some rivers were coming out of Aravalli with sufficient water, and a few of these rivers were running throughout the year. All these rivers were proving helpful to the inhabitants.

In semi-arid India, often, common pool resources (CPRs) are significant for livelihoods of poor people as they provide sustenance and income for household survival, and opportunities for sharing risk and to cope up with the seasonal crises. State lands classified as revenue wastelands were included in the total of wastelands and these were treated as common lands by the villagers. Often these lands have *de facto* open access that continues to further the degradation. These are particularly important to poorer people, who typically lack the minimum threshold requirement for survival, and influence the management of private resources and other livelihood options. From time immemorial, in almost every village of western Rajasthan, a substantial portion of land has been kept aside, specifically as grazing ground in order to support animal husbandry on a sustained basis. With the breakdown of traditional management systems exacerbated by privatization and encroachment (for quarrying and mining), most CPRs in semi-arid India have become severely degraded, and the damages caused are irreparable.

Johads were the low-lying areas where rain water accumulated and with the receding water, naturally grasses grew. The nearby villages depended upon these *johads* for grazing their cattle. Even the intense desert of Jaisalmer had good number of functional *johads*. The popular *johads* of Jaisalmer were Karah, Voh, Vahala, Rebarsar, Sangan, Kiluriya, Sam, Lakhina, Dewa, Uparla, Khariga, Waticha, Buj, Harjisar, Sonan, Kuchra, Muhare, Unkha and Basnapi.³⁸⁸ Two types of grass grew in these *johads* namely, Khiwai and Sewan. Village Shivraad had a *johad* in 100 *bigha*.³⁸⁹ In pargana Sojat, village Dudhwad had a big *johad* and village Khariyo nibaro had a *johad* in 200 bighas.³⁹⁰ *Johad* of village Mado

³⁸⁸ *Tawarikh Jaisalmer*, pp. 218-21.

³⁸⁹ *MRPRV*, vol. 1, p. 425.

³⁹⁰ *Ibid.*, p. 427.

was measuring 200 bighas.³⁹¹ *Johad* of village Khokhar was *sakbro* (good).³⁹² The parameters and specifications for qualifying *johads* as good have not been mentioned. The *johad* of village Aanbo was measuring 400 *bigha*.³⁹³ Village Jhad-dhand's *johad* was in 201 *bigha*. *Johad* of Sisarwaado was *nano-so* (small).³⁹⁴ *Johads* of village Madlo Khurd, Mehdaso³⁹⁵, Palasano bado³⁹⁶, Lolawaas³⁹⁷ and Mokal wasani³⁹⁸ were *choto-so* (small). '*Johad ek nipat bado chai* (one *johad* which is sufficiently big) was located in village Harsiya-heda.³⁹⁹ Hundred carts of fodder (*ghaas*) were produced in single *johad* of village Baghavas.⁴⁰⁰ *Johad* of village Dadhiyo Dhanhadi was of *kaas* grass (*jod kaas ro chai*).⁴⁰¹ *Johad* of village Badi was in 200 bighas.⁴⁰² Khariyo Fadra-ro⁴⁰³ and Hemaliyawaas⁴⁰⁴ had *jodiyo*. The *johad* of village Potaliyo was spoiled (*bhanjiyo*).⁴⁰⁵ *Johad* of village Maihev was *sakbro* (good) with the capacity of producing nearly 200 carts of fodder.⁴⁰⁶ Village Sanpo had one *sakbro johad*.⁴⁰⁷ *Johadi* of village Palasano khurd was near river Fulaaj.⁴⁰⁸ Village Bhanjhakudi had one *johad* measuring 400 *bighas*.⁴⁰⁹ A *johad* of

³⁹¹ Ibid., p. 430.

³⁹² Ibid., p. 432.

³⁹³ Ibid., p. 434.

³⁹⁴ Ibid., p. 436.

³⁹⁵ Ibid., p. 444.

³⁹⁶ Ibid., p. 448.

³⁹⁷ Ibid., p. 452.

³⁹⁸ Ibid., p. 455.

³⁹⁹ Ibid., pp. 444-5.

⁴⁰⁰ Ibid., p. 438.

⁴⁰¹ Ibid., p. 440.

⁴⁰² Ibid., p. 442.

⁴⁰³ Ibid., p. 446.

⁴⁰⁴ Ibid., p. 464.

⁴⁰⁵ Ibid., p. 456.

⁴⁰⁶ Ibid., p. 457.

⁴⁰⁷ Ibid., p. 460.

⁴⁰⁸ Ibid., p. 461.

⁴⁰⁹ Ibid., p. 511.

400 *bighas* was recorded in village Katahado.⁴¹⁰ Village Udasi Kuwo had two *jobads* that were worthy of producing 100 carts of grass.⁴¹¹ Pargana Pokhran had one big *jobad* and it produced *palo* that was sufficient to fill 400 carts.⁴¹² The states also made efforts to increase the production of grass in *jobads*. To increase the grass production in *jobad* of Chopda, Rs. 200 were allotted from Jodhpur court and officials were instructed not to delay the release of money.⁴¹³ Grass production of village Kharda (pargana Pali) was to be increased, thus, Rs. 100 were granted from court and official were instructed not to delay the release of grant.⁴¹⁴ Even the abandoned villages were crucial for the state. As many of them were the areas for producing grasses that were used for the imperial cattle. The village Dewasan of pargana Siwan was abandoned many years ago as there were no tanks and wells. From this village, 400 carts of grass were collected that were utilized by the *jagirdar*.⁴¹⁵ Village Kaksi was deserted still grass was cut and collected.⁴¹⁶ In year 1764, 500 carts of fodder were filled from Ladnu for taluqa Didwana.⁴¹⁷ Half of the village Gughrat was located on hillock and the Paitwani waterfall had sufficient water with shrubs at the fall point.⁴¹⁸ Thus, fodder was collected from different locations of village and waterfall point. Earlier, villages Tapan and Sener were on the hill-top and later shifted to the plains.⁴¹⁹ Accordingly the grasses were collected. *Jobads* were not only centres for grass. They were also used as breeding grounds, which will be discussed later in relevant place.

The salt production was a significant and regular economic activity in the Thar Desert. Kharola was the community that

⁴¹⁰ Ibid., p. 514.

⁴¹¹ Ibid., p. 527.

⁴¹² *MRPRV*, vol. 2, pp. 315 & 324.

⁴¹³ *Sanad Parwana Bahi*, dated *Kati Vad 2 VS 1821/1764 AD*.

⁴¹⁴ *Sanad Parwana Bahi*, dated *Kati Vad 3 VS 1821/1764 AD*.

⁴¹⁵ *MRPRV*, vol. 2, p. 262.

⁴¹⁶ Ibid., p. 265.

⁴¹⁷ *Sanad Parwana Bahi*, dated *Baisakh Sudi 5 VS 1821/1764 AD*.

⁴¹⁸ *MRPRV*, vol. 2, p. 256.

⁴¹⁹ Ibid., p. 256.

engaged in production of salt.⁴²⁰ It was found after the word '*kharo*' which signifies the salt. Thus, the people who engaged with the *kharo* were called Kharloa. Kharolas mainly lived in or around, the salt producing villages.⁴²¹ Jaisalmer had many salt-marshes (*sar*) formed by the collection of water coming down from sand hills. Kanod-sar was a popular salt lake that covered a space of eighteen miles. Its produce was a source of revenue for the crown.⁴²² Village Muriyaardo was an abandoned village and had the '*lun ra aagar* (mines/lakes for salt production)'.⁴²³ Hamawaas have a '*lun ro aagar*'.⁴²⁴ Bhiwarlaai had rich mine of salt (*lun ri khanghani*).⁴²⁵ Village Mandawaas had one salt mine.⁴²⁶ In middle of village Khokhara, there are five *aagars* of salt.⁴²⁷ Village Khardi had fields for salt production (*lun aagar*).⁴²⁸ The abandoned village Harsiya-heda had twenty *lun aagar* in territory of two *kos*.⁴²⁹ Hasalpur Khurd had the *lun aagar*.⁴³⁰ One *lun aagar* was in Godhelav.⁴³¹ Both Thahar vasani and Panchwo khurd had four *aagars* of salt.⁴³² Village Hungav had two salt *aagars* and they were near river Luni.⁴³³ Village Maihev⁴³⁴ and Baniyawaas kharola⁴³⁵ had *lun ra aagar*, five each. For village Vadiyalo, '*lun ra aagar kare titra hurwai* (any number of salt mines can be dug)' and two mines

⁴²⁰ Ibid., p. 36.

⁴²¹ MRPRV, vol. 2, p. 36.

⁴²² Tod, vol. 2, p. 1247.

⁴²³ MRPRV, vol. 1, p. 257.

⁴²⁴ Ibid., p. 262.

⁴²⁵ Ibid., p. 356.

⁴²⁶ Ibid., p. 360.

⁴²⁷ Ibid., p. 420.

⁴²⁸ Ibid., p. 443.

⁴²⁹ Ibid., p. 444.

⁴³⁰ Ibid., p. 447.

⁴³¹ Ibid., p. 448.

⁴³² Ibid., pp. 450-1.

⁴³³ Ibid., p. 456.

⁴³⁴ Ibid., p. 456.

⁴³⁵ Ibid., p. 474.

were flooded with river water.⁴³⁶ One salt mine each in the villages of Nathalkundi⁴³⁷ and Sobhdawaas.⁴³⁸ The village Godhanli had 200 *aagar* (mines) of good quality salt in the *bera*.⁴³⁹ The salt production and revenue collection from salt have been significant economic activities in the desert. In the decade of 1760, the total personal revenue for princes of Marwar was Rs 16 lakhs, 'one-half of which arose from the salt-lakes alone'.⁴⁴⁰ This amount was actually realized by the treasury. The following are the details of salt mines that were located in seven *parganas* of Jodhpur:

S.No.	Pargana	Number of mines
1.	Jodhpur	141
2.	Medta	13
3.	Jaitrna	Nil
4.	Sojat	55
5.	Siwaan	300-325
6.	Faludi	200
7.	Pokaran	20 beras for salt-production

* Village Pachpadra had 201 salt mines and 40-45 mines of salts in village Gopadi.

In total, there were 709 salt-mines with Jodhpur state. The number of salt mines in *pargana* Pokaran was not mentioned, but from the number of *beras* it can be presumed that a large number of salt fields must have been actively running on the supply of water that was made available into the *kyaris* (inundated fields for filling water to make salt) from these 20 *beras*. In village Pachpadra, the water was collected in the holes-dug in the desert. After four months, salt was procured from these holes that get formed with

⁴³⁶ Ibid., p. 478.

⁴³⁷ Ibid., p. 483.

⁴³⁸ Ibid., p. 486.

⁴³⁹ *MRPRV*, vol. 2, p. 21.

⁴⁴⁰ *Tod*, vol. 2, pp. 1114-5.

the evaporation of water.⁴⁴¹ There were 201 salt-mines in village Pachpadra and the entire produce from these mines was the property of state that generated good amount of revenue.⁴⁴² The salt produced at Pachpadra (Pachbhadra) was of most esteemed quality. It was 'produced by natural evaporation, expedited by dividing the surface into pans by means of mats of the sarkanda grass, which lessens the superficial agitation'.⁴⁴³

Due to salt production, ample economic activities surrounded the Sambhar lake. Its economic significance gets highlighted by the fact that even after granting Didwana to Rathore Kupa Mahrajaot through *patta*, Sambhar was retained under the direct control of Jodhpur state.⁴⁴⁴ Even after general decline in the revenues during the 19th century, the income from salt lakes was most certain. Col. Tod has scheduled the exhibits to indicate at this lucrative source of wealth⁴⁴⁵:

S.No.	Lake	Income	Sale price per maund
1.	Pachbhadra	200,000	Rs. 5
2.	Phalodi	100,000	Rs. 5
3.	Didwana	115,000	Rs. 4
4.	Sambhar	200,000	Rs. 4
5.	Nawa	100,000	Rs. 5
Total		715,000	

Taking revenge on Chander Sen of Jodhpur, Man Singh of Dhundhar looted the *Mahajans* of Pokhran and spoiled the salt mines of Pokhran by filling them with sand.⁴⁴⁶ The *reni* (non-

⁴⁴¹ MRPRV, vol. 2, p. 36. *Paani kyariya mai aawai so jamai* (the water that comes in fields gets deposited and forms salt). *Paani kyariya bharai tin ro lun huwai* (Salt was produced from the water that filled in the fields).

⁴⁴² MRPRV, vol. 2, p. 247.

⁴⁴³ Tod. Vol. 2, p. 1118.

⁴⁴⁴ MRPRV, vol. 2, p. 54.

⁴⁴⁵ Tod, vol. 2, pp. 1117-18.

⁴⁴⁶ MRPRV, vol. 2, p. 295.

fertile lands) in *pargana* Pokhran were used for production of salt.⁴⁴⁷ The salt lakes of Pachbhadra, Didwana and Sambhar were referred to as 'mines of wealth, and their produce is exported over the greater part of Hindustan'.⁴⁴⁸ The Sambhar lake was a major source of revenue. Therefore, the state of Jaipur and Jodhpur constantly canvassed to gain control of this lake. In c.1650, Sambhar Lake was under jurisdiction of Amber kingdom as khalisa land. In same year, Mirza Julkaran was removed from the office of Sambhar and Sheikh Abdul Karim Kirodi was appointed in his place. Instructions for sale of *khari* (salt) were taken and have been shared with the *banjaras* and *jagirdars*.⁴⁴⁹ In another event, the production of salt at Amber halted due to the filling of excess water in salt plots. This miss in the production of salt made the *banjars* to return. The instructions were issued for production of new salt, furtherance of arrangements for carts, labour and for calling the traders (*banjaras*).⁴⁵⁰ The turmoil caused by Hidayatullah also discouraged the *banjaras* from collecting the salt and that caused a dip in the revenue. Diwan Ram Chand was deputed by the court to manoeuvre the *banjaras*.⁴⁵¹ Nearly after a month, officials were sent to locate and call the *banjaras* for collection of salt.⁴⁵² After death of Ishwari Singh, Rathor Ram Singh lost his support and 'accepted the Marwar share of the Salt Lake of Sambhar, and Jaipur relinquishing the other half'.⁴⁵³ In c.1720, to assert his independence and authority against the Mughals, the king of Jodhpur-Ajit Singh, 'took possession of salt lakes of Sambhar and Didwana' after seizing the fort of Taragarh.⁴⁵⁴

⁴⁴⁷ Ibid., p. 316.

⁴⁴⁸ Tod, vol. 2, p. 1107.

⁴⁴⁹ *Arzdasht*, dated *Sawan sudi 7 VS 1750/1693 AD*.

⁴⁵⁰ *Arzdasht*, dated *Kati budi 3* and *Kati sudi 1 VS 1766/1709 AD*.

Both the *Arzdashts* were written by Nain Sukh.

⁴⁵¹ *Arzdasht* written by Nain Sukh, dated *Mangsir sudi 15 VS 1766/1709 AD*.

⁴⁵² *Arzdasht* written by Nain Sukh, dated *Posh budi 7 VS 1766/1709 AD*.

⁴⁵³ Tod, vol. 2, p. 874.

⁴⁵⁴ Ibid., p. 1026.

Chhappar, Lunkaransar and Sar were sources of salt production for state of Bikaner, however their produce was considered of inferior quality in comparison of Marwar lakes.⁴⁵⁵ All the above evidences point at the ample salt production activities that were carried out in the Thar Desert. Politically, active states were always canvassing and contesting to get more and more share in this produce. As this was a rich and regular source of revenue so the states were also making logistics arrangements to ensure the export of salt.

The significance of drought animals for the people living in the arid and semi-arid regions has been discussed earlier. Besides these, the Thar Desert also offers a large variety of wildlife. The ruling elites often went on the hunting expeditions, either to practice the war skills, or to spend leisure time. The Amber prince went for *shikar*.⁴⁵⁶ *Arzdashts* were written to Mirza Raja Jai Singh reporting the regular hunting excursions of two *maha-rajkumars* (princes).⁴⁵⁷ In the year 1684 AD, Ganga Ram reported to Raja Ram Singh about the joint-hunting excursions of Nawab Amir Khan and *Kuwar*.⁴⁵⁸ Next year Amber prince went for hunting with Umdat-ul-Mulk.⁴⁵⁹ Bishan Singh was also informed that *Kumar* often goes for hunting.⁴⁶⁰ Lot of wild animals were available around the *pargana* of Faludi.⁴⁶¹ In the 12th century the lions were the great enemies to the repose of Paliwal Brahmans inhabiting Pali that made them to invite Siahji to whom they finally lost their land.⁴⁶² Here, it seems that lions were lesser foe! The hunting grounds of the *pargana* Medta was towards the Pinrupji *bhakar*.

⁴⁵⁵ Ibid., p. 1153.

⁴⁵⁶ *Arzdasht*, dated *Posh sudi* 12, VS 1701/1644 AD.

⁴⁵⁷ *Arzdasht*, dated *Fagun sudi* 4 VS 1702/1645 AD and *Fagun sudi* 2 VS 1703/1646 AD written by Raj Singh and Kisan Singh respectively.

⁴⁵⁸ *Arzdasht* written by Ganga Ram, dated *Phalgun sudi* 3 & 5 VS 1740/1684 AD.

⁴⁵⁹ *Arzdasht* written by Hardatta Bakhsh to Raja Ram Singh, dated 11 *Rabi-ul-Awwal* AH 1096/5 February 1685 AD.

⁴⁶⁰ *Arzdasht* written by Shiv Singh Kumbhani, dated *Kartik sudi* 11 VS 1755/1698 AD.

⁴⁶¹ *MRPRV*, vol. 2, p. 50.

⁴⁶² Tod, vol. 2, p. 812.

Rana Udai Singh went towards the hill to engage in hunting exercise.⁴⁶³ The abundance of wildlife around Bhatner (in Bikaner state) pushed Col. Tod to suggest 'the physiologist, when tired of the habits of man, may descend from the nobler animal to the lion, the wild ass, every kind of deer, the flocks of sheep which fed on the succulent grasses, touch not water for six weeks together'.⁴⁶⁴ There was abundance of the *sal-sikaar* on the banks of Sabarmati.⁴⁶⁵ Around the banks of Luni, fox hunting was a popular sport till the 19th century.⁴⁶⁶ The wildlife common with rest of India was also available in the desert along with the presence of tiger, fox, jackal, hare and lion.⁴⁶⁷

The dogs were employed for chasing the hunts. The constant demand for trained hunt chasing dogs led to the emergence of professional trainers and breeders. In 1693 AD, Miyan Panna wrote a letter to Thakur Hari Singh instructing him that Maharaja wants some doges to be brought from Udai Ram of Lawniwala, as he had large herd and he can afford to part away with some.⁴⁶⁸ Later in the same year, Haibat Khan informed that he has brought five dogs and a falcon for Amber king from Udai Ram.⁴⁶⁹ In the second decade of the 19th century, around Mandor, the companions of Col. Tod, Captain Waugh and Major Gough conducted a successful chase of an antelope with the aid of Rohilla greyhounds. The whole carcass of antelope was covered with a large, inert, amorphous white maggot as confirmed to them by the cuisinier.⁴⁷⁰ Around Bikaner, *nilgai*, large variety of deers, desert fox, jackals and hyenas were available in plentiful. Even lions were not unknown.⁴⁷¹ The orders given by Rawal Lakhansen in the 13th century for making *daglas*

⁴⁶³ *MRPRV*, vol. 2, p. 69.

⁴⁶⁴ Tod, vol. 2, p. 1167.

⁴⁶⁵ *MRPRV*, vol. 2, p. 71.

⁴⁶⁶ Tod, vol. 2, p. 890. The foxes were called *jirakh* in Marwari language. Even today the term is in use.

⁴⁶⁷ Tod, vol. 3, p. 1306.

⁴⁶⁸ *Khatut Abalkaran*, dated *Bhadrapada Sudi 7*, VS 1750/1693 AD.

⁴⁶⁹ *Khatut Abalkaran*, dated *Kartik Badi 2* VS 1750/1693 AD.

⁴⁷⁰ Tod, vol. 2, p. 834.

⁴⁷¹ *Ibid.*, p. 1154.

(quilted dresses) flowed with the command to built houses for the jackals in royal preserves of Jaisalmer were enormous for calling him a great simpleton!⁴⁷² An idea about the abundance of the tiger population in the territories of desert can be attained from the number of animals shot by certain individuals. 'Rice (1857) shot or wounded 158 tigers, including 31 cubs, in Rajasthan between 1850 and 1854'.⁴⁷³ Maharaja of Udaipur shot at least 1000 tigers during his lifetime (ksingh 1959). Amar Singh had independent charge of Nagaur, 'hunting the boar or the tigers was his only recreation'.⁴⁷⁴

The wild animals were also objects for gifting. Large variety of wildlife was available in the hills of *gasba* Awari, Ramgarh and Achrol. On the instructions of Piragdas, a pair of chital was entrapped in order to send them across to Mirza Raja Jai Singh. As no instructions came from king so the pair was set free in the hills.⁴⁷⁵ Nawab Asafjahan wanted a *nabri* (lioness). He placed this demand to the Amber state. In response, the Amber state conveyed its wish of providing the raised demand and its arrangements were informed.⁴⁷⁶ Afzal Khattak sent two hawks to Amber king Ram Singh as present.⁴⁷⁷ A *cheetah* (leopard) came on the way of *mauja* Sithwani and was caught by the *chaukidars*. The *cheetah* was young and in good health. An *arzdasht* was written to Raja Bishan Singh to request for the orders regarding the animal.⁴⁷⁸ A white deer and a female chinkara were received at Amber and were sent to

⁴⁷² Ibid., p. 1210.

⁴⁷³ Schaller, George B., *The Deer and The Tiger: A Study of Wildlife in India*, The University of Chicago Press, Chicago and London, 1967, p. 226.

⁴⁷⁴ Tod, vol. 2, p. 976.

⁴⁷⁵ *Arzdasht* written by Ramsahai Prithimal, dated *Bhadarpad badi* 5, VS 1696/1639 AD.

⁴⁷⁶ *Arzdasht* written by Raghunath Kesodas, dated *Bhadarpad sudi* 11 VS 1698/1641 AD.

⁴⁷⁷ *Arzdasht* written by Afzal Khattak, dated 20 *Rabi-ul-Awwal* 1094 AH/1683 AD.

⁴⁷⁸ *Arzdasht* written by Kisordas, dated *Mangsir budi* 13 VS 1754/1697 AD.

Jai Singh. The female chinkara gave birth to calf during the travel. Four Meenas were deputed for transporting the animals and Rs. 44.1 anna, 2 paisa were allotted to them for en route expenses.⁴⁷⁹ In 1684 AD, request was made for two deer that were required for leopard (*Baoly*).⁴⁸⁰ These types of control over and regulation of the wildlife and hunting excursion were means to display the political power. The games were organized in closed arenas. These were means of entertainment and ways to settle the issues of prestige. The sarcasm of Abhai Singh (Jodhpur King) towards Jai Singh and its befitting reply by the later through a trick, took toll of life on an enormously bulky buffalo, 'fed in the luxuriant pastures of Hariana'.⁴⁸¹ Thus, proving that the sacrifice of animals and hunting exercises were means to display the political authority and power in the disguise of fine-tuning the war skills.

The abundance of wildlife in the desert of Thar, interiors of Marwar (Jodhpur) and Dhundhar (Amber-Jaipur) is evident through a careful study of revenue records and court chronicles. The Thar Desert had various imperial hunting grounds that further prove it. The efforts initiated by the Amber state to protect the wildlife and forest constantly appear in *arzdashts*. The engagements of imperial forces in the hunting-excursions in environs of the Thar were recorded by Jahangir in his memoirs: 'I was employed in hunting in the environs of Ajmir...'.⁴⁸² 'Cheetahs were found in west Punjab in Lakhi jungle on the northern bank of Sutlej, and in the territories of Pattan, Bhatnair, Bhatinda and Sunam, where imperial hunting grounds were located. The other localities of cheetahs in Rajasthan were the scrub in close proximity of rocky regions or desert at Jodhpur, Merta, Nagaur, Jhunjhunu and Amarsar'.⁴⁸³ Being mesmerized by the abundance

⁴⁷⁹ *Arzdasht* written by Purohit Harshram, dated *Baisakh sudi* 6 VS 1759/1702 AD.

⁴⁸⁰ *Arzdasht* written by Rai Man Singh, dated 25 *Zilbijja* AH 1095/ 23 November 1684 AD.

⁴⁸¹ Tod, vol. 2, p. 1053.

⁴⁸² Tod, vol. 1, p. 420.

⁴⁸³ Moosvi, Shireen, *People, Taxation and Trade in Mughal India*, Oxford University Press, Delhi, 2008, pp.97-98.

of flora and fauna in Aravalli ranges, Tod suggested, 'In short, I know no portion of the globe which would yield to the scientific traveler more abundant materials for observation than the alpine Aravalli. The architectural antiquary might fill his portfolio, and natural history would receive additions to her page in every department, and especially in botany and zoology. I should know no higher gratification than to be of a scientific party to anatomize completely this important portion of India. I would commence on the Gujarat, and finish on the Shaikhawat frontier. The party should consist of a skilful surveyor, to lay down on a large scale a topographical chart of mountains; several gentlemen thoroughly versed in natural history...to transcribe ancient inscriptions as well as to depict the various races. The "Aravalli delineated," by the hand of science, would form a most interactive and delightful work'.⁴⁸⁴

Even now, western Rajasthan is a stronghold of the black buck in India. Nearly 50 years ago, Schaller wrote, 'According to K.Sankhala and Prakash they are still found sporadically in the isolated semi-desert parts of Jodhpur, Bikaner, Jaisalmer, Jhalore and other districts, especially where protected by Maharajas or by locals villagers. In the heavily populated eastern parts of the state, the species has been almost wiped out, with only a few small herds surviving; the 70 animals in the Keoladeo Ghana Sanctuary may be the largest of these'.⁴⁸⁵ On similar lines, 'in Aravalli hills between Ajmer and Idar, the tiger population is said to have reduced from more than 150 to perhaps 10 in the recent years. As recently as May, 1964, however, a maharaja was able to shoot 6 tigers in two weeks'.⁴⁸⁶ All these instances clearly highlight the richness of wildlife in the Thar Desert that has been destroyed over the centuries, due to human interventions. In year 2019, I was lucky to see a few herds of black-bucks, chinkaras, Great Indian

⁴⁸⁴ Tod, vol. 2, p. 790.

⁴⁸⁵ Schaller, George B., *The Deer and The Tiger: A Study of wildlife in India*, pp. 152-3.

⁴⁸⁶ *Ibid*, p. 227.

Bustard, desert foxes, desert cats and birds of various species in the deserts of Jaisalmer during the month of February.

The fine quality of many resources available in the Thar Desert has defined the economic life of its inhabitants. Typically brownish and thorny surroundings of Jodhpur indicate to a dry land. Deposits of various kinds of stones are keeping the moisture of soil low. These deposits allow the water to run soon on surface, even with a little rainfall. The sand deposits of the Jaisalmer are a mix of granules of volcanic rocks of different hues and textures, with occasional vegetation of *phog* and cotton-wood plants. The large and huge sand dunes around Bramer without any vegetation are indicators of welcome into the neat ocean of sand. At times the dunes of fine sand particles found in Bikaner support vegetation. Nearly, entire Thar desert have various types of under-earth deposits like fuller earth, marble, granite etc. Foots of the Aravalli are very rich in the deposits of stones and minerals. Large stone deposits in Thar Desert were pushing its economy to next level. Village Paadardi of pargana Siwan had stone-mines.⁴⁸⁷ Tod travelled from Udaipur to Marwar. His travel notes have details of nearly all the things, persons and objects that he encountered en route. On October 11, 1819, the entry into the region of Marwar was 'change...from all that constitutes the enchantments of vision, from wood and water, dale and mountain, verdure and foliage, to the sterile plains of the sandy desert of Marwar, it was sufficient that it was change'.⁴⁸⁸ The villages of Merta and Tus which were chosen spots for pitching the tents before entry into 'the region of death'⁴⁸⁹ (the region had a traumatic effect over the psychology of Col. Tod, as he constantly used this particular term for defining the region of dry Thar) where the 'granite barriers of the valley'⁴⁹⁰ formed the fringes. The hills around Nathdwara 'composed of a brown granite intersected with protruding veins

⁴⁸⁷ *MRPRV*, vol. 2, p. 254.

⁴⁸⁸ Tod, vol. 2, p. 761.

⁴⁸⁹ *Ibid.*, pp. 763, 786, 810, 820, 894.

⁴⁹⁰ *Ibid.*, p. 762.

of quartz, incumbent on blue compact slate'.⁴⁹¹ The entry into the sandy deserts and chaotic mass of mountains covered with cactus luxuriated amidst the rocks of Aravalli⁴⁹² and the frontiers of Marwar made a magnificent scenery with 'mountains rising on each side in every variety of form and their summits...masses of rose-coloured quartz'.⁴⁹³ 'the quarries of Aravalli...are rich in every mineral as well as metallic production'.⁴⁹⁴ The deposits of deep rose-coloured quartz and grayish granite were in the mountains of Pushkar.⁴⁹⁵ The sand *tibas* (dunes) of Pushkar are embedded in the legends which are constantly repeated to confirm the sanctity of this township. The marble quarries of Makrana (Dist. Nagaur) yielded considerable revenue and the splendid edifices of palaces, mosques and tombs in Delhi and Agra owe their grandeur to Makrana marble!⁴⁹⁶

Town Pipar had abundance of wells. In these wells, water was attainable only after 60 to 80 ft, in which the first 20 ft were composed of earth called *dhamani*, [a mixture of decomposed sandstone with black earth and stratum of bluish clay mixed with particles of quartz (called *morar/morand*)], then for 30 ft cut through red granite rock which was succeeded by stalactitic concentration of sand-stone and quartz.⁴⁹⁷ Around Indawar, quartz, sandrock, sand stone, mica and calcareous cement were available in abundance.⁴⁹⁸ Around Ajmer, brilliant deposits of minerals and stones were found. 'Granite appeared of every hue...a fine field for mineralogists; on each side high over the pass, rise peaks of reddish granite...reposing on a blue micaceous slate,...slate there is more compact freer from mica and quartz...black marble; its crystals were large and brilliant'.⁴⁹⁹ Taragarh hill had rich deposits of lead,

⁴⁹¹ Ibid., p. 769.

⁴⁹² Ibid., p. 779.

⁴⁹³ Ibid., p. 786.

⁴⁹⁴ Ibid., p. 898.

⁴⁹⁵ Ibid., p. 891.

⁴⁹⁶ Ibid., p. 1107.

⁴⁹⁷ Ibid., p. 852.

⁴⁹⁸ Ibid., p. 855.

⁴⁹⁹ Ibid., p. 895.

iron, mica and copper and here the quarrying activities started in the beginning of the nineteenth century as confirmed by Col. Tod: 'Superintendent's were unlocking the latent treasure in the bowls of the mountain. The vein is of lead; a sulphuret, or galena'.⁵⁰⁰ These deposits don't free the Aravalli and its surroundings from the desert and sand, 'the higher we ascended the valley, the loftier became the sand-hills, which appeared to aspire to the altitude of their granitic neighbours'.⁵⁰¹ Now, these sand hills are no more visible around the township of Ajmer. Most of these dunes have exhausted to the constant building and quarrying activities. Sojat had deposits of tin and lead, whereas Pali was known for alum deposits.⁵⁰² Large quantities of unctuous clay (fuller earth or *multani mitti*) were excavated from a pit near Kolait for export that added Rs 1500 to the treasury of Bikaner annually.⁵⁰³ Fuller earth was also obtained from village Mandhav Nahdai of *pargana* Dewa. It was carried to Sindh and Punjab by the *banjaras* after paying a *rahdari* of one *anna*. It was also excavated at *pargana* Khas, village Makkai (*pargana* Fatehgarh), Bhoj (*pargana* Jaisalmer) and Khudi (*pargana* Khambha). It was used for washing hairs and was applied on *chanda* of camels and horses.⁵⁰⁴ Many other types of soils (*pili-mitti*, *lal-geru*, *mitha-chuna*) were also available that were used for making and levelling houses and decorative purposes. Availability of coal in *mauja* Hamira was confirmed.⁵⁰⁵ Large varieties of stone deposits were major source that were adding to the revenues of states. The constant mining has destroyed the Aravalli ranges and in the long run, it has taken a toll on the natural vegetation and wildlife species.

Another major source of income for desert states was horse-breeding. Various horse-breeding grounds were located in the

⁵⁰⁰ Ibid., p. 901. The lead of Taragarh hill was purer than European pig lead as confirmed by Watson.

⁵⁰¹ Ibid., p. 895.

⁵⁰² Ibid., p. 1108.

⁵⁰³ Ibid., p. 1154.

⁵⁰⁴ *Tawarikh Jaisalmer*, p. 202.

⁵⁰⁵ Ibid, pp. 203-4.

midst of desert. It indicates that good breeds of horses were available in the desert of Thar and its environment was conducive for horse-breeding. Kalawaas (*pargana* Jodhpur) had good fertile fields but it was devoid of any facilities for rabi crops. Thus, the economy of this village was entirely dependent on the horse-breeding as '*ghoda sakhra ghodiya chrae* (horses of good-breed and freely grazing mares produce good calves)'.⁵⁰⁶ The entire economy of Sahaniya ri waasani was dependent on *ghoda mukre chute* (good horses are produced).⁵⁰⁷ Village Nehwai of *pargana* Siwan was famous for producing good horses.⁵⁰⁸ Horses from Multan and Lakhi Jungle were chief attraction at animal fairs of Gajner and Kolait in Bikaner.⁵⁰⁹ Lakhi Jungle in India was well-known for its celebrated breed of horses that became extinct by the beginning of the 19th century.⁵¹⁰ A horse market was functional in *pargana* Pokhran.⁵¹¹ Around Pali, Col. Tod meet his old friend, Gough, who was 'rambling to the south-west amongst Sahariys, Khosas, and all the wild beings of these uncivilized tracts, in search of new breeds of horses'.⁵¹² Horses breded in *pargana* Dewa were beautiful and in originality were of Ajhad breed that was popular for speed, robustness and strength.⁵¹³ Good horses were produced in *ghoda ka khet* (breeding-grounds) of Ahalajulkayaas, Khueyala, Harrajsar, Khariga and Uparla.⁵¹⁴ *Johad* Uprla in *pargana* Dewa of Jaisalmer was exclusively meant for grazing horses. At times the grasses were not sufficient, so liaison with other pastures were

⁵⁰⁶ MRPRV, vol. 1, p. 354.

⁵⁰⁷ Ibid., p. 362.

⁵⁰⁸ Ibid., vol. 2, p. 248. *Ghodiya chai, taiyara bachera nipat sakhra huwai chai* (there were mares and they produce good calves).

⁵⁰⁹ Tod, vol. 2, p. 1156.

⁵¹⁰ Ibid., p. 1184.

⁵¹¹ MRPRV, vol. 2, p. 302. *Thakur aswaar 200 tha so ghoda to pobokaran rai bazaar haat maabe vaadha.* (There were 200 cavalry men with Thakur so they tied their horses in the horse market at shopping complex of Pokhran).

⁵¹² Tod, vol. 2, p. 814.

⁵¹³ *Tawarikh Jaisalmer*, p. 222.

⁵¹⁴ Ibid, p. 222.

made. *Johad* of village Basnapi (pargana Jaisalmer) was exclusively used by Thakurs of village Lathi and Lanola for grazing and breeding horses.⁵¹⁵ Good speed and strength of the horses that were bred at village Dewa of *pargana* Jaisalmer can be analysed from the incident that one mare from the *khet* (breeding ground) of *pargana* Dewa was taken by Purohit Indraj to Jodhpur to compete with the horse of Maharaja Shri Partap Singh, on a bet of Rs. 400. The mare ran 42 miles in 90 minutes and reached Pali. The commendation of mare was published in Report Jodhpur.⁵¹⁶ All these instances indicate that in the Thar Desert horse-breeding was carried out on large scale. The engagement of Thakurs in this profession suggests that breeding was a respectable occupation.

The accomplishments of *silotri-shastra* (science for treating equestrian) were popular in the dry land of Thar. Thus, horses were brought to its breeding grounds for treatment. In 1684 AD Ghaji Khan sent his ill horse to Amber king Ram Singh for securing treatment from latter's veterinary doctors and to know the disease from which his horse was suffering.⁵¹⁷ Malik Ghaji requested treatment for his horse by writing a letter to Ram Singh.⁵¹⁸ A manuscript of *silotri shastra* is available at Mahrangarh Fort (Jodhpur). It gives details for identifying diseases by observing the behaviour of animals. Further, as per the diseases it provides the list of treating ingredients and the methods for preparing different medicinal compositions. With this it can be proposed that the evolution of breeding paved way for this kind of deep engagement in the veterinary sciences which became possible due to the climatic conditions provided by the desert of Thar.

Similarly, camel and its industry became a blue star for the states located in desert. The use of camel in the battles was well established in the region of Thar. In the fight between Rao's

⁵¹⁵ *Tawarikh Jaisalmer*, pp. 220-1.

⁵¹⁶ *Ibid.*, p. 222.

⁵¹⁷ *Arzdasht* written by Ghaji Khan, dated 14 *Safar* AH 1095/22 January 1684 AD.

⁵¹⁸ *Arzdasht* written by Malik Ghaji, dated 8 *Shawwal* AH 1095/8 September 1684 AD.

and Bhatti's, camels were used.⁵¹⁹ At Mallinath (Barmer) great numbers of best camels were reared that had a ready market in every part of India.⁵²⁰ The village Khaltsar (pargana Pokhran) was abandoned by the Khalats, who received it during the reign of Rawal Bhiv. After this abandonment, it was allotted to Jeto Mahar who served by riding camel.⁵²¹ Sohad Golku Madhawat was also 'unt chadiyo chakari kar (serving by riding camel/service as camel-driver)'.⁵²² Camels were used in region of Bikaner to trodden out the moth.⁵²³ The camels of Bikaner are beautifully formed as their head possesses much blood and symmetry. These camels are especially used for expedition and the saddles were of high price.⁵²⁴ In between Barmer and Nagar-Gurha, on the banks of Luni there was a *thal* containing deep forest of *khair*, *khejra*, *khep*, *phog*. The excellent pastures for camels on the southern tract of Nagar Guha produced good breeds of dromedaries in the desert.⁵²⁵ Best breeds of camels were produced in *thal* of Dhat and Barmer. Many villages in *pargana* Siwan had Rebari community along with the small population of Rajputs and Patels. The members of Rebari community reared camels. Siwan (located between river Luni and Sukri) was famous for camel and horse husbandry. The *haats* of the cows and oxens were organized by Jaisalmer state. Camels breded in *pargana* Sahgarh of Jaisalmer were the finest breed. Besides Sahgarh, the camels breded at Skari and Bishnoiy ki Sedho were known for their beauty, height and fastness in action.⁵²⁶ They were reputed for good speed. During the reign of Mahraja Gaj Singh a camel named Kokwaan went from Jaisalmer to Jodhpur (140

⁵¹⁹ *MRPRV*, vol. 2, p. 4.

⁵²⁰ Tod, vol. 3, p. 1273.

⁵²¹ *MRPRV*, vol. 2, p. 337. Serving by riding the camel means that the person was either working as transporter for the state or was delivering the imperial messages to the far flung regions of the desert.

⁵²² *MRPRV*, vol. 2, p. 334.

⁵²³ Tod, vol. 2, p. 1152.

⁵²⁴ *Ibid.*, p. 1154.

⁵²⁵ Tod, vol. 3, p. 1275.

⁵²⁶ *Tawarikh Jaisalmer*, p. 222.

miles/224 kms) in four *pabras* (16 hours).⁵²⁷ In general the camels of Jaisalmer were used for riding purposes as they can commute or go upto 44 *kos* in four to five hours. Their fast speed increased their sale. Traders came from Sindh and other distant lands to buy them.

Besides the breeding of horses and camels, animal fairs were also an important means for the desert state to earn revenue. The states located in the desert organized various animal fairs. At the Ramdehra shrine (*pargana* Pokhran), two fairs were organized annually. It helped in generating Rs. 5000 as revenue.⁵²⁸ The fair organized at Ramdeora in the month of *Bhadon* attracted merchants from Karachi-bandar, Tatta, Multan, Shikarpur and Cutch, to exchange produces and sell horses, camel and oxen in great number.⁵²⁹ The animal fair of Kaparda held for 15 days, beginning on the 1st of the month of *Chait*. So, the letters offering promises: ensuring 50 per cent off in taxes; protection and security on routes in the territories of state; safety of the eatables and animals (horses, camel and bullocks), were extended to the Mahajan traders of Nagur, Medta, Jalore, Sojat, Parbatsar, Didwana, Sanchor, Jaitrana, Ghaneraw, Sahrura, Sadadi, Raighanpur, Bagadi, Harsod, Phalodi, Jhunjhunu, Chanod, Ajmer, Bhinmal, Palanpur, Bikaner, Bhairundo, Fatehpur, Maroth, Amarraipur, Thirad, Vaay, Vilado, Balotro, Kekakdi, Sehroi, Sambhar, Bhilado, Visal-nagar, Churu, Nohar, Bhanay and Taal.⁵³⁰ The two annual animal fairs at Mundwa (in month of *Magh*) and Balotra⁵³¹ that sold horses, oxen and camel were functional even in 19th century.⁵³² The state of Bikaner organized two cattle fairs in the months of *Karttik* and *Phalgun* at towns of Kolait and Gajner, respectively. These were celebrated destinations chiefly for procuring the

⁵²⁷ *Tawarikh Jaisalmer*, pp. 221-2.

⁵²⁸ *MRPRV*, vol. 2, pp. 323 & 308.

⁵²⁹ *Tod*, vol. 3, p. 1272.

⁵³⁰ *Sanad Parwana Bahi, Mah sud* 6 VS 1821/1764 AD.

⁵³¹ *Tod*, vol. 3, p. 1270.

⁵³² *Tod*, vol. 2, p. 1111. See Erskine vol. 3, pp. 206 & 208.

produce of desert like camel, kine and horses.⁵³³ Besides these fairs, regular markets were also actively selling animals. In 1764 AD, Maharaja Vijay Singh of Jodhpur ordered for giving four male calves (*bin nathiya*-uncastrated) to Mangaliya Natha from the *haat* of Ladnu.⁵³⁴ Many such cattle fairs still form the base of rural and urban economy. Besides, the major cattle fairs at Tilwara, Gugaji-ka-than, Bikaner, Tejaji-ka-mela, Pushakar etc. fourteen cattle fairs were organized only in Ajmer at Baghera, Bandanwara, Bhinai, Bijainagar, Deogaon, Hingonia, Kekri, Kharwa, Lamana, Madanganj, Roopnagar, Sampla, Sarwar, and Tilonia.⁵³⁵ These animal fairs channelized the sale and supply of the Thar animals into the nearby and distant regions, making some of its breeds popular, hence sought after!

In vs 1640, Mota Raja (Jodhpur) got land assignment at Sojat from Nawab of Nagaur. To take charge, raja came to Nagaur. During this exchange, the *Rajlok* of Neto Rao Rai Singh was at Sojat. Thus, they were shifted to Jodhpur along with the miscellaneous staff.⁵³⁶ The town of Sojat was famous for trade activities. It was one of the most popular exchange centres with a functional *hatt* and *bazaar* that supplied the items imported in the desert. The presence of Laxmi-Narayan Mandir in Sojat is another indication of its active trading engagements. The total count of houses in Sojat city during 1659 AD was 2,244. Out of these 738 houses were of Mahajans.⁵³⁷ From these numbers it is evident that Sojat city was a prolific centre of fiscal activities and trade. In total there were 16 temples in the city. Out of which eight were dedicated to Jainism. Out of other eight, three were of Vishnu (Shree Chaturbhujji, Laxmi-narayanji and Mul-nayakji) and five were of lord Shiva

⁵³³ Tod, vol. 2, pp. 1155-6.

⁵³⁴ *Sanad Parwana Bahi, Posh vad 13 & 14 Friday VS 1821/1764 AD.*

⁵³⁵ Lodrick, Deryck O., 'A Cattle Fair in Rajasthan: The Kharwa Mela', *Current Anthropology*, University of Chicago Press, Vol. 25, No. 2 (April 1984), pp. 218-225.

⁵³⁶ *MRPRV*, vol. 1, p. 89.

⁵³⁷ *Ibid.*, p. 391.

(Pataleshwarji, Jogesur, Neelkanth, Sureshwur and Kapalesurji). The soil track of city was sweet (not salty), therefore gardens and orchids (*baagh-badi*) were planted. Plantation of mango and sugarcane were popular.⁵³⁸ The distribution of communities in the desert settlements helps to identify the significance of those respective regions. The *pargana* Faludi got its name from Faludi, a daughter of Brahman Phalu.⁵³⁹ In Faludi, the total number of houses was 636, out of which 242 houses were of Mahajans (121-Oswals and 121-Maheshwaris).⁵⁴⁰ Thus, it hints that in Faludi, trading was the main economic activity.

It has been discussed above that ample arrangements for water harvesting were made. Its aim was to provide sufficient water to the groups in transit and inhabitants, for their onward journeys and regular requirements, respectively. Vaghelav tank was important as it had two *barwadis* inside it. Water of Reidmelav tank was sufficient for six to eight months. Baghelav was a good tank with many *chattris* over it and its water was sufficient for four months. Arrangements for digging Hanwant Nadi were made by Shrimali Gadga. Pabu Nadi and *Nadi* Neebali had *beri* inside. In village Pachpadra (*pargana* Pokhran), there were three good *naddis* that retained water for eight months.⁵⁴¹ Water in Siwano talab was sufficient for four months. Kapadiyo held water for four months.⁵⁴² In total, there were 10 tanks in the city of Sojat. The city had two *arhats*, one with *atut pani* (unbroken supply of water) was located at Pavta. Thus, *sara sehar ri mand Pavta upar* (population of entire city was depending on the *arhat* of Pavta). Two *oris*, one *saal*, one *haud* (small tank) and one *pavti* with lot of water were other sources of water. Rivers Sukhadi and Giladi both meet at the entry of city Sojat. The water of these rivers was mostly brackish and at some places it was sweet. Possibility of putting up *chanch* and *arhat* on the bank of these rivers was very high. Thus,

⁵³⁸ Ibid., p. 394.

⁵³⁹ Ibid., vol. 2, p. 1.

⁵⁴⁰ Ibid., p. 9.

⁵⁴¹ Ibid., 2, p. 328.

⁵⁴² *MRPRV*, vol. 1, pp. 392-3.

the city of Sojat didn't have acute scarcity of water.⁵⁴³ The features that indicate strained environment were not working as deterrent for the settling communities. Hence, the city of Sojat along with its adjoining areas continued to flourish!

During the 15th century (c.1448) Chachakdeo Rawal offered protection to Janjua Rajput against Birjang Rathor of Satalmer. This act laid the foundation of trading and business activities in Jaisalmer. Satalmer was an abode of wealthy merchants and its forays were spread far into desert. Chachak through a surprise attack confiscated the encamped horses and citizens of Satalmer. Their release was denied even on offer of large sum ransom. The hostages (merchant and inhabitants) shall settle in the territory of Jaisalmer was the only condition that was put forward for their release. This condition was accepted by 360 families and this event dates the influx of wealth in Jaisalmer.⁵⁴⁴ Much of Jaisalmer was 'a desert waste', which was called *thal* or *rui* with lofty *tibas* and low jungle. The rock ridge (*magra*) is the most important part of this region as 'rocks of Jurassic age, such as sandstone, shales and limestone, crop up beneath the sand and a large area of Nummulitic rock occurs to the N.W. of the capital'.⁵⁴⁵ Commercial activities were the basis of liberty in the dry desert land and 'even despotism is compelled to leave it unrestrained'.⁵⁴⁶ In the 19th century, Salim Singh of Jaisalmer exploited his official powers immensely. He fell from the advantages and couldn't gain back the confidence of the outraged ones. For him Col. Tod notes, 'with commercial men, with the industrious husbandman or pastoral communities... forfeited all claim to credit, that his oath was not valued at a single grain of the sand of their own desert dominion'.⁵⁴⁷ These instances prove that Jaisalmer gained prominence as a trade centre.

A close perusal of the villages of pargana Medta helps to identify that this entire territory had sufficient water that was

⁵⁴³ Ibid., pp. 393-4.

⁵⁴⁴ Tod, vol. 2, p. 1221.

⁵⁴⁵ Ibid., p. 1246.

⁵⁴⁶ Ibid., p. 812.

⁵⁴⁷ Ibid., p. 1240.

obtained from rain pour. Rain water was mainly used for producing wheat and gram. At times, mustard (*sarsu*) was also sown.⁵⁴⁸ All three crops qualify as *sewaj*. The lifting of rain water was made possible through *kosita*.⁵⁴⁹ Fields of more than thirty villages ranging from 100 to 1500 *bighas* were located in the dunes. All the fields had ample production of the *sewaj* (wheat and gram).⁵⁵⁰ Village Vedavadi didn't had *sejo*, whereas *sewaj* of wheat and gram was in 1000 *bighas*.⁵⁵¹ The fields of village Gogardo were big and located midst of desert. It was producing wheat and gram as *sewaj* in 2000 *bighas*.⁵⁵² Rahan Khass had good fields surrounded by the dunes, in *sewaj* wheat and *chana* were produced in 2500 to 3000 *bighas*.⁵⁵³

Pargana Pokhran was known as Satalmir in the documents of the Mughal court.⁵⁵⁴ Besides various produces that were indigenous to the Thar desert, a large variety of goods were imported by the trading communities. In Pokhran, the *Mahajans* (Oswals & Maheshwaris) executed the trading activities. They were crucial for the state as executors of trade and revenue paying subjects. The activities of the traders were crucial for the intense desert areas, as some of the desert areas were the connecting links between the North-Western Frontiers that paved way into Sindh and further to Central Asia and vice-a-versa. The tax was collected on ivory, silk, kasturi, camphor, brass (*tamba*), *kansi*, *pital*, *jasad*, *siso*, *katbeer*, *garee*, *narel*, *mirch*, *papal*, *majeeth*, *hing*, *sukhado*, *tel*, *misri*, *guli*, *khad*, *sut*, *sunth*, *pipalamul*, *dhirat*, *gul*, *tel*, *rub*, *loha*, *lac*, *jira*, *anjavi*, *sova*, *dhana*, *birali*, *halad*, *maithi*, *raai*, *sarso*, *alsi*, *til*, *munj*, *saji*, *kabada*, *doda*, *kubada* in *pargana* Pokhran.⁵⁵⁵ The fourth share

⁵⁴⁸ *MRPRV*, vol. 2, pp. 129-141.

⁵⁴⁹ *Ibid.*, p. 120. 200 *kositas* were working in each village, namely Anadpur Khass, Kekidar, Lambiya, Bhawal. Village Rohiso had 130 *kosita*.

⁵⁵⁰ *Ibid.*, pp. 129-145.

⁵⁵¹ *Ibid.*, p. 142.

⁵⁵² *Ibid.*, p. 144.

⁵⁵³ *Ibid.*, p. 153.

⁵⁵⁴ *Ibid.*, p. 356.

⁵⁵⁵ *MRPRV*, vol. 2, pp. 325-6.

was collected on the agricultural produce of vegetables, tobacco, onions and jiku.⁵⁵⁶ Different rate of taxes were applied on the different categories as per their availability, nature of accessibility and luxury statement.

Since ancient times Pali was significant as a region of commerce. The geographical position of Pali made it a happy site. Col. Tod, called Pali 'emporium of Rajputana'.⁵⁵⁷ With his illustrations the commercial vitality of this town can be understood better:

'Pali, like Bhilwara, Jhalrapatan, Rani and other marts, enjoys the right of electing its own magistrates, both for its municipal regulations and the arbitration of all matters connected with commercial pursuits...Pali had its own currency, which amidst universal deterioration, it had retained undebased. From remote times, Pali has been the connecting link between the sea coast and northern India. Commercial houses established at Muskat-Mandavi, Surat, and Navanagar transmit the products of Persia, Arabia, Africa and Europe, receiving that of India and Thibet... to name the various products of each: from the coast, elephants' teeth, rhinoceros' hides, copper, tin, pewter, dates dried and moist of which there is an immense consumption in these regions; gum-arabic, borax, coconut, broad-cloths, stripped silks called *patang*, various dyes, particularly the kermes or crimson, drugs especially the oxides of arsenic and quicksilver; spices, sandalwood, camphor, tea, momiai or mummy, which is much sought after in medicine and green glass (*kanch*). From Bahawalpur, soda (*sajji*), the dyes called *al* (*morinda citrifolia*) and *majith* (*rubia cordifolia*), matchlocks, dried fruits, *asafetida*, Multan chintzes and wood for household furniture. From Kotah and Malwa, opium and chintzes. From Jaipur, various cloths and sugar. From Bhuj, swords and horses. The exports of home production are two staple articles of salt and woollens; to which we may add coarse cotton cloths, and paper made in the town of Pali. The *lois* or blankets, are disseminated throughout India,...scarfs and turbans are made of the same material, but no for exportation. But salt is chief article

⁵⁵⁶ Ibid., p. 326.

⁵⁵⁷ Tod, vol. 2, pp. 812 & 1108.

of export, and the duties arising therefrom equal half the land revenue of the country. Of the *agars*, or 'salt lakes, Pachbhadara, Phalodi and Didwana are the principal, the first being several miles in circuit. The commercial duties of Pali yielded 75,000 rupees annually...'.⁵⁵⁸

Pali was also popular for manufacture of matchlocks, swords, boxes of iron and iron platters for culinary purposes.⁵⁵⁹ The commercial vitality of the Thar Desert gets firmly established through many such evidences.

Town Pipar had considerable traffic of chintz manufactory. One-third of its inhabitants (1500 houses) were Oswals (Jain traders) along with 200 families of Maheshwari traders.⁵⁶⁰ Rajgarh was a great commercial mart for Bikaner. It received produce from Panjab and Kashmir; Delhi, Rewari, and Dabri (silk, fine clothes, indigo, sugar, iron, tobacco); Haraoti and Malwa (opium), Sindh (via Jaisalmer), from Multan and Shikarpur by carvans (dates, wheat, rice, lungis and fruits) and Pali (imports of maritime countries such as spices, tin, drugs, coconuts, elephant teeth).⁵⁶¹ The iron-works of Bikaner were also popular (like sword blades, matchlocks, daggers, iron lances etc.), especially the sword-handles which were exported to various parts of India.⁵⁶² The wool of sheep pastured in desert was a grand article of manufacture in Jaisalmer along with cups and platters made from a mineral called *abrak* (soapstone, soft magnesium).⁵⁶³ The decline in these commercial activities set-in during the nineteenth century due to the opium-trade, in which grower, retailer and many others were affected in variety of ways.⁵⁶⁴

In the regions of Dhundhar, the *bohras* were active as traders and most of the grain deals for and of the state were executed by

⁵⁵⁸ Ibid., pp. 812-3 & 1109.

⁵⁵⁹ Ibid., p. 1108.

⁵⁶⁰ Ibid., p. 851.

⁵⁶¹ Ibid., p. 1155.

⁵⁶² Ibid., p. 1155.

⁵⁶³ Ibid., p. 1248.

⁵⁶⁴ Ibid., pp. 1110-11.

them. In 1630 AD Gulam Satidas wrote a letter to Mirza Raja Jai Singh confirming the *latai-batai* (measure and distribution) of crops and deposition of the state share with the *bohras*.⁵⁶⁵ *Latai-batai* of kharif and rabi crop and arrangement of the brokers for same was reported by Prayagdas Goverdhandas.⁵⁶⁶ Bhartha reported about the measure and sale of the grains in *pargana* Dausa and its payment that has been made to the *bohras*.⁵⁶⁷ Salary of *bohras* was fixed and the details of their revenue were informed.⁵⁶⁸ A dip in deposits with the *bohras* was reported in year 1704 that occurred due to the drought.⁵⁶⁹ Ramkisan Kirori was sent by the king to make arrangements for the sale of grains as good crop of *jo war* and *jau* was obtained.⁵⁷⁰ The price fixation for bajra in presence of Patels indicates to the regularity of grain in markets of Amber state.⁵⁷¹ In 1641 AD, Mirza Raja Jai Singh was informed that the grains were sold on balanced prices due to good production and less sale in previous year. Further, *shyalu fasal ki latai* and *unbalu fasal ki shani* was informed.⁵⁷² The good rains were followed by good crops and *talabs* (Mansagar and others) of Amber were full.⁵⁷³ In 1650 AD, good rains that filled the *talabs* were reported.⁵⁷⁴ In the year 1664, four *arzdashts* were written to Mirza Raja Jai Singh informing about good rains and the expectation of

⁵⁶⁵ *Arzdasht*, dated *Margsirh (Mangsir) sudi 1*, VS 1687/1630 AD.

⁵⁶⁶ *Arzdasht*, dated *Baisakh sudi 12* VS 1702/ 1645 AD.

⁵⁶⁷ *Arzdasht*, dated *Chait budi 9* VS 1714/1658 AD.

⁵⁶⁸ *Arzdasht*, dated *Chait sudi 1* VS 1740/1683 AD.

⁵⁶⁹ *Arzdasht* written by Rup Ram and Purohit Harshram, dated *Posh budi 4* VS 1761/1704 AD.

⁵⁷⁰ *Arzdasht*, dated *Mangsir budi 9* VS 1716/1659 AD.

⁵⁷¹ *Arzdasht* written by Mohan, dated *Fagun sudi 8*, VS 1697/1640 AD.

⁵⁷² *Arzdasht* written by Kalyandas, dated *Chaitr sudi 4*, VS 1698/1641.

⁵⁷³ *Arzdasht* written by Mohan and Raghunath Kesodas on *Sawan sudi 3*, VS 1698/1641 AD and *Aswin budi 1* VS 1698/1641 AD, respectively.

⁵⁷⁴ *Arzdasht* written by Rai Singh, dated *Sawan sudi 7* VS 1707/1650 AD and *Bhadwa budi 1* VS 1750/1693 AD written by Ajitdas Manram.

good crops.⁵⁷⁵ Many *arzdashts* were written to Raja Bishan Singh in the year 1699 with the information and details of rains and the crops that would follow the rains.⁵⁷⁶ Good rains were sufficient reason for the officials of Jaipur state to motivate and convince the patels and peasants, for bringing more land under cultivation.⁵⁷⁷ The fear of losing the crops always loomed over the state. Thus, the state constantly kept watch on the upcoming crop season. The expectation of receiving good yields in the coming season of rabi and kharif was regularly reported to the Amber king, as they were distantly posted as mughal governor.⁵⁷⁸ The loss of the agricultural revenue due to the shortfall of rain even affected the royal expenditures. In 1683 AD, due to non-collection of grains, the salaries were not paid to the inmates of *patar-khana*.⁵⁷⁹ The good rains of next year were reported with details of quantity and quality of the water as collected in each *talab*.⁵⁸⁰

The draughts were the times for the state to ensure the welfare measures to keep the peasants stationed, in order to avoid the outward migration. In c.1684, the wrongful expenditures by the officials in the villages of Amber created draught situation. Similarly, the *akaal* in *pargana* Bahatri was a sufficient cause for the

⁵⁷⁵ *Arzdasht* written by Ramchand and Kalyan, dated *Sawan budi* 2, *Sawan Budi* 7, *Sawan budi* 12 and *Bhadra budi* 11, VS 1721/1664 AD.

⁵⁷⁶ *Arzdasht* written by Purohit Harshram is dated *Asoj budi* 11 VS 1756/1699 AD (informing no more rains were required for the crop of *bajra*. The need of one more rain for the crops of *moth*, *jowar* and upcoming rabi crops). On *Asoj sudi* 7 VS 1756/1699, Kuwar Lal Harvalabhdas wrote about the need of one more rain shower for crops of *jowar*. More than 100 villages had good rain and good crop of *jowar* was coming up in those villages. The villages that didn't had the rain have been helped through the well irrigation for growing the crop of *jowar*. An *arzdasht* with similar information was written by Mir Gulam Asrat.

⁵⁷⁷ *Arzdasht* written by Dhanraj, dated *Sawan budi* 4, VS 1724/1667 AD.

⁵⁷⁸ *Arzdasht* dated *Posh sudi* 13 VS 1739/1683, *Mah budi* 13, VS 1739/1683 and *Mah sudi* 15, VS 1739/1683 AD.

⁵⁷⁹ *Arzdasht*, dated *Sawan budi* 14 VS 1740/1683 AD.

⁵⁸⁰ *Arzdasht*, dated *Sawan budi* 2 & 11 VS 1741/1684 AD.

state to take initiatives through officials, for ensuring the stay back of villagers and to manoeuvre the villagers to come back.⁵⁸¹ Next two years had good rains. Thus, good harvest was reported along with the details of water collection.⁵⁸² In year 1693, good rains were reported from pargana Malpur and Toda-bhim. Whereas, *mauja* Chapri had *akaaal* due to that the collection of revenue became difficult.⁵⁸³ In 1699 AD, the scarcity of grass and water occurred in Jaisalmer due to failure of rains. Therefore, a request was made to the Amber state for postpone-ding the scheduled marriage.⁵⁸⁴ In 1705 AD, Mahdho Singh Rajawat wrote to Sawai Jai Singh informing about the draught that was constantly occurring for last three years.⁵⁸⁵ The *akaaal* of c.1705 forced the inhabitants to migrate-out with their cattle. In-order to keep the inhabitants in the pargana a lot of counselling was done.⁵⁸⁶ Purohit Harshram informed about the delay in sowing as the lack of rain and blowing of winds has dried the soil. Thus, the cumulative effect of the weather will lead to decline in yield.⁵⁸⁷ Later, a few *arzdashts* were written which conveyed good rains that occurred in the month of *bhadwa* and these rains helped in filling the *talabs* of Amber.⁵⁸⁸ The temperature in the Thar Desert varied on large scale. The cold and freezing winds during the months of November and December

⁵⁸¹ *Arzdasht*, dated *Sawan sudi* 3 VS 1741/1684 AD.

⁵⁸² *Arzdasht* written by Kughal Singh, Sawal Singh Saraf and Manran Natani, dated *Bhadwa sudi* 14 VS 1742/1685 AD and *Ashadh sudi* 15 VS 1743/1686 AD respectively.

⁵⁸³ *Arzdasht* dated *Bhadwa sudi* 5, *Sawan sudi* 15 and *Sawan sudi* 13 VS 1750/1693 AD.

⁵⁸⁴ *Arzdasht* written by Purohit Harram. Dated *Kati sudi* 7 VS 1756/1699 AD.

⁵⁸⁵ *Arzdasht*, dated *Jaith budi* 2 VS 1762/1705 AD.

⁵⁸⁶ *Arzdasht* written by Bhagoti das Cakturbhuj. Dated *Asadh sudi* 2 VS 1762/1705 AD.

⁵⁸⁷ *Arzdasht* written by Purohit Harshram. Dated *Sawan sudi* 3 VS 1762/1705 AD.

⁵⁸⁸ *Arzdasht* written by Purohit Harshram and Rupraam dated *Bhadwa sudi* 6 & 7 VS 1762/1705 AD respectively.

were confirmed by Col Tod.⁵⁸⁹ Water harvesting, agro-pastorals activities, cattle fairs, drought reliefs, salt manufacture, etc. and prominent trade-cities around these activities are indicators of the vibrant economy that was unfolding, in and along the dunes, of Thar Desert.

Overall, in nutshell it can be said that the Thar region was dry and devoid of regular water supplies but that didn't made it an economically derailed region. Abundance of the natural resources was the fulcrum of economy. Agro-pastoral activities were the blood-line for the states of Thar. Taxes and trade activities formed the spine of Thar economy. Presence of cattle fairs and the foundation and expansion of various cities indicates that in absence of the regular agricultural revenues, the states shifted to the innovative revenue generation activities, such as duties levied on imports/exports, security and protection fee etc. Thus, the Thar Desert was not at all an economically deficit zone. Its crop production was not uniform with the mainland regions (watered by tributaries of Yamuna and Ganga), but it was significant and sufficient to meet the requirements of the inhabitants. Occasionally, states intervened to keep the inhabitants pacified and participative in the intense circles of Thar economy.

⁵⁸⁹ Tod, vol, pp. 890-91.



Social Groups, Settlements, Community Networks and Culture-‘Nomadic’

Shar waalo se ye jogan dekhi nahi jaati!

(The people of town can't bare this
meditating-liberated soul)*

The human settlements within natural setting display a fundamental aspect of the human relationship with Nature. Even after employing the skills and mechanism to make the dwelling, working apparatuses and structures conducive against the natural environment, the nature exists and human societies accommodate its presence. The continuing relationship between the humans and the nature in the Thar Desert becomes visible as the oppressive heat and scanty rainfall. It dominates the conscious of the residents. Constant manipulations are required to build association with the environmental conditions, as has been discussed in the preceding chapter. Since pre-historic times, humans have been living in Thar Desert. Communities did migrate for survival of self and cattle, and to meet the losses inflicted by the droughts. Abandoning of village located in desert has never been a blanket phenomenon. The inhabitants made the consistency of demographic representation regular in this desert and made it possible through local innovations. These innovations were mainly towards building an environment,

* The people of cities are unable to accommodate this vibrant approach.

in which the most important concern was to harvest rain water and conserve it for the prolonged usage. The vast varieties of *bera*, *beris*, *talabs*, *talai*, *dhibras*, *chanch*, *kosita* are evidences that prove the initiative taken up by the *tharis*.

Most of the Thar Desert communities share similar environmental circumstances if not uniform. This chapter aims to explore the social networks, the commonalities, and the differences that existed between the various groups (settled and nomadic) and communities, who jointly constitute the social set-up and cultural framework of the Thar society. Considering the similar nature of environmental circumstances and physical setting, in which the societies of Thar are firmly grounded, it is expected that all the communities of Thar Desert must have been following a close pattern of social living. But, interestingly, the large plethora of evidences does not hint so. No doubt, in this dry and arid area the personal views make obvious differences. The basic factors that contributed to this divergence are natural, environmental, cultural, and political. All these factors have contributed to the ethnic make-up of Thar communities. Historically, community living has been the way of life in Thar Desert. Even today it is prevalent. To understand the social life of Thar, it is important to see the relationship of Thar people with their natural surroundings (of desert).

All the living beings try to associate with their surrounding environment. Nearly all the human civilizations have tried to link up with their respective natural environments and got accommodated. In long traditions, these types of associations with the landmasses and natural surroundings have helped to evolve an association, in which tribes and communities try to form a bond with their natural physical settings in order to assert their claims. Therefore, the tribes and the communities, still living in forest and mountains are different in their mannerism and social ordering, in comparison of the main land people who claim to have reached some standardization of culture. 'Those who inhabit the forests... little removed from savage life, and whose dialects are as various as their manners. These are content to be called the 'son of the earth,' or 'children of the forest,' while their conquerors, the Rajputs,

arrogate celestial descent'.¹ Juxtaposing to these claims, in context of the Thar Desert, it is important to highlight that no one in history has claimed to be the '*thal-putra/thali-puta* or *rait-putra*'.² In the Thar Desert generally, the air is dry, sun shines high and clouds are an exception. All these regular natural indicators signify tough weather conditions that humans generally avoid. Albeit, a lot of medieval heritage sites attract large flocks of tourists, mainly October onwards.

The harsh weather conditions of the Thar Desert also contributed to the ethnic composition of communities based on the clan ties (Rathors, Bhattis and Kachhwahas). Later, these communities formed the political initiatives and authorities that aimed to stimulate the economic gains and growths. The political leaders were canvassing and organizing the state machinery for maximizing the economic gains as Thar was devoid of extensive agricultural activities being a difficult area. Limited agricultural activities allowed to innovate alternate means of income as discussed in preceding chapter.

The inhabitants were required to bind together in order to survive through the harsh conditions of the Thar Desert. The tracts of Jaisalmer, Bikaner and Barmer are less hospitable than the regions of Jodhpur, Jaipur, Shekhawati and Nagaur. 'The eyes range over the sandy deserts and the chaotic mass of mountains, which are on all sides covered with cactus, which luxuriates amidst the rocks of the Aravalli'.³ It is interesting to highlight that nearly all the inhospitable regions were always populated. None of the regions was facing acute thin demography. In pre-industrial societies humans lived with natural constraints that were determined by the natural environment. Thus, the nature set the parameters but humans constantly endeavoured to stretch nature's limits to greatest possible degree or allowable parameters, permitted within their ethnic and spiritual concepts of appropriate behaviour. When the mechanical abilities were limited, the nature

¹ Tod, *Annals and Antiquities*, vol. 2, p. 651.

² All these signify 'the son of sand'.

³ Tod, vol. 2, p. 779.

exerted a dominant force on the society and all the political, social, and cultural guidelines were channelized on basis of the parameters delimited by nature.

Many tribes/communities lived in the desert areas. Most of these tribes survived on the pastoral activities. Raring the heard animals like sheep, goat, camel, oxen, and horses were their main occupation. Agricultural activities were possible only as per the mood of rain showers. The popular tribes of the Great Indian Desert were Sodha, Kaurava, Dhathi, Rebaris, Jats, Sahariya, Khosa, Mer, Thori, Mangaliya, etc. Most of these tribes functioned as single community groups, except the Jats, who housed many branches (like, Johiyas, Godara etc.), all under the single ambit of Jat community. Due to the nature of their occupation, the Banjaras were mainly on move with their caravans. Lot of Banjara settlements in the desert indicate that they were natives of the Thar desert. They were investing in desert to facilitate the movements of their caravans. A few communities/tribes/groups will be discussed in this section to get a sense of their lifestyle. In Annals of Marwar, the distribution of population indicates that 'the jats constitute five-eight, the rajputs two-eight, while the remaining classes, sacerdotal, commercial, and servile, make up the integral number'.⁴ Sanchor Brahmans and Paliwal Brahmans constituted a significant section of the Thar society due to their cultural, social, and political roles. The large trading community of desert was mainly constituted by Oswals and Maheshwaris.

Most of the human settlements were in midst of the sand desert. The sandy winds (*andhad*) were very natural and most common phenomenon of the desert nature. In order to protect the village from the sand and to set up the security in place, the *kanta-ka-kot* (circumvallation of thorns) and stacks of chaff were made around the inhabited areas.⁵ Col. Tod mentions that *kanta-ka-kot*, and stacks of *bhus*, or 'chaff' were placed at intervals and they give an appearance of respectable fortification.⁶ Even today

⁴ Ibid., p. 1105.

⁵ Ibid., p. 850; vol. 3, p. 1277.

⁶ Ibid., p. 811.

such fortifications are visible, but are limited to intense deserts of Jaisalmer, Barmer and Bikaner. Most of the communities live in small groups and accordingly they make arrangements for subsistence.

Agro-Pastoral Communities

Many communities/groups/tribes are living in the Thar Desert for centuries. *Mer* or *mera* were termed as mountaineers of Rajputana and the country inhabited by them is called Merwara (the region of hills).⁷ The *mers* got their name from a portion of the Aravalli chain that lies between Kumbhalmer and Ajmer, which rises from three to four thousand feet above the sea level and abounds with a variety of natural production.⁸ However, the Arabian geographers have been mentioning about the presence of *Mids* and their loots/raids from the 8th century onwards.⁹ Nainsi and Tod also confirm them as raiders. The *mers* of Merwara claim that they are descending from a grandson of the last Chauhan emperor of Delhi, thus they are Rajputs.¹⁰ These original inhabitants of Merwara (the Mers), who claim to be descendants of Prithvi Raj, the Chauhan ruler of Ajmer, are now concentrated in Ajmer, Beawar, and Todgarh *tehsils*. The Mers are divided into two clans, Barar and Chita. According to Mer tradition, a man named Chita, grandson of Mera, converted to Islam during the reign of Aurangzeb. His descendants are Muslims, known as Katat Merats. On the other hand, the Gorat Merats and Barar Mers are Hindus.¹¹ Even today, the distinctions between the Moslem Merat community and the Hindu Merats and Rawats remain undefined. Indeed,

⁷ *Ibid.*, p. 789.

⁸ *Ibid.*, p. 789.

⁹ Choudhary, Manisha, 'Tracking the *Mers*: An insight in their History and Culture' research paper presented at Natnagar Sodh Sansthan, Sitamau, 22nd February 2020. (In press)

¹⁰ Tod, *op. cit.*, vol. 2, p. 790. See my paper on *mers*.

¹¹ Lodrick, Deryck O., 'A Cattle Fair in Rajasthan: The Kharwa Mela', *Current Anthropology*, University of Chicago Press, Vol. 25, No. 2 (Apr., 1984), pp. 218-225.

apart from the practice of circumcision and burying their dead, the nominally Moslem Katat Merats are closer in many respects to the Hindu Mers, than to fellow Muslims. Until recently, all Mers intermarried irrespective of their religion, and Brahmans performed their marriage ceremonies according to Hindu rites. Merats and Rawats shared a common culture, inter-dined, wore similar dress, and even worshipped the same Hindu deities. The communities began to move apart only with the introduction of the franchise, and communal representation in British India. Recently, Muslims Mers discarded Hindu dress and customs and abandoned intermarriage with Hindu Mers, while Hindu Merats and Rawats moved closer to the general Hindu community.¹² Even today, Kharwa village is an excellent example of the religious complexity of mer society. Although part of the erstwhile state of Ajmer, Kharwa is located on the northern margins of Merwara, a tract of land separating Ajmer from Marwar to the west and Mewar to the south.

Loots were the way of life for many to survive in the desert and secure resources as discussed in the preceding chapter. Even the high caste communities indulged in loots and thefts. In Jaisalmer, Rajputs conducted raids and thefts in the villages of Jats and Bisnois¹³, as both communities were settled agriculturists of par excellence. Further, Tod mentions that all the Maldot tribes have become synonym of Pindaris, Kazzak due to lawlessness.¹⁴ Maldots were called 'the most daring robbers of the desert'.¹⁵ The *vigat* compiled by Mahnto Nainsi in the 17th century for the state of Marwar also confirms the presence and the notorious activities carried out by the Mers. 'The Mers were spoiling and looting Pali...a rich town'¹⁶ and the nomad, travelling with animal and

¹² Dixon, C. J., *Sketch of Mairwara*, Smith Elder, London, 1850 and Harbilas Sarda, *Ajmer: Historical and Descriptive*, Fine Arts Printing Press, Ajmer, 1941. For details see my paper.

¹³ *Tawarikh Jaislamer*, p. 225.

¹⁴ Tod, *op.cit.*, vol. 2, p. 1242.

¹⁵ *Ibid.*, p. 954.

¹⁶ *MRPRV*, vol. 1, p. 9.

trading in salt.¹⁷ Ample evidences prove various loots, conducted by the mers. In personal narratives Mers have been referred as raiders of cattle.¹⁸ But, mers were not the only raiders in desert.

Pargana Sojat had many Mer settlements. Mers of Chita branch were leading a settled life in villages, namely-Fulaj, Gajnaai Dhadhi, Baniyamalo, Thal, Borimado, Khiran Khedo, Sichiyaayi, Gigawad, Nibadi, Saran etc.¹⁹ Some Mers also established the villages. Village Boirmado was called after name of Mer Boriyo, as he established the settlement.²⁰ Kalamb, Dghod, Rayro Khurd and Khodiyo were some of the villages that were established by Chita Khan Mer. The willing isolation chosen by of mers (on hill-top, in dense desert) didn't allow them to change much since their settlement in their respective regions. As in the early 19th century, Col. Tod states 'the mers appear to have been in the twelfth century what he was is in the nineteenth, a bold, licentious marauder. He maintained himself throughout the whole of the Mogul domination, alternately succumbing and departing; and since the Mahrattas crippled these countries, the mers had regained all his consequence and was rapidly encroaching upon his Rajput suzerain'.²¹ This hints to continuity in their social-organization. Overall, it can be asserted that the moral and political revolution enervated the Mers, Maratthas, Pindaris and Pathans, and all rose to power from the common occupation of plunder, aided by the national jealousies of the Rajputs.

In terms of population and activities, the Jats follow Mers in the regions of Thar Desert. Through a careful study of the *Marwar vigat*, it can be proposed that the Jats were mainly concentrated in the dense desert and majority of them engaged in agro-pastoral activities. There is complete ignorance about the question: When did this tribe (Jats) settled in the Thar Desert? But even when the

¹⁷ Ibid., pp. 16-7.

¹⁸ Tod, *op.cit.*, vol. 2, p. 788. Redeeming the cattle from plundering mountain Mer.

¹⁹ *MRPRV*, vol. 1, pp. 465-70.

²⁰ Ibid., p. 469.

²¹ Tod, *op.cit.*, vol. 2, p. 793.

Rathors were invading the Marudesh, these tribes were present there, chiefly leading a pastoral life. Early Arab geographers (8th century) have also confirmed the presence, and profession of Zutts (Jats) in the regions of desert.²² They have been called dromedary-men.²³ 'Without any settled ideas on religion, the jats of the desert jumbled all their tenets together'.²⁴ Rao Bika found his capital at Bikaner in 1489 AD.²⁵ The narrative of capital establishment was mixed with the inhabitants. It went further and the folk etymology defined the word 'Bikaner' as the recollection of bloodless conquest of Bika, over the Jats, by giving 25 pieces of gold as 'the fine of relief'. As the spot chosen by Bika to make his capital was the birth right of a Jat, which the latter was ready to concede only on the condition that 'his name should be linked in perpetuity with its surrender. Naira (Nera) was the name of the proprietor, which Bika added to his own, thus composing that of the future capital, Bikaner'.²⁶ All the Rajput vassal-kin acknowledge the origin of their power. Thus, they hold annual memorials acknowledging the rights of the Godaras, as they all quartered on the lands of the Jat.²⁷ Until the reign of Rae Singh (1573 AD), 'the Jats had, in a great degree, preserved their ancient privileges'.²⁸ During the 19th century, the Rajputs could not maintain them. Consequently, they disposed of the Jats from all the political authority. With the loss of independence, their military spirit (of Jats) also decayed and they became mere tillers of the soil.²⁹ The subjugation of Johiyas and Puniyas caused political annihilation of the Jats cantons of desert and pushed them in agriculture and old pastoral pursuits. Thus, they became 'an industrious tax-paying race under their

²² Wink, Andre, *Al-Hind: The Making of Indo-Islamic World*, vol. 1, Oxford University Press, New Delhi, 1999, pp. 48 & 142.

²³ *Ibid.*, p. 142.

²⁴ Tod, *op.cit.*, vol. 2, p. 1125.

²⁵ *Ibid.*, p. 1131.

²⁶ *Ibid.*, p. 1130.

²⁷ *Ibid.*, p. 1130.

²⁸ *Ibid.*, p. 1132.

²⁹ *Ibid.*, p. 1133.

indolent Rajput masters'.³⁰ Over the centuries, the Jats have earned a reputation of 'par excellence agriculturists'. The evidences to support it will be provided at relevant space.

In context of Bikaner, 'the settlement of Jats...had for ages been established in these arid abodes...as the lands they held form a considerable portion of the state of Bikaner...singular people... their pastoral commonwealths. It appears to have been the most numerous as well as the most conspicuous of the tribes of ancient Asia...At every step made by Muhammadan power in India it encountered Jats...waged war against Timur...while Babur, in his commentaries, informs us that, in all his irruptions into India, he was assailed by multitudes of Jats...during his progress through the Panjab, are chiefly of this tribe...military retainers...as sectarian followers of Nanak, merge the name of Jat or Jāt, into that of Sikh or 'disciple'.³¹ During his invasion on India in c.1397, Timur 'cut off a tribe of banditti called Jats'.³² Writing in 19th century, Col. Tod notes that it is a fact that three centuries ago this race was far surpassed in number than any other tribe or race in India and even now they 'constituted a vast majority of peasantry of western Rajwara, and perhaps of northern India'.³³ To get an idea about the density of Jat population in the desert of Thar, an insight in their numbers will be of great help. The total souls in the Bikaner region (in 180 miles) extending from Pugal to Rajgarh were counted 539,250. Out of it 'full three-fourth are the aboriginal Jats'.³⁴ Six cantons of Jats lived in the boundaries of Bikaner, namely Punia, Godara, Saharan, Asaich, Beniwal and Johya (Joiya).³⁵ The Jats and Johyas extended in the northern desert and led a pastoral life and 'their wealth consisted in their cattle, which they reared in great number, disposing of the superfluity, and of the *gbi* (butter clarified) and wool, through the medium of Sarsot (Sarasvati)

³⁰ Ibid., p. 1135.

³¹ Ibid., pp. 1124-5.

³² Ibid., p. 1165. Check Elliot and Dowson (vol. iii: 420, 487, 492).

³³ Ibid., p. 1125.

³⁴ Ibid., p. 1147.

³⁵ Ibid., p. 1126.

Brahmans (who in these regions, devote themselves to traffic) receiving in return grain and other conveniences or necessities of life'.³⁶ During the 19th century, Bhatner was integral part of the Bikaner state. Anciently, it was chief abode of another Jat community. Chaghat Khan acquired it from the Jats, who later under a truce accepted Islam.³⁷

Details of inhabitation as per caste and community circles were provided by Mahnto Nainsi in *MRPRV*. Large numbers of Jat villages were located in the dense desert areas. In *pargana* Jodhpur, out of 315 villages, 215 villages were exclusively of Jats.³⁸ The remaining 100 villages had a mixed population of Bishnois, Rajput, Bohras, Baniyas, Sirvi-baniyas, Rebaris, Kharols (salt-makers), Paliwal Brahmans and Patels with Jats in each village.³⁹ Mahnto Nainsi settled northern Jats in village Mondaro and in 1663 AD requested the king of Jodhpur (Gaj Singh) to expand the territory of village.⁴⁰ All the villages of *pargana* Medta had significant presence of Jats.⁴¹ Except *sasan* villages, each village had Jat houses. Village Kawaliya had mixed population of Charans, Jats and Baniyas. Village Mohalwaas accommodated the Jats and Charans.⁴² In village Gangadas-ro-baas, Jats and Brahmans live together.⁴³ Hence, most of the villages in *pargana* Medta were Jat settlements and to surprise, all their fields were located in deserts.⁴⁴ Thus, the Jats were an industrious community that mainly engaged in the agricultural pursuits with some pastoral ventures.

In his personal narrative Col. Tod notes that Indawar had 200 of the Jat cultivators and 'these proprietors of the soil, a sturdy,

³⁶ Ibid., p. 1127.

³⁷ Tod, vol. 2, p. 1165.

³⁸ *MRPRV*, vol. 1, p. 190. Details of the villages: 15 at Haveli, 41 in Pipad, 3 in Pali, 5 in Dunad, 22 in Osain, 29 at Laverro, 3 in Belada, 3 at Wahalo, 7 in Kodhano, 3 in Bahelwa, 12 at Khiwsar and 3 at Asop.

³⁹ Ibid., pp. 190-2 & 206-33.

⁴⁰ Ibid., vol. 2, p. 265.

⁴¹ Ibid., pp. 117-206.

⁴² Ibid., pp. 128-9.

⁴³ Ibid., p. 139.

⁴⁴ Ibid., pp. 152-161, 166-183, 186-195.

independent, industrious race, who “venerate the plough,” and care little about the votaries of Mars or their concerns, so that they do not impose excessive taxes on them’.⁴⁵ Jats have been the ‘most industrious of all husbandmen’⁴⁶, ‘belonging chiefly to the agricultural classes’.⁴⁷ Being the primary producers, 10 thousand Jat cultivators were demanded by Rana of Mewar from Rao of Jodhpur in a marriage negotiation, who (Jats) agreed to migrate on assurance of hereditary proprietary rights.⁴⁸ *Tawarikh Jaisalmer* was compiled in 19th century by Lakhmi Chand under guidance of Diwan Nathmal Mehta. He reports that new settlements of Jats and Bishnois have come up in many villages of Jaisalmer. Their settlement (and engagement) in the region has enhanced the production of wheat, *til* and cotton.⁴⁹ Due to the efforts of Jats ample production of wheat became possible in a village. Thus, the village was named *gehu* (wheat) and its well was called *kuwa gehu*.⁵⁰ In 1852 AD, *Qasba* Mohangarh flourished with the coming of Jats and river Lathi.⁵¹ In Amber (Jaipur) kingdom, the Rajputs, Brahmans, Baniyas, Jats, Gujars and Minas were the principal tribes.⁵² During the 19th century, Minas and Jats formed nearly equal number.

Trading Communities

The Paliwal Brahmans are converts from Buddhism as evident

⁴⁵ Ibid., p. 854.

⁴⁶ Ibid., vol. 3, p. 1430.

⁴⁷ Ibid., vol. 1, p. 127.

⁴⁸ Ibid., p. 394. Cf. Rosin, R. Thomas, ‘Locality and Frontier: Securing Livelihood in the Aravalli Zone of Central Rajasthan’, in Karine Schomer, Joan L. Erdman, Deryck O. Lodrick (eds), *The Idea of Rajasthan: Explorations in Regional Identity*, vol. 2 (Constructions), Manohar, Delhi, 2001, pp. 30-63 (p. 45).

⁴⁹ Lakhmi Chand & Mehta Nathmal, *Tawarikh Jaisalmer*, Chirag, Rajputana Gazette Office, Ajmer, 1948, p. 111.

⁵⁰ Ibid, p. 145.

⁵¹ Ibid, p. 206.

⁵² Tod, *op.cit.*, vol. 3, p. 1429.

from the name Pipa.⁵³ Later, Tod extends and connects them to the Pali as a pastoral tribe that came from Saurashtra, and lived in Pali prior to the colonization of Marwar by Rathors.⁵⁴ Paliwals mainly engaged in business and agricultural activities. Accumulation of wealth in Paliwal villages attracted the Mers, who disturbed their peace by plundering. The constant threats in the 12th century made most of the Paliwals to move out of Marwar. Going towards west they entered the Bhatti territory and took refuge in Jaisalmer. Initially, they settled along the south-east border of state and gradually moved into the interiors. This process of settlement continued for a few centuries until Paliwals established themselves in 84 villages called Khera, as corroborated from the architectural remains. The fallen temple of Mandal on Barmer border was originally a Paliwal settlement. It is earliest in the series of temples made in Jaisalmer.⁵⁵ Villages, Kuldhara, Khaba, Dedha and Kothori were strongholds of Paliwals that were close to the capital. The popular Paliwal villages in Jaisalmer were Khaba, Kuldhara, Devikot, Fatehgarh, Rivati, Manadai (Barmer). All these villages represent similar architectural designing and lay-out.⁵⁶ Being active merchants they took control of all the internal trade. They advanced money, took security of the crops, and purchased all the wool and *ghi*, and later transported these items to the foreign lands.⁵⁷ Describing the country of Jaisalmer, the author of *Tawarikh Jaisalmer* mentions that the residences of Paliwals, Jagirdars-bhomias were made of stone, while the dwelling-units of *sabukars* were made of lime and bricks and the huts (*chappar*) of sepoy, poor people, and *rajayal-kaum* were made of dry grass (*poogh*).⁵⁸ They also became the brand agriculturists by

53 Ibid., vol. 2, p. 852.

54 Ibid., p. 1254. Rathors came from Kanauj and established by the end of twelfth century through treachery.

55 Sureshwar Nand, *Art and Architecture of Jaisalmer*, Research Publishers, Jodhpur, 1990, p. 92.

56 Ibid., p. 28.

57 Ibid., p. 1255.

58 *Tawarikh Jaisalmer*, p. 200.

producing wheat in the dry lands of Jaisalmer. Even today outside the devastated remains of the village Kuldhara, lush green fields of wheat and cumin are visible.⁵⁹ They were at zenith of prosperity until the 17th century. Many Paliwals entered royal services, held high positions, and were at times real custodians of the state wealth. When Salim Singh Mehta was the *diwan*, all the 84 villages were vacated overnight. The depletion in the number of Paliwal villages and their population was a subject of worry for the Jaisalmer state. Paliwals even moved out of the main city, whereas overall the population was on increase.⁶⁰ To settle Paliwals in Jaisalmer, Jats and Bisnois were forced to vacate the villages. The displaced communities were allowed to settle in distant open lands. Later, the state also gave a warning that if the Paliwals will not come, the vacated villages will be allotted to some other castes.⁶¹

Demographically, in Marwar also the Paliwal Brahmans were a dominant community. Village Sawarig (pargana Jodhpur) had 150 houses of Paliwals. All the four *talabs* of this village were patronized by Paliwals.⁶² Exclusively Paliwals lived in village Godhanli.⁶³ Nine villages of *pargana* Pokhrana had inhabitation of Paliwal Brahmans.⁶⁴ Originally, village Sirano was an ancient village of Paliwal Brahmans. During 17th century, Patel, Baniya, Brahmans and *kumbar* (potters) inhabited in it.⁶⁵ In *pargana* Siwan, four villages (Vithojo, Mandapado, Ramsen⁶⁶ and Nehwaa⁶⁷) were settlements of the Paliwal Brahmans. When they settled in these regions is not known. However, it is relevant to put forward that many times the term '*paliwala ro kadim gav*' (ancient/old

⁵⁹ I visited this village in 2019.

⁶⁰ *Tawarikh Jaisalmer*, p. 200.

⁶¹ *Ibid.*, p. 241.

⁶² *MRPRV*, vol. 2, p. 15.

⁶³ *Ibid.*, p. 21.

⁶⁴ *Ibid.*, p. 327-31. Villages with Paliwal population were Badali Pithala-ri, Badali Manda-ri, Baniyaa, Chanch, Pachpadro, Kala, Bhiva, Mahwa, Dhuhadsar.

⁶⁵ *Ibid.*, p. 238.

⁶⁶ *Ibid.*, p. 246.

⁶⁷ *Ibid.*, p. 248.

village of Paliwals) appears in *MRPRV*. Thus, it clearly indicates that Paliwals settled in Marwar in ancient times.

A close study of the *sasan* lands granted to the Brahmans in Marwar by Rao Maldeo during the 16th century proves that the Paliwal Brahmans didn't receive any of these grants. Perhaps, in those times the Paliwals Brahmans didn't act as religious functionaries. Instead of performing religious duties, they choose to engage in trade and agricultural activities. In nutshell, it can be proposed that Paliwal Brahmans had widespread presence throughout the Thar Desert and their main occupations were cultivation and trading.

Malpura (in Amber) was the famous town, where wealthy merchants lived.⁶⁸ The economy of Jaipur state was depending on the agricultural activities. The internal disturbances caused by recalcitrant bhomias were posing severe challenges to the economy of state. Thus, Sawai Jai Singh tried to evolve the city of Jaipur as a trade-mart, in-order to attract merchants and traders. He ensured their settlement in the city and facilitated their participation in the economy of the state.⁶⁹

Many communities and castes were living in the desert. Tanot in Jaisalmer is midst of an intense desert. The charans, rajputs, bhat-kaviraj,⁷⁰ muslims⁷¹, maheshwaris⁷², brahmans (Pushkarna, Purohit, Vyas, Acharya and Thanvi)⁷³, Oswals⁷⁴ and Bhattis⁷⁵ lived there and worked for subsistence. In c.1827, there were 1200 houses of Pushkarna Brahmans out of which 700 were in the city.⁷⁶ Muslims included a group, that was called Sindhi and

⁶⁸ Tod, *op.cit.*, vol. 3, p. 1269.

⁶⁹ Choudhary, Manisha, *The Eternal Dastur Craft: A History of Mannerism, Social Groups and Formation of Amber-Jaipur State*, Primus Books, Delhi, 2020.

⁷⁰ *Tawarikh Jaisalmer*, p. 232.

⁷¹ *Ibid.*, p. 242.

⁷² *Ibid.*, p. 236.

⁷³ *Ibid.*, p. 233.

⁷⁴ *Ibid.*, p. 234.

⁷⁵ *Ibid.*, p. 238.

⁷⁶ *Tawarikh Jaisalmer*, p. 233.

these Sindhi Muslims traded in camels and oxen. They walked behind the bullocks for long distances.⁷⁷ Sanda-ka-warge and Changa kept the sheep and goats in the forests for four and half months, from Diwali to Holi. If the grass of *neela* and *tus* were available during these months then grazers were not given water. Even the water of *gun/goun* (a small catchment of rainwater) was not offered to sheep and goats.⁷⁸ During their stay in forest the shepherds survived on milk and *khata* (a sour drink made out of curd). For the safety of the animals they religiously surrendered at *Pabuji-ka-than* (temple of Pabuji). Mallinathji (a folk deity) was considered for Holi festival. Pokharna brahamans of Tharda believe that if Holi is lit well, good crop will yield and the villages will have peaceful time.⁷⁹

The Pokharna Brahmans lived in Jaisalmer, Marwar and Bikaner. They mainly engaged in agricultural and pastoral activities. The legend of title Pokharna is associated with Pushkar, where the ancestors of Pokharna Brahmans were working as *beldars*, for excavating the lakes of Pushkar. To reward their favour, the deity Brhma graded them as Brahmans. Pushkar is the sacred lake in India, in terms of respect it is the only lake that can compete with Mansarovar of Tibet.⁸⁰ As per a traditional legend, Brhma used the sand to extinguish the fire, which Shiva was supposed to put out. So, the *tibas* around Pushkar have the sanctity of mythology, as available for its ponds.⁸¹ *Kudal* (pick-axe) is their chief object of worship as supported by tradition.⁸² The ancestors of Rakhisar Pokharna Brahman are credited for laying the foundation of Pokharan. Through a legend, Pokharna Brahmans have also been rooted in mythology. As per the anecdote they went to attend marriage of Shree Laxmiji and Shree Thakurji, where 50,000 Brahmans assembled. Out of which 45,000 were

⁷⁷ Ibid., p. 245.

⁷⁸ Ibid., p. 243.

⁷⁹ Ibid., p. 244.

⁸⁰ Tod, *op.cit.*, vol. 2, p. 891.

⁸¹ Ibid., pp. 892-3.

⁸² Ibid., pp. 1256.

Shrimali Brahmans and the rest 5,000 were Pokharna Brahmans. Shree Thakurji and Laxmiji honored the Shrimali Brahmans first as they were their gurus (teacher). Pokharna Brahmans took offence at the secondary reception and decided to withdraw from ceremony, thus, walked away. Shree Thakurji tried to please them but nothing worked. Finally, Shree Thakur-Laxmiji cursed the Pokharnas as: *ved heen huwo; kriya bhrust huwo, nir-jal desh baso, man heen huwo* (you shall live without knowledge of Vedas; the ceremonies performed by you shall never accomplish results, live in the area that is devoid of water, you shall not have any respect). In retaliation, the Pokharnas left the ceremony and settled at Pokharan. Later, they employed an evil spirit through a camel that didn't allow the families of Shrimali Brahmans to flourish. The Shrimalis worshipped Thakurji, thus, the later came and spoke to Pokharnas. After deliberations, the Pokharnas agreed to eject the spirit on two conditions, firstly, the lord shall remove the curse, and secondly, Thakurji shall bless them. So, in this exchange the lord withdrew the curse and extended the blessing by saying '*ved mat bhano, ved ra ang purna jotag bhano. Raj man huwo. Thari thodi lichami ghane dekh se*' (don't be devoid of Vedas, be the expert on the body-*puranas* of Veda and recite them, you shall have the rule, a little of your wealth will be visible as superabundant). Later with efforts of Pokharna Rakhisar, *pargana* Pokharan got water.⁸³ In-spite of these efforts, Pokharan had sparse human population owing to the control of an evil spirit—*rakshash*. Ramdev freed the village of Pokharan from the clutches of the devil. With this human settlements began in this region. Later, Ramdev left for Ramdevro and gave Pokharan to his son-in-law, Hamir.⁸⁴ After sometime, Satalmer kept village Pokharan along with 30 other villages.⁸⁵ In the 17th century, Pokharan city had fifty houses of Pokharan Brahmans to whom initially the land was granted.⁸⁶ Taking assessment of the population of Pokharan city, Mahnto

⁸³ *MRPRV*, vol. 2, pp. 289-90.

⁸⁴ *Ibid.*, p. 291.

⁸⁵ *Ibid.*, p. 293.

⁸⁶ *Ibid.*, p. 310.

Nainsi recorded three hundred ten villages of Mahajans (30-Oswal and 280 Maheshwaris).⁸⁷

Sanchor Brahmans are another popular branch of Brahman community in the Thar. They are called so because they hail from Sanchor. Sanchor was a popular centre, but the traditions suggest that this region got its name due to the curse of lord Shankar. The name *sanchor* comprises of two words (*sanch* and *chor*) and as the two words are together, it means 'thieves of the truth'.⁸⁸ A contrary derivation of the name was suggested by Col Tod, 'the name of Sanchor is corrupted from Satipura, Sati or Suttee's town, said to be very ancient'.⁸⁹ Sanchor possesses a distinct reputation being the cradle of Sanchora Brahmans, who were the officiating priests at the celebrated temples of Dwarka, Mathura, Pushkar, Nagar-Parkar.⁹⁰ Out of 1,200 houses in Mallinath (Barmer), 300 houses were of Sanchor Brahmans.⁹¹ Thus, it can be asserted that various branches of Brahman community were not engaging in brahmanical or ritualistic performances however their participation was limited to the regular social and economic life of the Thar Desert.

Most of the Indian trade is in the hands of traders, who have been casually termed as Marwaris. This is a linguistic categorization, inspired from the language spoken by the traders, irrespective of the area (in Rajasthan) they hail from. The Marwari merchants never constituted a monolithic and homogenous entity. The hierarchical distinctions exists as *jagatseth* followed by *nagarseth*, modis (official suppliers of *jagir*), local traders, ordinary traders, and merchants form the last ring. Common business interests, culturally and economically distinct functions made the trading communities and business families to bind together, for mutual social help and economic support. Welfare activities (like *dharamshalas*, wells, temple, hospital, *talabs* etc.) also found space

⁸⁷ Ibid., p. 310.

⁸⁸ *MRPRV*, vol. 2, p. 360.

⁸⁹ Tod, *op.cit.*, vol. 3, p. 1269.

⁹⁰ Ibid., p. 1269.

⁹¹ Ibid., p. 1272.

in their social-acts. A kind of traditionalism works at the base of these business houses. Setho ka Ramgarh (District Sikar) is the living example to see these welfare and social activities. Marwaris were renowned for their calculations, thrift, and innovations. Despite harsh commercial practices, the Marwaris have acquired considerable social acceptability and respect in desert states. Col. Tod recorded 128 merchant castes in Rajasthan. Out of those Aggarwals, Maheshwaris, Oswals, Khandelwals and Porwals were most numerous.⁹² Further he notes, 'the Osi or Oswal, numbers 100,000 families; and that more than half of the mercantile wealth of India passes through the hands of the jain laity'.⁹³ Town Pipar had high presence of Oswal houses. Out of 1500 houses, one-third were inhabited by Oswals of Jain faith along with two hundred families of Maheshwaris.⁹⁴ Banarsidas reports them at Agra (then Mughal capital). He also mentioned that around 1598 AD, even in a small city like Fatehpur, west of Allahabad, there was a quarter inhabited by traders of Oswal community. The Oswals utilized their mercantile credentials well and their trading potential added a lot of vibrancy to the economy of the Thar Desert. Due to their investments in the trading activities, the dry landmass of the Thar Desert became a commercial zone with intense networks of trade, and ensured trade-traffic throughout the year.

From the 15th century onwards the Maheshwari traders had prolific presence in Jaisalmer. The progressive activities of Jains in the regions of Jaisalmer are visible since the beginning of the 14th century. Inscriptions from Parshavnath, Sambhanath, Rishabhadeva and Shantinath temples and extracts from Tappa Pattika prove the constructions of Jain temples, monasteries and charitable houses. The Jain *acharyas* and *stesthis* indicate to the amount of wealth generated by the local Jain merchants. Probably, the luxuriant wealth with these merchants (Jains) was the cause for them, to invite *Yatis* for *Chaturmasaa*. During the months of monsoon (*Chaumasaa*), the *Yatis* stationed and conveyed the

⁹² Ibid., vol. 2, p. 603.

⁹³ Ibid., p. 603 & 1108.

⁹⁴ Ibid., p. 851.

teachings of Jainism. The Jain merchants extended hospitality and financed the stay of *Yatis*.⁹⁵ Shreshti Nemi Kumar, Ganadeva and others spent lavishly on the consecration ceremony in 1301 AD. In c.1300, a *diksha-mahotsava* was attended by the monks from Bikampur, Maroth, Uchcha and Jalore Jain *sanghas*.⁹⁶ The temples of Chintamani Parshavnath, Sambhanath, Chandra Prabhu Swami, Shantinath, Shitalnath, Rishabhdeva, Mahaveer Swami and Jinabhadra Suri Gyan Bhandar were constructed inside the fort of Jaisalmer between 1463 to 1500 AD.⁹⁷ All these instances prove active engagements of Jain merchants. The merchants of Bikaner and Shekhawati also performed well, and gradually emerged as traders, entrepreneurs, and industrialists. Ashim Dasgupta has pointed out three factors that have facilitated the spread of their mercantile activities: (1) the economic network of trade, (2) the social organization within which the merchants' function, and (3) the relationship between the merchant and the state.⁹⁸ Since medieval times the Marwari traders are following the *mabajani* (the indigenous Rajasthani method of accountancy) which is base of their economic enterprising. 'Three-fourth of the mercantile class of these regions are the descendants of the martial conquerors of India and that seven out of ten and a half niyats or tribes, with their innumerable branches, still profess the Jain faith, which beyond controversy, was for ages paramount in this country'.⁹⁹

Another prominent example to prove the prolific presence

⁹⁵ Prajapati, Sweta, 'Jaisalmer Vijnaptipatra: A Socio-religious Portrait of Jainism' published in *Kirti Rakshana*, vol. 5, no.5-6, April-July 2010, pp. 11-8 and 'Baroda Vijnaptipatra: A Socio-Historical Portrait of Baroda City' published in *Journal of Oriental Institute*, vol. 61, September-December, 2011, pp. 111-26.

⁹⁶ Somani, Ram Vallabh, *History of Jaisalmer*, Jaipur, 1990, p. 31.

⁹⁷ Singh, Chandramani, *Protected Monuments of Rajasthan*, Jaipur, 2002, p. 240.

⁹⁸ Dasgupta, Ashim, 'Indian Merchants in the Age of Partnership, 1500-1800' in Dwijendra Tripathi (ed.) *Business Communities of India*, Manohar, Delhi, 1984, p. 33.

⁹⁹ Tod, *op.cit.*, vol. 2, p. 839.

of trading communities in the Thar Desert is the city of Jaitrana, established in c.1468.¹⁰⁰ In year 1662, the total houses in Jaitarna were 1839, out of it, 720 houses were of Mahajans, followed by 268 Brahman households, 170 houses of *julaha bangar* (weavers), 150 Multani establishments, 100 houses of Turks, 10 houses of Thoris along with many other service providing communities like *mali, dbed, luhar, mochi, nachna, kalal, chipa, kumbar, sonar, teli, darzi, kayasth, dhobi, halalkhor* (butcher), *suthaar* (*khati*/carpenter), etc.¹⁰¹ Thus, after close scrutiny of the records it can be proposed that all the settlements in the Thar Desert were a combination of different communities. Many communities lived in each village but all communities resided in their respective *dhanis*. Jointly, they were carrying-out the social, political, and economic roles, in-order to keep their zones relevant.

Pastoral Nomadism

The spread of the desert communities from India to Africa and vice-a-versa can be traced through the remains that are available in the deserts. Similar voices of the Maru, Maruka (Marocco), Merv (Iran) used for referring to different deserts do provide some hints of continuity.¹⁰² The prominent features of the Phallic rites in Egypt along with the presence of Barbary tribe helps in asserting that the deserts of Africa and Asia were sharing the shepherd cultures, that culminated in the kingship. Rao Kehar laid the foundation of fortress of Jaisalmer. He was succeeded by his eldest son Tano, who had five sons and all of them stayed in the desert. Alan was his fourth son and had four sons, namely Deosi, Tirpal, Bhaoni and Rakecha. The descendants of Alan's eldest son (Deosi) became Rebaris, the community who rears camels.¹⁰³ The name sounds little anglicized due to the training of the author. Aan was the

¹⁰⁰ *MRPRV*, vol. 1, p. 493.

¹⁰¹ *Ibid.*, p. 497.

¹⁰² Tod, *op.cit.*, vol. 2, pp. 1194-5.

¹⁰³ *Ibid.*, p. 1193.

person whose descendants constituted the Rebari community.¹⁰⁴ The offsprings of Rakecha became merchants (*baniyas*), who were classed as Oswals.¹⁰⁵ Oswals were termed after town Osian, which was their first settlement and their occupation was commerce. The Maheshwari Baniyas were an offshoot of Ulraaj, the ninth son of Tunrawji of Jaisalmer. Rao Keharji had two sons, namely Tunrao and Jamrao. As mentioned in *Jaisalmer ri khyat*, the offsprings of Kuwar Jamrao became Baniyas.¹⁰⁶ Tunrao was named after deity Tuntiya Devi. He had 13 sons. The descendants of his second son Aan became Rebari, offsprings of ninth and tenth sons, namely Ulraj and Dagoji, descended into Mahajan Maheshwaris and Daga Maheshwaris, respectively.¹⁰⁷

The term Rabari (*Rebari*) was used in the desert for denting persons who engaged in rearing and tending camels. Besides rearing camels, they also steal them.¹⁰⁸ The camels were indispensable in the desert because they were used to yoke the plough, draw water from well. The property of the hoof to expand and contract according to the soil is worth a mention. Col. Tod called camel 'the Supreme Artist'¹⁰⁹ due to its drawing of the tongue to the branches of *babul*, *khair* and *jarwas* which possessed long, hard and sharp thorns, and harness them with clarity. The camels who bred in the *thals* of Dhat and Barmer were of best breeds. Rebariyori-baasani (*pargana* Sojat) was a hamlet of Rabari/Rebari.¹¹⁰ A lot of Rebaris lived in the *pargana* Siwan, Jodhpur and Medta. Villages namely: Devado, Baay, Bawalu, Katinod, Samdi, Jagisa Kotadi, Asotaro, Jidotari, Hotalu, Karmawaas, Paadsau, etc. of *pargana* Siwan had the Rebari population.¹¹¹ In village Jadotari,

¹⁰⁴ Bahti, Narayan Singh (ed.), *Jaisalmer ri Khyat*, published in *Parampara*, Chopasani Rajasthani Sodh Sansthan, Jodhpur, vol. 57-8, 1981, pp. 36 & 96.

¹⁰⁵ Tod, *op.cit.*, vol. 2, p. 1193.

¹⁰⁶ *Ibid.*

¹⁰⁷ Bahti, Narayan Singh (ed.), *Jaisalmer ri Khyat*, pp. 36-7 & 96.

¹⁰⁸ Tod, *op.cit.*, vol. 3, p. 1297.

¹⁰⁹ *Ibid.*, p. 1305.

¹¹⁰ *MRPRV*, vol. 1, p. 419.

¹¹¹ *Ibid.*, vol. 2, pp. 232-43.

Rebaris lived with baniya, Patel and Brahmins.¹¹² Eight villages of *pargana* Jodhpur had exclusive Rebari population.¹¹³ Not many villages were exclusive to Rebaris. While grazing camel herds, they lived entirely on the milk of camel (needs to consume it immediately, can't be kept for long as the worms take over the milk soon) and some wild fruits like *kair*, *dasriya*, *khiploi*, etc. Most of the times they lived in the villages that had population of Jats, Rajputs and Mahajans.¹¹⁴ The Thoris were close to the Rebaris as proprietors of camels. They hired camels to find employment as convoys to caravans.¹¹⁵ Thoris were mainly popular as thieves 'who will bring you either your enemy's head or the turban from it'.¹¹⁶ These demarcations and variations in day-to-day life practices and occupations can be attributed to the limitations, posed by this physical space.

Banjaras organized in-groups to carry-out the transport and trade activities. Oxen were employed for loading and transporting goods to distant places. While travelling for long distances they halted en route with their cattle. These indispensable traders were fulcrum of the medieval trade and were very efficient in executing their jobs. They were also attached with the imperial armies as the commissariat suppliers. They reached far flunk areas in the designated time.¹¹⁷ Absence of riverine transportation in the dry desert made *banjaras* crucial in these zones. They remained active in dry and semi-arid lands round the year. 'it seems that the Banjaras did often depend on credit: hence their fear of doing business "where the capital (*mul*) diminishes, while the interest (*bidju*) ever increase". Certain verses in the *Guru Granth Sahib* (c. 1600) picture the Banjaras as factors of a great merchant banker (*sabu*), obliged to buy only such goods as would have his approval.

¹¹² Ibid., p. 237.

¹¹³ Ibid., vol. 1, p. 194.

¹¹⁴ Ibid., vol. 1 & 2.

¹¹⁵ Tod, *op.cit.*, vol. 3, p. 1300.

¹¹⁶ Ibid.

¹¹⁷ Choudhary, Manisha, *Trade, Transport, and Tanda: Shifting Identities of the Banjaras*, Manohar, Delhi, 2018.

God is likened to a *sahu*, dwelling in a palace, served by millions of Banjaras'.¹¹⁸ This indicates that Banjaras were the organized traders of repute.

There is huge dearth of source material to weave a fine history of the *banjaras*. However, the scanty evidences are significant enough to highlight their social and economic role. 'Huge herds of Banjara bullocks moved salt, sugar, corn, and rice across the sub-continent. A *banjara qafila* (caravan) often contained 10,000 or more bullocks'.¹¹⁹ They also traded in grain, salt, raw cotton, coconut, cotton and woollen clothes and spices.¹²⁰ As dry land areas were their major activity centres, thus, their vibrant social and cultural organizations become visible there. Their role in economy was significant. The villager and the states of arid lands eagerly awaited their arrival. Whenever *banjara* traders didn't turn-up, the state sent out officials to locate and call them. In 1709 AD, Amber state sent the officials to call *banjaras* for collection of salt.¹²¹ To manoeuvre the *banjaras*, Diwan Ram Chand of Jaipur was deputed.¹²² Many such instances indicate the significance of *banjaras* in the economy of dry lands. Being active in the trading, some *banjaras* were able to collect good amount of wealth and were operating over long distances through their caravans.¹²³

¹¹⁸ Habib, Irfan, 'Merchant communities in pre-colonial India', published in James D. Tracy (ed.), *The Rise of Merchant Empires Long-Distance Trade in the Early Modern World, 1350-1750*, Cambridge University Press, Cambridge, 1990, pp. 371-99.

¹¹⁹ Kerr, Ian J., 'On the Move: Circulating Labor in Pre-Colonial, Colonial, and Post-Colonial India', *International Review of Social History*, Vol. 51, SUPPLEMENT 14: *Coolies, Capital, and Colonialism: Studies in Indian Labour History*, 2006, pp. 85-109.

¹²⁰ Halbar, B.G, *Lamani: Economy and Society in Change*, Mittal Publication, Delhi, 1986, p. 17.

¹²¹ *Arzdasht* written by Nain Sukh. Dated *Posh budi* 7 vs 1766/1709 AD.

¹²² *Arzdasht* written by Nain Sukh. Dated *Mangsir sudi* 15 vs 1766/1709 AD.

¹²³ Lakhi Banjara, Deepa Naik and Pema Naik operated up-to Kabul, Qandhar, Bengal and Maharashtra with large number of bullocks.

These nomads also contributed and participated in constituting the cultural wealth. Village Mahbado (*pargana* Sojat) was located beneath the Binjari-ghati.¹²⁴ The water supplies in the valley of Binjari-ghati were sufficient to attract the caravans to halt. Banjaras established the village Chochawadi (*pargana* Sojat).¹²⁵ Banjara Phool established the village Fulaj (*pargana* Sojat) and settled population in it. He also found the *kheda* (core of village) and constructed a temple and a well.¹²⁶ An ancient town in Bikaner was known as Banjara-ka-Nagar.¹²⁷ Banjaro-ki-chattri in Sikar was another illustrious contribution of the *banjaras*.¹²⁸ All these events indicate that the *banjaras* made a few destinations to ensure the safety and security of their caravans, and comforts of their cattle.

The legend of Ajmer is rarely referred in the context of Thar territory. Here, it is interesting to highlight that 'the residence of his great ancestor, Ajaipal, on the Nagpahar, or 'serpant-rock', directly south of the lake, where the remains of the fortress of the Pali or Shepherd-king are yet visible. Ajaipal as his name implies, a goat-herd, whose piety, in supplying one of the saints of Pushkar with daily libations of goats' milk, procured him a territory. Satisfied... he commenced his castle on the serpent-mount...he sought out another site on the opposite side of the range: hence arose the far-famed Ajamer'.¹²⁹ This description connects back the story of settlements in the nomadic activities.

Kaurava tribe was entirely nomadic that lived in the Dhat *thal*. The Census Report of nineteenth century doesn't mention it. They lived a settled life by making temporary huts with the widely available *pilu* grass. They constantly moved with their flocks and encamped on finding a pasture or spring. They rear camel, buffaloes,

¹²⁴ *MRPRV*, vol. 1, p. 421.

¹²⁵ *Ibid.*, p. 462.

¹²⁶ *Ibid.*, p. 470.

¹²⁷ Tod, *op.cit.*, vol. 2, p. 1168.

¹²⁸ Choudhary, Manisha, *Trade, Transport, and Tanda*.

¹²⁹ Tod, *op.cit.*, vol. 2, p. 893. The fortress of goat herd crowned the crest of a majestic isolated hill.

cow, and goats and sell them to Charans and other merchants for making livings. They were known for peopling the desert through their delightful *amal-pani*.¹³⁰ Like Kaurava, the Dhatis also claim for Rajput origin. They also inhabit in Dhat desert. Dhatis cultivated some tracks of land but were mainly depending on the pastoral activities. They bartered clarified butter (*ghi*) made from the produce of their flocks for grains and other necessities. They make *rabri* (porridge) from camel milk, as *ghi* cannot be extracted from it.¹³¹ The tribe of Samaicha was close to Dhatis in its habits. They were popular because they never allowed their animal to die of disease (whenever the hope of recovery is dim they kill the animal).¹³² The Rajars raid in the desert borders between Jaisalmer and Upper Sindh. They were cultivators, shepherds, and thieves.¹³³ All these communities of desert were dependent on the drought animals for their day-to-day survival. Thus, the pastoral pursuits and nomadic endeavours were necessary mannerisms/habits for subsistence in Thar Desert.

Professional Groups

The Manganiyars are hereditary professional folk musicians of the Thar Desert. They mainly belong to Muslim community, living in Jaisalmer, Barmer, parts of Jalor, Bikaner, and Jodhpur. The word Manganiyar comes from the verb '*mangano*' (to beg). Manganiyar, literally means 'a person who begs'. This professional club is caste neutral but highly revered. These musicians provide musical service to their patrons. In return, the patron rewards them with cattle, camels, goats, cash and at times a share in the patron's income from agriculture and animal husbandry. The reward paying and receiving in the form of animal hints at the significance of cattle as upheld by the communities of the Thar Desert.

Another significant class of people with modest living and

¹³⁰ Ibid., vol. 3, p. 1295.

¹³¹ Ibid., p. 1295.

¹³² Ibid., p. 1298.

¹³³ Ibid., p. 1299.

humble background was Nai. Nai signifies a barber. The origin of this professional community is attributed to the Bhatti Rajputs. Phool was the 13th son of Tunraoji (Bhatti Raja). Nai community formed after him.¹³⁴ Every village had a barber. He performed multiple functions such as haircuts, cutting of nail, beard-shaving and other primary grooming hacks. Khalpiyas of Sojat went to Jodhpur court and reported about the misbehaviour of barber Sadamand, who worked as per his whims and fancies and was not cutting hairs.¹³⁵ Besides these grooming activities, the Nais of the Thar Desert also performed certain duties and functions that were not associated with religious activities. They performed the rituals that were specified for purification of *jacha-bacha* (mother and child) after delivery. The rituals around cremation and acts of purification after cremation were also in their hands. The meals for celebrations of *chatti*, *tehrwi* and *seesi-khulai* were prepared by Nais, exclusively. 'A Nai or barber performs worship of manes of this illustrious Rajput...he has the universal care of the material portion of the Rajput, being always chosen as a cook'.¹³⁶ The Nais were important members of every Rajput family and were found in all the villages. Invariably they worked as cooks.¹³⁷ The cooks of Chauhan Rajputs were Nais.¹³⁸ It is significant to note that generally one Nai is associated with many families and was responsible to carry-out all the functions associated with marriage, death, child-birth etc. Most of the Nais were working as Nai of village, thus, they get associated with all the families of that particular village. With this association the opportunities in this profession, in that particular village were exhausted. After it no aspirant can slide in. To acknowledge his services, payment was generally made in kind (grains, cloth, etc.). Currency reward was only tokenism. Generally, Nais were accompanied by their wives. *Nayan/Naanma* (wife of

¹³⁴ Bahti, Narayan Singh (ed.), *Jaisalmer ri Khyat*, pp. 37 & 96.

¹³⁵ *Sanad Parwana Bahi*, dated *Miti Asadh vad 3 Guruwaar*, VS 1821/1764 AD.

¹³⁶ Tod, *op.cit.*, vol. 2, p. 842.

¹³⁷ *Ibid.*, p. 1148.

¹³⁸ *Ibid.*, vol. 3, p. 1280.

Nai) assisted Nai in carrying out his duties. Nais were considered semi-priests due to the duties performed by them. On modest occasions like *chatti*, *nahwan*, *baan*, *peel chawal* and *kriya*, people averted from calling a priest, and general preference was given to a Nai as he performed all the priestly and non-priestly acts. Their presence was considered crucial during the marriages and religious performances. On these occasions, they function along with the *shashtric* priest, mainly executing as a link between the patron and priest, and making varied kind of arrangements such as preparing food, execution of minor ritual and inviting people (as messenger), etc. Nais were reliable messengers. But, this role was very limited, especially restricted to marriages.

For Rajputs, Charan community was important. Charans were mainly the bards who sang praise of their patrons. Literally, 'charan' means 'transmitter of fame and renown'.¹³⁹ This profession was ensured to them due to their skills in poetry and individual wit, with which they reply. 'The poets are the chief, though not the sole, historians of Western India...they speak in a peculiar tongue, which requires to be translated into the sober language of probability. To compensate for their magniloquence and obscurity, their pen is free. The despotism of Rajpoot princes does not extend to the poet's lay'.¹⁴⁰ Due to their eloquence in *geet* and *dohas*, they were able to generate support for the ruling Rajput by singing the brave and heroic deeds. They were able to alter the social-order by singing the rebukes called *bhumd*. Due to promptness in composing spontaneously, and through their oral skills they were able to set the mood of listeners according to the need of surrounding environment, thus, they were employed in the courts, *thikanas*, and battlefields. In the battlefields, they sang about the heroic and valorous deeds of the warriors loaded with eulogies

¹³⁹ Menariya, *Rajasthani Bhasa aur Sahitya*, p. 32. *Report Mardumshumari: Raj Marwar babat san 1891 isvi*, Jodhpur, Census Report-1895, Part 3, pp. 328-29.

¹⁴⁰ Ziegler, Norman P., 'Marvari Historical Chronicles: Sources for the Social and Cultural History of Rajasthan', *The Indian Economic and Social History Review*, 13 (2), 1976, pp. 219-250, (p. 219).

of *veer-ras* (bravery), in order to boost and motivate them. The significance of Charans in the Rajput kingdoms can be understood through the fact that they always continued in the imperial arenas, and there are no evidences to hint at discontinuation of their services.

The sacredness of bards in the regions of desert was immense. Their esteem as warlike tribe show-casing heroism made them homily of the Brahman. The Rathors hold a lot of reverence for the Charans. Thus, the Charans hold lands literally on the tenure of 'an old song'.¹⁴¹ The Charans were also traders of the desert as 'the carriers of these region: their sacred character overawes the lawless Rajput chief; and even the savage Koli and Bhil, and the plundering Sahariya of the desert, dread the anathema of these singular races, who conduct the caravan through the wildest and most desolate regions. The traveller avails himself of such convoy who desires to proceed to the coast by Jalore, Bhinmal, Sanchor and Radhanpur, whence he may pursue his route to Surat or Muskat-Mandavi'.¹⁴² The Charans were successful and respected carriers of the opium trade as the 'denumbing qualities of the Charan's dagger would fall innocuous; it sheds no blood, but it dries up its channels'.¹⁴³ The Mers, Bhils and even Jamshid Khan Turk have set up a protecting tablet in favour of Charans of Marla. The Charans came to Marla along with Rana Hamir and due to mercantile capacity immunity against taxes was granted to them.¹⁴⁴ This respect was ensured due to their proficiency in trade.

Charans specialized in singing praise of their patron, in prose. The *baat* (*vat* or tale) were *dingal* prose-narrative and were 'traditionally domain of learned specialists of the caste of Maru Carans, who maintained hereditary attachment to particular Rajput families'.¹⁴⁵ The *bat* recitations were organized regularly at

¹⁴¹ Tod, *op.cit.*, vol. 2, p. 1148.

¹⁴² *Ibid.*, p. 813.

¹⁴³ *Ibid.*, p. 1110.

¹⁴⁴ *Ibid.*, vol. 3, pp. 1656-7.

¹⁴⁵ Ziegler, Norman P, 'Marvari Historical Chronicles: Sources for the Social and Cultural History of Rajasthan', *The Indian Economic and*

the homes of Rajputs as it was a means to recite the glory of family, and a traditional method-cum-medium to school the young ones (descendants) about history of their families, lineages and clans. It also schooled them in moral values of their forefathers and tutored about the future roles to be taken up in the society. The religious-gatherings and the festivals like Dushhra, Diwali, Holi, etc. were the days for singing or reciting *vats*. Festive celebrations were initiated only after *Afim-gali* (opium-offering). At these gatherings, as *amal nai ramg denau* (to express gratitude), the Charans' recitation of poem or a story always preceded the offering of opium. At such occasions, the presence of a Charan was considered most crucial as without him the events could not take off. After the recitation of Charan, the host (Rajput/Thakur) would offer opium-mixed water to all the members present at the gathering. The first drink (of opium) was always reserved for the reciting Charan. The senior-most Thakur would offer this drink to show honour and respect.

All these respects and offices happened to Charans only after a proper training as preservers and transmitters of tales. The trainings and instructions of the profession were acquired by living in company and under the guidance of a professional bard and poet. The elderly Charans generally trained the boys in the basics of compositions, poetry, poetical forms, meters and narrations, while stressing on significance of memory (memorization) and efficiency of oral recitation. Dave claimed that for the majority of the Charans, the art of recitation and poetic composition was only a hereditary pastime, which was subordinate to their primary occupations like horse and cattle trading, military service or agriculture.¹⁴⁶ However, it is evident that some Charans were in full-time job of composing poems, writing histories and preserving tradition. Traditionally most of the Charans attached with the Rajput families, were rewarded with land grants called *sasan*. *Marwar ra pargana ri vigat* provides a long, detailed list of villages that were granted to the brahmins and charans as *sasan*.

Social History Review, 13 (2), 1976, p. 219.

¹⁴⁶ Dave, T.N, 'The Institution of Bards in Western India', *Eastern Anthropologist*, IV, No. 4, June-August, 1951, p. 167.

Bhats were also maintaining and recording the histories in the form of *peedhavali* (line of generations) and *vamsavali/vansh-avali* (line of descendants). These histories are at variance from *baat* because the *baat* is one of the basic forms of oral tradition, whereas both *pidhavali* and *vamsavali* are types of genealogy that are in written form, recorded in large *bahis*. *Bahis* are property of the *bhat* and he is responsible to make appropriate entries in *bahis* about the events of birth, marriage and death, only after consulting the patronising family along with all the details around the events. After the recitation of genealogy by a *bhat*, the patronizing family identifies its genuine *bhat* and registers the new entries. These entries were recorded at the dwelling-place of *yajman* (patron), who also certifies them. In order to ensure the authenticity in event entries, the presence of family members and village elders was preferred while making the entries. The makings of entries were celebrated, and apparently, the *bhats* were honoured by special offerings of food, gifts, clothes, jewellery and money. The primary reasons for holding reverence towards *bhats* is their custodianship of the history, and whenever there are confusions and contentions in the matters of inheritance, adoption, and right to land, they were resonated. These sacrosanct and special roles highlight their significance for the society that identifies them as ‘Bhat Raja’.¹⁴⁷ Even these services didn’t secure *sasan* grant for the *bhats*. So far no evidence has hinted to the land grants that were bestowed on *bhats* by states. This miss can be attributed to the fact that the *bhats* were concerned with the individual families and thus, disconnected with the royal arenas!

Different views prevail about the authenticity of these histories (*vat/bat/vansh-avali/peedhavali*), written and sang by the bards. Some consider that creations of Charans only hold the literary-value. While some believe that they do have tendency to pick and twist as per the requirement of the events, but their creations are based on the historical facts and the truths which they present in favour of their patron. Tessitori records that ‘there

¹⁴⁷ Nahta, ‘Rajasthani Aitehasik Baton va Khyaton ki Parampara’, *Parampara*, part 2, 1961, pp.114-5.

is probably no bardic literature in any part of world, in which truth is so marked by fiction or so disfigured by hyperbole, as in the bardic literature of Rajputana'.¹⁴⁸ Whereas Lord propounds that it must be remembered that the role of Charan is not of an objective historian, but of a guardian of legend and a conserver of tradition and history as visualized by him.¹⁴⁹ Thus, it highlights that Charans were significant due to their multi-dimensional roles as historians, counsellors, advisors and singers for the purpose.

The Rajputs have been a dominant class in the region of Thar in terms of the political control and authority. The Rathors came in from Kannauj and established the kingdom of Jodhpur after sustained efforts of war, diplomacy, canvassing and treachery. By extending protection and security to the pastoral and agricultural communities their lands were confiscated and made territories of the state. The efforts of Rathors (Jodhpur) have been discussed in the preceding chapters in context of the *rabdari* and the security extended to the villages and that ultimately channelized the income. Initially, the inhabitants looking for protection willingly invited this martial community but later this protection-giver or watch-keepers took control over their lands.

Rao Bika's liaison with the various cantons of Jats, the later helped him to take control over the territories of *jangaldesh*. Later, the state was consolidated through the resources that were available as transit fee from the trade routes and various local taxes such a *dhuna*, etc. Col. Tod expresses his reverence towards the Rathors of the desert (Bikaner) as 'they have had enough to endure at home, in the tyranny of their own lord...have fewer prejudices than their more eastern brethren; they will eat food, without enquiring by whom it was dressed, and will drink either wine or water, without asking to whom the cup belonged. They would make the best soldiers in the world if they would submit to discipline, as they are

¹⁴⁸ Tessitori, 'Progress Report of the work done during the year 1916', p. 228.

¹⁴⁹ Lord, A.B., *The Singer of Tales*, Harvard University Press, Cambridge, 1964, pp. 28 & 220.

brave, hardy, easily satisfied and very patient...'.¹⁵⁰ Thus, it can be asserted that most of the communities/groups/tribes of the Thar Desert were nomadic in nature. Even the royal houses had long spans of nomadism to their credit.

Religious Sects and Groups

Over the centuries the Bisnois of the north-western India, especially from the state of Rajasthan have made a unique blend of ecological sensibility and faith, which forms their religious sensibility. The most interesting example of this unique blend is the burial practice of this sect. The Bishnois worship lord Vishnu and they bury their dead with the faith that they are duty-bound to give back to the nature. This belief forms the cornerstone of their religious beliefs.

Another witness to their faith and ecological sensibility is the fact the Bishnoi carpenters don't cut trees. They wait for the natural death of a tree, and then utilized it. Bishnois worship Nature in all its manifestations. They exert to any possible level and extent to protect and conserve Nature. A few examples to indicate their conviction towards nature are: 'Women suckle motherless deer, die to save trees, go hungry to provide food for animals and live a strictly *sattvic* (simple) life'.¹⁵¹ Upkeeping such principles in ruthless and demanding desert are acts worth praise. Animals and plants are part and parcel of their sacred traditions. The basic tenets of this philosophy are sharing of all the resources and consideration of every living being's right to survive.

The rationale behind word 'bishnoi' is the belief of this sect in the twenty nine doctrines that they follow. '*Bishnoi*' in the local dialect translates to 'twenty nine', where '*bis*' stands for 20 and '*noi*' means nine. Thus, a follower of the twenty nine principles is *bisnoi*. They trace their ancestry from an ascetic saint, named Jambhaji, who is regarded as an incarnation of Lord Vishnu. Jambhaji's birth is dated vs 1508 *Bhardrapad vadi* 8 (c. 1451) at Pipasar (Nagaur).

¹⁵⁰ Tod, *op.cit.*, vol. 2, p. 1149.

¹⁵¹ <https://rashidfaridi.com/2010/06/27/bishnoi-tribe-in-india/>

Thakur Shri Lohat Panwar was his father. The first member to enrol in the Bishnoi sect was Pulho Panwar, the uncle of Jambhaji.

In the 15th century, Jambhoji was residing in a village near Jodhpur. He had a vision that the cause of droughts (hitting the area) and hardships that followed was people's interference with Nature. Thereafter, he decided to become a *sanyasi* (ascetic) and laid the foundation of the Bishnoi Sampradaya in c.1485 at Sambhara-*thal* near village Mukam (Nokka, Bikaner) and here onwards he was called Swami Jambeshwar Maharaj. Jambhoji's seat Sambhara-*thal* was abound in forest and was inhabited by pastoralists. Jambhoji wandered in these forests but never cut any tree for firewood. He depended upon the broken twigs that fell from the tree in natural process. With these practices, the Bishnoi sect began to crawl. He also laid down the following 29 tenets for his followers¹⁵²:

1. Bath early morning, before the sun rises.
2. Observe abstinence for five days, when a woman has her menses by not allowing her to work at all.
3. Observe 30 days of untouchability in case of child-birth.
4. Obey the Ideal Rule of life: Modesty.
5. Patience.
6. Purification.
7. Perform '*sandhya*' two times in a day.
8. Perform *aarti* and eulogies of the God, the Lord Vishnu, in evening hours.
9. Perform *yagna/havan*.
10. Filter water, milk and wood.
11. Speak pure words.
12. Tolerance and forgiveness.
13. Do not steal.
14. Do not condemn, or criticize.
15. Do not tell a lie.
16. Do not waste time on disputes or arguments.

¹⁵² <https://www.speakingtree.in/blog/29-principles-of-bishnoi-religion>

17. Keep fast on *amavasya*.
18. Worship and offer prayers to Lord Vishnu, the almighty, daily.
19. Pity on all beings and save wild animals.
20. Do not cut trees or ruin the greenery.
21. Crush lust, anger, greed, attachment.
22. Do not accept food or water from the hands of those who have yet not been initiated through *pahal*.
23. Protect the male sheep and goats.
24. Do not sterilize the ox.
25. Do not use opium.
26. Do not use tobacco or smoke.
27. Do not take *bhang* or hemp.
28. Do not take wine and meat.
29. Do not use blue clothes.

A slightly different version of these rules is provided by Rose, writing in the early 20th century.¹⁵³ The alterations/shifts in these dictums are not significant. Their indications are more or less, the same.

All these principles or tenets were mainly the dictums to lead a good life that was inclined to protect the natural resources and living beings. The Bishnois consider trees as sacred, but their empathy extends to every living being. So, they protect the entire eco-system that exists in their surroundings. Animals like black bucks and *chinkaras*, and birds like vultures, partridges, peacocks and even the endangered great Indian bustard can easily be located in the Bishnoi villages. Not only do the Bishnois protect fauna from poachers, they also actively participate for helping the wildlife to lead a fearless life that is supplied with plenty. The assurance for the aforesaid practice can be inferred from the facts that they allow animals to graze freely in their farmlands, they keep stone vessels filled with water near their homes and even hang water-filled pots from the branches of trees for the birds to

¹⁵³ Rose, H. A, *A Glossary of the Tribes and Castes of the Punjab and North-West Frontier Province*, vol. 2, Lahore, 1911, p. 111.

drink from. All these are physically active efforts to abide by the norms set out by the founder of the sect. All these acts display the conviction of community towards Nature. 'Relevance and Contemporaneity of teachings drew Hindus and Muslims alike to this *Sampradaya*', sounds like an overstatement by the author.¹⁵⁴ There is no doubt about the fact that the philosophy and the socio-economic content of this movement made a great difference in the life of the followers. Therefore, it enjoyed popularity amongst the local inhabiting population of Rajputs, Jats, Rebaris or Raikas.¹⁵⁵ The Bishnoi philosophy of generating maximum pastoral wealth influenced the royal policies in western Rajasthan as the income from pastoral activities and pastures formed the main component of the desert economy. The main items of export were *ghee*, milk, leather products and wool. As a major produce, *ghee* was taxed in *pargana* Jalore and Phalodi.¹⁵⁶ *Hasil Babi* records maximum amount of *ghee* production in village Baas Bishnoiyan-ra.¹⁵⁷ It might have been due to the protection, and the discipline that was institutionalized in the Bishnoi villages through the twenty nine rules.

In Marwar, many villages had Bishnoi population, but their religious tenants and activities find no mention in the state records.¹⁵⁸ A rare document indicates that in the 18th century, Marwar state issued instructions to its officials of *pargana* Phaludi for not killing birds and animals, and not to cut trees in the villages and territories where Bishnois reside. The *pattayats* of the village were informed through a letter.¹⁵⁹ Some villages of *pargana*

154 Kapur, *Reconstructing Identities*, p. 157.

155 Bishnoi, Krishnalal, *Guru Jambhoji evem Bishnoi Panth ka Itibasa*, 1st edition, Sirsa, 2000, pp. 111-2.

156 Bhadani, B.L., 'The Pastoral Sector in the Economy of Seventeenth Century Marwar' in B.L. Bhadani and Dwijendra Tripathi (eds.), *Aspects of India's Social and Economic History (a volume in honour of Shri Govind Agrawal)*, Jaipur, 1996, pp. 227-51 (p. 244).

157 Ibid, footnote 53.

158 *MRPRV*, vol. 1 & 2.

159 *Sanad Parwana Babi*, dated *Miti Jaith sudh 8 Bhom VS1821/1764 AD*.

Jodhpur had Bishnoi population. For example, Rasid, Salabadi, Judi, Sinali Pawara-ri, Tabaiyo bado, Nadiyo bado, Bhowadi, etc.¹⁶⁰ Twenty-eight villages in *pargana* Jodhpur had exclusive population of Bishnois.¹⁶¹ Barmer and Jaisalmer also had Bisnoi population.

Hordes of religious literature are available about the Bishnoi sect in form of *sabad*, *sakbis*, *harjas*, *kavittas* and *garb-chitwani*. A few inscriptions and *khyats* from medieval states of Marwar, Bikaner and Jaisalmer do supplement to understand this movement, its lifestyle and culture.¹⁶² As mentioned earlier, Jamboji was believed to be the incarnation of Vishnu and so he was performing miracles and was living up to the principles laid down for conserving environment. With these disciplines, Jamboji was able to earn royal patronages and receptions. The enrollment of Bida Jodhavat Rathor and Raval Jaitsi into Bishnoi sect, and the extension of patronage by Raval Jaitsi (ruler of Bikaner) to Jamboji are interesting episodes to understand the process of establishment, and propagation of any sect.¹⁶³ In the 15th century, patronage and legitimation were sought by popularizing the miraculous features and merits (medicinal qualities) of the greatest *tirth* (of the sect), Jambholav Lake near Phalodi (district Jodhpur). In continuation, Vilhoji established another pilgrimage at Mukam (near Bikaner).¹⁶⁴ The significance of the community can be realized from the results that they have achieved in the last few centuries.

For centuries, the preservation of trees and protection of animals has inspired the Bishnois. The teachings of Jambhoji were based on the idea of conserving environment and natural resources. The scope of these preachings was further expanded by Vilhoji, by highlighting the environmental and economic importance of vegetation, particularly the *khejri* tree. He

¹⁶⁰ *MRPRV*, vol. 1, pp. 208, 212, 213, 214, & 216.

¹⁶¹ *Ibid.*, pp. 195-6.

¹⁶² Kapur, *Reconstructing Identities*, pp. 157-8.

¹⁶³ *Ibid.*, p. 168.

¹⁶⁴ Bishnoi, Krishnalal, 'Kesoji ke Harjas' in *Bishnoi Santon ke Harjas: Mula evam Tika*, 2nd edition, Sirsa, 1997, p. 29.

propounded that those who didn't demonstrate kindness towards trees would go to hell.¹⁶⁵ He asked his disciples to plant a tree that would bear nectar, like fruit, not poison-like. He also narrated the story of Karamni, a disciple of Jambhoji, who sacrificed her life in c.1604 for the protection of *khejri* tree (a lifeline of desert as it can survive severe draught conditions). Khinvani and Netu were other two heroes who laid down their lives while saving the trees.¹⁶⁶ The most repeated story in term of protection of *khejri* tree is of Amrita Devi, a Bishnoi woman. She died along with more than 366 other Bishnois, while saving trees. Maharaja Abhay Singh of Jodhpur required wood for his palace. So he sent his soldiers to cut trees. Amrita Devi and other villagers hugged tree trunks, while the soldiers chopped them down with the trees. This is still remembered as the great Khejarli sacrifice.¹⁶⁷ Thus, the efforts of Bishnois in regard of environment protection have been significant. They have been successful in carving out a separate identity for themselves by upholding, 'protecting and preserving culture' against the dominant culture and practices of Rajputs, for whom hunting animals and cutting trees was the way of life. Even today, Bishnois are successful in managing and maintaining the limited resources that has been provided by the Thar Desert and are leading a contained life, governed by the norms of sect. A visit to any Bishnoi village of the Thar Desert will be enough to be acquainted with their philosophy. Any explorer looking for real time experience and reliable evidence can see large variety of birds, chinkaras and black-bucks playing inside the homes of the bisnois or in their courtyards along with their children. Finding Bishnoi women breast-feeding the deer-fawns along with their own infants is incredible!

¹⁶⁵ Bishnoi, Krishnalal, *Vilhoji ki Vani (Mul evam Tika)*, 2nd edition, Sirsa, 1997, p. 30. *vani*. 5.

¹⁶⁶ *Ibid.*, pp. 40-2.

¹⁶⁷ Gottlieb, Roger S. (ed.), *This Sacred Earth: Religion, Nature, Environment*, Routledge, New York, 1996, p. 159.

Panch-Pir¹⁶⁸

All the communities of the Thar desert were directly, or indirectly, depending upon the animal wealth for their survival. Therefore, a lot of concern for the animals, especially the small grazers like goat and sheep prevailed because they were the lifeline in the desert. The small grazers were playing the role of a cow for poor. The ability of bovines to adjust to the hot weather has been harnessed well by the inhabitants of Thar Desert. The cattle were the synonym of wealth. The dependence on animals and their economic significance pushed the inhabitants to invoke, and believe in the spiritual power of the heroes, who defended and protected the cattle from various threats. A few humans performed extraordinary acts of defence and valour in the dunes of Thar, and thus became the celebrated heroes of the western desert. Their acts of valour were specifically limited to defence and protection of the cattle and inhabitants. The celebrated five heroes of the western desert who attained the status of deities were Mallinathji, Pabuji, Ramdeoji, Harbuji Sankhlaji and Gugaji. Jointly, these five heroes are called *Panch-Pir*. This union is rooted in nature of acts performed by them. All these legendary heroes were particularly protecting the cattle and were champions for the cause of cows.

In this union of five *pirs*, Mallinath¹⁶⁹ is the first to head this list. He is represented as 'mounted on a white charger, with a lance over his shoulder, to which is attached a flag; his quiver resting on his horse's right flank, and his mistress, Padmavati, with a platter of food welcoming him from the raid'. It is believed that she also

¹⁶⁸ On the cult of 'Panch Pir', see W. Crooke, *The Popular Religion and Folklore of Northern India*, 1893, reprinted Delhi, 1978, pp. 202-6 and H. A. Rose, *A Glossary of the Tribes and Castes of the Punjab and North-West Frontier Province*, 1919, reprinted Delhi, 1990, vol. 1, pp. 195 & 572-3 and D. M. Coccarri, 'The Bir Babas of Banaras and the deified dead', in A. Hildebeitel (ed.), *Criminal Gods and Demon Devotees-Essays on the Guardians of Popular Hinduism*, Delhi, 1990, pp. 254-6.

¹⁶⁹ He was eldest son of Rao Salkha. Dist. Mallani is named after him as he was the ruler of Mallani kingdom.

accompanied him to Suryaloka, or 'the mansion of the sun'.¹⁷⁰ Padmavati is a much debated name in the history. It seems that Tod also had its hangover. The shrine of Mallinath is in Tilwara¹⁷¹, the venue of the famous cattle fair. House-holder Nath (not *vairagis*) are the custodians of the temple dedicated to Mallinath and Rupande. In this shrine, both appear as deified Hindu-heroes. By organizing the night-long sessions known as *jama*, the Nath *pujari* sing devotional compositions related to the king of Mallani, his spouse and their guru and co-disciples, with the traditional *tandurd*. Some oral narrations refer that this Rathor ruler was a Pir who had Muslim disciples. Mallani also refers to a historical kingdom in Marwar (between Jodhpur, Jasol and Barmer, in the Luni valley). Its name suggests that it was established by a Hindu ruler, named Rawal Mallinath. If the historicity of this character connects with the lineage of Rathor kings then there is the possibility of a real connection (of this mysterious *panth*) with numerous legends preserved in name of this hero and his wife. 'One can certainly dismiss many details as legendary in the songs and ballads referring to Mallinath and his spouse Rupande, but there is nothing absurd in assuming that the ruler of the Mallani kingdom had become a secret follower of the Isma'ili sect, popularly known in that area as *Kdmadiya panth* or *kunda panth* and at times simply referred to as "*panth*". At any rate, he seems to have been closely connected with Ramdeo Pir whose family he found suitable for matrimonial alliances; besides, he is credited, as has been said, with the establishment of the *Mallani* diocese which probably gave its name to the kingdom rather than the reverse'.¹⁷² Probably, at an early date, the local Mallinath tradition was taken over by the royal lineages of Rathors. Mallinath Rathor occupies an important position in the history of Marwar, many of his battles and heroic deeds have been described in various

¹⁷⁰ Tod, *op.cit.*, vol. 2, p. 843.

¹⁷¹ *Ibid.*, vol. 3, p. 1270.

¹⁷² Khan, Dominique-Sila, 'The Kamad of Rajasthan-Priests of a Forgotten Tradition', *Journal of Royal Asiatic Society, Series 3*, 6, I (1996), pp. 29-56.

sources. He has become famous as a hero-saint, who took living *Samadhi*. 'Many devotional songs are common to the Ramdev and Mallinath traditions...disciples of Mallinath were both Hindus and Muslims and he is worshipped as a pir'.¹⁷³ It is believed that the temple of this deity was built by Abhey Singh of Jodhpur in the 18th century. The 18th century was an age of religious and cultural revival for the Rajput states as is evident from the construction activities carried out in Amber-Jaipur, Bikaner, Jaisalmer and Jodhpur kingdoms.

Pabuji¹⁷⁴ is next in the line. He rides on his famous charger 'Black Caesar'. His exploits are the theme of itinerant bards and showmans, who annually go around exhibiting the exploits and deeds of this warrior, through pictorial delineations supported with recitation of rhymes to the villagers of the Thar Desert. Pabuji was also a Rathor, who probably lived in the early 14th century. Central to his deification is the thought that he is an incarnation of Lakshmana, the younger brother of Rama. The *bhopas* are the singers of Pabuji's epic. They have linked Pabuji's story with the myth of Rama's existence. Further, they say that many businesses were left unfinished at the battle of Lanka. Therefore, both the god and the demon-king have to return (in the battlefield). In the epic *Ramayana*, Lakshmana chops off the nose of Sarupnakha (Ravana's sister), and thus accumulates demerit, and in order to repent, he has to come back to the mortal world. Thus, Pabuji is an appendix of the *Ramayana* and as per local tradition, he is the incarnation of Lakshmana.

Ramdeoji, Karni Mata, Jeen Mata, Pabuji and many other local deities (Gugaji, Tejaji, Devnarayanji, Salasarji, Khatushyamji) are seen as the incarnations of Vishnu, Shiva, or Shakti. The aim behind these considerations is to reiterate the idea that the timely incarnations do happen to hold the good and eliminate evil. Further, it enforces that the god and goddesses are amidst all,

¹⁷³ Khan, Dominique-Sila, *Conversions and Shifting Identities: Ramdev Pir and the Ismailis in Rajsathan*, Manohar, Delhi, 1997, p. 87.

¹⁷⁴ A Rathor chief credited as the first-hero to bring the camels' in-use and noted for protecting cows.

and whenever their worshippers remember them, they reincarnate, but not necessarily in full version. Like the mare of Pabuji is remembered as an incarnation of a nymph!

It is significant to explore: how the believers see their hero-deity, while worshipping or remembering them, as he is the one who has sacrificed his life for the welfare of mankind.

Pabuji holds a special-status for the rebari/raika community. He is not only a primordial incarnation. He is the hero-deity who has given meaning to the lives of *Raikas*, by bringing the she-camels (*rati dbauli sand*) to Marwar, and specifically by putting the duty of breeding and grazing the camel on *Raikas*. Since then *Rebaris* became camel-breeders and later performed as 'camel-riding messengers'¹⁷⁵ and 'postmen'¹⁷⁶. Many entries in *Hukumat ri Bahi* indicate to the instances in which the *Raikas* have been rewarded, for bringing in messages, and turbans of princes who fell in battlefields. Thus, Pabuji becomes a respected figure worth worshipping because of two reasons; primarily, as an incarnation of Lakshmana, and secondly, being the warrior who brings the camels and annihilates the demons.

Even as the annihilator of demons, Pabuji didn't accumulate demerits. While he was rounding up the she-camels, the soldiers of demon-king Ravana stopped him. He embattles them valiantly, and finally speared Ravana to death. In another episode, while dealing with a family feud between the Rathors and the Khicis, Pabuji gave directions to completely destroy the army of the latter. During the battle, when one of his courtiers was about to strike a fatal blow on the leader of Khicis (Jindrao), Pabuji stops him from doing it because the Khici leader was the husband of his sister. On another occasion, Jindrao was face to face with Pabuji in the battlefield, but even then latter decided not to kill him.

¹⁷⁵ Westphal-Hellbusch, Sigrid, 'Changes in Meaning of Ethnic as Exemplified by the Jat, Rabari, Bharwad, and Charan in Northwestern India', in L.S. Leshnik and G.D. Sontheimer (eds), *Pastoralists and Nomads in South Asia*, Otto Harrassowitz, Wiesbaden, 1975, pp. 117-38.

¹⁷⁶ Sharma, G. N., *Rajasthan Studies*, Lakshmi Narain Agarwal Educational Publications, Agra, 1970, p. 126.

On both these occasions, he gives *jivan-dan* (donation of life) to his enemy because he does not want to accumulate the demerit of widowing his sister. At this moment, being divine, he was carried away by the heavenly palanquin. His departure was avenged by his nephew (brother's son) Rupnath, who is also known as Jhardoji. Here, the credit for maintaining the crux of divinity in Pabuji goes to the composer, who has been conscious enough throughout the creation to keep the protagonist away from demerits, and consciously, justifying his actions, as steps taken for upholding the good in society.

Events from Pabuji's life are painted on a huge piece of cloth, each scene is painted in a rectangular column. Various columns appear on one such piece. These paintings depicting each life event in separate columns are called *phars*. Except during the performances, *phars* are always kept rolled, from left to right. During performances, *phar* is mounted. It is a gesture to show respect for this spiritual object as *phars* can never be kept on the floor. *Phars* are like mobile-temples that are carried by the narrators (*bachnis*) to the performance destinations. Smith concludes, *phars* are mainly painted by the painters (*citero*) of Josi caste, mostly settled in south-east Rajasthan.¹⁷⁷ He also forwards that the Naik Bhopas have also painted some *phars*. *Bhopas* are the narrators of Pabuji's story. Among the *Rebaris*, there are men who specialize in singing some episodes from these *phars*, as depicted on the cloth and they are called *Pabuji re jhurave*. Alike, the singers of *jhurave* are called *jhurave ganewale* (*jhurave* singers). The *bhopas* and *jhurave ganewale* sing the same themes. Both groups organize their sessions in night, but unlike *phar*, there is no use of musical instrument by *jhurave* singers. By plugging one of the index fingers in their right or left ear, the *jhurava* experts sing at a loud pitch. The last word of each line recited by the singer is repeated by the audience, this act is called *hunkara dena*. The singing of *phars* by Naik Bhopas is considered as the most specialized and prime singing. Their recitations are called *Pabuji ra parbachan*

¹⁷⁷ Smith, John D., *The Epic of Pabuji: A Study, Transcription and Translation*, Cambridge University Press, Cambridge, 1991, p. 66.

(holy-narrations about Pabuji). The performance and acts before the cloth-painting (*phar*) are accompanied by a string-instrument (*ravan-hatha*), *ghun-ghru* (ankle-bells) and *maat* (drum made on an earthen pot covered with a raw-hide membrane). During these narrations, the Bhopa points at the pictures on the *phar*, with the bow of his string instrument (*ravan-hatha*), and his wife takes the lit oil-lamp closer to the indicated space/column in order to illuminate it. Thus, the sacred journey gets organized over the limited space of *phar*. The performances outside Pabuji's temple in village Kolu¹⁷⁸ are still in practice. In Rajasthan, singers are commonly found outside the temples. In many temples (Karni Mata, Jeen Mata, Tejaji, Gugaji, etc.), I have seen these music performers, who sit at the corner of entrance and play *nagaras/nangadas* and *chang*. They specialize in singing the praise of their respective deities. *Bhagats* of Jeen Mata temple are famous for their skilful singing accompanied by *chang*. These practices might have evolved around the temple in the long run.

The reason for *Rebaris* to venerate Pabuji is not limited to the fact that he brought camels to Marwar. Its primary root is attached in the confirmation of community in a respectable job (to rear and graze camel). According to the tradition of *Rebaris*, the theory of their origin goes back to mythological roots, in which the first she-camel was created by goddess Parvati, consort of Shiva. In response, Shiva created the first Rebari with a rational that he will graze this creation (camel).¹⁷⁹ Thus, since their inception, the *Rebaris/Raikas* are associated with camel grazing.

Now, if we follow life-narrative of Pabuji, the *Raikas* were without camels. Their primordial status as camel-breeders also comes under dark cloud. So, the question arises how to relate these stories. Thus, the need for a rational lookout becomes essential. It is significant to indicate that the camels were introduced in the regions of Thar only around the first century millennium and

¹⁷⁸ Here, Pabuji lived and ruled.

¹⁷⁹ *Report Mardumshumari Raj Marwar*, 1891, part-3 (2 vols.), Jodhpur, 1895, pp. 567-8.

became popular only during the early medieval times.¹⁸⁰ So, it is evident that the *Rebaris* were not without camels before the intervention of Pabuji. The intervention of Pabuji was significant as he got them a special-breed (called *thok*), the 'reddish-brown she-camel' from Lanka, located across the sea. This opinion is supported by many traditional knowledge-keepers who say that the breed Pabuji brought has a reddish-brown complexion and locks of hair on their upper condyles of hind-legs. This is acceptable as camel (dromedary) is indigenous of South Africa.¹⁸¹ Illuminating significance of the Pabuji's cult in Rajasthan, the locals say that every dying camel always looks towards Lanka. Sindhi Muslims believe that the 'motherland' of camels was a *dhani* (hamlet) called Sairo Bagani in village Lankaye, 12 miles from Umarkot (now in Pakistan). Further they say that camels of this *dhani* were conveyed to Pabuji by a *Charan*. On his advice, Pabuji raided Lankaye and after defeating the local graziers (called Sindhis) he brought the herds of camels to Marwar. This description fits in the narrations of Bhopa's that 'when these camels being driven to Marwar, it appeared as if thousands of *khejri* (*Prosopis cineraria*) were walking'. Thus, closely associates the animal and tree. In return, Pabuji gifted *Charans* to the Sindhis, and since then the former are keeping the genealogical accounts of Sindhi Muslims. Pabuji emerges in the role of a brigand for the Sindhis. Various communities were surviving on raids in the desert as discussed earlier. But the *Rebaris* don't describe him as a raider. For them, he is a warrior who seized the camels from the 'tyrant/demonic' king of Lanka. Here, the creativity of the epic composer becomes evident, who has equalled the Lankaye of Sindh to Lanka of Ravan (Sri Lanka). Thus, the effect of conditioning that happened during cultural interaction is apparent.

The version of story given by Sindhi Muslims is also confirmed by Nainsi. The *Raj Marwar Census Report* also confirms the same. According to Marwar Census report, Lankthali was a region (*ilaqa*)

¹⁸⁰ Bulliet, R. W., *The Camel and the Wheel*, Harvard University Press, Cambridge, 1975.

¹⁸¹ Ibid.

in Sindh that was famous for she-camels. To reach this region, one needs to cross a sea. For crossing back into Marwar through sea with herds of camels, Pabuji laid his bow between the two coasts and cushioned it with peacock feathers. As the camels walked over the bridge of feathers, the pug marks came over them. They believe that since then these marks are on the peacock feathers. Different opinions on the fate of she-camels have been recorded. Bhopas say the camels brought by Pabuji were divided and half of them were sent to Kelam Bai and other half were gifted to Harmal Dewasi (co-brigand of Pabuji). The *Raj Marwar Census Report* records that most of them were sent to Kelam and some were left free in the Khejri groves and *dhauras* of Marwar. No evidence is available to confirm any of these versions, but it establishes that camels were brought from the distant lands. The image of Pabuji is of the martial-ascetic, who even after his demise in the battlefield is guiding people on all the worldly-affairs. Therefore, Pabuji's temple is found in every *Rebari* hamlet. In fact, whenever a new hamlet is found by the *Rebaris/Raikas*, the first thing for them to do is confirmation of a land-piece (called *oran*) in the name of their deity, on which they built the temple of Pabuji. The funds for construction are raised through collections. At times, they build only a platform (*than/chutra*) in name of Pabuji and erect a stone-tablet over it, symbolizing Pabuji. In these representations, Pabuji is shown seated on his divine mare. So far, more or less, Pabuji has remained a caste-bound deity. His cult has not extended beyond the confines of a specific caste like Devnarayanji (of the Gujars) and Tejaji (of the Jats). Neither big temples nor a separate class of priests have emerged in his honour, as in the case of Ramdeoji.

Next on rolls is Ramdeo¹⁸² a famed name in Marudesa in whose honour altars are raised in every Rajput village. As per Tod, he was a Rathor.¹⁸³ Village Ramdeora in Runicha houses the shrine of Ramdeo that is three *kos* from Pokharan towards north on the Jodhpur-Jaisalmer road. Ramdeo is credited for clearing

¹⁸² A Tonwar or Tanwar Rajput, who is now worshipped as Ramsah Pir or Baba Ramdev.

¹⁸³ Tod, *op. Cit.*, vol. 2, p. 843.

the Pokharan area that was earlier devastated by a *rakshas* (Bheru). Later, he established a small kingdom. After sometime, without consulting Ramdeo, his brother Viramde, married the daughter of former to Hamir, son of Rathor Jagpal Malawat. Ramdeo assigned Pokharan to his son-in-law and moved-out to other region. Thus, Pokharan came to the Rathors. Leaving Pokharan, he went to the vicinity where now Ramdeora is located.¹⁸⁴ The tradition of Ramdev is centred around the personality of Ramdev. It is believed that Ramdev was an *avtar* of Vishnu-Krishna which is a popular theme behind many *bhakti*-cults and their leaders. Binford indicates that Ramdev has been viewed as a powerful *kshatriya* god who is 'protector of untouchables' and 'saviour of poor'.¹⁸⁵ Dominique-Sila Khan blames her for failing 'to understand the historical link of Ramdev with the untouchables, Tantrism and Islam', and reducing this tradition to the common denominator of Hindu *bhakti*.¹⁸⁶ In her interesting work Khan argues, 'The cult of the Hindu deity Ramdeo is now very popular in Rajasthan, among devotees of all castes and creeds; however it is traditionally linked with certain untouchable communities. The numerous Muslim elements which are conspicuous in this tradition have generally been ascribed to vague Sufi influences. Ramdeo was actually an Ismaili Pir whose grand-father had been converted by the Nizari missionary Shams-al-din Sabzwari. When the *Pir* of Rajasthan declared himself independent from the centre then located in Persia where the *Imam* resided, the tradition was gradually re-hinduiz'.¹⁸⁷ She has tried 'to reconstruct the 'missing links' between the past and the present, and show how the Ramdev movement can be perceived as a 'forgotten branch' of Indian Ismailism...this

¹⁸⁴ *MRPRV*, vol. 2, pp. 291 & 349.

¹⁸⁵ Binford, Mira, 'Mixing in the Colour of Ram of Ranuja', in B.L. Smith (ed.) *Hinduism: New Essays in the History of Religion*, E.J. Brill, Leiden, 1976, pp. 120-42.

¹⁸⁶ Khan, Dominique-Sila, *Conversions and Shifting Identities*, p. 64.

¹⁸⁷ Khan, Dominique-Sila, 'L'Origine Ismaélienne Du Culte Hindou De Ramdeo Pir', *Revue de l'histoire des Religions*, vol. 210, No. 1 (Janvier-Mars 1993), pp. 27-47.

would lead us to raise once more from a different perspective, the fundamental question of the nature of Hinduism and Islam in the subcontinent and their interactions throughout history'.¹⁸⁸

Kamad (or *Kamadiya*) was a community of wandering minstrels or jugglers who sing hymns in praise of Baba Ramdeo of Marwar like Bhopas and *jubarve* singers. They worship footprints of the saint. The devotional singers of the Kamad and Meghwal communities purpose that the figure appearing in their compositions as *Nikalank avatar* or Kalki, is Ramdeo himself who had already descended (*avtarit huai hai*) once in the *kaljug* to help untouchables and low caste devotees.¹⁸⁹ Two fairs are organized at the shrine of the saint. The cult is popular among the untouchables, such as Bhambi (Meghwal), Regar, Berwa, Chamar, Raikas, etc. most of them are leather-workers, pastoralists and weavers. In popular culture, Ramdeo, the Pir of Runicha was regarded as a 'god of the pariahs' (*dhedhon ka deo*). Grave (*samadhi*) of saint is the main object for the cult followers. Both Hindus and Muslims worship the deity alike with invocations like Ramdeo-Pir or Ramshah-Pir. According to an oral tradition, Ramdeo prohibited the worship of sacred images, therefore the cult did not promoted temples. Thus, alike Bisnois, the reverence towards the saint was expressed through sacred vigil called *jama-jagran*. Nowadays, the main temple of Ramdeora is important pilgrimage centre for various communities in Rajasthan and surrounding states. It is commonly referred as Ramdeo's *samddhi*. Structurally, it is a grave in the Mohammadian style, topped by a big half cylindrical stone and covered with a *chadar* (cloth) like the graves of Muslim saints and martyrs. It is actually a grave that is enclosed with numerous similar structures called *smadhhis* of Rajput warriors and saints. All these graves are located inside the compound of a Hindu temple that has been built by the Maharaja of Bikaner in the 20th century. The main shrine inside the compound is dedicated to the Pir of Runicha, other graves are said to be of his parents, sons and disciples. On the opposite, one can see a smaller shrine of Dali Bai,

¹⁸⁸ Khan, Dominique-Sila, *Conversions and Shifting Identities*, p. 61.

¹⁸⁹ Khan, Dominique-Sila, 'The Kamad of Rajasthan'

an untouchable female saint who is regarded as Ramdeo's *dharam bahan* (sister for worldly-matters) and at times *guru bahan* (co-disciple).¹⁹⁰ Outside the shrine, on the front wall two paintings are hanging, the left one represents the 'Five-Pirs' of Rajasthan (Ramdeo, Pabu, Harbu, Goga and Mallinath or Meha) and the painting on the right side depicts the 'five Pandava' of the epic *Mahabharata*. The combination of a replica tombstone with the *Panch-Pir* and the *Panch Pandava* is a strong reminiscent of the Hindu folk-cult that highlights the *Panch Piriya*. The regular offerings at this shrine of Ramdeo are rag-horses, foot-print stones and *chadar*. The performances of rituals by the Hindus at this grave have been questioned by many, on the terms, that why a Hindu has been buried? But looking at Jambuji (founder of Bisnoi sect) it can be said that Ramdeo is not the only Hindu who has been buried. Another popular saint was Harji Bhatti to whom devotional songs have been ascribed and his *samaddhi* is located in Panditjiki-dhani near Osian (dist. Jodhpur) which is shrouded with the Muhammadian practices.¹⁹¹ Perhaps, the tradition of burial might have been a popular concept in the dry lands due to the scarcity of wood, or a method to limit the use of wood.

The hagiography around the title (Ramdev Pir/Ramshah Pir) is embedded in the story, that the title was conferred on him when he won a contest of miracles against five Muslim *pirs* who came from Mecca. After accepting defeat, the five *pirs* admitted that Ramdev had more spiritual excellence than all of them. The acceptance and popularity of this story has overshadowed all the other versions of this legend and became a favourite discipline of the popular iconography that is associated with Runicha-Pir. The extensions of representations (in stone-slabs, pictures) and expansions in the temple complex are contributions of the Rajput kings of Jodhpur and Bikaner as pushed during the 18th and 20th centuries. During these centuries, other popular traditions such as

¹⁹⁰ Ibid.,

¹⁹¹ Khan, Dominique-Sila, *Conversions and Shifting Identities*, pp. 88-9.

Guga and Mallinath were also revived to fit them into the general framework of Hindu tradition.

The brave Harbuji Sankhla¹⁹² is the fourth hero-deity. Rao Jodha was indebted to Harbhuji, for the protection extended by him, while the former was in exile, due to aggression of Chonda,¹⁹³ and for the redemption of Mandor, when seized by the Rana of Chittor. Mehraj was the father of Harbuji Sankhla, the Paladin of Marudes exploits are themes for the erratic bards of Rajasthan. Three hundred of his kin and clan have sacrificed their lives for the protection of the landmass of their activities that has 'moistened the sand-hills of the Luni with their blood'.¹⁹⁴ Further, 'Harbuji Sankhla, at once a soldier and a devotee, was one of those Rajput cavaliers *'sans peur et sans reproche'*, whose life of celibacy and perilous adventure was mingled with the austere devotion of an ascetic; by turns aiding with his lance the cause which he deemed worthy, or exercising an unbounded hospitality towards the stranger. This generosity had much reduced his resources when Jodha sought his protection. It was the eve of the *Sada-bart*, one of those hospitable rites which, in former times, characterized Rajwara. This 'perpetual charity' supplies food to the stranger and traveller, and is distributed not only by individual chiefs and by the government, but by subscriptions of communities. ...Hospitality is a virtue pronounced to belong more peculiarly to a semi-barbarous condition. Jodha, with one hundred and twenty followers, came to solicit the 'stranger's fare': but unfortunately it was too late, the *Sada-bart* had been distributed. In this exigence, Harbuji recollected that there was a wood called *muja*, used in dyeing, which among other things in the desert regions is resorted to in scarcity. A portion of this was bruised, and boiled with some flour, sugar, and spices, making altogether a palatable pottage; and with a promise of better fare on the morrow, it was set before the young Rao and his followers, who, after making a good repast,

¹⁹² A Panwar Rajput of Bengti (near Phalodi) where his cart is still worshipped.

¹⁹³ Tod, *op. cit.*, vol. 1, p. 327.

¹⁹⁴ *Ibid.*, vol. 2, p. 733.

soon forgot Chitor in sleep. On waking, each stared at his fellow, for their mustachios were dyed with their evening's meal; but the old chief, who was not disposed to reveal his expedient, made it minister to their hopes by giving it a miraculous character, and saying "that as the grey of age was thus metamorphosed into the tint of morn and hope, so would their fortunes become young, and Mandor again be theirs". Elevated by this prospect, they enlisted Harbuji on their side. He accompanied them to the chieftain of Mewa, "whose stables contained one hundred chosen steeds". Pabuji, a third independent of the same stamp, with his 'coal-black steed' was gained to the cause, and Jodha soon found himself strong enough to attempt the recovery of his capital. The sons of Chonda were taken by surprise: but despising the numbers of the foe, and ignorant who were their auxiliaries, they descended sword in hand to meet the assailants. The elder son of Chonda with many adherents was slain; and the younger, deserted by the subjects of Mandor, trusted to the swiftness of his horse for escape; but being pursued, was overtaken and killed on the boundary of Godwar. Thus Jodha, in his turn, was revenged, but the 'feud was not balanced'. Two sons of Chitor had fallen for one chief of Mandor. But wisely reflecting on the original aggression, and the superior power of Mewar, as well as his being indebted for his present success to foreign aid, Jodha sued for peace, and offered as the *mundkati*, or 'price of blood' and 'to quench the feud' that the spot where Manja fell should be the future barrier of the two States'.¹⁹⁵

Guga Pir¹⁹⁶ was a Chauhan Rajput who had 47 sons. He attained 'martyrdom' while defending the passage of Sutlej during invasion of Mahmud. Goga Chauhan is believed to have lived during the 11th century in Western Rajasthan according to most of the sources. The evidences suggest that by the 15th century, he had acquired the status of a folk deity. Goga according to some traditions was born in a Chauhan Rajput family; however his cult

¹⁹⁵ Tod, *op. cit.*, vol. 1, p. 328-30.

¹⁹⁶ At the end of the thirteenth century, Gigaji, Gogaji or Guggaji, was killed in battle with Firoz Shah of Delhi.

emerged and grew in non-Brahmanical traditions. The study of traditions associated with Goga indicates that in pre-18th century, the cult was socially and politically dominant but the high caste didn't associate with it.

The cult of Guga in Rajasthan encompasses three dominant images which are of serpent-God, a *nath-panthi* and a *pir* (sufi saint). In popular perception, it is believed that Goga had a supernatural influence over the serpents as he is a god of serpents. Followers believe that he is incarnation of Padam-nag (the god of snakes). Most of the anecdotes related to him are depiction of his miraculous powers related to snakes, and are about his spiritual-power to cure the snake bites and control snakes. His power to cure the snake bites is remarkable and unprecedented, which provides a justification for the reverence upheld by the believers towards Goga. As per the traditional method, in order to propitiate Goga, milk shall be sprinkled in the direction in which the snake has been seen while reciting the name of Gogaji. Another popular ritual that is sacrosanctly performed by the farmers of Rajasthan is *Goga Rakhdi* (tying of thread) to the plough on the first day of ploughing. For *Goga Rakhdi*, the thread is tied to the plough and the prayers (*Hali, Bali, Gogo Rakhvale*) are said for the protection of plougher and bullock when all the participants are on fields. Thus, it clearly highlights that variety of snakes were a constant threat to the cattle and the human resource in the Thar Desert.

Another popular image of Goga is as a *Nath-panthi*. Oral as well written traditions portray Goga as a disciple of Gorakhnath, founder of a non-Brahmanic sect. It may be mentioned that the period between 10th and 11th centuries and 14th and 15th centuries witnessed the growth of powerful non-Brahmanical Nathpanthi movement in various parts of northern India. Most of these sects or cults that evolved in the Thar Desert during the medieval times are basically the byproduct of the Nathpanthi movement. The limited impact of the Muslim sects like Ismailies and Chistis is evident in rituals. Thus, the emergence of various sects like Ramdev, Mallinath, Harbuji, etc, was followed by the cocktail of rituals.

Dashratha Sharma highlights a 13th century source that

records the existence of Goga *math*.¹⁹⁷ Sources also indicate that Gogaji was associated with *Jafarpanth*, a branch of Gorakhpanth.¹⁹⁸ Interestingly, all the legends signifying Goga share a common thread. In all legends, Gorakhnath is seen as an important personality, who has played a significant role in the life of the protagonist. Goga is widely accepted as a *pir*. Constant acknowledgements address him as *Gogapir* or *Zaharpir*. Traditionally, Muslims are also his followers, due to the pastoralist activities carried out by them as they also look forward to protect their cattle from the vermin. Approximately, 12 generations after Goga, a branch of his family converted to Islam and they were known as the Kyamkhani Muslims.

A legend about conversion of Goga to Islam is prevalent amongst the followers. They believe that once the mother of Goga rebuked him for meeting his wife clandestinely. Being unable to bear the shame, he appealed to the mother earth to break open and accept him inside. Mother earth refused his request by saying that 'only Muslims can be buried'. So, in order to ensure the acceptance of his request, he converted to Islam. Over the centuries, many artefacts have evolved around the cult, which are linked to the Islamic practices, like the Ramdeo cult and the Bishnoi sect. As he was buried, his grave (*mazar*) became the main centre for rituals. It is interesting to note that '*Bismilla*' is engraved on a stone that is placed on the top of entrance door of the Goga's main shrine.¹⁹⁹ The traditional followers of Goga are Chamars, potters, Bhagats, Jogis, peasants specially the Jat peasants, Gujjars, Ahirs, nomadic tribe Gaduliyas, Muslims communities who engage in pastoral activities and the Mirsanas.²⁰⁰ The direct engagement of

¹⁹⁷ Sharma, G. D., 'Gugaji ke samaiy par kinchit aur prakash', *Varda*, no. 4, 1960.

¹⁹⁸ Chandran Charan, *Gugaji Chauhan Ri Rajasthani Gatha*, Bikaner, 1962.

¹⁹⁹ Parik, Surya Shankar, 'Goga Meri: Ek Atihasik Vivaichan', *Maru-Bharti*, Vol. 4, Jan 1965.

²⁰⁰ Gehlot, Jagdish Singh, *Report Murdumshumari Raj Marwar 1891*, Sodh-Sansthan, Jodhpur.

the peasants and communities engaged in pastoral activities with the agricultural fields and pastures respectively has placed them directly in the danger zone, as snakes wander in open fields. Thus, it is clear that the snake god (Gogaji) gained prominence amongst the communities that engaged in the pastoral and agricultural activities, as a defender, protector, and rehabilitator, who cured from snake bites and ensured all kinds of protection against the venomous reptile. Gradually, he attained a spiritual elevation.

As Gogaji is popular amongst the agro-pastoral communities, his manifestation is limited through construction of *thaans*, which are ordinary and inexpensive, due to the limited availability of modest resources. The *thaan* is generally a platform with an erected stone, over which offerings are made in the name of the deity. The elderly people around the villages highlight, 'Gogaji ka *thaan* hi *howai*, *mandir nai*; *maharaj jiwari rakho* (Gogaji's manifestation is only through *thaans*, not temples; he (lord) shall keep things safe)'. Existing *bardic* literature of pre-19th century also suggests absence of big architectural structure.²⁰¹ This indicates that the *thaans* were mainly built by the common people, and the socially, politically and economically dominant groups did not extend patronage to this snake god. Col. Tod notes that Guga-ka-thal is celebrated after historic hero of Chauhans-Guga, who fell defending the cows.²⁰² He completely missed the powers of Gogaji against snakes. A festival-cum-fair of Gogaji called Guga-*navmil/naumi* was organized on 9th dark-half of *bhadaun*.²⁰³ In recent years, small square chamber of 2-3ft has come up on the *thaans* (platforms) that houses symbol of snake, and a stone-slab with image of Gogaji engraved, in-which protagonist is shown riding a horse with a spear in his hand.²⁰⁴ Slowly, the *mazaars* are getting replaced by temple structures and modifications in the associated

²⁰¹ Dhali, Rajshree, 'Tracing the Process of Brahmanisation of a Folk Cult during 19th and 20th Century in Rajasthan: A Case Study of Goga', *Proceedings of Indian History Congress*, vol. 75, 2014, pp. 783-789.

²⁰² Tod, *op. cit.*, vol. 3, p. 1270.

²⁰³ *Ibid.*, p. 807.

²⁰⁴ See Plate-10.

traditions are also promoted to make it befitting for a particular agenda. Till the mid-20th century, there was no literature concerning the protagonist. It has been witnessed that with the emergence of print culture as an important medium of expression, a good collections of *bhajans* and verses have been composed to praise Goga, and recently, all these verses and *chalisas* have become available in print that is fashioned in line with the Sanskritic traditions where Gogaji is depicted as *mangal-karta* and *dukh-barta*. Attempts are continuing for writing religious treatises on the glory of Goga that are identical to the patterns of Brahmanical deities. The imitation of the popular Hindu titles is dominating the religious scriptures, thus, they are titled as *Goga-Puraan* and *Shri Goga Chalisa*, *Shri Gogaji ri bhajanmala*, etc. Here, it is interesting to highlight that recently, specially in last three decades, the *dhunas* (fire-alters) have come up at most of the *thaans*, where a *trishul* is generally erected midst of alter, and dry coconuts are offered as oblations. After offering a coconut at the altar, the believers collect *bhabhuti* (ash of alter), which signifies the *prasad*. *Bhagats* are the official priests of Goga *thaans*. Generally, these *bhagtas* were from the lower castes and were responsible for conducting primary rituals at *thaan*. During the 20th century, this role slowly merged into the ambit of main Brahmanical castes. Now, the brahmins are playing lead role at *thaans*/temples by disseminating the Brahmanical rituals and performing idealized *Sanatani pujas*. Presently, in village Jharli (village-post: Shri Madhopur, district Sikar), a Brahmin is performing the priestly functions of Goga temple. The Hiramal *thaan* is also going through this process.

Chayal Muslim priest functions for 11 months at Gogameri, the main shrine of Goga. During the fair in the month of *bhadaun* (August-September), a Brahman priest joins the regular priest in order to manage the offerings and hoards of devotees. A festival is annually organized at the temple of Goga-Meri for a month where trade in variety of items, including cattle, is executed. After Rakhi, the first *navmi* (9th) of *Bhadaun* is celebrated as *Goga-navmi*. On this day, the *rakhis* tied on the day of *raksha-bandhan* are removed and offered to the Gogaji. The celebrations prescribed for this day are performed in homes with simple rituals, in which the offerings

made out of milk-like kheer are offered to the deity. Later, as *prasad*, the preparations are consumed and distributed. Still, the traditional devotees follow these simple methods of worship.

The genealogical chart of incarnated deities as prepared by Charans usually begins with Hinglaj Mata followed by Awadhji Mata and Karni Mata. Each successive figure is believed to be an incarnation of the previous *sagat*. Many of the contemporary goddesses are also at test as an incarnation of some earlier deified figure such as, Karni Mata. Other famous examples of it are Jeen Mata and Bae Mata. However, it is important to note that not all the incarnated deities follow Karni Mata's line, who is perhaps the best-known of all the living-goddesses. She was born in 1387 AD in the village Suwap, some 20 miles south-east of Phalodi in north-western Rajasthan. She was the seventh daughter of Meha Kiniya and Adha Mandha. According to a range of accounts articulated in form of songs, stories, prayers and written texts, Karni Mata first demonstrated her extraordinary powers of *shakti* at her birth. It is said that at the time of her birth, she was able to speak, a feat which reaffirmed a prophecy which her mother and father had received separately, from the goddess Durga. Karni's power was confirmed when she fused all five fingers of her aunt's hand together, when the aunt expressed her disappointment on the birth of another niece. The Jangal-desh was locus for religious-mission of Karni and the state building enterprise of Rathor Bika, who laid the foundation of Bikawat dynasty. Jangal-desh is a 37 thousand sq. km. tract of scrub and sand-desert in the extreme north-west of the Thar region. Mainly, the semi-nomadic tribes lived in this tough desert by cultivating *jowar*, *bajra*, *til* and wheat around the oasis, and in dunes with the collected rain water. In order to survive the tough conditions, they reared and grazed sheep, goats, camel and desert cattle. The expansion of the Rajput sovereignty in the early 15th century, in form of petty kingdoms led to their assimilation in the newly emerging states, but due to the nomadic nature of economic activities they were able to retain a high degree of autonomy.

Shakti is a significant feature that has been attributed to Karni by people. The followers believe that Karni possesses the power

and ability, even to revive the dead, because she is a *purna avtar*. Karni became important not only as a *charani* with miraculous powers. She attained significance mainly due to her associations and relationships with the Rathor states of Jodhpur and Bikaner. Some legends even promote that the foundation stone of Jodhpur and Bikaner forts were laid by Karni. However, *MRPRV* doesn't have any specific information on it except the mentions that Rao Jodha laid the foundation of a fort on the *bhakar* of *Chidiya ka tunk*. The history of both the states highlights that the deity was interceding throughout on behalf of the rulers, even in times of battle, or in the matters of alliance-formation.

Rathor Bika left Jodhpur on *Asoj Sudi 10* vs1522 (1465 AD) with hundred horse and five hundred foot soldiers.²⁰⁵ Another source confirms 400 foot soldiers.²⁰⁶ And after the march of the first day, he reached 'Deshnuk, 16 miles south to the present city of Bikanir, he paid his respect to a famous Charan woman named Karniji, who was known to be gifted with supernatural power'.²⁰⁷ When Karni arrived in Deshnoke in the third decade of the 15th century, this backwater was severely disrupted by incursions of Rathor Rajput war-bands that were associated with the recently established Marwar kingdom. It was a prime example of the new-style Rajput state that was formed by the invading Rathor warlords on the model of dominion. They exterminated and subjugated the indigenous Rajput lineages and the tribal population in order to bring their land holdings under the control of Rathor sovereignty.²⁰⁸ Rao Bika knew well that he needs to persuade Karni to gain her support, for boosting his chances of success in Jangaladesh at any rate, and to cease any opposition to

²⁰⁵ Powlett, P. W., *Gazetteer of the Bikaner State*, Book Treasure, Jodhpur, second edition 2017, p. 1.

²⁰⁶ *Bikaner: A Fifth Centenary Commemorative Volume*, Rao Bikaji Sansthan, New Delhi, 1988, pp. 15-16.

²⁰⁷ Powlett, *Gazetteer of the Bikaner State*, p. 2.

²⁰⁸ Harcourt, Max, 'The Deshnoke 'Karni Mata' temple and political legitimacy in Medieval Rajasthan', *South Asia*, vol. XVI, Special Edition, (1993), pp. 33-48.

his proposed expedition. Accordingly, before commencing his advance into the aforesaid region, he visited Deshnoke to seek her favour. Like most of the Rajputs, Rao Bika was a sincere believer of Shakti and on knowing about this *sagat*, he had many reasons to visit her. Till then, none of Bika's marriage had produced sons. As Karni was famous for fertility miracles, thus, the birth of a son after blessings of Karni also appears in the legends. Rao Bika courted Karni and acknowledged her as the tutelary *devi* of the Rathor clan. He claimed to be her *bhakta* along with his retinue. Subsequently, Deshnoke and its hinterland were declared *sasan jagir* pertaining to her and her affinal lineage.²⁰⁹ All these events indicate that the alliance between Karni and her *bhakta*, Bika, were forged and sufficient care was taken to ensure mutual benefits.

Describing the act of his ancestor, Karni Singh said that 'the first act of Bika upon entering the territory of the *Jangli Desh*, was to come to touch the feet of the most revered incarnate deity, Karni Mata'.²¹⁰ Powlett also confirms the act of veneration towards Karni. As Lunkaran, son of Bika, succeeded to the throne in c.1505, 'his first act was to pay respect to Karniji, who still lived'.²¹¹ Rao Kalian Singh came to the throne of Bikaner in year 1571 and 'as usual began his reign by a visit to Deshnok to worship Karniji'.²¹² Under directions of Charani deity, Rao Bika initially settled at Chandasar for three years, and later, he shifted to Deshnok, where he frequently waited on Karni to consult the matters of the state. After six years at Deshnok, he shifted to Koramdesar, near Gajner, and lived there for three years recruiting troops from various local tribes.²¹³ The strength of his horsemen expanded to 400 riders.

Out of Jangludesh, Rao Kanha (Chundawat Rathor) carved out a lodgement around the oasis of Deshnoke and this hamlet

²⁰⁹ Swaraj, Mohan, *Story of Karni Mata*, Deshnoke, pp. 10 & 80.

²¹⁰ Paul, Kim, 'Negotiating Sacred Space: The Mandir and the Oran as contested sites', *South Asia: Journal of South Asian Studies*, Vol. XVI, Special Issue, (1993), pp. 49-60.

²¹¹ Powlett, *Gazetteer of the Bikaner State*, p. 10.

²¹² *Ibid.*, p. 22.

²¹³ Powlett, *Gazetteer of the Bikaner State*, p. 2.

became the milieu of Karni's remarkable career.²¹⁴ Observant Karni was staying in the said area for a long time, thus, she had a good understanding about its social circumstances and political events. Due to the constant encounters, she was seasoned in the matters of Jangal-desh polity, thus could foresee the possibilities of securing alliances which were crucial for settlement. So, in order to conciliate the subjugated indigenous tribes, Bika was guided carefully to grant subordinate tenure rights to all the subjugated tribes, over their ancestral lands, as they acknowledged his overlordship. Her advice was particularly important in the rituals of legitimacy devised by Bika, to conciliate his new subjects. For example, apparently it was at her suggestion that Bika institutionalized a coronation ceremony. As per the ceremony, each new monarch of his dynasty was required to receive the *tika* of authority from the leader of most influential indigenous Jat clans, i.e. Gowdara Jats.²¹⁵ Consequently, while Bika was dwelling at Jangal, Karni expressed her wish 'that he should marry into a family of local consequence' and even suggested that he shall marry into the family of Shekho, the Bhatti Rao of Pungal. She even fixed it because she styled Shekho as her brother. But the proposal was declined. While on a raid to Multan, Shekho was held captive by the *Sardar* of Multan and confined in a matchlock-defended fort. His ladies appeared before Karni for seeking help and promised 'that his daughter Rang Kaur should marry Bika if the prayer were granted'. On orders of Karni, immediate arrangements were made and the marriage was solemnized in her presence. The presence of father was necessary for the ceremony of *kanyadaan*, so 'Karniji flew-off to Multan, brought Shekho and caused him to complete the marriage'.²¹⁶ Hence, the first significant marriage alliance of Bika was held. Gogli was in-charge to make arrangements for marriage of Rang Kaur. Acting against the wish of his master (Shekho), he invited his displeasure. Subsequently, he was expelled from Pugal.

²¹⁴ Ujwal, K. S. Dan, *Bhagwati Shri Karniji Maharaj*, Universal Printing Co., Jaipur, 1972, pp. 45-7.

²¹⁵ Tod, *op.cit.*, p. 1129.

²¹⁶ Powlett, *Gazetter of the Bikaner State*, p. 2.

He reported the matter to Karni. On Karni's advise, Bika granted a village to Gogli. This allotment is 'the first recorded grant of land made in Bikaner State'.²¹⁷ These events are suggestive of the fact that efforts were made by Karni and Bika to ensure alliances with the regional groups to ensure political stability. Karni's influence was not only limited to Bikaner. She was also interacting with the royal family of Jaisalmer. Once she went to Jaisalmer to cure Rawal Jet Si of tumour.²¹⁸

Jet Si, son of Lunkaran, marched up to Dronpur only after doing homage to Karni.²¹⁹ In 1490 AD, Roa Jodha died and was succeeded by Satal (didn't survive for long), thus, Sujoji came to the throne of Jodhpur. Being the eldest living son of Rao Jodha, Bika claimed for heirlooms²²⁰, which were denied by the reigning king. Thus, after consulting Karni, Bika assembled his forces that were contributed from estates of Sahiba, Rajasar, Chachabad, Village Sarounda, Bhattis of Pugal and Johiyas, and made a contingent of about three thousand men. The victory was declared after getting possession of the heir-looms. It is interesting to note that from c.1465 to 1490, in a period of 25 years, Bika was able to form alliances and made a united front. All this was possible only through the efforts of Karni, who was constantly present as a mentor and alliance-maker for Bika. The integration of Pugal through marriage alliance rounded off Bika's conquests, leaving him with a kingdom, bounded by the Delhi Sultanate (on north), the Rathor state of Marwar stood on the south, the Kuchchawa state was on east, the west was concorded by Bhattis of Jaisalmer and the Bhatti Muslim were controlling the principality of Bhawalpur. With all these boundaries, he felt secure enough to

²¹⁷ Ibid., p. 3.

²¹⁸ Ibid., p. 14.

²¹⁹ Ibid., p. 12.

²²⁰ Ibid., p. 9. The heirlooms consisted Kanauj relics, a throne, an umbrella and 'chonris', a dagger (gifted by Harbuji Sankhal to Rao Jodha), *karan-garbh* (*saligram*), 18-armed image of devi Nagniji, *bairi-sal nagara* (foe-fighting drum), steed Dal Singar and ancient cooking cauldrons.

establish a capital city for the newly found kingdom on the site of Janglu oasis. For laying the foundation stone of the dynamic fort, Karni was invited to Janglu. Today, the Junagarh fort stands on this site. Along with the political settlements, Karni was also performing miracles by curing people from diseases, by ensuring success of followers in battles, etc. So, it can be proposed that she became a living-goddess and her presence was felt by every section of the society.

The end of Karniji has been termed as 'disappearance or translation' as 'a jet of flame issued from her body' which completely enveloped her and she was not seen any more.²²¹ Generally, these sorts of ends have been prescribed for the living deities, to uphold the grain of their miraculous and spiritual powers as possessed by them during the lifetime.

The state and populace of Bikaner region continues to affiliate with Karni. Until recently, the flag of Bikaner carried the colours associated with the deity, and even in the independent secular India, the cheques of the State Bank of Bikaner carried a logo which incorporated the figure of *sagat*. Army troops posted in the Bikaner region also regard Karni Mata as their patron deity. A similar kind of submission by the Indian Army and Border Security Force (BSF) is visible at Tanot Mata in Jaisalmer, as the personnel serving at the Indo-Pak international border considered her the protector (*raksha-daiyini*).

Temple of Karni is located some 33 km south of Bikaner, on the road to Nagaur. It is one of the largest and most important Shakti temples in north-western India. It is unusual, if not unique, among major Shakti Temples, as Karni Mata is not a puranic *devi*, but a deified local historical personage, like Pabuji, Tejaji, Ramdevji, etc. In the 15th century even being a *charani* (female bard), she was successful in asserting her claim as an incarnation of the *devi*. Subsequently, she played a prominent role in the turbulent history of the region.

Two varieties of living goddess are recognized: lesser *avatars* (*sagts*) and more powerful messianic *avatars* (*purn-avatars*). The

²²¹ Ibid., p. 14.

former are expected to occur in every generation and they possess limited powers. They are not, however, expected to function as major politico-religious leaders. Although they are allowed to participate in the male public realm of politics, unlike ordinary *charanis*, who still observe strict *pardab*, except the ones who have westernized to next level. On the other hand, messianic Shakti incarnations are not expected to occur very frequently. They appear only in the moments of crisis for mankind.

Karni repeatedly displayed her divine powers and gained a reputation of miracle-maker since her childhood. The most famous ones were sufficient for the believers to accept her as a messianic *devi*. The most popular miracle was performed by Karni to dissuade Deepa, her husband, from consummating the marriage. In this appropriate miracle when Deepa 'lifted the curtain of the palanquin that brought her to his quarters after the marriage ceremony, he found a lion, the *devi's* vehicle animal, occupying the cushions!²²² Besides this, she performed many other miracles for healing and curing people.²²³ All these claims are based on the stories that are prevalent amongst the followers.

The political assertions by Karni during her lifetime were essentially involving the Jats, low caste and tribal people. The royal patronage and its radical tones become clear from the incident that arose out of a conflict that developed between Karni's party and Rao Kanha, the Rathor Rajput overlord of Deshnok. Similar to the Rathors of Marwar and Bhattis of Jaisalmer, the Rathor warlords of Jangaladesh were trying to gain feudal control over the water resources of the territory that they had carved out as their land-holding in the Jangaladesh. In line with this strategy, Rao Kanha attempted to restrict the access of Karni's party and their numerous live-stocks to the wells of Deshnok. Karni successfully defied his local agents, thus, forced Rao Kanha to confront her in

²²² Harcourt, Max, 'The Deshnok 'Karni Mata' temple and political legitimacy in Medieval Rajasthan', *South Asia*, vol. XVI, Special Edition, (1993), pp. 33-48.

²²³ Powlett, p. 14. He mentions about curing the blindness of an aged carpenter.

person. At this encounter, he accused her of witchcraft, in order to neutralize the widespread beliefs about the effect of her miraculous powers. This encounter took form of an extended investigation of her predictive powers. Rao Kanha loaded with excessive Rajput bravado asked her to predict the time of his own death. 'Dismissing her veiled initial replies, he compelled her to make ever more precise and proximate forecasts until future merged with present and he was miraculously slain'.²²⁴ With this conclusive demonstration of her powers, Karni established undisputed control over Deshnoke. She planted a sacred forest (*oran*) and constructed a temple of Awadhji (tutelary *devi* and a *puran avtar*), a hermitage for herself (*garbha-grah* of today's temple), some residences and public buildings. Here onwards the war-lords of Jangaladesh were careful to cultivate goodwill with her. Though, occasionally she still faced dacoit raids.

Adoption of Karni as *puran avtar* by the people of Jangaladesh was impressive. This acceptance soon made Deshnoke a major pilgrimage centre where large hordes of faith-keepers arrive to receive her *darshan* (blessing) and to solicit healing miracles. The authority of Karni gave rise to a unique 'legitimacy ritual' for the Bikaner state, whereby each new successor to the throne of Bikaner visits Deshnoke to receive the blessing of the Deepawat *pujaris* (temple priests of Karni, after her husband Deepa to whom her sister was married). Two *melas* are organized at the Karni's temple. The *bada mela* (big festival) is organized at the end of cold season (March/April) which is popular for religious activities. Annually, it draws nearly 30 thousand pilgrims. The footfall of the *chota mela* (smaller festival organised in the months September/October) is nearly five thousand souls.

Jeen Mata is also a lesser deity who has emerged in the village Rewasa (district Sikar). Rewasa is famous for salt-production. Jeen was sister of Harsh (an incarnation of lord Shiva), who resides on the hillock of Harshnath. The temple of Harsh-Harshnath is dedicated to lord Shiva. The temple was built by a Shiva ascetic in

²²⁴ Harcourt, Max, 'The Deshnoke 'Karni Mata' temple and political legitimacy', pp. 33-48.

973 AD.²²⁵ As per the legend, brother (Harsha) and sister (Jeen) were living together on the hill-top. Once wife of Harsha and Jeen, together went out to fetch water from a nearby *johad*, and on the way back home, they had a bet. The bet was to finalize whom Harsha loves more? As both of them were carrying *do-ghadh* (carrying one pot over the other on the head) so, accordingly both of them agreed that whosoever's *do-ghadh* is removed first by Harsha, shall be the winner of bet! Harsha being unaware of the bet condition between his wife and sister, first removed *do-ghadh* of his wife, on which Jeen got angry and sad. Heartbroken Jeen jumped from the hill and got embedded in the soil. The spot at which Jeen Mata fell was reserved for spiritual activities and now, the temple of Jeen Mata is located here. Saddened by the loss of sister, Harsha renounced the world and became an ascetic. He went into meditation on the hill-top. It is promoted that since then, Harsha has been waiting for his sister on the hill-top and Jeen is blessing all her believers being at the foot of hill. She is a family deity of many communities as they consider her a form of Durga (Shakti). Until 2004, the popular offerings (*prasad*) at her temple constituted of liquor and meat of he-goat. The offerings of meat and liquor were banned by the court of law. Also, *bali* (sacrifice) is no more practised. However, secretly the liquor is still offered. With new laws in place, the rudimentary rituals and performances around the deity gradually eliminated. Apparently, the composition and rituals around the deity and temple were altered to fill the gaps that came up with the legal restrictions. The Sanskritic traditions are getting appropriated in form of new rituals. New literatures are evolving in form of *Jeen chalisa*, *Jeen mala*, *bhajan sangrah*, etc. Believers have contributed immensely to the temple and its surroundings in form of *dharamshalas* and *tibaras*.

The priests of Jeen temple are called *pandas*, *pujaras* and *jagas*. The popular way to remember and venerate deity is *rat-jaga* (staying awake whole night by singing *bhajans*). A special group of people called *bhajani* sing in praise of Jeen. They initiate singing only after

²²⁵ Choudhary, *Trade, Transport and Tanda*, p. 207.

offering liquor to the deity with a beat of *nagada* (drum). This beat-full offering of liquor is known as *danka-dena*. Generally, the *bhajanis* consume the offered liquor during the night-long session of singing, while offering small shots to a few males present at gathering as liquor is the *prasad* of *mata*. It is interesting to note that they generally sing the praises after getting intoxicated, and even under the influence of liquor they ensure perfect pitch, flow and meters. *Bhajanis* are accompanied by musical instruments like, *chimta, chang, dhap*.

The main celebrations at the temple are associated with festival of Navratri. The annual fair of Jeen Mata temple is organized on the *asthami* of Ashvin (September-October). The spiritual powers of deity are narrated, and passed-on with the help of many legends and their multiple versions. Overall, it can be said that the deity is still in process of Sanskritization, and awaits the corpus of literature to venerate its miraculous glory.

It is significant to highlight that the *Orans* are traditional biodiversity management systems that are unique to Rajasthan, and locally known as *Devbhumi*. *Orans* are commonly preserved sections of forest that are protected by villages in the name of gods or goddesses. They are generally around temples. *Orans* are the common-pool resources which are usually managed under a mixture of open access. They are loosely defined as common property in the region with no effective owners or secured rights. The ecosystem of western Rajasthan is very rich in livestock. Hence, these *Orans* are very important for the economy, and the security of livelihood, of the rural people. *Orans* have an important role in promoting the livestock-based economy. Ancient laws are utilized for the management of *Orans* that are based on a common belief in a divinity, and the principle that entire community have equal stakes in the available resources. Generally, the females are responsible for the conservation of resources, enforcement of the rules, and the management of *Orans*. The *Oran* management committees comprises the locals who oversees the management of forest, along with matters of conflicts, taking action against offenders and distribution of benefits. Maximization of utility behaviour, social pressures and cultural norms together form a complex equation for management of *Orans*.

Orans were basically associated with the religious practices and were followed along the cults. Environmentally, they serve to conserve natural resources because people do not harm sacred groves mainly due to the socio-religious traditions and believes. The most popular belief that works around these *orans* is 'if anyone cuts a tree or uses an axe in the forest of deity, they may invite wrath of or, may get harmed by, the presiding deity'. This kind of belief has helped in conservation of sacred groves. Continuous community protection has resulted in the conservation, and helped in preserving variety of herbs, shrubs, grasses and trees. In sacred groves, idols of different deities like *Majisa*, *Jamboji*, *Jog-Maya*, *Bhomiaji*, *Mamaji etc.*, are placed under the green trees, and nobody is allowed to cut trees, twigs, leaves or anything, for fear of the god/goddess. In long run, these practices ensure the maintenance of ecosystem and prove instrumental in controlling the process of desertification. *Orans* are vital zones for grazing livestock, to fetch rain water, to collect minor forest produce, medicinal plants and to secure firewood.

Yet, a comprehensive and well-tested model and approach for management of *Orans* and conservation of its bio-diversity has not been developed. The rehabilitation packages shall be designed to suit the unique edaphic, climatic, vegetational, social and utility status of the *Orans* and shall be technically feasible. Proper planning is required to implement these tailored packages, intelligently.

The water supplies in entire *thal*, stretching from Barmer to Bikaner including Jaisalmer and Jodhpur are sparse. Thus, tanks evolved as the sole means for harvesting rain water which forms the lifeline of the Thar Desert. The utility of tanks is evident from the large number of investments made by all the sections of society towards excavating, constructing and repair of this water-source. The tanks became centres for activities that ensured social participation, which made the conservation of a natural resource possible. The inscription of Ghasisar tank dated c.1454 shows some deeds (of repair/expansion) at tank by Rawal Sri Jatrasimha, son of Rawal Devkaran. Gadhisar (Ghasisar) tank inscription of c.1504 and Jaitsagar inscription of 1516 AD indicates at the continuing politico-economic and religious importance of the tanks. Many

wealthy traders also excavated tanks and opened them for the general masses, in times of need. The excavations of Dedan-sar, Mohta-sar, Kheta-sar, Suda-sar and Govind-sar were financed by trading community (Maheshwari), and during famines these tanks were dependable sources of water for inhabitants of Jaisalmer. As tanks were the only sources of water during scarcity so both the royals and locals held reverence towards these water bodies, and state made efforts to preserve and protect them. Two officials were appointed for keeping a watch to repel the polluting factors and to ensure the judicious use of water. The annual joint-exercise of cleaning the *talabs*/tanks brought all the sections together and everyone participated as per the respective capacity. *Aaj bhi khare hai talab* puts light on the procedures, works and methods that were employed to keep the *talabs* functional.²²⁶ It was customary for the prince of Jaisalmer to go to lake Ghasisar, to perform ceremony of *las* (clearing away of accumulated sand and mud. When raja took-out handful, then the rich and poor followed).²²⁷ Similarly, during pilgrimages at Jambholav Lake (*tirth* of Bishnois), the visitors collected the soil from the lake, considering it divine and it helped to deepen it further. Similarly, the villages with *talabs* ensured to clean them annually before onset of monsoon, so that the water for coming year can be harvested. In the previous chapter, the water holding capacities of *talabs* have been discussed in detail. Most of the tanks could harvest water supplies for eight to 10 months and some could sustain for a year.

Even during the 19th century, the states were making efforts to settle the peasants in desert areas. Agricultural tax was not levied on *bhils* and *dums*, in the kingdom of Jaisalmer as they didn't have lands in their name and they were cultivating in *seer* (in-joint). Thus, the state allotted fields to these communities by granting a relaxation of one-fourth in the tax rates.²²⁸ It indicates that the Rajput states were trying to bring more and more nomadic groups under ambit of peasantization. There were many villages that were

²²⁶ Mishra, Anupam, *Aaj bhi Khare hai Talab*, Vani Parkashan, Delhi, 2014.

²²⁷ Tod, *op. cit.*, vol. 2, p. 1228.

²²⁸ *Tawarikh Jaisalmer*, p. 214.

considered unfit for settlement. At times the inhabitants also evacuated villages due to the non-availability of water. The drought was the most common reason for the inhabitants to abandon their living areas. A description of *akaal* in Jaisalmer indicates that the situation was worst for survival of humans and animals. Due to constant failure of rain, '*log to aise karz me dab gai hai ki abto sir mundane se hi nahi mile hai...sata, san, vadi vagarh ghaas vai kaire, khajjade ke chode khane tak naubat pahuche...log sindh...cable gai hai aur maveshi jo bache hai so hi barish jaldi hone se rahege...ghass pani kisi pargane mai nahi...logo ne pali me kache kurwe banakar maal bachaya* (people are deeply embedded in the loan...extent has been reached to eat grasses of *sata, san, vadi*, etc. the level has been reached where people are forced to eat barks of *kair* and *khejadi*... people have gone to Sindh...animals that have survive will only live if the rain arrives soon...no pargana have grass and water... some have survived by making kacha wells in Pali)'.²²⁹ Many such instances appear in the states of the Thar Desert, where due to the drought conditions, the inhabitants have been forced to switch into nomadism, in order to save their lives and livestock. Thus, nomadism was an integral culture of Thar Desert that was mainly followed to preserve the resources.

Another prominent feature of Thari culture is *manubaar*. *Manubaar* is a semi-meal offered out of respect that doesn't include grains. Opium was most important *manubaar*. It was offered to mark both happiness and losses. On occasions of rejoice like marriage, child-birth, *gilav* (by mixing with water)²³⁰ was preferred and to register grief or losses, it is taken dry.²³¹ Tobacco was also a *manubaar*. As there was no local production of tobacco, it was imported from Sindh, Marwar and Malwa. The liquor was not popular with the locals of Jaisalmer. Villagers never drank it. Only *sardars* (Rajput leaders) were drinking alcohol. Thus, its supply was ensured from Bikaner, Phalodi, Pokhran and Barmer.

²²⁹ Ibid., pp. 214-5.

²³⁰ *Gilav* preparation is made by filtering down of opium from the opium-stand with the flow of water. The opium stands worked like coffee-filters from which the coffee drips down with the help of water.

²³¹ *Tawarikh Jaisalmer*, p. 247.

In Jaisalmer, there was only one shop of *kalar* (alcohol), who was able to run the shop because *pattars* (dancers protected by state) took liquor. Staff of state depended on the supplies from state. *Charas* didn't fit in *manuhaar*. *Bhang* and *ganja* was produced in village Lodi (*pargana* Dewa) and Dhrawa of Nokhaolali. In city, on daily basis, Vyas and Bhojak used *bhang*. General population had *bhang* drinks only on special occasions. *Ganja* was offered to the guests only.²³² Many other things like dates, *saunf*, *anardana*, etc. also add to the large bag of *manuhaar*. Water shall be the immediate offering/serving to any guest in the hot and arid region, but it never happened so. Therefore, the system of *manuhaar* was evolved which actually helped to do away the effect of heat, *loo* and harsh sun, as the immediate intake of water after exposure to heat might cause stroke, and at times death. All these mechanisms were evolved by the locals mainly to cater the constantly moving groups and to save the efforts that were involved in keeping the food and the edible preparations ready, as they would perish soon due to heat and warm weather. Thus, *manuhaars* were the offering to show respect to the guests that arrived every now and then, in search of water or inquiring about the routes, while transcending through the deadly desert. Inflation of history is always disturbing for the historians, but the aim of history is not to achieve a timeless unity of traditions, it rather cherishes the diversity.

Overall, in nutshell, it can be proposed that the general character of the desert communities was nomadic. Definitely some had the means to travel in some comfort, whereas majority were constantly negotiating through this harsh desert with limited resources. The hardships of constant movements, and travels not only helped them to organize the available resources better, but also made them considerate about the necessities and requirements of the others. In the long run, the society (inhabitants) of Thar has learnt to appreciate, conserve and protect the available resources and slowly these virtues have evolved as a culture that has become an integral part of their economy and finally eco-systems.

²³² Ibid., pp. 247-8.

CHAPTER 6



The Habitation in Subjective Spaces

Barwariyo huo phire!

(Roaming like a care-free ramshackle nomad!)

Despite spread of cosmopolitanism, regional identities are assuming increasing significance. This development is making the study of regions more and more important. The regional identities and cultural diversities are guided by the physical environments, regional traditions that get shaped by the ecological factors. In recent years, historical studies have moved away from the state-oriented perspective that were guided by the super apparatuses, ignoring the focus on and role of the little communities, such as nomadic troops, professional groups. Maureen L. P. Patterson has done the most significant work that has stressed on the significance of regional and areal components for conceptualization of the Indic civilization.¹ In his remarkable work, he has organized a complex architectonic scheme of geo-cultural areas, cultural-linguistic regions and sub-regional areal units and has examined the super-local patterns and networks. Recently, many scholars have turned their attention towards the regions, but most of their researches are mainly limited to: addressing the question of regionalism, exploring turfs between the region and centre, definitions and typologies, rather than, exploring the regional distinctiveness and identities.

¹ Patterson, M. L. P., *South Asian Civilizations: A Bibliographic Synthesis*, University of Chicago Press, 1981.

Many concepts have evolved in social sciences to understand and conceptualize a 'region'. Jacqueline Beaujeu-Garnier has examined nearly forty definitions of the region and identified only one point of unanimity that region is different from the space that surrounds it, which means that a region is limited to geographical extents whereas the space goes beyond, as per the subjective perception, activities and acceptance of the performer and participants. She concludes that a region means 'all things to all men'.² For geographers, the region is an intellectual concept, not an object (self-determined or given by nature), and an entity that has been created with a purpose by selecting certain features which are relevant to an areal interest or problem.³ Geographers classify region in three categories as instituted, denoted, and naively given. All the three classifications have some purpose. The naively-given regions are 'recognized as meaningful territorial entity by the people who live there and/or by other people to whom it is of some concern'.⁴ Nearly all the branches of social sciences are in agreement that the instituted regions are 'objective', whereas 'subjective spaces' are denoted and naively-given regions, which origin in people's perceptions, their mental perceiving of the world around them.⁵ With help of these deliberations it can be said that naively-given region embodies totally different perspective.

Every human holds a sense of space which is collectively a subjective-link with its natural environment and man-made

² Jacqueline, Beaujeu-Garnier, *Methods and Perspectives in Geography*, Jennifer Bray (trans.), Longman, London and New York, 1976, p. 81.

³ Whittlesey, Derwent, 'The Regional Concept and the Regional Method' in *American Geography: Inventory and Prospect*, Preston E. James and Clarence F. Jones (eds), Syracuse University Press, Syracuse, New York, 1954, pp. 19-68.

⁴ Schwartzberg, Joseph E., 'Prolegomena to the Study of South Asian Regions and Regionalism', in *Regions and Regionalism in South Asian Studies*, in Robert I. Crane (ed.), Duke University, Durham, pp. 89-111.

⁵ Cohn, Bernard S., 'Regions Subjective and Objective: Their Relation to the Study of Modern Indian History and Society', in Robert I. Crane (ed.), Duke University, Durham, 1967, pp. 5-37.

institutions and social patterns that have evolved in historical traditions and cultural landscapes. Most of the understandings about a region are grounded in objective realities, where both insiders and outsiders construct subjective connections in order to explore any region. This work will be an effort to provide a composite and multifaceted picture of the Thar Desert, by studying the habitations located in regionally distinct Thar Desert, and exploring the subjective identities that evolved amongst its inhabitants with a collective sense of the space (created-by effect of natural-features and man-made institutions) available around them.

In order to understand a region in its entire uniqueness one requires an informed and sensitive insight into the complex and subtle characteristics of the particular geographical area, its inhabitants and the culture/s created and evolved with participation of inhabitants. Further, one needs to carefully consider and work-upon the environmental factors, its influences and limitations, remembered histories, folklores, oral traditions, traditional and cultural patterns and believes, languages, linguistic styles, literary creations and styles, common institutions and mutually recognized symbols and shared social structures with a pluralistic perspective. The Thar as an entity is the theme for this work, so in this ongoing dialogue this geographical entity and its way of life as shaped by its interactions, with its physical, historical and cultural environment will be highlighted. The gradual integrations in this region guided the idea of subjective space and habitations that were mainly dependent on the availability of natural resource, i.e. water.

The preceding sessions have provided enough evidences about the intelligent and most efficient and effective use of the water by the inhabitants of Thar, as it was made available by the Nature. Thus, in this session I will desist from repeating the similar kind of evidences to support the argument of the habitations in subjective spaces. The social, political and economic adaptations in this limited-resource environment (Thar Desert) were basically the legacy of the feudal polities. The inhabitants touch upon and interweave many themes individually, and reinforce some of them mutually. Thus, while working in their own subjective spaces,

the inhabitants were simultaneously interacting with the other living beings in a structured common space of mutual needs and concerns.

A close perusal of the sources like *Tawarikh Jaisalmer*, *Bahis*, *MRPRV*, travelogues and various inscriptions, helps to locate that the desert was mainly a subjective space for each resident who were otherwise living in the common spaces, like cities, hamlets, etc. The distribution of the population in each city and village of Marwar, Bikaner and Jaisalmer is an interesting study, as majority of the settlements had a mixed population. The rural and urban settlements possessed and represented a cosmopolitan character. The description of each community was basically indicating their professions. In Phalodi, the total *basti* (inhabitation) was 636 houses. The classification of its inhabitants was represented through the professional categories as *mahajan* (Oswal/Maheshwari), brahman, *darzi* (tailor), rajput, *doum* (performer), *dbedh* (leather-worker), *darzi* (tailor), *chīpa* (printer), *teli* (oil-maker), *nachana* (dancers), *thori*, *bojan* (cooks), *mali* (gardeners/vegetable growers), *sunar* (gold-smith), *kumbar* (potter), *sipahi* (soldiers), and *nai* (barber).⁶ These categories don't represent caste. These are mainly the professional categories as per the occupation of individuals. Thus, the category of caste does not apply to these classifications. Further, all these professions are skill-oriented, thus, all these groups were engaging as the skilled-workers. It is important to highlight that in this long list of population classification, the community of peasants was missing. Thus, it indicates that the actors of agricultural sector (peasant community) mainly inhabited in the distant territories of the state (dunes). Their habitation was mainly in the villages that were small clusters of mixed-groups, mainly performing agro-pastoral activities.

During 1663 AD, Nainsi recorded the populace of Medta. The recording pertaining to Medta is unique, as along with the classification of communities it also provides the intra-classifications of these communities by broadly classifying them as 'high' and 'noble'. The assemblage of Mahajans (money-lenders/big

⁶ *MRPRV*, vol. 2, p. 9.

traders) has been called *lahan* which gives distribution of traders as Oswals, Mahesri, Aggarwal and Khandelwal. The smaller traders were termed as *biji-jaat* (lower) and the *lahan* of *biji-jaat* included Bhojag, Khatri, Bhats and Niratkari.⁷ Nayat (total) of brahmans included Pokharnas, Rajgur, Gujar Gaud, Parik, Dahma, Sarshwat, Sankhwal Uppadhyas, Shrimali, Gujarati, Gaud and Sanawad. Kayasthas were classified as Bisa, Dasa and Bhatnagar. The intra-classification of the Sipahi community included Pathans, Turk musketeers, Deshawali and Kaji.⁸ The professional communities (like *darji*, *maali*, *naai*, *sonar*, *teli*, *neelgar* etc.) were put under *pavan-jaat* heading. In total the list of *pavan-jaat* includes 50 communities.⁹ The abundance of professional classes in the region of Medta clearly indicates that economically, it was a very active zone. The description of the city and its adjoining areas also indicates to the economic and social vibrancy. The professional opportunities in the region were limited to handicraft and skill oriented jobs due to the harsh natural conditions. However, these limited opportunities were significant and elevating, for the practitioners, as they allowed the communities to enjoy their subjective spaces while inhabiting in the multi-layered habitations.

Most of the habitations in the Thar Desert were subjective spaces where each inhabitant was relating as per collectively constructed experiences held by them individually, and simultaneously they were negotiating on the matters of mutual concerns. Mahnto Nainsi was compiling large varieties of information in respect of the *parganas* that were under the rule of Marwar state. The

⁷ Ibid., p. 83.

⁸ Ibid., p. 84.

⁹ Ibid., pp. 85-6. The professional classes enlisted under category of *pavan-jaat* were: *darzi*, *maali*, *sonar*, *naai*, *teli*, *neelgar* (dyer), *kalal* (liquor distilling class), *sikalgar*, *chipa*, *khelwaar*, *kahar*, *kasara thanthaar*, *lohar*, *khati*, *ghosi*, *tamboli*, *mocha* (cobbler), *saabangar* (soap-maker), *jatiya bangar* (weaver), *kumhar*, *bhadbhujia*, *gancha*, *tirgar*, *baajdaar*, *lakhara*, *bharawa*, *pinjara*, *silawat*, *ghanchi*, *dhobi*, *saudagar*, *naalbandh*, *kharadhi*, *julaha*, *multani*, *kasabgar*, *tabab*, *kunjada*, *dakot*, *chitara*, *hamaal*, *bajigar*, *bhadihaar*, *babar naai*, *sargar*, *khatik*, *balai bangar*, *jatiya andhodi range*, *nagar-naika* (prostitute/dancer) and *aacharaj khapan-khosa*.

distribution of the inhabitants in *pargana* Siwan (of year 1664) was provided in *MRPRV*. The residency of *qasba* Siwan has been classified as per the professions, whereas the identities of the villages were executed as per the habitation of demographically dominant groups. So, the identity of villages was constituted as Rajputa-ra-baas¹⁰, Patel-basai (reside)¹¹, Baniya-basai¹², Jat-basai, Paliwal-baman-basai¹³. From these nomenclatures it is clear that these categories of villages were guided by the groups and communities that dominated the habitation (villages). Thus, it proves that the villages were administrative units that were functioning as autonomous units, on social and economic levels. An absence of the appeals to the state also indicates that the matters of mutual care were settled through negotiations, amongst the contending parties, as they were the stakeholders and parties to be affected.

The fort of *pargana* Pokharan was built by Rao Maldeo. While defining the fort and its integrities Nainsi records that 'the dwelling houses of officials were simple. There are hundred houses of Bhattis inside the fort. There are no villagers (*gavati*) inside the fort'.¹⁴ Temples dedicated to Adisur (Jain) and Deviji were located inside the fort complex. The absence of any villager inside the fort complex clearly indicates that the villagers were limited to the hamlets and their fields were generally located in some distance from the seat of imperial-power. The description about the habitation of the Pokharan city highlights the presence of Mahajans (Oswal/Maheshri), along with many other professional communities. The presence of Karsara community in the Pokharan city is a deviation, from the general settlement patterns that were evident in other cities of Thar. The Karsara community included 20 *sanji* and 30 *malis*.¹⁵ Both these groups were excellent vegetable

¹⁰ Ibid., p. 224 & pp. 227-28.

¹¹ Ibid, p. 225.

¹² Ibid, p. 224.

¹³ Ibid, p. 226.

¹⁴ Ibid., p. 309.

¹⁵ Ibid., p. 310.

growers. Perhaps, they were kept in the city to grow vegetables in order to meet the day-to-day requirements of grocery.

The Pokhran village settlements have been described with great details. Nine villages of *pargana* Pokhran had exclusive inhabitation of Pailwal brahmans. In five villages, Paliwal brahmans and Rajputs lived together, but their *baas* (colonies) were separate.¹⁶ Eight villages were kept aside for settling the Rajputs. Pokharana Rathor's had 30 villages, out of which 14 were inhabited and 16 were abandoned.¹⁷ Thirty professional communities were living with the Mahajans, in their *qasba*. The inhabitation of the 30 professional communities in the territories of Mahajans indicates that both the traders and artisans, who were significant operating units in the economy of the Pokhran were working in close co-ordination for attaining the mutual goals. This settlement in a common area might have been a mechanism to avert the differences and to cease the delays, which might come in due to the long distances that they have to negotiate, in order, to interact with each other. Thus, it is evident that the diverse communities were interacting and negotiating with each other, on the issues of mutual concerns, while functioning independently in their respective economic and social zones.

The activities around the tanks, of annual cleaning, building *paal*, pulling out sand, keeping the water safe, regulation regarding utility of water etc. are the prime examples to show that the stakeholders were jointly addressing the issues of mutual concerns. Besides common issues the communities were free to address and treat their economic and social zones of activities as objective, as well as subjective spaces. In Nature, the Thar communities were mainly nomadic. Their nomadic character was an essential requirement for survival in the harsh weather conditions of dry desert. The nomadic groups were negotiating with the settled communities, and the states for getting access to the water resources like oasis, *dhebras*, *beris*, tanks and well respectively. Shepherds needed to interact and exchange with the villagers, in order to channelize

¹⁶ Ibid., p. 317.

¹⁷ Ibid., p. 319.

the negotiations for getting access to fee-free small enclosures, where they can shave-off (cut-off) the wool of their herds. The seasons play an important role for the process of shearing. Thus, a defined area for carrying out shearing activities was an essential requirement. As it was a cumbersome task, its execution generally took long, at times weeks together, mainly depending on the numbers of animal in a herd. Further, the necessities of grass and water were also pressing matters to be looked after constantly. Lastly, these nomads wanted to part away with the animal produce (wool) soon, so that the bulky produce (weighty wool) can get converted into easy-to-carry cash. They looked for the nearest market in order to dispose of the produce immediately. Besides, the above mentioned worries and technical requirements, these nomads wandered freely in the tracts of sand with their cattle and herds, who picked the scattered vegetation, and thrived becoming the best breeds. Even today, the herdsmen of the Thar Desert are the perfect example of the habitation in subjective spaces. In past, they were relating to the world around them only on matters of mutual concern, otherwise they continued to proceed on basis of their collective experiences that were shaped by the natural environment, cultural tradition and social institutions.

The experiences incurred from any natural surroundings are always immense. Similarly, the environment of Thar Desert was also imparting rich experiences amongst the souls that were interacting with its horizons. Most of the travellers, wanderers and inhabitants have experienced the scarcity of water and harsh heat. These common experiences made most of them to believe in certain disciplines, which were crucial for a successful interaction with this desert. On these lines, whenever the travellers were transcending through the region of Thar, with or without proper guides and help, they kept looking for the water resources, where they could relax and prepare themselves for onward journey. In c.1606, Josi Chund Damodar halted at Kakroya *talab* when he came to Jodhpur from Ahmadabad.¹⁸ In 1637 AD, Mughal governor attacked on Rao Mohandas. Rao fled to save his life and his whereabouts were unknown. Thus, the locals came looking

¹⁸ Ibid., vol. 1, p. 98.

for him in the *paal* of Ghadasar *talab* near Phalodi. In search of Rao, Nainsi himself walked into the *paal* of tank along with 60 to 70 men, who came from Phalodi.¹⁹ From this incident, it can be inferred that *talabs* were crucial centres for the escaper and fighting forces for keeping the water supplies sound. The constantly moving armies of Marwar state were keeping their control intact over the water bodies. They always halted near the *talabs* and ensured control over other water sources. So far I have not been able to find any evidences that can highlight the adverse experience (like scarcity of water and harsh weather conditions) of desert armies in the desert. Mughal sources do mention a few instances about the tough and hot weather conditions of desert along with the scarcity of water that lead to death of many soldiers and animals of expedition. 'Jauhar and Abul Fazal describe at length the hardships and toils the royal fugitive and his party had to face in the 'Sahara'. Sujan Ray Khattri says that the heat in the dreary desert of Rajsathan was so immense and the scarcity of water for miles together was so acute that the imperial forces could not reach the place'.²⁰ This experience of the Mughal army hints that they didn't had access to the water resources of the desert, whereas the armies training and interacting in desert were able to harness the desert's water resources due to their experiences and interactions with the physical environment of desert. The lack of interaction and experience with desert pushed the Mughal forces into this difficult situation. Protection of the Mughal trade interests was the sole prospect for which Akbar wanted a firm military control over the desert region. Aliening to this need, he garrisoned Merta, Jalor and Nagaur as the strongholds and outposts of the Mughals.²¹ Similar strenuous efforts were made by Aurangzeb to keep Marwar under control.²² *Babi Mardumshumari* available at Bikaner Archives also highlights a similar kind of despair that made Shar Shah to say

¹⁹ Ibid., p. 120.

²⁰ Sharma, G. N., *Social Life in Medieval Rajasthan (1500-1800 AD)*, Lakshmi Narain Agarwal, Agra, 1968, p. 13.

²¹ Abul Fazal, *Ain-i-Akbari*, (tr.) Jarrett, vol. 2, p. 227.

²² K. Khan, *Muntakhab-ul-lubab*, vol. 2, Bibliotheca Indica, Calcutta, 1869, p. 261.

‘for a handful of bajra (millet) he had nearly lost the empire of Hindustan’²³, that too after registering victory over Maldeo.

In year 1658 AD, Bhattis surrounded Pokharan with two thousand men.²⁴ So, allies were called to help against the Bhattis. All the men supporting the Marwar state assembled at the *talab* that had water sufficient for eight months. Nainsi and forces did *dera* (halt) at *talab* of Devijhar and later at *bahalo* of Dewada Purohits.²⁵ Another halt was made at a *talai*.²⁶ During this expedition the Marwar forces were constantly halting in separate groups. Interestingly, the halts were organized at Rupa-ri-talai, Khoja-ri-talai and Bachihaay-talab near Lathi. Bachihaay *talab* was made by Bocha Charan at a distance of 1.25 *kos* from village Charan-thal.²⁷ After chasing the Bhattis from Pokharan, the Marwar forces entered the territories of Jaisalmer. In Jaisalmer they looted and burned villages. During all these days of loot and plunder, the Marwar forces halted at *talab* Jognihait (at Bhojak), as it had lot of wells and small water collection units (*bera*), Lahor *talai*, at *talab* that was located near the temple of Devi Sangviya (the family deity of Bhattis).²⁸ There were many such instances which indicate that the desert forces were halting only near the water sources. In reaction, Bhattis attacked on Pokhran and they halted at *talab* Ranisar in Phalodi.²⁹ In vs 1718/1661 AD, while Jaswant Singh was coming from Gujarat, his *dera* was arranged at *talab* Kankariya.³⁰ In the year 1657 AD, Jaswant Singh moved from Ujjain and after a day of journey, he halted on bank of river Shipra. Later, he halted on the bank of river Gambhir at Naraina.³¹ All these instances help to understand that the different desert forces, acting in the desert in different times, shared common experiences.

²³ *Babi Mardumshumari*, vs 1913/1856 AD.

²⁴ *MRPRV*, vol. 1, p. 137.

²⁵ *Ibid.*, p. 138.

²⁶ *Ibid.*, p. 139.

²⁷ *Ibid.*

²⁸ *Ibid.*, p. 140.

²⁹ *Ibid.*, p. 143.

³⁰ *Ibid.*, p. 149.

³¹ *Ibid.*, p. 176.

In the Thar Desert, the scarcity of water was hitting the royals and regulars equally. Thus, their early common experiences nurtured a subjective space for interaction. Therefore, common efforts were made to ensure the care and well-being of all. The cleaning of *talab*, digging of *paal*, maintenance of common resources, etc. were the efforts that were actually guided by the interactions of subjective spaces. Thus, the dikes were repaired in the proper season so that they can hold in times of inundation; and the canals were cleaned, so that the moisture gets satisfactorily distributed. Similarly, in semi-arid areas receiving a limited or uneven rainfall, an accurate annual calendar is important.³² The orders were passed for expediting the construction of tank on the *paal* of Jal Mahal and Man Singh temple.³³ The lake Gharsisar was built by Rawal Gharsi and on his death his queen took up the task and completed the construction of tank.³⁴ Thus, the objective reality of water scarcity has played an early common effect on the mentalities and supplied uniform experiences to all the actors of the region that created a subjective space for the inhabitants. Moving forward the inhabitants took ownership of the common but limited water resources, as made available by the nature, and made most effective use of these by making multiple calculations around its capacity to sustain (8 months, ten months etc.), in order to save the adversity.

Orans were the sacred groves, which were left around some religious centres. These *Orans* were common community properties which were co-operatively managed by the locals. The only principle and one single rule that guided the community rights in these sacred groves was that nobody was allowed to cut the trees, because it was believed that cutting of any tree will invite wrath of the deity. Under the community rights people were free to graze cattle, use water resources, and collect firewood, fruits,

³² Karl A. Wittfogel, *Oriental Despotism: A Comparative Study of Total Power*, Yale University Press, London, 1957 (ninth print 1976), p. 29.

³³ *Arzdasbt* written by Mohan to Mirza Raja Jai Singh, dated 14 *Mangsir Budi* VS 1697/1640 AD.

³⁴ Tod, *op.cit.*, vol. 2, p. 1217.

berries and other items of utility that were available in the groves. Thus, it is clear that these groves were open for all the locals, irrespective of their class, clan and caste. The mechanisms set in for the management of these sacred groves depicts that Oran was an objective space with a subjective appeal that guided all the stakeholders to relate with it as per their utility. However, everyone was regulated through the effect of subjective influence. The management of Orans through participation of communities that were interacting in subjective spaces was effective for maintaining the ecological resources and protecting the available vegetation.

Various deities were actively present in the lives of desert people. Out of various deities *panch-pirs* were the most popular amongst the Thar inhabitants. All these *pirs* were mainly defending and protecting the cattle of inhabitants from loot and chases of raiders. A few deities extended their power and provided protection and cure against the venomous reptiles of desert. The reverence for these hero-deities made the inhabitants to build figurative commemoration evident in forms of *mazar*, temples, *chuthra*, *chowki*, etc. In the preceding chapter, the historical developments around these hero-deities have been discussed in detail. Pastoralism was a common and collective experience. Thus, the pastoral communities respect and hold faith for these hero-deities. Among the Raikas, whenever an important occasion that is referred as 'big work' (*mota-kam*), like feast (*mausar*), marriage (*parnana*), successful return of the migratory herds, is successfully accomplished, then, the Raikas organize a *phar*-narration session in honour of Pabuji. In the similar manner, the Gujars opt for the prayers of Devnarayanji, who is their caste-specific deity. The Rajputs prefer to have an all-night devotional singing (*bhajan*, *sangat* or *kirtan*) in honour of one of their Mother Goddesses, whereas, the Meghwals arrange *rat-jaga* (all night devotional singing) for their caste deity-Ramdeoji. None of the higher castes opt for the narration of Pabuji's *phar* (*puḍ*/verses) unless there are some special reasons. No such rigorous and extensive activities are visible around the cult of Gugaji, the one who protected against poisonous reptiles and cured from the snake and scorpion bites. The village communities worshipped these deities cutting across

their caste affiliations for achieving purpose-oriented results. Thus, it is apparent that the 'caste-specific' and 'purpose specific deity' distinctions were invoked as per the requirements. The 'caste-specific' distinctions were relevant for the inhabitants for executing the social arrangements and associations, beyond it the fulfilment of purpose was always primary. Most of the times, in any village, the 'following-of' and 'belief-in', both these specifications do not conflict with the caste. Thus, the faith in the existence and powers of deities survived irrespective of the caste associations. Hence, the connects with the deities were not as per the objective social categories of caste, community and clan, but these links were mainly purpose oriented subjectivities.

The collective learning helped the inhabitants to develop a uniform idea about the importance of the cattle wealth. Thus, the protection was given to all the objective wealth (cattle) through the subjective approaches that evolved over the centuries due to interaction, amongst the objective beings and their subjective appeals and approaches. Gradually, these interactions developed mutual cares and concerns.

Akaal (draughts) were the times for the communities to come together and to evolve mechanisms for minimizing the losses, through mutual participation. Non-arrival of rains caused drought in year 1696. Thus, the *pargana* of Sanchor became devoid of grass and fodder, so large number of cattle died. In order to protect the remaining cattle, the inhabitants of the *thal* came out of the *pargana* and sought refuge in the pastures of village Nai-khad. This village had functional *kositas* and it was the season for crop of *bajri* that was coming up in the fields. The migration of inhabitants with their cattle to other villages and the welcome extended by other villages with sharing of resources to these immigrants, suggests that the common experiences (of draught) of experienced region and collective learning were making them to come together in the tough times, as these people perceived the space they occupy. It is evident that people's reaction to their particular space, and to the specific features associated with that space created an awareness and compassion within them, which they displayed by extending the resources to each other. These kinds of involvements promote

an awareness of a distinctive identity that further strengthens the ties between the people and their region, and it gets expressed in social and political actions. The mutual coming together of village communities to manage their resources and wealth are remarkable examples to support the fact of subjective spaces that were working in the Thar Desert.

In Medta, few individuals of a Chauhan Rajput branch broke away from their lineage and declared themselves, Danga Jats. Fifteen villages of Medta had exclusive Jat population.³⁵ It is a unique case of breaking-away from the class and caste alliances. Generally, it has been observed that these kinds of exit from community association were done to elevate the social status and to acquire share in the unattained resources. During medieval times, these shifts from community associations were mainly to gain access into and share the landed property of the state, which was usually possible through enrolment in the *sarkar-ki-chakri* (state services). But this exit is unique as it was aiming to merge in an agricultural community. This exit from an elite group (Rajputs) that was mainly associated with ruling class might have been an effort to settle better with the surrounding, demographically dominant neighbours. Demographically, the Jat community dominated the territories of Medta. The villages were functioning as autonomous units. The villages given as grant to the brahmins and charans were called *sasan*. The *sasan* villages were exempted from taxation. All the *parganas* of Marwar state had some *sasan* villages, allotted to brahmins and charans. Most of the *sasan* villages were occupied by the recipients. Some *sasan* villages were abandoned at a later stage. In most of the cases, scarcity, and unavailability of water were the causes for migrations.

All the above discussed habitations, social settlements, character of mutual negotiations, traditions and cultures have evolved due to the unique environment setting of Thar Desert and all these objective elements have played significant roles in shaping the character and nature of Thar inhabitants. It is important to bring in notice that even after living in a common environment,

³⁵ *MRPRV*, vol. 2, p. 41.

none of the individuals, professions, professional classes, groups, social classes, communities, clans, traditions or cultures have created a uniform image of Thar Desert. Thus, it can be said that all the aforementioned factors were instrumental in forming the identity of Thar Desert. The nature, character and strength of the region have been significant that has allowed its biotic and abiotic components to survive through the testing times, and subsequently maintain its conceptual framework as one region.

Locality and Frontier: Crossing over Thresholds

The physical complexities of Thar Desert have pushed the travellers to define this region as *Marusthali*. This definition is without exploring and knowing all the dimensions that lay within its physical frontiers. This limited approach undercuts any notions of physical diversities. The diverse ecological set-ups inside its geographical frontiers need a close study in order to understand its environmental diversities. The Aravalli ranges make natural frontier by bisecting the dry land located in north-western from the watered lands of south-eastern Rajasthan. River Luni makes another frontier by dividing the saline lands of west from the fertile tracts of south. Overall, to mark a region for study it can be purposed that most of the desert region works as a locality due to its uniform ecology and similar type of experiences that the inhabitants collectively go through. The physical features to mark the desert were dunes, scattered vegetation, scarcity of water, limited sources of surface water with limited quantity of water, etc. This eco-system permits limited scope for production of grains and other crops. It also limits the pastoral activities to the draught animals like bovines, sheep, camel, horse and goats. The breeding of horses and camels became specialized activity due to the conducive environmental conditions provided by the ecology of desert. Rosin states, 'In north, the technology and social organization for well irrigation necessitates partnerships that often cut across solidarities afforded by kinship, affinity and caste'.³⁶ All

³⁶ Rosin, R.Thomas, 'Locality and Frontier: Securing Livelihood in

the requirements, limitations and managements that were posed and facilitated by a specific environment has brought the entire community of dry Thar together as a single unit which, functions and interacts more like a locality, forging its frontiers that have been mainly laid down for administrative purposes by the ruling clout. This feature of locality could evolve because the nature has not marked the different terrains of dry desert with diverse opportunities and resources. Even the commonality of experiences gathered by different souls, in different parts of desert, act as an uniting and a binding factor, which permitted the exchanges and negotiations for benefit of all.

The feature of locality has allowed various types of travellers to constantly transcend through this desert. Since then the travellers became a constant feature in the Thar Desert. Bedouin (desert-dweller) communities were acting as guides and transporters by using their experiences of desert and with animals (camel and horse), respectively. For the travellers and the transporters the Thar Desert was a cultural space which was working as a locality with underlying unity and historical attributes. Historically, language has been the first and foremost expression of culture through which interaction happened. In this desert, language works as a binding factor and enhances the essence of locality. As it is one of the components to demarcate the cultural space, therefore, it also provides glimpse into the selective nature of the culture. It was only the language that made the elaborate trade exchanges and transactions possible in Thar Desert. The language and script developed for maintaining the huge records of trade was called *Mahajani*. It is one of the most difficult scripts to decipher. The training for learning this language is strictly limited into the circles of business families, where the young traders are taught while they were practicing the active trade. This is the reason that has automatically debarred the other communities from learning

the Aravalli Zone of Central Rajasthan', in (eds.) Karine Schomer, Joan L. Erdman, Deryck O. Lodrick, *The Idea of Rajasthan: Explorations in Regional Identity*, vol. 2 (Constructions), Manohar, Delhi, 2001, pp. 30-63 (p. 50).

this language. For centuries, traders have been maintaining *rokad-potha* in this language. Grierson considered Rajasthani as a language.³⁷ There are various dialect groups of Marwari language and nearly all of them are used by the inhabitants. All the versions differ from each other either slightly or majorly, depending upon the vocabulary and accent. All the regions of Thar Desert like Bikaner, Jaisalmer, Jodhpur, Shekhawati and Dhundhar are speaking Marwari. All these versions of Marwari can be called as dialect groups that are defined as per the regions in which they are used. Marwari as a category of language is different from Mewati (Mewar), Marwari (Jodhpur and adjoining areas with slight variations), Hadoti (Kota and Bundi), Thali (Jaisalmer), Bikaneri (Bikaner), Bagri (around Churu), Dhatki (Barmer region), Sirohi and Mewari (Mewar). All these varied dialect groups have been clubbed under one head and called, Rajasthani. None of these languages work as a tool that is bound in defined frontiers. For example, the Thali is the dialect for people who live in region of Jaisalmer. But the Kanjars and Kalbeliyas residing in Jaisalmer speak a language that is a rude mixture of Sindhi and Thali. Similarly, the use of language by *charans* is also very interesting which is guided by the principles of verse-making (with proper application of meters) based on rules of Sanskrit grammar and vocabulary of Marwari. Manganiyars are the groups of singers and the language in which they sing is very different from what they use for regular conversation and communication. Jaga/Bhajani (singer who sing in-praise of Jeen Mata), Bhopas, Kamad and various other devotional singing communities are also living examples for understanding the essence and reach of cultural space owned by the Rajasthani language. Lodrick has purposed that language has 'done most to define Rajasthan as a subjective region in which perceived cultural space and instituted political space coincide'.³⁸

³⁷ Grierson, George A., *Linguistic Survey of India, vol. IX, Indo-Aryan Family, Central Group Part II, Specimen of Rajasthani and Gujarati*, Superintendent of Government Printing, Calcutta, 1908, p.17.

³⁸ Lodrick, Deryck O., 'Rajasthan as a Region: Myth or Reality?', *The Idea of Rajasthan*, pp. 1-44 (31).

All these examples clearly highlight the various cultural spaces, where the groups interacted irrespective of their frontiers. Many such types of cultural spaces are still active and vibrant due to the effect of locality that has been developing in continuity.

On the contrary, at the same time the desert of Thar was a frontier for the ruling class and administrators, who wanted to mark it as a denoted region.³⁹ Tod, constantly called the Thar desert as *Marusthali* and recognized the frontiers of the desert on basis of the vegetation.⁴⁰ The distribution of the land assignments also reflects that the land-grants were made by keeping in mind the territories as per the access available to the kingdoms. The frontiers of kingdoms were marked on basis of the political and territorial control attained by the related kingdom. As discussed above Akbar tried to control the trade shares of Mughal empire, so he took control of Jalor, Medta and Nagaur and made them outposts of empire. The garrison ground at Ajmer is a fine example to understand that the geographical features were working as guiding factors to mark the territorial (direct control area and outposts) limits of empire. The rajputs laid foundation of many kingdoms in the desert of Thar. The famous states that evolved during the medieval centuries were Bikaner, Jodhpur, Barmer and Jaisalmer. All the desert states had porous frontiers which were geographically defined for the administrative purposes. Whereas, socially and culturally most of these frontiers were overlapping and this paved way for the elements of locality to take over. All the above discussed cases indicate that the physical markers were used only to demarcate the revenue frontiers. Thus, highlighting that for the administrators and ruling classes, Thar was a physical space, marked with aridity and sand.

Erdman in his interesting work suggests that for the Rajasthanis the externally imposed analytic distinctions were of lesser importance than relationship among themselves as everyone knows who the others are. For the people of Rajasthan, the social

³⁹ Denoted region are primarily created for purpose of organizing and analyzing information.

⁴⁰ Tod, vol. 2, p. 803. *Anwal, anwal Mewar, Bawal, bawal Marwar.*

and political structures are dependent on complementarity and cooperation. The devotional singers, belief in deities and participation for conserving resources are fine examples of the same. Preservation and assertion of pluralism was not an agenda on table, but a hidden trait located in traditional cultures and hierarchies. This became possible due to the interactions that happened amongst the inhabitants by crossing over the political frontiers and exchanges in the zones of locality. The different cattle fairs organized in different areas of Thar are another category to witness the element of locality. Thousands of people travel to interact with the cattle-traders, who have assembled at the venue of fair from different regions of Thar, in order to execute business. These fairs were platforms which brought together the unrelated members of rural and urban communities. During fairs, the interactions with the state were immense. The state provided the management of fairs by putting officials on deputation duties. All the initiatives for organizing the cattle-fairs were taken by the state because substantially rich economic transactions were getting executed in these assemblages. Similarly, the functioning of different traders (Oswals/Maheshwaris) also worked and apparently created different circles in which residents interacted, negotiated, participated and executed while operating in the overlapping economic circles and layer, thus creating the locality.

For the inhabitants of Thar, the dominant model of human environment relation stresses 'the stability of locality'. The homogeneity of tough geographical unit (Thar) provided the binding force in which people respond to environmental crisis of various kinds and mobilize the social and natural resources to resolve the crisis. The desert has left a deep mark on the mind of its inhabitants and the occasional travellers. Even the robust fighting forces have narrated the frightening experiences as discussed above. Rajrupak mentions that the deep effect of desert has made hospitality, bravery and alarming habits as second nature of its inhabitants.⁴¹

Geographical conditions often carry a direct effect on art,

⁴¹ Sharma, *Social Life in Medieval Rajasthan*, p. 12.

craft, religion and culture of the region. The *Panch-pirs* and Karni Mata are the live examples of this effect. Pastoralism was the main occupation for most of the communities that resided in the Thar Desert. The specialized breeders of camel were called Raikas and the evolution of Pabuji's cult around their day-to-day activities is mainly an effect of geography. On a similar line, the cult of Tejaji, Ramdeoji, Gugaji, Mallinathji and Harbuji has also developed. In today's world, their appeal has become general, as the followers believe them to be the boom-granting deities. However, most of these were heroes that were protecting the cattle in the area of their influence. Many Rajputs (Virende, Asthana, Satalmer, Naru etc.) were also making living by protecting cattle and extending security services. All these activities lead to the rise of several influence areas in the midst of Thar Desert. Later, these warriors and area managers took up the role of village leaders, giving rise to certain norms in which *ghughari* (expenses) were allotted as honorarium. This was the primary exchange between the service provider and seeker. In order to grant a safe travel within their territories and exit from their areas of influence, these leaders charged some fee. These route taxes (toll taxes) became regular source of income for all the states. As most of these frontiers were basically demarcated as per the efficiency of leaders to operate and manage. Due to the lack of the defined boundaries and marked frontiers of operations, constant struggles continued between different community leaders, who requested troops and men from other allies as per the requirement. Therefore, raids and loots became the norm of the day for securing the resources. The loots conducted by the hill tribes were limited to cattle and food items, whereas the community leaders, who were famous for exploits, collected all the possible items available with the victim. The popular instances to get an understanding about the dimensions of the raids, loots and plunders conducted by the settled community and their operation areas are raids conducted by Satalmer, Maldot, Viramdev, Pabuji's attack on village of Sindh to secure camels, Shekho Bhatti Rao's raid (of Pungal) on Multan, and various loots conducted by the Mers. In the late 19th century Sirohi, was raided by the Rajputs

of Marwar.⁴² In Jaisalmer, Rajputs conducted raids and thefts in the villages of Jats and Bisnois.⁴³ These rampant raids are clear instances to understand that some efforts were made by the leaders or petty kings to mark the frontiers of their territories, but the impossibility of managing these borders in desert has always overturned their initiatives. Thus, even after little efforts of the ruling classes and later administrators the frontiers of the desert states largely remained porous. The nomadic element dominated the desert landscape and it didn't allow the fixing of domains. Frontiers in dunes were ineffective, therefore, allowed unregulated movements of large variety of groups for various purposes.

Nomadism became an integral part of Thar culture due to the challenges posed by the environment of Thar. In Thar Desert, nomadism displays a cohesive human-environment relationship, in which the local communities have learnt to deal with environment compassionately. Nomadism was mainly practiced by the groups and communities who were associated with pastoral activities. Rebaris moved with their *tolas* (camel herds) in search of the open land areas where the animal can pick twigs, leaves, and grasses. The breeding of animal also required large open tracts of sand. Historically, a large number of cows were kept in herds and the designated people of each village took cows out for grazing. Large cowherds were constantly on move, from one place to another under observation and guidance of one or two cow herder (*gurwal*). These moves were mainly meant for meeting the requirements of fodder and water. These searches for pastures and water bodies were most effective links to keep the elements of locality alive, as the travelling agents were constantly interacting with the settled habitation. The effective communication skills allowed them to get access to water and pastures in areas outside their own habitation. So far, the contribution of these constantly moving herders for up keeping the element of locality has not been noticed. Any kind of primary anthropological and sociological study will facilitate

⁴² *Rajputana Gazetteer 1880*, vol. 3, p. 90.

⁴³ *Tawarikh Jaisalmer*, p. 225.

adequate understanding of the significant role played by these cow herders. The routes travelled by them while taking out the animals to surplus zones are unexplored. The efficient management of the limited resources along with a large number of cattle is a remarkable skill which needs to be explored in order to get a full picture of this entire process.

Bawariya was the community that roamed in a defined territory and performed service of local hunter/chaser. The herd animals like cows, *nilgais*, deer, *chital* and *chinkara* prove dangerous to the standing crops due to their habit of constant grazing. If a large herd enters a field and plucks for some time, then the loss of crop is definite. In order to avert these herd grazers the villagers hire services of *barwariya*. He guards the fields of that particular village. *Barwariyas* generally chase out the herds from fields into forest areas. At times, he was also duty bound to keep the birds away from fields, especially when the crop is rippling. Hence, he was made responsible for guarding the fields of villages. He also collected items from the forests and hills that were demanded by the villagers. In return of his services, the villagers would give him clothes, grains, fodder and various dairy products like milk, buttermilk, *ghee*, etc. On festivals, certain items specific to the celebrations were also extended. One *barwariya* interacted with many villages and his open interactions with the multiple villages allowed the element of locality to seep in. He also passed on the information pertaining to the availability of fodder and water, condition of pastures and availability of water in different water sources around the habitations. Thus, being constantly on move, the *barwariyas* create a ring of locality in the regions of their service. On various occasions, *barwariyas* were instrumental for arranging the fodder supplies.

The *banjaras* were major transporters of Indian subcontinent during the medieval centuries, who moved with large number of oxen to distant places while trading. They had a dominant role to play in dry land (north-western India) as transporters due to absence of riverine transportation in the desert region. These transporters constantly travelled through large landmass without fodder for large number of animal and food for the souls that

constituted the caravan. This practice was to reduce the baggage in caravan. While *en route*, they managed food, fodder and water by invoking the principle of locality (brewed over language, tradition or culture) and in long run by connecting with the settled communities and villages.⁴⁴ Thus, extending the principle of subjective locality, the *banjaras* approached and operated well beyond the defined frontiers of different states.

In nutshell, it can be proposed that the persistent survival and vibrancy of Thar was possible due to the interaction amongst inhabitants, cultures and environment. The periodical dominant political influences came in to mark the economic frontiers, but the general way of life that was closely identifying with arid and semi-arid lands continued to survive, with underlying historical and cultural unity. The culture of Thar is holistic as an assemblage of localized traditions that lead to the creation of a dynamic cohesive cultural entity which works as a phenomenon for generating and designing the elements of locality, without being affected by the political/physical frontiers. Thus, challenges of nature have marked the Thar Desert as a habitation given to the subjective spaces which are defined through the territorial frontiers within which localities have been developed by the inhabitants due to their constant crossing-over of the thresholds!

⁴⁴ Choudhary, *Trade, Transport and Tanda*.

CHAPTER 7



The Imperial Connects

Negligence for a moment becomes the cause of disgrace for long years to come.

—AURANGZEB

Garmsir (hot region) was experienced by Babur for first time when he entered Hindustan. The hot region of Thar was a reality of India to which this Sultan of Hindustan never got exposed. But, the fate of his descendents made them to experience this region either willingly or unwillingly. It is interesting to note that any region that was given to environmental hardships or threats was considered as ‘no-goers’ area. During medieval times, the forest of Jharkhand was a safe abode for the rebels to state. Most of the rebels use to hide in the thick forests of Jharkhand after failing in the attempts of challenging the state. Hence, the forest became a synonym for ‘home of rebels’, ‘abode for the ones who have fallen from righteous path’ and ‘a place for the unfortunates whose virtuous and fate is going to dust’. Similar kinds of expressions were employed to describe the desert and its dunes. The desert of Marwar and Jaisalmer were referred as ‘wilderness of mirages’ and ‘evil halting-place’. Thus, the forest and desert were both unappreciated regions that were mainly representing the anti-state elements and the unmannered sections and savages.

This chapter is an effort to explore the interests of the non-desert states in the regions of desert. To take if forward an insight in their respective activities will be attempted, to understand the nature and aim of their activities. The distance of desert from the imperial centres was no excuse for the latter, to leave former in

isolation. The limited sources of the Mughal India will be used to explore these connections. Through a careful study of the regional and vernacular sources, the reciprocation of the desert states has been explored. A close perusal of these sources allows to put forward that the relationships and connects between the Mughal and various desert states were mutual. Besides the interactions between the desert states and imperial centre, other rings of the power circles were working at the local level in which various states of desert were contesting and negotiating amongst themselves, aspiring for a better stability in the region. In order to gain stability in the region of Thar Desert, the desert states formed alliances and made truce. At the intra-desert state level, the matrimonial alliances were the most preferred mode to ensure associations and avert rivalries. Besides, the associations amongst the ruling clans and classes, the politically and militarily dominant groups also collaborated with the ruling class. Similarly, both these dominant groups fraternized with the local lobbies. All these efforts were mainly to ensure peace and safety in region and to avert battles, killings and raids, concerning safeguard of the economic activities to secure their respective share in economy of Thar.

The aspirations with desert were not many, but defiantly existed due to the complex and vast networks of the trade that were connecting the north Indian subcontinent into Central Asia. The efficiency of the local groups like *Ounti* (the one who rides a camel), *Rebaris*, *Banjaras*, horse traders and breeders, further facilitated the trade activities by providing smooth and effective means of transportation that made the dispatch of goods to the distant lands, in desert and beyond, possible. Availability of a large variety of animals and their best breeds in the Thar also opened the avenues of cattle trade. With the aim of procuring best breeds of camel, horse and oxen, large number of traders came to desert. Thus, interactions and negotiations of these groups helped in building a subjective environment for the objective region of Thar Desert, which was generally avoided due to the harsh objective reality of arid and dry weather, given to intense heat and maddening, huge and extensive sand dunes.

The envoy accompanying Col. Tod, en-route to Marwar has

defined the capital (Marwar) of desert as: ‘*Ak ra jhonpra, phog ri var, Bajra ri roti, motham (motha) hari dal, dekho ho raja, teri Marwar* (Huts of the ak, barriers of thorns, bread of maize, lentils of the vigna (vetch), behold raja, your Marwar!)’.¹ Another version similar to it was propounded by Adam, ‘*Bajri ka sogra, montha ke daar (daal), Akre ke jhupri, phogan ke baar, dekhi raja Man Singh teri Marwar!* (The bread of *bajra*, curry of green pulses, the hut of *akra*, the peripheral wall of *phog*, oh! Raja Man Singh, have seen your Marwar!)’.² So far these are the best possible expressions about the deserts and cultural life of the Marwar city. In brief, it explains the geographical features and culture of Marwar. As has been mentioned in the previous chapters, he also requested Tod for marking the territories of Mewar and Marwar as per the geographical features and availability of flora (*Anwal anwal Mewar; Bawal, bawal Marwar*). Throughout his collection, Col. Tod has used word ‘*Marusthali*’ to refer to the desert of Thar. This highlights that not only the outsiders, but even the people living in the close territories were in fear with the idea and thought of desert. And, they wanted to avoid any interaction with this intense ocean of sand, marked with scarcity of water and harsh heat. The people of desert lived in this ecology surrounded with sand, with their cattle that was the only reliable source of subsistence in this harsh environment. It has been highlighted earlier that the agricultural activities were entirely rain dependent. Water harvesting was the norm of day. The flood waters offered the moist for rabi crops. A few wells and other irrigation sources were employed for maintaining the animal and human resource along with minimum irrigation. Thus, the difficulties posed by the nature were immense and acute human labour was constantly required to secure the best possible deal for survival.

The inhabitants of Thar always awaited monsoon eagerly. However, its failures were never cursed. The categorization and

¹ Tod, *Annals and Antiquities*, vol. 2, p. 811.

² Adam, Archibald, *The Western Rajputana States: A Medico-Topographical and General Account of Marwar, Sirohi, Jaisalmir, Jodhpur*, 1889, p. 97.

usage of terms like *kaal*, *sukaal*, *dukaal* and *trikaal* indicates the mental preparedness of the inhabitants, for the unpredictable monsoon rains. They channelized their efforts to co-operate with the environment as per the aforesaid categorizations, depending upon the visible indications that were received from the nature. Accordingly, they featured the requirements. The agro-pastoral economy of western Rajasthan emphasized on the risk-management and oriented its efforts for effective management of the environmental crisis. For Fisher, migration is a risk-management reaction. He has also classified migration as permanent, permanent migration with maintenance of ties, life cycle migration, dual residence, casual migration and crisis migration.³ There is no debate that migration was one out of the many ways to deal with the drought. However, migration was not the first and only choice. There were many other techniques that were applied in-between the failure of rains and migrations. The formulas for averting the migrations were the dependence of villages on each other's water sources as per the availability of water, sending out the cattle in collective herds and registering as wage earners and seeking refuge in some neighbouring village or town, etc. If the drought conditions continued, the villagers mainly shifted to wage-earning and depended on the economically affluent classes to survive. Thus, even in droughts, the entire population didn't exit from Thar Desert. Definitely, the cattle were sent out in toto as they were the only wealth of the modest inhabitants. However, all the animals were moved out in batches depending on their capacity to endure the drought conditions. In line with this capacity, the cows composed the first batch to move out from the drought-hit regions, followed by goats, and lastly, the sheep and camel moved out when the draught became intense.

When exiled, Babur first conquered the north India, he complained bitterly about Indian climate and culture, lack of melons and absence of good quality pomegranates, whereas, till

³ Fisher, R. J, *If Rain Doesn't Come: An Anthropological Study of Drought and Human Ecology in Western Rajasthan*, Manohar, 1997, pp. 201-202.

then he didn't had any encounter with the desert of Thar. Before coming to Hindustan in 1526 AD with the aim of finding an empire, Babur never saw 'the *Garmsir* nor the country of Hindustan'.⁴ This expression of Babur was mainly guided by the environment of the land from where he was chased out. *Baburnama* has numerous evidences that illustrate the efforts made by the protagonist to plant fruit trees, specially pomegranates in the Indian subcontinent. He also tried to introduce some other fruits.

After the death of Babur, Humayun ascended the throne of Mughal Sultanate. Humayun's struggle with Sher Shah pushed him in exile. During the years of exile, this Mughal emperor travelled through some parts of the Thar desert in search of asylum. He experienced the region of Bikaner, Nagaur, Phaludi, Satalmer and Jaisalmer.⁵ The illusionary nature of Thar Desert can be accessed from the fact that 'whilst the officers who had been dispatched to check them, had lost their way and gone-off in another direction'.⁶ Maldeo denied asylum to Humayun, so the later turned towards Jaisalmer. It seems that troubles were awaiting upon Humayun in the desert when after turning towards Jaislamer 'Rai Lonkaran took out of wickedness, the position of hostility and set guard over the water-pond, so the royal army which has experienced the toils of the desert and has come from a wilderness of mirages to this evil halting-place, was put to trouble from want of water'.⁷ In 1542 AD, Humayun came to Jaisalmer looking for asylum. Lunkaran denied him the refuge. However, Humayun was charged for killing a number of cows.⁸ Further, the Thar Desert has been described as 'that waterless and grainless Sahara where it was difficult to find any trace of corn, the caterers for the holy court were in despair, when suddenly a man brought a bag full of millet (*jawar*) for sale'.⁹ Sher Shah also didn't had good experience in the desert.

⁴ *Akbarnama*, H. Beveridge (tr.), Vol. 1, p. 235.

⁵ *Ibid.*, pp. 372-74.

⁶ *Ibid.*, p. 374.

⁷ *Ibid.*, p. 375.

⁸ Gahlot, J.S, *History of Rajasthan*, vol. 1, Jodhpur, 1937, p. 669.

⁹ *Akbarnama*, p. 375.

After ensuring victory, 'against Maldeo the lord of Ajmer, Nagor and many other cities'¹⁰, he said in despair that 'for a handful of *bajra* (millet) he had nearly lost the empire of Hindustan'.¹¹ In the 19th century, Col. Tod had a similar experience that has been noted as 'the sand, since we crossed Luni, had become gradually heavier, and was quite fatiguing as we approached the capital of "the region of death", but the Marwaris and camels appeared to move through it as briskly as our men would on the plains of the Ganges'.¹² The extensive desert of Jaisalmer and its miseries were defined as 'the barren ridges...the lofty undulating *tibas* of sand are the only objects which diversify the almost uniform sterility of the regions. No trees interpose their verdant foliage to relieve the eye, or shelter the exhausted frame of the traveller. It is nearly a boundless waste, varied only by a few stunted shrubs of the acacia or mimosa family, some succulent plants, or prickly grasses, as the bharut or burr, which clings to his garment and increases his miseries...northern portion, where "a sea of sand without a sign of vegetation" forms the prospect, the vicinity of the capital is a paradise'.¹³ All the above instances hint to similar kind of experiences that were perceived and endured by these different souls while navigating through Thar Desert, in different times. Thus, it brings out well that the Thar Desert was a 'no-goers area' and all the states that were seated at the imperial centre of India, controlling the political and economic affairs of the subcontinent, never wanted to willingly liaison with this dry land mass. However, the reality proved contrary!

From the 11th century onwards, various Rajput clans made active efforts in the Thar Desert for establishing (Rathors), shifting (Bhattis) and consolidating their respective kingdoms. The Rajputs inhabiting in desert were trying to take control over the resources.

¹⁰ Ibid., p. 400.

¹¹ Abbas Sarwani, *Tarikh-i-Sher Shahi*, Elliot and Dowson, IV, p. 406. Cf. G. N. Sharma, *Social Life in the Mediaeval Rajasthan*, Lakshmi Narain Agarwal, Agra, 1968, p. 13.

¹² Tod, *op. cit.*, vol. 2, p. 820.

¹³ Ibid., pp. 1246-7.

In this process, they mainly relied on the principles of caste, clan and kin. Prior to the establishment of Jodhpur city as capital of Marwar, the efforts of Rao Siha, Solanika, Aasthan, Kanha Dev, Rao Raipal, Rao Viram Dev and Chunda (s/o Viram) towards the formation of Marwar State (Jodhpur) were immense.¹⁴ Rao Ranmal was a noble expansionist who was the crowned prince of Marwar state. Under state policy, he tried to maintain cordial relationship with the adjoining state. Thus, he made a nuptial proposal for Rana Chunda, the heir apparent of Mewar. But this marriage could not solemnize. Thus, Hans Bai was married to Rana Lakha, the ruler of Mewar. The progeny of Hansabai and Rana Lakha will succeed to the throne of Mewar was the primary condition for formation of this marriage alliance. Rana Chunda was removed from the line of succession under the condition of treaty, so Rana Mokal came to the throne. On succession Rana Mokal was a minor, thus, Rana Chunda served as his regent. After serving for some time as a regent of Rana Mokal (son of Hansabai and Rana Lakha), Rana Chunda left Mewar and established himself in the region of Malwa.

Rana Kumbha killed Rao Ranmal in order to get rid of his colossal participations in the activities of Mewar state. After killing Rao Ranmal, Rana Kumbha didn't allow anyone to perform the cremation ceremony (*mar nai, loth padi rakhi, daag dewa, n diyo nahi*) of Rao. Risking his life, Chandan Khadiya finally performed the cremation ceremony and took the ashes of Rao to Gangaji (*pache phool gale bandh nai gangaji le gayo*).¹⁵ Rao Jodha was son of Rao Ranmal. Rao Jodha laid the foundation of Jodhpur city in 1459 AD. He was a skilled warrior and the credit for consolidation of the Marwar kingdom goes to him. Constant attacks of Rana Kumbha forced Rao Jodha in exile. Rao Jodha travelled in the desert during exile and collected horse riders for composing troops. During exile, he met Sankhla Harbuji Mahrajot who was living near Phalodi. Being a man of resources, Harbuji use to arrange feasts (*ghani mung bajri ro khich ran, d daal rotiya pahte kheer goras*

¹⁴ *MRPRV*, vol. 1, pp. 22-7.

¹⁵ *Ibid.*, p. 37.

saro taiyaar karnai rakhiya) and fed people. On receiving Rao Jodha and his retinue (guests), the feast of fest was also offered to them.¹⁶ On expression of query by Rao Jodha about regaining the control over lost territories, Harbuji replied – ‘*Jodha tharo aaj su dil (din) baliyo. Thae pagadai pag dewao. mahoro mung thara pait mai, thako jitri dharti maabe ghodo fir si, titri dharti thari, beta pota su kade dharti jaarwasi nahi* (from this day onwards your days have turned around. You mount your horse. My grain is in your stomach, in whatever land your horse will roam, that entire territory will be yours, even your sons and grandsons will not lose this land/preserve this territory).¹⁷ Col. Tod mentions that Harbuji also drew allies (chieftain of Mewa and Pabuji) to support Jodha in his project of regaining *bapoti* (hereditary property).¹⁸ Rao Jodha was able to regain his lands. Rao Jodha sought support of his contemporary hero-deities for gaining control over the vast territories that later formed the kingdom of Marwar. Rao Jodha also reclaimed the lands that were annexed by Khumbha after defeating Rao Ranmal. Mandor was taken as *bapoti*, along with Sojat and Jaitran which were till then in kingdom of Mewar. When the clash between Rao Jodha and Rana Khumbha was not settling down, the locals came forward and tried to fix boundaries for both, Marwar and Mewar by purposing ‘*taree utha re Aarwal Aarwal rana ro, no barwal Babal rawa ro*’.¹⁹ This distribution of territory was drawn upon the natural availability of flora. This demarcation of territories between the two rivals is unique for many reasons. Primarily, the flora has been used to distinguish the difficult terrains and secondly, the locals had decided it for the fighting royals. Thus, it puts light on the significant roles that were executed by locals in the regional matters and highlights their significance as social partners. Since then this saying is popular.²⁰ Even today, it is in use due to the element of participation of the locals.

¹⁶ Ibid., p. 33. *Jitra dhayan dhay hota. Kheer khand goras sare bata tript hua hota.*

¹⁷ Ibid., p. 34.

¹⁸ Tod, *op. cit.*, vol. 1, p. 329.

¹⁹ *MRPRV*, vol. 1, p. 36.

²⁰ Ibid., p. 36.

Later, Rao Jodha subjugated the states of Jalore and annexed Ajmer and Sambhar. With these annexations, the territories of Marwar state expanded immensely. Before Rao Jodha, Marwar was a sovereign monarchy limited to a small territory but after gaining control over many smaller regions, he declared Jodhpur as capital of the Marwar kingdom. In c.1455, Rao Jodha got back his land and laid the foundation of Mehrangarh fort on *jaith sudi* 11 vs 1515/1458 AD.²¹ Rathors started their journey for formation of kingdom from Kher (Mallani district) under leadership of Siha in around 1243 AD. Nearly after two centuries, during Rao Jodha's reign (c. 1438-1488 AD), the territories of Marwar included Merta, Phalodi, Mandor, Pokhran, Bhandrajan, Sojat, Jaitrana, Shiva, Siwana, Sambhar, Ajmer and large parts of Nagaur. In the 14th century, Rathors got control over Pokhran, after marriage of Pir Ramdeo's daughter to Rathor Hamir. Ramdeo left the region in favour of his son-in-law, Hamir, and moved to village Runicha. At Runicha, he established his abode and even today, Runicha is popular for Ramdeora. In vs 1600/1543 AD, Maldeo fought with Badshah Shershah. In vs 1604/1547 AD and vs 1607/1550 AD, Maldeo took control of Phalodi (from Dungarsi) and Pokhran (from Jaitmal s/o Satalamer) respectively. After victory over Pokhran he moved to west and took Barmer.²² All these instances indicate that the Rathors were constantly acquiring territories in order to expand the area of their influence. The continuity of clan efforts was first consolidated by Rao Jodha by laying the foundation of Jodhpur, as capital of Marwar. The contestations and struggles of the ancestors became valid with the foundation of Marwar state.

Amongst the desert states, Jaisalmer holds a distinct identity. As per the traditional belief, the foundation of Jaisalmer fort was laid down in vs 1212/1155 AD. Devidas of Jaislamer was succeeded by his son Jait Singh II in 1496 AD. In c.1528, Karan Singh II came to throne but later stepped down, when his elder brother Lunkaran returned from Kabul. Lunkaran died in c. 1550 and was succeeded by his son Maldev. During the reign of Maldev, Jaisalmer

²¹ Ibid., p. 38.

²² Ibid., vol. 2, p. 63.

was constantly under attacks from Qandharis and Rathors. These attacks considerably weakened the defence of state, to the extent that once the Rathors of Jodhpur besieged and captured Jaisalmer. Later, on payment of huge sum of money, Jaisalmer was resorted to Bhattis.²³ Maldev was succeeded by Rawal Har Rai, who was a political animal. In order to stabilize his authority, Rawal Har Rai formed matrimonial alliances with Mughals and Governor of Sindh. In 1577 AD, after death of Rawal Har Rai, Bhim came to the throne of Jaisalmer. Bhim was in service of Mughal court and was a trusted servant of the state. After a few weak successors in between, Rawal Sabal Singh came to the throne. He was in service of Shahjahan's imperial army. He proved himself outstanding at Peshwar by protecting the royal treasure from the Afghans. This remarkable act of bravery helped him to secure the throne of Jaisalmer and he ruled till 1659.²⁴ Amar Singh, son of Sabal Singh, succeeded to *Gaddi* of Jaisalmer after death of his father. As an able ruler, Amar Singh was successful to put an end to robberies in his kingdom. He built the Amreshwar shiv temple and Amarsar dam. These activities (of public works) indicate that Jaisalmer was regaining its health under the sovereignty of Mughal empire. The cordial relations between the Mughals and Bhattis lasted long. Though, the Mughal state withered away in the 18th century, even then the fading association between the Mughals and the Jaisalmer house continued till the 19th century. It comes out explicitly in the letter written by emperor Bahadur Shah to the Maharawal Ranjit Singh of Jaisalmer, requesting him to send armies to help the cause of 1857 and further he requests Maharawal to finish all English men that were in the territories of Jaisalmer.²⁵

The John Company was also interested in the desert of Thar due to the resources available in its territories. The presence of limestone, stone and gypsum mines were main attractions along

²³ Nand, Sureshwara, *Art and Architecture of Jaisalmer*, Jodhpur Publishers, 1990, p. 12.

²⁴ *Ibid.*, p. 14.

²⁵ Kaya and Malleson, *History of Indian Mutiny of 1857-58*, vol. 5, London, 1897, p. 334.

with the richness in a variety of buff, or brown colour sand stone of extremely fine texture. As discussed earlier, the camels of Jaisalmer were famous for their speed and hardiness. They were the only successful means of transport to negotiate the dense deserts. During Afghan wars in 1838-9, the British took assistance from Jaisalmer state who provided valuable assistance to the British army by supplying them camels and other articles for which company tendered special thanks.²⁶ The Jaisalmer state also supported the Company during conquest of Sindh, and in return the forts of Gharsia, Ghotaru and Shahgarh were handed over to the king of Jaisalmer, which were earlier taken by the Amirs of Sindh.²⁷ Thus, it can be asserted that all the non-desert states that were ruling from political centres of Indian subcontinent during different centuries were averting from the environmental challenges posed by the Indian desert, but, none of them could kill their aspiration of securing a share, in the economic resources of Thar.

Prior to the coming of Mughals, all the Rajput clans (Rathors, Sisodiyas, Bhattis) residing in the Thar Desert were fighting amongst themselves. With the coming of Mughals and establishment of their control in the territories of Thar, all the intra-desert states accepted the subordinate status and enrolled for service under the Mughal empire. Henceforth, the Mughal emperor decided the questions of succession and certified it by granting *panja* (a mark on a piece of paper certifying the succession). Even after putting the Rajput states of desert in the subordinate status, the Mughal emperor Akbar granted them twin-*jagirs* (*watan-jagir* and *tankhwah-jagir*). Thus, the Rajput allies of Mughal state got hands-on large economic resources. During reigns of Jahangir and Shahjahan, the territories of the *watan-jagirs* of Marwar state were constantly altered and shifted.²⁸ Some land assignments were not sufficient for meeting the expanses as it had scarce agricultural production. So the recipients requested for a change in allotted assignment. Jalor was a no-income area so most of the recipients

²⁶ Erskine, K. D., *Jaisalmer Gazetteer*, vol. 3, Calcutta, 1909, p. 16.

²⁷ *Ibid.*

²⁸ *MRPRV*, vol. 1, pp. 105-7.

returned it. In vs 1712/1655 AD, Ratan Maheshdasot declined the land grant of Jalor as there was no production and requested for land assignment at Ratlam.²⁹ After this denial, Shah Jahan gave Jalor to Jaswant Singh of Marwar and told him to release Malrno. The recipient (Jaswant Singh) requested for keeping the carts and people of Ratlam in his share as region of Jalor didn't had potential of agricultural production.³⁰ In vs 1682/1625 AD, Fidayi Khan intervened to get Medta for Gaj Singh.³¹ These events indicate that the Mughals were interested in the desert, through these interventions and land-assignments they assured information from the desert interiors, and the direct control over certain regions of Thar for achieving balance of polity and ensured safety of the empire. Jointly, these safeguards helped in effective management of state affairs.

Rao Bika was son of Rao Jodha. In 1488 AD, he founded an independent principality in Bikaner with support and under guidance of Karni. By dauntless wars he included Sirsa, Ladnu, Bhatner, Bhatinda, Singhana, Rini, Nohar and Pungal in his domain. The Bhatti Rajputs settled down in Jaisalmer (Mad) in the 8th century and by 15th century 'the limits of Jaisalmer touched Amarkot in the west and Mallani in east'.³² Thus, the Thar of the 15th century housed Mad (Jaisalmer), Maru (Marwar) and Jangal (Bikaner) states. The constant struggles within the intra-desert states make it evident that all the ruling classes had interests in the dry lands of Thar and everyone was attempting to secure more and more lands of this desert.

The experiences of the Mughal personalities in the dry region could not puncture their aspirations of controlling the economic resources of the Thar Desert. Even the near death experiences (described above) didn't dissuade the imperial centres, from exercising control over this vast desert. The interest of Mughals in

²⁹ Ibid., p. 129.

³⁰ Ibid., p. 129.

³¹ Ibid., p. 109.

³² Sharma, G. N., *Social Life in Medieval Rajasthan*, Lakshmi Narain Agarwal, Agra, 1968, p. 28.

desert persisted and they made prompt and aware efforts to keep this distant territory under control. After subjugation of the desert states the Mughal imperial forces were regularly appearing in the dry region. A share in the revenues arising from the desert trade activities was the chief inspiration for Mughals to participate in the activities of desert.³³ In order to gain a direct control over the passages into western India, desert region, its trade routes, Nagaur, Ajmer and Jalor were made the outposts of the Mughal empire. Plethora of evidences indicate that the Mughal state was constantly working to keep Nagaur safe and under control. The strategic importance of Nagaur can also be accessed by analysing the facts that it was always a *jagir* that was assigned to the most trustworthy officials. During the early years of Akbar's reign, Nagaur was a *jagir* to Bairam Khan. Later, it was allotted to Munim Khan and many other officials who enjoyed the trust of the emperor. When Bairam Khan rose in rebellion, he was the *jagirdar* of Nagaur. To take back Nagaur under imperial control, 'Nagor and its territory were given to M. Shrifuddin Hussain'.³⁴ After reconciliatory round, when Bairam Khan escaped from Agra, the first order given by Akbar was 'the word-traversing standards should advance from Delhi and establish themselves at Nagor, so that Bairam Khan might not be able to plant his foot in that region'.³⁵ During Bairam Khan's rise in rebellion, Sharafuddin Husain got charge of Nagaur, as one of Akbar's most trusted official. In 1562 AD his credentials of 'real worthlessness and insubstantiality became' manifested when he escaped from the capital of Agra for 'Ajmer and Nagor which were his *jagirs*'.³⁶ On getting information of his escape the first order given by Akbar was, 'that one of his trusty servants should be appointed to the province of Nagor'.³⁷ To execute emperor's orders, Husain Quli Beg was immediately promoted and the title of Khan was conferred upon him. Consequently, the *jagir* of Sharafuddin

³³ See Chapter four and five for details.

³⁴ *Akbarnama*, vol. 2, p. 155.

³⁵ *Ibid.*, p. 152.

³⁶ *Ibid.*, p. 303.

³⁷ *Ibid.*, p. 303.

Husain was assigned to him and he was sent-off to take charge of Nagaur.³⁸ The significance of Nagaur, Jalore, Sojat, Jaisalmer, Ajmer, Bikaner and Pali was due to their strategic geographical locations and immense trade that passed and exchanged through these centres, before getting dumped into the destined markets. Thus, Akbar was no exception to aspire for authority over Nagaur. Besides him, many others kings irrespective of their influence tried to acquire jurisdiction over Nagaur. All these aspirations were mainly governed by the objective of safeguarding the share in trade activities. Nagaur became a popular centre for trade activities due to its geo-position. Its economic significance multiplied manifold, being a cross-road for commercial purposes. During reign of Rao Chunda, Mandor was the capital of Marwar. But after gaining victory over Nagaur, he shifted his capital to Nagaur.³⁹ In vs 1428/1361 AD, he died while fighting against Salem Khan of Multan, who was called by Bhatti (Kelan). There was a rivalry between Bhatti Kelan and Chunda. To take revenge, Bhatti (Kelan) called Salem Khan of Multan to attack on Chunda.⁴⁰ The cultural significance of Nagaur also attracted the competitors who had the ability to wield power.

Abul Fazal noted that 'he for political reasons, and for subduing oppressors, etc., under the veil of indulging in hunting, proceed... towards Nagor...and halted at the city'.⁴¹ In c.1570, after taking control of the Nagaur affairs, Husain Quli Beg addressed the next imperial order that was for 'taking of the fort of Jodhpur, which was the strongest fort in that country'.⁴² Col. Tod also confirms that the Mughal governor Husain Quli Khan seized the fort of Jodhpur and called it 'the strongest fort in that country'.⁴³ A good number of forces were sent to assist Husain Quli Beg and soon the control of fort was taken. In vs 1638/1571 AD, Akbar gave

³⁸ Ibid., p. 304.

³⁹ *MRPRV*, vol. 1, p. 25.

⁴⁰ Ibid., p. 26.

⁴¹ *Akbarnama*, vol. 2, p. 517.

⁴² Ibid., p. 305.

⁴³ Tod, vol. 2, pp. 958-9.

Jodhpur to Mota Raja.⁴⁴ The royal princes were also granted *jagirs* in the desert. In vs 1680/1623 AD, the *jagir* of *suba* Ajmer was granted to Pervez, under which he received all the *parganas* of *suba* Ajmer. In this land assignment, he also got Medta as part of his *jagir*.⁴⁵ In AD 1649, *patta* of Pokhran came in the territories of Jodhpur that too after intervention of queen Manbhavati. The reigning Mughal emperor responded '*chaho to Jaisalmer thanu da* (if you wish Jaisalmer can also be given to you)'.⁴⁶ Then the queen requested that 'Jaisalmer serves no purpose for them. It is an area where Bhattis dominate. Pokharan was always ours'. This is how on her pursuance Pokharan was granted to Marwar. A *farman* was issued with immediate effect to communicate the decision of emperor to the concerned parties. King of Jodhpur showed the copy of *farman* to Rawal Ramchand and Rathor Sadul Gopal Dasot.⁴⁷ All the above instances clearly reflect that the desert was no wasteland for the empire and control over its territories was always desired for ensuring the economic wellbeing of empire.

Another pivotal reason for the Mughals to extend sovereignty over the regions of desert was the 'horse-trade'. The dry environment and sandy dunes of Thar Desert were conducive for horse breeding. The *johads* and pastures of Thar were supplying nutritious grass for horses. In chapter four, various *johads* of Marwar have been described. Describing the landscape of Marwar, Col. Tod noted that 'there were several horse-fairs, especially those of Balotra and Pushkar where the horses of Cutch and Kathiawar, the Jungle and, and Multan, were brought in great numbers. Valuable horses were also bred on the western frontier, on the Luni, those of Rardara being in high estimation. But the events of the last twenty years appear to have dries up every source of supply. The breeding studs of Rardara, Cutch and the Jungle are almost extinct, and supplies from the west of the Indus are intercepted by the Sikhs. The destruction of the predatory system, which created a constant

⁴⁴ *MRPRV*, vol. 2, p. 297.

⁴⁵ *MRPRV*, vol. 1, p. 108.

⁴⁶ *MRPRV*, vol. 2, p. 298.

⁴⁷ *Ibid.*, p. 298.

demand, appears to have lessened the supply. So much for the general peace which the successes of Britain have produced'.⁴⁸ The horse consignments for Mughal cavalry were received from distant lands of Central Asia. The routes through the desert were popular with the horse traders for ensuring health of the animal. The *Atlas of Mughal India* is a remarkable work that reflects the author's deep understanding about the physical features and political boundaries of the Mughal India along with his labour for love (history).⁴⁹ Lakhi Jungle was a breeding ground for a celebrated breed of horses.⁵⁰ This in-depth study of historical geography has incorporated relevant information regarding politico-administrative divisions, administrative centres and economic products of the 17th century.

The limited agricultural activities made Thar a region of irregular agricultural incomes. Thus, large varieties of new taxes were introduced for extracting income for the state, like *dhuna*, *dand*, *anga*, *charai*, *paan-charai* etc.⁵¹ Besides, these taxes, the raids, *rahdari* (toll tax) and the money earned by extending protection and security services (*ghughari*) were also means of income. *Ghughari* and *khichado* were other ways employed by the state to shift the fiscal burden onto the populace. In *pargana* Medta, the population of Jats was highest. Being agriculturists, the members of Jat community of Medta kept oxen and camels for executing agricultural activities. In vs 1718/1661 AD, the state took a separate tax on both the animals.⁵² The taxes levied by the state of Marwar under *Amal Dastur* (tax on succession to throne) in the *pargana* of Medta on succession of Rao Gaj Singh, in year 1634 AD, were *ghassmaari* on the animals [cow, buffalo, bartho, jhota (calf), *chali-gadar* (goat-sheep), *jhunpe* (hut)], and *pan-charai* on the grazing animals like camel and goats, *bbog* on the agricultural

⁴⁸ Tod, vol. 2, pp. 1105-6.

⁴⁹ Irfan Habib, *The Atlas of Mughal India*, Oxford University Press, New Delhi, 1985.

⁵⁰ Tod, vol. 2, p. 1184.

⁵¹ See Appendix- 4.

⁵² *MRPRV*, vol. 1, p. 93.

produce (*shiyalu* and *tarkari*) and fodder (*kadbi*).⁵³ The rates of these taxes hint that a large amount of money was levied. Similar types of taxes were levied in other *parganas* as well. At times, the exploitation by the state made the peasants to approach to the Mughal court. In year 1661 AD, the exploited peasants of *pargana* Medta approached the court of Aurangzeb for relief in taxes. Their request was accepted. Thus, from taxes, *vakil* Manohar Das struck off the excess amount that was levied on the peasants under new heads and the same relaxation was accepted by the king.⁵⁴ After taking control of the Thar region, the Mughals collected large amount of taxes under organized system of taxation. Until 1625 AD, two lakh *daam* was assessed tax for Medta, with the interventions of Khoja Awal Hussian, it was enhanced to 2.5 lakh *daam*.⁵⁵ Pargana Medta was also taken into *khalisa*. Until the intervention of eunuch Awal Khan, Medta was under Rajsingh as *jagir* which was allotted to him on recommendations of Mahabat Khan.⁵⁶ These instances prove that the lucrative revenue opportunities in the trading towns were sufficient motivation for the imperial centre to keep a constant check of this region as it offered immense economic opportunities midst of the adverse environmental conditions.

Thus, it can be proposed that there were sufficient avenues in desert for both, the imperial states and, intra-desert states. In order to stabilize the political scenario of Thar region and to ensure economic mobilization various other types of efforts were also initiated. Under these efforts the matrimonial alliances were most successful means to ensure long term associations and collaborations. Aforementioned marriage of Hansa Bai in the house of Mewar was a step in that direction only. The political and military influence of Asthana rose while he was in territories of Pali. Looking at his success and fame, Raja Pratapse of Gohla

⁵³ Ibid., pp. 88-9.

⁵⁴ *MRPRV*, vol. 2, p. 93.

⁵⁵ *MRPRV*, vol. 1, p. 109.

⁵⁶ Ibid.

Thakurai offered Asthana to marry his daughter.⁵⁷ Maldeo married nearly in all the Rajput houses that were active in the Thar region during his lifetime. He married in dynasties of Jhala, Bhatti, Hada, Kachhwaha, Tank, Ahada, Surawat, Chauhan, Jadam, Sodhi and Jasad.⁵⁸

The matrimonial alliances were not limited within the Rajput clans and families. In order to ensure cordial relationship with the Mughals, the Rajput states desired to form matrimonial alliances with the imperial bloods. The objective of these matrimonial alliances was to ensure some kind of permanent association with the Mughals. Thus, marriage alliances were preferred that gradually helped the Rajputs to become part and parcel of the extended Mughal family. While Akbar was *en route* to Ajmer in 1562 AD, Raja Bihari Mal came to pay his respect and meet Akbar at the camping ground of village Sanganir and expressed his sincerity towards emperor and his empire. This was Akbar's first interaction with the Rajput kings of Rajasthan. Here Bihari Mal requested to be an ally of the empire, and to operationalize it he proposed 'a special alliance'⁵⁹ under which he wished to marry his daughter (princess Hira Kunwari) to the emperor. His request was acceded and the bride *dola* was brought to Sanganir to perform the nuptial rites. After this marriage alliance, many other Rajput clans also came forward and offered their daughters and sisters in marriage to the Mughals.

During his visit to Ajmer in 1570s, Akbar solemnized two marriages. Rai Kalyan Mal of Bikaner presented himself at the royal camp and expressed his wish to marry his brother's (Kahan) daughter to emperor. The permission for solemnizing this marriage was granted by the would-be groom.⁶⁰ The second proposal came in from Rawal Har Rai, the ruler of Jaisalmer, who wished her daughter to be included among 'female servants' of Akbar. As he could not appear before the royal presence, in person,

⁵⁷ *MRPRV*, vol. 1, p. 12.

⁵⁸ *Ibid.*, pp. 55-6.

⁵⁹ *Akbarnama*, vol. 2, p. 242.

⁶⁰ *Ibid.*, p. 518.

so he requested that the noble acceptance by the emperor shall be communicated to him through a courtier. Raja Bhagwant Das was deputed to carry out this task. When Akbar returned from Nagaur after enjoying feast of Khan Kilan, the marriage with princess of Jaisalmer was solemnized.⁶¹ This marriage of Nathi Bai⁶² with Akbar helped to get some peace in Jaisalmer. Rawal Bhim was successor of Rawal Har Rai and he married his daughter to prince Salim.⁶³ Many other rulers from distant kingdoms also married their daughters and sisters to the Mughal emperors, princes and nobles.

Jahangir in his memoirs notes 'To Jagat Gosain, daughter of Mota Raja (the fat raja) was born Sultan Khurram, in the 36th year of my father's reign...in the city of Lahore'.⁶⁴ Khurram (Shahjahan) was son of Balmati (Jagat Gosain), who was daughter of Udai Singh of Marwar.⁶⁵ Daughter of Mota Raja gave birth to a daughter of prince (Salim).⁶⁶ 'Udai was the first of his race who gave a daughter in marriage to a Tatar. The bribe for which he bartered his honour was splendid, for four provinces, yielding £200,000 of annual revenue, were given in exchange for Jodh Bai, at once doubling the fisc of Marwar'.⁶⁷ Jodha Bai was wife of Jahangir and title granted to her was *Miryam-i Zamani*, Mary of the age.⁶⁸ In vs 1680/1623 AD, Manbhavati married to Pervez.⁶⁹ Lilawati, daughter of Rao Sakhat Singh, was married to Shahajahan.⁷⁰ Norman P. Zigler has successfully brought out the various dimensions of Mughal-Rajput matrimonial alliances and has tried

⁶¹ Ibid., p. 519.

⁶² Nand, Sureshwara, *Art and Architecture of Jaisalmer*, Jodhpur Publishers, 1990, p. 13.

⁶³ Erskine, K. D., *Jaisalmer Gazetteer*, vol. 3, Calcutta, 1909, p. 13.

⁶⁴ *Tuzuk-i Jahangiri*, vol. 1, p. 19 and *Akbarnama*, vol. 3, p. 921.

⁶⁵ Tod, vol. 2, p. 973.

⁶⁶ *Akbarnama*, vol. 3, p. 880.

⁶⁷ Tod, vol. 1, p. 389.

⁶⁸ *Akbarnama*, vol. 1, p. 33.

⁶⁹ *MRPRV*, vol. 1, p. 108.

⁷⁰ Ibid., p. 111.

to understand them as units of political significance.⁷¹ Overall, it can be said that the institution of marriage was a well established mechanism to ensure loyal allies and firm ties.

The Mughal court in India represented the Timurid royal court in India. The Timurid identity was profoundly based on 'hybrid cultural system' which was 'the accumulation of popular makers of kingship, spirituality and power'.⁷² Their culture was an elastic and porous membrane and its strength lied in its highly adaptive character which allowed assimilation and co-existence. In this culture of assimilation, patronization of the subordinate groups was a crucial link to keep the loyalties in place. Thus, patronization was one of the most significant elements of the local and improved Mughal polity. A continues fabrication of the associations was possible only through appreciations and adorations, which were means to extend patronage. The Mughals were careful to do it regularly, to keep continuity of the culture, legitimacy, loyalty and cultural and ideological legacy. Raja Udai Singh Rathor of Marwar was called the 'King of Desert' by Akbar.⁷³ Dilemma of Raja Man Singh of Amber about crossing the snowy Caucasus was melted down by Akbar by writing a couplet in Rajasthani dialect.⁷⁴ In 1616 AD, Kalyan Das, the chief of Jaisalmer was called to court by Jahangir and the title of '*Maharawal*' was bestowed upon him.⁷⁵ *Maharawal* was the title of the Jaisalmer house as it was Rao and Rana for the Jodhpur and Udaipur houses, respectively. These titles were ways to praise and encourage the servants of state and to

⁷¹ Ziegler, Norman P., 'Some Notes on Rajput Loyalties during the Mughal Period', in J. F. Richards, (ed.) *Kingship and Authority in South Asia, South Asia Studies*, Maidson, 1978, pp. 215-250.

⁷² Balabanlilar, Lisa, *Imperial Identity in the Mughal India: Memory and Dynastic Politics in Early Modern South and Central Asia*, Viva Books, New Delhi, 2013 (reprint 2017), p. 141.

⁷³ Tod, vol. 2, p. 965.

⁷⁴ Tod, vol. 1, p. 391. *Sabhi bhumi Gopal ki, jaa mai Atak kaba, Ja ke man mai atal he, soi Atak raba* (the whole earth is of God, in which he has placed Atak, the mind that admits impediments will always find a *atak*/ stuck.)

⁷⁵ Shyamal Das, *Vir Vinod*, vol. 4, Udaipur, 1886, p. 1763.

keep them contained. All these methods of appreciation, bestowal of titles, etc. were mainly actions for keeping the health of empire intact. As these personal engagements did not allow the recipient to deviate from the path of loyalty.

There are many evidences to prove contrary to the claims made by the Rajputs in the contemporary political scenario. Various evidences prove that the Rajputs happily married their daughters into the Muslim families. Besides marrying their daughters and sisters to the powerful Mughals, the Rajput also formed matrimonial alliances with many other ruling muslim families that were present, either, in local, or, in neighbouring territories. Maldeo himself married into many Rajput houses. Under the similar policy, he married off his daughters in different families. His eldest daughter Kankawati was married to Padshah Mahmud of Gujarat. Another daughter, Ratnavati Bai, was married to Haji Khan of Nagaur.⁷⁶ Dhana Bai, the daughter of Mota Raja of Marwar, was married to Nawab Chiram Khan of Nagaur and in response, the Nawab ensured help to him during his expeditions.⁷⁷ In the 16th century, a daughter of Jaisalmer chief was married to Turkoman Governor of Umarkot. The child born from this union was Khani-Zaman, who became a distinguished general of Sindh. He maintained good friendly political ties with Rawal Har Rai.⁷⁸ In the 16th century, the Rathor clan was expanding aggressively for securing territories. Its constant expansion posed grave challenge to the Jaisalmer state. By forming the matrimonial alliances with the Mughals on one hand and with the governor of Umarkot on other, Rawal Har Rai was attempting to stabilize his political position. Thus, it can be proposed that in the politically disturbed scenario of Thar Desert, the matrimonial alliances were a successful social formula to ensure peace and stabilize the political frontiers.

The marriage alliances were ways to form associations with

⁷⁶ *MRPRV*, vol. 1, p. 53.

⁷⁷ *Ibid.*, p. 89.

⁷⁸ Nand, Sureshwara, *Art and Architecture of Jaisalmer*, Jodhpur Publishers, 1990, p. 13.

the other clans, outside the blood relations. However, to keep the clan associations inviolable and blood ties vigorous, other social institutions were invoked or explored. The various festivals and occasions were the means to keep the kin and clan ties intact. In vs 1609/1552 AD, Rao Mandowar Raoji came to Rao Maldeo and the latter performed the ceremonies of *rakhi* festival for ensuring a binding association.⁷⁹ While the Bhattis were fighting against the Rathors, the fellow man of Rao Mandalik, wished to go back home for celebrations of Dushara. On knowing this wish of fellowmen, Rao got angry, but later promised to celebrate the festival on the *naddis* of Nibaliyo.⁸⁰ King of Marwar celebrated Dushara at Sojat and the approaching Diwali celebrations were organized at Ajmer.⁸¹ Many events of festive celebrations are mentioned in the *dastur-bahis*. These festivals were actually occasions to assert the blood ties and clan associations.

The imperial connections of any landmass and person generally get reflected through the actions of the state towards the client. The structural contributions made by the states are also significant to understand these connect. As mentioned previously the states extended patronages to keep the loyalties in place and to make the participants of empire feel as an internal unit of the patron. Religion also played a crucial role in the apparatus of any state. None of the states in medieval India desisted from making religious statements, nor did they made any explicit religious depictions against any religious group. Through this kind of approach, the medieval states tried to appease all the sections of society in order to maintain the vitality of the economic activities. As evident, all the medieval states were applying the policy of assimilation. Hence, it helped to keep the avenues of economic activities open, in which a variety of religious groups, sects and communities were participating at various stages for collection, production and distribution of the produce.

In midst of these economy-oriented states, religion was

⁷⁹ *MRPRV*, vol. 1, p. 64.

⁸⁰ *Ibid.*, p. 86.

⁸¹ *Ibid.*, p. 101.

not a miss. Keeping the religion out of economic activities, the states practiced religion in their personal circles. A few of religious practices by the actors of state were limited to the arenas of kingship. To reflect the religious associations certain acts and events were performed. At times, some processions were organized and taken out for making some political statements with the element of religion. But those events and acts were only to garnish the acts of polity. These proposals for medieval states can be asserted with the help of evidences which indicate that most of the states were concurrently patronizing various religious institutions. The donations made by the Kachhwahas of Amber, Bhattis of Jaisalmer, Rathors of Jodhpur and Bikaner to the shrine of Mohinuddin Chisti were significant and are sufficient to support the above preposition of the states. Along with the major sects and shrines, many other minor groups and cults were also patronized. The involvement of the desert states with the hero-deities (Ramdeo, Gugaji, Harbuji, Tejaji, Pabuji etc.) were remarkable attempts to reach out to the populace. The later additions to the shrines of cult gods were also efforts in the same direction. The act of patronization is also evident in the association of Karni and Rao Bika. This association continued to exist with the future generations of the Bikaner state. Even today the effects of this patronization act are visible in the Rathor house of Bikaner. The Nagaine Mata⁸² and Jogmaya, the family deities of the Rathor house, are other powerful examples of religious patronization. Shila Mata, the deity of Amber kingdom, also attained significance due to her miraculous interventions. Swanjiaji is a family deity for the Bhattis of Jaisalmer.⁸³ Similar kinds of legends surround her also.

Geographically, Jaisalmer was located at the crossroads of the trade routes that were connecting the Indian landmass with the Central Asian cities. Many states wanted to control its territories in

⁸² Harlan, Lindsey, *Religion and Rajput Women: The Ethics of Protection in Contemporary Narratives*, Munshiram Manoharlal Publishers, Delhi, 1994, pp. 56-7.

⁸³ Bhatti, L. Hari Singh, *Ghazni se Jaisalmer (Bhattiyo ka purv Madhiya-Kaleen Itihaas)*, XVII (V), 1998, p. 590.

order to secure a share in its economic activities and toll-taxes. The Jains dominated the economic environs of Jaisalmer and controlled nearly all the aspects of trade passing through or conducted in Jaisalmer. They were affluent due to control over resources. The engagement of the Jains in the state of Jaisalmer helped to develop a different type of social and religious environment that was not looking for patronage from the royal quarters. The traders of Jaisalmer looked towards the state only for security of life and protection of trade. In the 11th century, Jains entered Jaisalmer and erected the magnificent temple of Parshavnath at Lodrava.⁸⁴ Many Jain temples were built in Jaisalmer city during the 15th century. The Pashavnath temple⁸⁵ and Shitalnath temples⁸⁶ were built during the reign of Maharawal Laxman in vs 1473/1416 AD and vs 1479/1422 AD respectively.

During the reign of Maharawal Bairi Singh, in year vs 1497/1440 AD, Sambhavnath temple was built.⁸⁷ Shantinath and Ashtapada temples are dated vs 1583/1526 and 1536/1479 respectively.⁸⁸ Chandraprabhnath temple was constructed in vs 1509/1452.⁸⁹ The plan of grand temple of Rishabhath was consecrated in vs 1536/1479.⁹⁰ Another example to support the constant domination of Jaisalmer by the Jain community (until the 19th century) are Patua havelis named after the business of *patua* — (silver and gold threads) used for tying ornaments.⁹¹ A. H. E. Boileau visited Jaisalmer in 1835 and has written an extensive account about the beauty of these *havelis*.⁹² In total, seven Jain temples were constructed in Jaisalmer between c. 1416 and 1526. All these are of pre-Mughal times belonging to Khartara *gachcha* of

⁸⁴ Nand, Sureshwara, *Art and Architecture of Jaisalmer*, p. 29.

⁸⁵ *Ibid.*, p. 48.

⁸⁶ *Ibid.*, p. 55.

⁸⁷ *Ibid.*, p. 56.

⁸⁸ *Ibid.*, p. 61.

⁸⁹ *Ibid.*, p. 63.

⁹⁰ *Ibid.*, p. 67.

⁹¹ *Ibid.*, p. 79.

⁹² Boileau, A. H. E., *Personal Narrative of a Tour through a Western States of Rajwara in 1835*, Calcutta, 1937, p. 43.

Swetambara sect.⁹³ The *Kirti-patras* written by the representative of the community to the Jain monk on behalf of the community, proposing to invite the monk for the stay during *chaumasa*, are significant sources of information to know about the richness and influence of the Jaisalmer Jain traders.

A few statements were made by the Jaisalmer kings to reflect the religious affiliations of the state. Under it, the Laxminath temple inside the fort of Jaisalmer was constructed by Maharawal Bairi Singh.⁹⁴ A 12th century Shiva temple, with *chaturmukh linga*, was located on the banks of river Kak.⁹⁵ Ratneshwar Mahadev temple was constructed by Queen Ratna Kunwar, wife of Maharawal Bair Singh in vs 1498/1441 AD.⁹⁶ Maharawal Bair Singh constructed the Sun Temple inside the fort in 1494 AD.⁹⁷ In the last few decades, under the influence of a political shift, a large number of inscriptions have been put up on these sites but the authenticity of these inscriptions can't be proved. But the architectural designs indicate that all these constructions were done during the 15th century. In the 17th century, Rawal Sabal Singh built the Amreshwar Shiv temple and Amarsar dam.⁹⁸ All the temples built by the Jaisalmer rulers are dedicated to Shiva, thus they clearly hint to their religious faith. However, the constant support extended by the state to the Jain temples, and their activities highlights that the economy of the state was holding prime importance for both the participants. Their mutual participation led to the evolution of Jaisalmer as a trade-mart of great significance with amazing potential.

In the nutshell, it can be proposed that the Thar was geographically a difficult terrain. Due to its environmental difficulties and challenges the agricultural economy of the region was not strong. The limited agricultural activities pushed this

⁹³ Nand, Sureshwara, *Art and Architecture of Jaisalmer*, p. 84.

⁹⁴ *Ibid.*, pp. 40-2.

⁹⁵ *Ibid.*, p. 29.

⁹⁶ *Ibid.*, p. 46.

⁹⁷ *Ibid.*, p. 46.

⁹⁸ *Ibid.*, p. 13.

zone to develop as a trading zone through which a large number of consignments passed. The trade activities in this hot and arid zone became possible due to presence of the draught animals that were acquainted to carry large quantity of loads, over long tracts with efficient speed. These engagements led to the evolution of some specialized classes of transporters like Rebaris, Thoris, Banjaras, etc. The extensive trade activities made Thar a vibrant zone of economy. The lucrative opportunities of trade made many actors to come together, who mutually participate to organize the commercial activities and facilitated for safe and smooth transports and travels. The toll taxes and security assignments were introduced for attaining better results. The vastness and intensity of the trade activities even attracted the imperial centres and prompted them to control the regions of Thar, through various approaches. By constantly engaging in the politics of desert states the imperial armies were also attempting the same. Overall, the economy of the Thar was dominated by the trade activities. Commercial exchanges created enough incentives for the intra-desert states and the imperial centres to establish links and connect with the Thar, which was otherwise a 'no-goers area'. With the introduction of the imperial links, the trade activities became more organized and facilitated many desert cities to attain the status of trade marts.

Conclusion

The policy discourses about any dry land have been dominated by terms like degradation, desertification, over-cultivation, over-grazing, scarcity and resulting socio-ethnic tension and conflict. More recently, the inability of the dry-land inhabitants to adapt to climate change has also crept in. Consequently, local populations managing desert forest resources and trees have been defined as the enemies whose unsustainable practices and ever-growing demands for forest products have become the main threat to dry-land forests. In these debates and processes, the present states are completely ignoring the aspects of socio-cultural diversity and question of gender in the dry land of the Thar Desert. The management that works at grassroot level, between nomadic pastoralists and farmers, men and women, high caste and low caste, cults and communities and finally the class distinctions must be properly considered before framing any policies for the unique environment zones. As the specialized and a sensitive understanding is required for agro-ecological growth and management of forests in the distinct environment zone. The bio-scientists and climate experts shall be employed to get an overall perspective of the zone.

So far, nearly all the states have completely failed to have a wholesome approach towards their respective unique zones. Moreover, the political groups aim to gain control over the natural resources that are found in these special zones. The Thar Desert has also gone through a similar type of journey and its fate doesn't appear different. Further, the political instability and lack of institutional development has contributed to the mismanagement

of the remaining desert forest resources. Some attempts have been made by social scientists and some natural scientists to give back some agency to the inhabitants of dry lands, so that they can focus on the local mechanisms by which they have historically managed their resources. Despite it no change is visible in their lives. Even the dominance of the state-oriented policy and applied science has not been able to do any good. The natural environment is getting destroyed to the next level, from where there is no hope of return. The states have tried to address decries for the climate change through policies in which the local communities don't have any representation. It is a doom situation when the most affected people or inhabitants don't get a say in the policies, and the planted experts finalize policies and course of actions for their habitations.

The sad condition of state affairs gets reflected in most of the policies that depict dry lands as amorphous and homogenous areas. Further, the states believe that an increasing number of marginalized people governed by dysfunctional social and political institutions are responsible for over-exploiting the natural vegetation and forest resources, with inappropriate technologies. This debate becomes unproductive at the very outset as it labelled the entire dry land as homogenous. These facts can't be denied, but the need is to engage in a more fruitful debate about dry land management by defining new points of departure, that should be rooted in local realities and empirical studies. These studies must aim to explore the effective management systems of the inhabitants through which they have effectively managed the local resources in the dry lands. Even today they are successfully doing it. These researches shall not limit to the technological involvements, beyond they shall see and explore the roles played by the social institutions and socio-cultural traditions. Alive example of the socio-cultural tradition that has helped to manage and conserve the resources in the desert of Thar is the Bishnoi community. In recent decades the environment of Thar has been drastically destroyed. Its revival and management demands a dynamics in which all kinds of marginalized groups and residents such as women, pastoralists, nomads, the poor, indigenous inhabitants shall come forward

together to address the issues of environment and to promote the sustainable use and management of available resources, in order to contextualize the ecological instability.

Geographical entity of Thar Desert has been defined by marking its territories. It is interesting to note that these markings never existed for the people that survived, lived and flourished in the midst of this desert. They generally marked the objective space of Thar Desert by associating with the availability of different vegetations. In chapter one, an effort has been made to understand the historical shifts that continued to influence the demarcation of its territory.

Much less is known about the Thar Desert and its environment that has been shaped by the various cultural and social traditions over the centuries. So far, the ecological zones of the Thar Desert have not been recognized. The reason for it are absence of the lush green forest cover, the presence of sand tracts and the seasoned understanding of environment that is limited to the water bodies and green forests. As an ecological unit, the Thar is very diverse internally with variety of the dunes and different types of sand. For centuries, the presence of minerals under the sand has been a reason for the destruction of desert. The medieval states were always active in this region to exploit the resources for ensuring the economic gains. Chapter two is a step in direction of collecting the variety of the resources, both biotic and abiotic that has shaped the identity of the Thar Desert. An attempt has been made to understand the simultaneous presence of Jurassic age fossils and the availability of various types of stone mines. A historical sketch of the presently scanty or extinct, water sources has also been attempted.

Every ecological zone must be treated independently to get a sense of its original environment. As an eco-system, the Thar Desert was inherently unstable and therefore unique. The inhabitants of Thar have understood their natural surroundings and have evolved various social and cultural institutions and their evolution was based on the traditional knowledge system. The requirement of these institutions was felt for conserving the animal resource that has saved the humans in an agriculturally

unstable zone. Historically, this desert had a rich bio-diversity with flora and fauna; a few of these are indigenous to the region as discussed in chapter 3. In order to teach about environment, the traditional methods of teaching (oral narrative) were used along with the vernacular literature. The interactions during day-to-day discourses were natural methods that were popular and effective for passing-on the traditional knowledge. Various vernacular literary creations have been used to showcase the methods employed by the inhabitants to pass on the knowledge available with them. Variety of scattered pieces of sources have been weaved together to get an idea about the flora and fauna of the Thar desert and to understand the challenges and threats faced by these components of nature.

Scarcity of water was a constant challenge to the inhabitants. Monsoon was the only source of water for the Thar region. The water received through the rains was intelligently used for the agricultural purposes. Various ways of water harvesting were put in place, to conserve the water for approaching seasons. A large vocabulary evolved around the water sources distinguishing them as per their specific features. Traditionally, the inhabitants have learnt to use the flood waters of the rivers that came in the dunes. They also developed the methods and techniques to grow crops, making best use of the naturally flowing water that was moving along the dunes as per the inundations and slopes of surface. Using rain water a large variety of crops and vegetables were grown. The animal wealth, presence of the wild life and naturally occurring resources were the means to run the economy. All these aspects of economy, kept the intra-desert states and the imperial centres interested in desert. All these aspects of Thar Desert have been looked carefully in chapter four.

The fundamental aspect of the human relationship with nature gets reflected through the settlements. The social groups inhabiting in any region are the real representatives of their natural environment. Their social and cultural practices represent their sensitivities towards the co-living beings. The harshness of hot and arid weather midst of the dense sand dunes that are given to the scarcity of water has made nomadism 'the way of life for

the inhabitants'. The settled groups and communities developed their lifestyles which were given to compassion for the fellow living-beings. A few communities also tried to organize their day-to-day activities around the theme of conservation and achieved immense success. Gradually, on social platforms co-operation evolved as feature that became central to all the communities. Various political, social and religious groups emerged in the Thar Desert during the medieval centuries. They successfully related to the surrounding environment and developed the mechanisms that were approaches for conservation and preservation of nature. The efficiency of these groups lies in the fact that subsequently they were operating in all the different circles of environment, polity, society and economy. Through chapter five, an attempt has been put forward to understand the efficiency of their systems.

In the present scenario, the desert is increasingly under the land-grabbing practices and militarization. The control over desert land by powerful non-inhabiting people for purposes of bio-fuel production, large-scale agriculture and wildlife conservation is threatening. The high risks for cultivation and livestock-keeping are integral part of desert life. Historically, the food insecurity has been a normal feature. Food insecurity makes the role of limited resources important, as a buffer for tough times in order to meet hardships, not only as a source of food, but also as a source for income. Fruit and berries were collected and included in the food. A substantial part of the collected fruits was also used to generate cash income. All these were due to the inconsistencies and irregularity of the agricultural production. In dry areas of Rajasthan, trees like *Ziziphus Mauritania*, *Prosopis cineraria*, *Tamarindus indica* and *Salvadore oleoides* are extensively used as famine foods. The nomadic groups of *barwariyas*, *guwal*, *sansi*, *banjaras*, *rebaris*, etc. were the berry-gatherers, who made substantial collections and later sold them. Through all these survival hacks, the nomadism evolved as a principle feature of the Thar Desert. The constant movement of the inhabitants has made Thar Desert a habitation of subjective spaces, where the residents related with their own subjective spaces, while living in an objective space. Acting and associating in the subjective spaces that were governed by the lived

experiences, the inhabitants have developed a sense of locality with distant lands that were at times even beyond the marked political and social frontiers. Chapter six is an effort to highlight various subjective spaces that evolved in the mentalities of the inhabitants being guided by the common lived experience and psychological effects of an objective space (dry Thar). And, in order to experience and exercise in their subjective space they have developed a sense of locality with the distant lands and their residents. Often they cross the thresholds of various frontiers to relate with the components of subjective spaces.

Most of the medieval sources have defined the Thar Desert as a 'no-goers area'. The intense descriptions around sparse agricultural production have made people to believe that it is a zone devoid of any activity. The undermining of the agricultural activities has generated a different picture of the region. A close and deep reading of the regional documents helps to understand that this region was not devoid of any of the activities that were happening or performed in the main land of India. Defiantly, the limited and sparse agricultural activities that too dependent on the scanty rainfall demanded an engagement in some other type of activities like pastoralism and trading, in order to survive through the harsh weather. Both, pastoralism and trade activities became representatives of the economy of the Thar Desert. The availability of the best breeds of animals and conducive environment for their breeding has opened up the avenues for breeders, who harnessed the opportunity and made good fortunes. The abundance of the business activities passing through intense network of trade routes facilitated the development of various commerce-oriented cities in the Thar Desert. Chapter seven highlights that a large number of cities in the midst of dunes attained the status of trade marts due to the volume of trade and abundance of mercantile activities. Gradually, many groups and communities developed around the trade activities, which performed various duties like providing security to caravans, extending transportation services, money-lending, etc. The abundance of the economic activities kept the imperial centres interested in the regions of the Thar. In order to ensure a share in the huge economy of dry land, the Mughals

formed matrimonial alliances with the desert states, which secure not only the share in trade but also the longevity of Mughal presence in the Thar Desert and that too peacefully.

This work so far has looked into the environment and ecology of the Thar Desert and has tried to understand the culture and society of desert through the prism of environment. After collecting a lot of information about the environment of the Thar desert I would like to propose that the inhabitants of the Thar have been living in co-ordination with their natural surroundings, and over the centuries, they have developed the mechanisms to deal effectively with scarcities. Their management skills are visible in their day-to-day lives. Historically, the compassion and care for the fellow living beings has guided them and even today they believe in the guidance, signs and indications that are received from the nature.

The Gender Dimension and Marginal Groups

The gender dimension has not been given its due in the main text due to the nature of themes that have been selected for the work. Gender and diversity in general, have been neglected in the analysis of the use and management of dry land resources. For example, hardly any attention is given to the position of pastoral women in dry lands. Since the herding of livestock and the negotiation of access to fodder and browse from trees for animals is considered a male affair. However, in a large number of cases, women own livestock. Thus, they should be taken on the platform for the management of pasture and trees.

The construct of gender defines the culturally defined roles for men and women. Generally it identifies with the pre-supposed specific roles in social and political life. To a large extent, gender indicates and determines the kind of roles one shall or can take, the activities one can undertake and the kind of rights one has with respect to their bodies. As far as management of the resources is concerned, both male and female have same nature of duties. Various ethnic groups don't draw the distinctions between the roles to be played by the respective genders. The groups and

communities who don't entertain these gender defined roles are Bishnois, Jats, Bhils, Meenas, Mers and Thoris. Their women are hardy and they work equal with their counterpart males, in fact more. Their role in the management of resources is crucial and they shall be brought to front. Being the seed-keepers for their community, they have various traditional methods that are helpful for conserving the variety of indigenous faunas.

Partnerships are crucial for managing the natural resources in the desert. Directly and indirectly, nomadic pastoralists, indigenous people, tribal people, small-holders and other marginal groups play a symbiotic role in the collective management of desert resources which helps in maintaining the diversity of flora and fauna. Seeds, twinges, leaves are picked by the grazing animals while walking. These constant grazers are the natural transporters of seeds to different land, where they get germinated in the due course as soon some moist is received. The rains in year 2020 have made the intense dunes lush green. The entire desert region of Jaisalmer looks like a huge, extensive and unending pasture with many water catchment areas that appear like ocean. Under traditional methods, local communities have developed the systems for disciplining the society at large. For example, during the rainy season no one is allowed to venture in the arenas of *johads* and *talabs*, because it is the time for the embedded roots and seeds to germinate with the help of the moist received by rains as it gets damaged by the hoofs and walking over. Similarly, the annual cleaning and digging of *talabs* is also a community activity where the elders guide on the norms like each shall take to their homes a good amount of soil taken out from a *talab*, no one shall venture in the *paal* of *talab*, no animal shall come in the catchment area of *talab*, etc.

Thus, on basis of this historical study it can be proposed that the present policy reforms need to recognize the traditional methods of water conservation, make the local communities to participate in the policy-making, recognize the role, identity and rights of these marginal groups of the vulnerable dry lands and ensure their meaningful participation and contribution to attain sustainability. Historically, the ethnic groups have been active participants for the environmental conservation, who were able to survive successfully

by managing their little resources with occasional episodes of failures. Thus, it is required that the policy-makers and executors shall come in partnership with women and the marginalized nomadic and pastoral groups to gain sustainability. The revival of historic roles that the women and marginal groups played in regard of the environment is the need of hour for conserving the natural environment of the Thar Desert, a crucial component of the ecology.

Appendix I

जलम भोम

आ धरती गोरा धोरां री, आ धरती मीठा मोरां री
ई धरती रो रूतबो ऊंचो, आ बात कवै कूचो कूचो,
आं फोगां में निपज्या हीरा, आं बांठां में नाची मीरा,
पन्ना री जामण आ सागण, आ ही प्रताप री मा भागण,
दादू रैदास कथी वाणी, पीथळ रै पाण रयो पाणी,
जौहर री जागी आग अठै, रळ मिलग्या राग विराग अठै,
तलवार उगी रण खेतां में, इतिहास मंडयोडा रैतां में,
बो सत रो सीरी आडावळ, बा पत री साख भरै चंबळ,
चूंडावत मांगी सैनाणी, सिर काट दे दिया क्षत्राणी,
ई कूख जलमियो भामासा, राणा री पूरी मन आसा,
बोजोधो दुरगादास जबर, भिड़ लीन्ही दिल्ली स्यूं टक्कर,
जुग जुग में आगीवाण हुया, घर गळी गांव घमसान हुया,
पग पग पर जागी जोत अठै, मरणै स्यूं मधरी मौत अठै,
रूं रूं में छतरयां देवळ है, आ अमर जुझारां री थळ है,
हर एक खेजडै खेडा में, रोहीडा खींप कंकेडा में
मारू री गूंजी राग अठै, बलिदान हुया बेथाग अठै,
आ मायड संतां शूरां री, आ भोम बांकुरा वीरां री,
आ माटी मोठ मतीरां री, आ धूणी ध्यानी धीरां री,
आ साथण काचर बोरां री, आ मरवण लूआं लोरां री
आ धरती गोरा धोरां री, आ धरती मीठै मोरां री।

कन्हैया लाल सेठिया

Appendix II

धरती धोरां री !

धरती धोरां री !
आ तो सुरगां नै सरमावै,
ई पर देव रमण नै आवै,
ई रो जस नर नारी गावै,
धरती धोरां री !
सूरज कण कण नै चमकावै,
चन्दो इमरत रस बरसावै,
तारा निछरावल कर ज्यावै,
धरती धोरां री !
काळा बादलिया घहरावै,
बिरखा घूघरिया घमकावै,
बिजली डरती ओला खावै,
धरती धोरां री !
लुळ लुळ बाजरियो लैरावै,
मक्की झालो दे'र बुलावै,
कुदरत दोन्यूं हाथ लुटावै,
धरती धोरां री !
पंछी मधरा मधरा बोलै,
मिसरी मीठै सुर स्यूं घोलै,
झीणूं बायरियो पंपोळै,
धरती धोरां री !
नारा नागौरी हिद ताता,
मदुआ ऊंट अणुंता खाथा !
ई रै घोड़ां री के बातां ?
धरती धोरां री !
ई रा फल फुलड़ा मन भावण,

ईं रै धीणो आंगण आंगण,
बाजै सगळं स्यूं बड भागण,
धरती धोरां री !

ईं रो चित्तौडो गढ लूंठो,
ओ तो रण वीरां रो खूंटो,
ईं रे जोधाणूं नौ कूटो,
धरती धोरां री !

आबू आभै रै परवाणै,
लूणी गंगाजी ही जाणै,
ऊभो जयसलमेर सिंवाणै,
धरती धोरां री !

ईं रो बीकाणूं गरबीलो,
ईं रो अलवर जबर हठीलो,
ईं रो अजयमेर भडकीलो,
धरती धोरां री !

जैपर नगर्यां में पटराणी,
कोटा बूटी कद अणजाणी ?
चम्बल कैवै आं री का'णी,
धरती धोरां री !

कोनी नांव भरतपुर छोटो,
घूम्यो सुरजमल रो घोटो,
खाई मात फिरंगी मोटो
धरती धोरां री !

ईं स्यूं नहीं माळवो न्यारो,
मोबी हरियाणो है प्यारो,
मिलतो तीन्यां रो उणियारो,
धरती धोरां री !

ईंडर पालनपुर है ईं रा,
सागी जामण जाया बीरा,
अै तो टुकड़ा मरू रै जी रा,
धरती धोरां री !

सोरठ बंध्यो सोरठां लारै,
भेळप सिंध आप हंकारै,
मूमल बिसर्यो हेत चितारै,
धरती धोरां री !

ईं पर तनडो मनडो वारां,
ईं पर जीवन प्राण उवारां,

ई री धजा उडै गिगनारां,
 धरती धोरां री !
 ई नै मोत्यां थाल बधावां,
 ई री धूल लिलाड लगावां,
 ई रो मोटो भाग सरावां,
 धरती धोरां री !
 ई रै सत री आण निभावां,
 ई रै पत नै नही लजावां,
 ई नै माथो भेंट चढावां,
 भायड कोडां री,
 धरती धोरां री !

कन्हैया लाल सेठिया

Appendix III

Birds of Rajasthan¹

1. Black bird
2. Indian cuckoo
3. European cuckoo
4. Indian koel
5. Common coucal or crow-pheasant
6. Little spider hunter
7. Violet eared red honey sucker
8. Amethyst rumped honey sucker
9. The tiny honey sucker
10. Robins
11. Small flower pecker
12. Indian hoopoe
13. European hoopoe
14. Indian grey shrike
15. Indian rufous backed shrike
16. Bay backed shrike
17. Desert shrike
18. Malabar wood shrike
19. Wrens
20. Warblers
21. Honey sucker
22. Bee-eater

¹ The list is prepared by using A. Adams, *The Western Rajputana States: A Medico-Topographical Account of Marwar, Sirohi and Jaisalmer*, Junior Army and Navy Stores Ltd., London, 1899.

23. Spider hunter
24. Fly catcher
25. Bulbul
26. Finches
27. Oriols
28. Tits
29. Purple honey sucker
30. Water fowls
31. Imperial Sand Grouse
32. Cranes
33. Indian bustard
34. Indian Hobara bustard
35. Black vulture
36. Long billed brown vulture
37. White backed vulture
38. The white or Indian scavenger vulture
39. Peregrine Falcon
40. The Shaheen Falcon
41. The Lagger Falcon
42. African Buzzard
43. European Hobby
44. Goshawk
45. Kestrel
46. Lesser kestrel
47. Eastern orange legged hobby
48. Indian Sparrow Hawk
49. Sooloon Falcon
50. European Sparrow Hawk
51. Besra Sparrow hawk
52. The Indian tawny eagle
53. Bonnellis eagle
54. Crested hawk eagle
55. Common serpent eagle
56. South Indian harrier eagle
57. White eyed buzzard
58. Harrier buzzard
59. Maroon backed or brahminy kite

60. Common pariah kite
61. Large pariah kite
62. Crested honey buzzard
63. Black winged kite
64. Indian screech owl
65. The grass owl
66. Brown wood owl
67. Dusky horned owl
68. Mottled wood owl
69. Rock horned owl
70. Brown fish owl
71. Malabar scops owl
72. Twilight owls
73. Spotted owlet
74. Brown-hawk owl
75. Malabar owlet
76. The common swallow
77. The wire-tailed swallow
78. The red-rumped or mosque swallow
79. Indian cliff swallow
80. Indian sand martin
81. Dusky crag martin
82. Mountain crag martin
83. English house martin
84. Common Indian swift
85. Palm swift
86. Indian crested swift
87. The jungle night jar
88. Nilgiri night jar
89. Ghat night jar
90. Common Indian night jar
91. Malabar trogon
92. Common Indian bee-eater
93. The chestnut headed bee-eater
94. The Indian roller
95. Common Indian kingfisher
96. Beavans kingfisher

97. Pied kingfisher
98. Great Indian hornbill
99. Jungle grey hornbill
100. Rose ringed parroquet
101. Indian loriquet or green parrot
102. Rose headed parroquet
103. Blue winged parroquet
104. Salty headed parroquet
105. Yellow fronted wood-pecker
106. Southern large golden backed wood-pecker
107. Small green wood-pecker
108. Yellow wood-pecker
109. The lesser golden backed wood-pecker
110. The rufous wood-pecker
111. The western ghat barbet
112. Small green barbet
113. Crimson breasted barbet or copper-smith
114. The common wood shrike
115. Little pied shrike
116. Black headed cuckoo shrike
117. Orange minivet
118. White-billed minivet
119. Yellow throated minivet
120. Common drongo shrike or king-crow
121. Long tailed drongo
122. White bellied drongo
123. Bronzed drongo
124. Malabar racket tailed drongo
125. Hair crested drongo
126. The paradise fly-catcher
127. Black napped blue fly-catcher
128. White browned fantail fly-catcher
129. White spotted fantail fly catcher
130. Southern brown fly-catcher
131. Verditer fly-catcher
132. Tickell's blue redbreast
133. Rufous tailed fly-catcher

134. White tailed robin fly-catcher
135. Malabar whistling thrush
136. Indian ground thrush
137. Blue headed chat thrush
138. White winged ground thrush
139. Orange headed ground thrush
140. Black capped black-bird
141. Yellow eyed babbler
142. Black headed wren babbler
143. White throated wren babbler
144. Southern scimitar babbler
145. Large grey babbler
146. Rufous babbler
147. The ghat black bulbul
148. Yellow browed bulbul
149. Abbott thrush babbler
150. White browed bushed bulbul
151. Ruby throated bulbul
152. Grey headed bulbul
153. Southern red-whiskered bulbul
154. Common green bulbul
155. Black headed
156. Black-headed Green bulbul
157. Indian oriole
158. Black napped Indian oriole
159. Bengal black headed oriole
160. Magpie robin
161. Shama
162. Indian black robin
163. White winged bushchat
164. Indian bushchat
165. Indian red start
166. Blue wood chat
167. Indian tailor bird
168. Ashy wren warbler
169. Franklin's wren warbler
170. Rufous grass warbler

171. Earth brown wren warbler
172. Great rufous wren warbler
173. Syke's warbler
174. Large billed tree warbler
175. Bright green tree warbler
176. Tickells tree warbler
177. Olivaceous tree warbler
178. Crowned tree warbler
179. Black capped warbler
180. Large pied wagtail
181. Black faced wagtail
182. Indian white faced wagtail
183. Salty-headed yellow wagtail
184. Black-cap field wagtail
185. Grey-backed yellow wagtail
186. Black-breasted wagtail
187. Indian ticklark
188. White eyed tit
189. Indian grey tit
190. Southern yellow tit
191. Indian bow billed corby or carrion crow
192. Common Indian grey-necked crow
193. Indian raven
194. Common Indian magpie
195. Bayley's blue tree-magpie
196. Green or blue jay
197. Common myna
198. Dusky myna
199. Rose-colored pastor or jowari bird
200. Common yellow weaver bird
201. Spotted munia
202. White-backed munia
203. Red waxbill or common amidavad
204. Green waxbill
205. Indian house sparrow
206. Common rose-finch
207. Red-winged bush lark

208. Rufous tailed finch lark
209. Black bellied finch lark
210. Small crown crested lark
211. Northern crown crested lark
212. Indian skylark
213. Southern green pigeon
214. Grey-fronted green pigeon
215. Common Indian blue-rock pigeon
216. Indian turtle dove
217. Rufous turtle dove
218. Spotted dove
219. Common ringdove
220. Little brown dove
221. Common water-hen
222. Indian courier plover
223. Cream courier plover
224. Indian golden plover
225. Ring plover
226. Stone plover
227. Black-sided lapwing
228. Red-wattled lapwing
229. White-breasted water-hen
230. Adjutant or gigantic stork
231. Black stork
232. White-necked stork
233. Common blue heron
234. Large egret or large white heron
235. Little white heron
236. Pound heron
237. Bittern
238. Pelican ibis
239. White ibis
240. Watery-headed or black ibis
241. Glossy ibis
242. Flamingo
243. Little grebe or dabchick
244. Salty herring gull

245. Large river tern
246. Black-billed tern
247. Indian snake-bird
248. Great Indian bustard
249. Common sand grouse
250. Spotted or Painted imperial sand grouse
251. Black-breasted grouse
252. Painted sand grouse
253. Grey partridge
254. Painted partridge
255. Black partridge
256. Grey partridge
257. Jungle bush quail
258. Grey quail
259. Rain quail
260. Rock bush quail
261. Painted bush quail
262. Indian button quail
263. Grey jungle fowl
264. Spur fowl
265. Jungle fowl
266. Red jungle fowl
267. Large grey or spotted bill duck
268. Nukhta or combed duck
269. Three varieties of geese
270. Four varieties of snipe
271. Bitterns
272. Rails
273. Plovers
274. Godwits
275. Gadwall or smaller grey duck
276. Shollver
277. Ruddy Sheldrake or brahminy duck
278. Pintail
279. Mallard
280. Sheldrake
281. Pink-headed duck

282. White-winged wood duck
283. The pochard or dun-bird
284. Red-crested pochard
285. White-eyed pochard
286. Tufted pochard
287. Scaup
288. Smew
289. Goosander
290. Golden eye or garrot
291. Common teal
292. Garganey or blue-winged teal
293. Cotton teal
294. Baikal or clucking teal
295. Crested teal
296. Marbled teal
297. Wigeon
298. Barred headed goose
299. Grey-lay goose
300. Bean goose
301. Common or fan tailed snipe
302. Jack snipe
303. Painted snipe
304. Bittern
305. Snipe-billed godwit
306. Yellow-shank
307. Red-shank
308. Black-tailed godwit
309. Indian water rail
310. Purple coot
311. blue-breasted rail
312. white-brown crake
313. blue-breasted crake
314. Gadwall
315. Pintail
316. Mallard
317. Shovellers
318. Ruddy Sheldrake

319. Pochard
320. Belted Sheldrake
321. Smew
322. Florican (*sypheotides aurita*)
323. Florican (*sypheotides bengalensis*)
324. Demoiselle crane
325. Common crane
326. Sarus crane
327. Straling (*sturnus vulgaris*)
328. Straling (*sturnus indicus*)
329. One-eyed plover
330. Grey plover

Appendix IV

Taxes collected by Marwar (Jodhpur) State

S.No	Tax	Meaning
1.	Agricultural tax	On crops
2.	<i>Anga</i> (body) tax	A poll tax levied on adults of either sex
3.	<i>Ghasmali</i>	The right to pastures
4.	<i>Kewari</i>	Door tax, started by Bijai Singh
5.	<i>Sair</i>	Impost or transit tax

Taxes collected by Bikaner State

6.	<i>Dhuna</i>	Tax on Hearth
7.	<i>Rahdari</i>	Transit tax
8.	<i>Khalisa</i>	Fiscal tax
9.	<i>Dhuan</i>	Hearth tax
10.	<i>Anga</i> ¹	Body tax
11.	<i>Sair</i>	Transit and town tax/imposts
12.	<i>Paseti</i>	Plough tax
13.	<i>Malba</i> ²	Land tax
14.	<i>Datoi</i>	Triennial tax levied on each plough
15.	<i>Dand</i>	Compulsory contribution
16.	<i>Khusbbali</i>	Benevolence or voluntary

¹ Anga tax was levied as per age and sex in human species and according to utility in brute. Thus, it can be termed as property tax.

² Malba literally means rubbish or sweepings. This tax was imposed by Jats upon themselves, when they submitted to Bika.

17.	<i>Feudal levies</i> ³	Payment for troops who respond on demand in national emergencies
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Taxes levied by Jaisalmer State

18.	<i>Dan</i>	Impost
19.	<i>Dhuna/thaali</i>	Hearth tax
20.	<i>Dand</i>	Arbitrary tax

³ Assemblage of sons of Bika, who were household troops.

Glossary

<i>aagar</i>	fields/mines of salt or salt pans
<i>aarekh</i>	sign well
<i>'adalah</i>	probity
<i>Afim gali</i>	opium offering
<i>agun</i>	on east
<i>ahadi</i>	a royal servant sent to call or receive someone
<i>akhariya</i>	limited supply of water
<i>akhariyasa</i>	normal water
<i>akhariyo</i>	salty well
<i>amal-pani</i>	arrangements for opium, tobacco, food and water
<i>aman</i>	guarantee of safety
<i>anga</i>	body tax levied on both male and females
<i>antut pani</i>	water oozes out without break
<i>arhat</i>	Persian wheel
<i>aonad</i>	uncontrollable human being
<i>baas</i>	colony
<i>bachni</i>	narrator
<i>bahalo</i>	flowing water stream/ <i>nala</i>
<i>baji rakam</i>	balance
<i>ban</i>	cotton
<i>barsali</i>	kharif crop
<i>barsondiyo</i>	water sufficient for a year
<i>bejad</i>	wheat and gram produced together
<i>bera</i>	small digs made in sandy plains for water supply
<i>betano</i>	water can be pulled out only twice

<i>bechiya</i>	beans of <i>acacia</i> tree
<i>bhakri</i>	hill
<i>bhakar</i>	hill
<i>bhalbhalo</i>	brackish/little salty water
<i>b-balo</i>	<i>nala</i> /water channel
<i>bhits</i>	sand dune of stable nature/occasional sand hills
<i>bhog</i>	fiscal tax
<i>bhopa</i>	a singer of Pabuji's story
<i>bhumd</i>	singing rebuke
<i>bhus</i>	chaff
<i>biji-jaat</i>	low castes
<i>bohras</i>	trader
<i>chali</i>	goat
<i>chanchd</i>	chana/black gram
<i>chanch</i>	a unit assembled to lift water from <i>kositas</i> , inspired from the beak of Siberian crane
<i>charai</i>	grazing tax
<i>char-boor</i>	grass and grains for horses
<i>charsa</i>	a bucket made of hide to pull up water
<i>chatiya</i>	pockets/bags made of sheep or goat skin
<i>chipa</i>	one who prints cloth
<i>chitthi chalan lagi</i>	the rule was established
<i>chonpau</i>	cow herd
<i>chor</i>	thief
<i>chotra</i>	thin produce/scarce production
<i>citero</i>	painter
<i>colai-lo</i>	stripe type string made out of leather
<i>dand</i>	tax levied as punishment/ penalty
<i>darzi</i>	tailor
<i>dhands</i>	long narrow ridges of sief type between dune lakes
<i>dhani</i>	community-wise house clusters
<i>dharma deewar nikalana</i>	evacuating palace under a truce, that no life will be harmed/taken
<i>dhed</i>	leather-worker
<i>dherna</i>	dunes mobile in nature

<i>dhimda</i>	small wells with <i>rehat</i> (arhat) of single oxen
<i>dhobi</i>	washer-man
<i>dhora</i>	dunes
<i>dhuna</i>	hearth tax
<i>dola</i>	bride procession
<i>do-sakhiyo</i>	two sessions of yield
<i>dra-in</i>	dunes mobile in nature
<i>dubis</i>	milkman
<i>dunado</i>	well with plenty of water on which simultaneous extraction of water on two sides is possible
<i>dungari</i>	hill
<i>ek-sakhiyo</i>	single crop
<i>faliya ro hos mara</i>	dying in scarcity
<i>falso</i>	in front/entrance
<i>gadar</i>	sheep
<i>garmsir</i>	hot region
<i>gaud</i>	raddish
<i>gaun/guan</i>	a small catchment of rainwater
<i>gavati</i>	villager
<i>gelakade</i>	finding path/route
<i>ghass-charai</i>	tax on the grazing animals
<i>ghughari karni/kiwi</i>	decided to give the expenses
<i>govalis</i>	cow grazers
<i>gudha</i>	village
<i>hairu/heru</i>	spy
<i>halalkhor</i>	butcher
<i>hali</i>	peasant with a plough
<i>haykal</i>	large edifices
<i>hul-bhut</i>	hospitality
<i>'ismah</i>	infallibility/immunity from sin and error
<i>jaga</i>	singer
<i>jhunpe/jhunpa</i>	huts
<i>johad/jodh</i>	a water catchment area surrounded with grasslands that are used for grazing animals

<i>kachariyo/kachari</i>	a kind of cucumber
<i>kadbi/kadab</i>	fodder made out of <i>bajra</i> and <i>jowar</i> stalks
<i>kalal</i>	professional distiller/ wine-seller
<i>kankad</i>	border/territory
<i>karbi</i>	stalks of <i>jowar</i> and <i>bajra</i>
<i>katha/kantba gehu</i>	a variety of wheat
<i>katka</i>	camel
<i>kawla/kanwala</i>	beautiful/soft sand and soil
<i>kayasth</i>	twice-born
<i>khad charai</i>	grazing in a particular territory
<i>khad-chars</i>	shepherd
<i>kharchiya</i>	salty
<i>kharol kare</i>	making salt
<i>kharolan/kharol</i>	the salt manufacturing community
<i>khariyo</i>	salty well/salt mine
<i>kheda</i>	centre of village
<i>khēt</i>	breeding grounds
<i>khichadi ki rakam</i>	expenses of military
<i>kho-kha</i>	beans of <i>jati</i> tree
<i>khyal</i>	play
<i>kiwari</i>	door tax
<i>kochar</i>	dunes mobile in nature
<i>kobar</i>	well
<i>korad chachada</i>	<i>bajra</i> shoot
<i>kosita</i>	wells with <i>chanch</i> fixed on it for lifting water
<i>kul-vraksh</i>	family tree
<i>kumhar</i>	potter
<i>kuwar</i>	prince
<i>lahan</i>	assemblage
<i>langa</i>	singer
<i>latai-batai</i>	measure and distribution of crops
<i>luhar</i>	iron-smith
<i>maand</i>	population
<i>mahajan</i>	moneylender-cum-trader
<i>makad</i>	monkey

<i>mali</i>	vegetable-cultivator
<i>maliyo</i>	small palace on <i>pol</i> (entrance)
<i>mand</i>	story
<i>marag marai chai</i>	looted
<i>marusthali</i>	the region of death
<i>maṭwali</i>	slave
<i>maṭwla</i>	slave
<i>mithwaniyo</i>	sweet
<i>mochi</i>	shoe-maker
<i>mujra</i>	obedience
<i>naar</i>	lion
<i>nachna</i>	dancer
<i>nadi</i>	a small water channel around talab or river
<i>nadidh</i>	date liquor
<i>nabri</i>	lioness
<i>nayat</i>	total
<i>okhali</i>	fresh sand dunes
<i>olgan</i>	singer by profession
<i>oran</i>	community lands with pastures and water bodies that are attached to a religious site
<i>ounti</i>	camel-rider
<i>paadhar</i>	plains
<i>paan-charai</i>	tax on the animals grazing on the leaves
<i>pagwatiyo</i>	wheel drawn by feet to lift water from <i>dhimda</i>
<i>palo</i>	a special fodder for camel and goats
<i>pani moto</i>	water which is heavy to digest
<i>pataliyo</i>	underground water is very deep
<i>patar-khana</i>	dancer-house
<i>patla</i>	low fertility land
<i>pavan-jaat</i>	noble castes identified with profession
<i>pawanda</i>	measure by feet
<i>peel</i>	the yellow crop, mainly to refer mustard
<i>piyal</i>	possible by irrigation
<i>pursai</i>	a measure to mark the presence of underground water

<i>purs</i>	a local unit to measure /one <i>purs</i> is equal to three hands
' <i>ra</i> 'aya	subjects
<i>rabari/rebari</i>	dromedary men/camel-breeders/people rearing and tending camel
<i>rajayal-kaum</i>	inhabitants paying tax
<i>rel</i>	flood water from river
<i>reni</i>	non-fertile lands
<i>rohi</i>	forest
<i>rokad-potha</i>	balance statement
<i>ruda</i>	good and fertile
<i>rupata</i>	tax levied on sale of camel
<i>sahukar</i>	landowner-cum-moneylender
<i>sair</i>	impost
<i>sakhra</i>	beautiful/good quality
<i>sanch</i>	truth
<i>sangri</i>	raw beans of <i>jati</i> tree
<i>sar</i>	salt marsh
<i>sasan</i>	tax free land-grant to the Charans and Brahmans
<i>sejo/seja</i>	underground water
<i>sejho ghano</i>	lot of water
<i>sev</i>	territory/border
<i>sewaj</i>	rabi crop
<i>sidho wadhho</i>	food items
<i>silah-khana</i>	armoury
<i>solanchaks</i>	heavy textured saline soils
<i>sonar</i>	gold-smith
<i>suthaar/khati</i>	carpenter
<i>tafada-bagana</i>	rut
<i>talab-bant</i>	revenue from <i>talab</i>
<i>talai</i>	small tank
<i>tarkari</i>	vegetables
<i>teli</i>	oil-presser
<i>thal</i>	desert
<i>thaali</i>	table tax
<i>thaan</i>	temple

<i>thar</i>	sea of sand
<i>thul</i>	a tract particularly sterile
<i>tibbas</i>	sand dunes of stable nature
<i>tola/tolo</i>	camel herds
<i>'umran</i>	inhabited regions
<i>unaliyo</i>	a type of well
<i>unhali</i>	rabi crop
<i>unkrado</i>	heap of garbage
<i>vaar</i>	region/reign
<i>vahalo</i>	a water channel
<i>veeran</i>	abandoned
<i>veergati</i>	martyrdom
<i>waad</i>	violent confrontation
<i>yati</i>	Jain monk

Bibliography

Archival Sources:

Arzdasht written by Bhawani Shankar Bablu. Dated Sawan sudi 3 vs 1741/1684 AD.

Arzdasht written by Rai Chand and Rup Chand. Dated Bhadwa budi 3 vs 1741/1684 AD.

Arzdasht, *Sawan sudi* 9 VS 1752/1695 AD.

Arzdasht, *Bhadva vadi* 7 VS 1774/1717 AD.

Arzdasht, *Fagun sudi* 11 VS 1751/1694 AD.

Arzdasht, *Sawan sudi* 11 VS 1659/1602 AD.

Arzdasht, *Sawan sudi* 1 VS 1762/1705 AD.

Arzdasht, dated *Fagun budi* 10 vs 1698/1642 AD.

Arzdasht, dated *Ashwin budi* 7 vs 1705/1648 AD.

Arzdasht, dated *Kartik budi* 14 vs 1698/1641 AD.

Arzdasht dated *Bhadwa budi* 13 vs 1743/1686 AD.

Arzdasht written by Dalaraam Nathmal, dated *Bhadwa sudi* 11 vs 1751/1694 AD.

Arzdasht written by Ajitdas Manram, dated *Asoj budi* 6 vs 1751/1694 AD.

Arzdasht, dated *Asoj budi* 7 vs 1751/1694 AD.

Arzdasht written by Ajitdas manram, dated *Kati budi* 3 vs 1750/1693 AD.

Arzdasht written by Mohan, dated *Jaith sudi* 15 vs 1705/1648 AD.

Arzdasht, dated *Posh budi* 7, vs 1740/1683 AD.

Arzdasht written by Kisordas, dated *Asoj sudi* 2 & 12 vs 1751/1694 AD.

Arzdasht written by Lal Chand Dalaram, dated *Bhadwa sudi* 5 vs 1761/1704 AD.

- Arzdasht* written by Rana Kalyandas, dated *Kartik sudi* 9 vs 1697/1640 AD.
- Arzdasht* written by Kalyan and Sadanand, dated *Jaith sudi* 6 vs 1713/1656 AD.
- Arzdasht* written by Madhur Nathuram, dated *Bhadwa budi* 11 vs 1743/1686 AD.
- Arzdasht*, dated *Sawan sudi* 7 vs 1750/1650 AD.
- Arzdasht*, dated *Kati budi* 3 and *Kati sudi* 1 vs 1766/1709 AD.
- Arzdasht* written by Nain Sukh, dated *Mangsir sudi* 15 vs 1766/1709 AD.
- Arzdasht* written by Nain Sukh, dated *Posh budi* 7 vs 1766/1709 AD.
- Arzdasht*, dated *Posh sudi* 12, vs 1701/1644 AD.
- Arzdasht*, dated *Fagun sudi* 4 vs 1702/1645 AD.
- Arzdasht*, dated *Fagun sudi* 2 vs 1703/1646 AD.
- Arzdasht* written by Ganga Ram, dated *Phalgun sudi* 3 & 5 vs 1740/1684 AD.
- Arzdasht* written by Ramsahai Prithimal, dated *Bhadarpad badi* 5, vs 1696/1639 AD.
- Arzdasht* written by Raghunath Kesodas, dated *Bhadarpad sudi* 11 vs 1698/1641 AD.
- Arzdasht* written by Afzal Khattak, dated 20 *Rabi-ul-Awwal* 1094 AH/1683 AD.
- Arzdasht* written by Kisordas, dated *Mangsir budi* 13 vs 1754/1697 AD.
- Arzdasht* written by Ghaji Khan, dated 14 *Safar* AH 1095/22 January 1684 AD.
- Arzdasht* written by Malik Ghaji, dated 8 *Shawwal* AH 1095/ 8 September 1684 AD.
- Arzdasht* written by Purohit Harshram, dated *Baisakh sudi* 6 vs 1759/1702 AD.
- Arzdasht* written by Rai Man Singh, dated 25 *Zilhijja* AH 1095/ 23 November 1684 AD.
- Arzdasht*, dated *Margsirh (Mangsir) sudi* 1, vs 1687/1630 AD.
- Arzdasht*, dated *Baisakh sudi* 12 vs 1702/ 1645 AD.
- Arzdasht*, dated *Chait budi* 9 vs 1714/1658 AD.
- Arzdasht*, dated *Chait sudi* 1 vs 1740/1683 AD.

- Arzdasht* written by Rup Ram and Purohit Harshram. dated *Posh budi* 4 vs 1761/1704 AD.
- Arzdasht*, dated *Mangsir budi* 9 vs 1716/1659 AD.
- Arzdasht* written by Dhanraj, dated *Sawan budi* 4, vs 1724/1667 AD.
- Arzdasht* dated *Posh sudi* 13 vs 1739/1683, *Mah budi* 13, vs 1739/1683 and *Mah sudi* 15, vs 1739/1683 AD.
- Arzdasht*, dated *Sawan budi* 14 vs 1740/1683 AD.
- Arzdasht*, dated *Sawan budi* 2 & 11 vs 1741/1684 AD.
- Arzdasht*, dated *Sawan sudi* 3 vs 1741/1684 AD.
- Arzdasht* written by Kughal Singh Sawal Singh Saraf and Manran Natani, dated *Bhadwa sudi* 14 vs 1742/1685 AD and *Ashadh sudi* 15 vs 1743/1686 AD respectively.
- Arzdasht* dated *Bhadwa sudi* 5, *Sawan sudi* 15 and *Sawan sudi* 13 vs 1750/1693 AD.
- Arzdasht* written by Purohit Harram. Dated *Kati sudi* 7 vs 1756/1699 AD.
- Arzdasht*, dated *Jaith budi* 2 vs 1762/1705 AD.
- Arzdasht* written by Bhagoti Das Cahturbhuj. Dated *Asadh sudi* 2 vs 1762/1705 AD.
- Arzdasht* written by Purohit Harshram. Dated *Sawan sudi* 3 vs 1762/1705 AD.
- Arzdasht* written by Purohit Harshram and Rupraam dated *Bhadwa sudi* 6 & 7 vs 1762/1705 AD
- Arzdasht* written by Mohan, dated *Fagun sudi* 8, 1697/1640 AD.
- Arzdasht* written by Kalyandas, dated *Chaitr sudi* 4, vs 1698/1641 AD.
- Arzdasht* written by Mohan and Raghunath Kesodas on *Sawan sudi* 3, vs 1698/1641 AD
- Arzdasht* written by Hardatta Bakhsh, dated 11 *Rabi-ul-Awwal* AH 1096/ 5 February 1685 AD.
- Arzdasht* written by Lal Chand and Dalaram to Bishan Singh, dated *Posh budi* 9 vs 1755/1698 AD.
- Khatoot Abalkaran* (Rajasthani), Rajasthan State Archives, Bikaner.
- Khatut Abalkaran*, dated *Bhadarpada sudi* 7, vs 1750/1693 AD.
- Khatut Abalkaran*, dated *Kartik badi* 2 vs 1750/1693 AD.
- Sanad Parwana Bahi, Miti Bhadwa sud* 10 vs 1821/1764 AD.

Jodhpur Records:

Sanad Parwana Bahi, Fagun sud 12 vs 1821/1764 AD.

Sanad Parwana Bahi, Mah sud 4 Shukarwaar vs 1821/1764 AD.

Sanad Parwana Bahi, Fagun vadi 10 1672/1615 AD.

Sanad Parwana Bahi, dated Kati vad 2 vs 1821/1764 AD.

Sanad Parwana Bahi, dated Kati vad 3 vs 1821/1764 AD.

Sanad Parwana Bahi, Mah sud 6 vs 1821/1764 AD.

Sanad Parwana Bahi, Posh vad 13 & 14 Friday vs 1821/1764 AD.

Persian & Arabic Sources:

Fazal, Abul, *Akbarnama*, 3. Vols, H. Beveridge (trans.), Low Price Publications, Delhi, 1902, reprint 2010.

Ibn Khaldun, Abd Ar Rahman bin Muhammed, *The Muqaddimah: An introduction to History*, translated from Arabic by Franz Rosenthal, 3. Vols., Bollingen Foundation, Princeton University press, Princeton New Jersey, second print of second edition, 1980.

Jahangir, *Tuzuk-i Jahangiri*, Alexander Rogers (trans.), Henry Beveridge (ed.), 2 vols., Low Price Publication, Delhi, 1909 (reprint 2006).

Khan, K., *Muntakhab-ul-lubab*, vol. 2, Bibliotheca Indica, Calcutta, 1869.

Vernacular Sources:

Lakhmi Chand, *Tawarikh Jaisalmer*, Rajasthani Granthagar, Jodhpur, 1899 (reprint 1999).

Lakhmi Chand & Mehta Nathmal, *Tawarikh Jaisalmer*, Chirag, Rajasthan and Rajputana Gazette Ministry, Ajmer, 1948.

Mahnot Nainsi, *Marward Ra Pargana Ri Vigat*, 3 vols., Narayan Singh Bhatti (ed.), Rajasthan Oriental Research Institute, Jodhpur, 1968, 1969 & 1974.

Munhot Nainsi, *Munhot Nainsi ri Khyat*, Badri Prasad Sakaria (ed.), 4. vols., Rajasthan Oriental Research Institute, Jodhpur, 1960, 1962, 1964 & 1967.

Shyamal Das, *Vir Vinod*, 4. Vols., Udaipur, 1886.

Rathoda ri Khyat, Hukum Singh Bhatti (ed.), 3. Vols., Ithihaas Anusandhan Sansthan, Jodhpur, 2007.

Administrative Reports, Travel Diaries and Gazetteers:

Australian Bureau of Agricultural and Resource Economics and Sciences 'Economic and Environmental impacts of Rabbits in Australia' published in *Pest Smart*, feral.org.au.

Adam, Lt. Col. Archibald, *The Western Rajputana States, a medico-topographical and general account of Marwar, Sirohi, Jaisalmir*, Junior Army and Navy Stores Limited, London, 1899.

Adam, R.M., 'Notes on the birds of the Sambhar Lake and its Vicinity', *Stray Feathers*, 1 (5), 1873, pp. 361-404.

Boileau, A. H. E., *Personal Narrative of a Tour through a Western States of Rajwara in 1835*, The Baptist Mission Press, Calcutta, 1837.

Erskine, K. D., *Rajputana Gazetteers*, vol. II-A, *The Marwar Residency*, Scottish Mission Industries, Ajmer, 1908.

Erkine, K.D., *A Gazetteer of the Jaisalmer State and Some Statistical Tables*, Scottish Mission Industries, Ajmer, 1909.

———, *Jaisalmer Gazetteer*, vol. 3, Calcutta, 1909.

Kaya and Malleson, *History of Indian Mutiny of 1857-58*, vol. 5, London, 1897, p. 334.

Indian Historical Quarterly, vol. 35, no. 3.

Imperial Gazetteer of India, Provincial Series: Rajputana, 1908 (Superintendent of Government Printing, Calcutta), Books Treasure, Jodhpur, reprint 2007.

Crooke, W., *The Popular Religion and Folklore of Northern India* (1893), Delhi, 1978.

Grierson, George A., *Linguistic Survey of India, vol. IX, Indo-Aryan Family, Central Group Part II, Specimen of Rajasthani and Gujarati*, Superintendent of Government Printing, Calcutta, 1908.

Poole, S. Lane, *Mediaeval India: Under the Mohammedan Rule*, Seema Publication, Delhi, 1980.

Powlett, Captain P. W., *Gazetteer of the Bikaner State*, (Office of

- Superintendent of Government Printing, Calcutta, 1874),
Book Treasures, Jodhpur, second edition 2017.
- Rose, H. A., *A Glossary of the Tribes and Castes of the Punjab and North-West Frontier Province*, vol. 2, Lahore, 1911.
- Tod, Col. James, *Annals and Antiquities of Rajasthan*, William Crooke (ed.), 3. Vols., Humphrey Milford-Oxford University Press, London, 1920.
- The Gazetteer of India: History and Culture*, Vol. 2, Publication division, Government of India, 1973, 2015 (reprint).
- The Rajputana Gazetteer*, 2. Vols., Office of the Superintendent of Government Printing, Calcutta, 1879.
- Tessitori, 'Progress Report of the work done during the year 1916...'
- Bikaner: A Fifth Centenary Commemorative Volume*, Rao Bikaji Sansthan, New Delhi, 1988.
- Report Mardumshumari Raj Marwar babatsan 1891 isvi*, Jodhpur, Census Report, 1895.

Secondary Sources:

- Acharya, R. M., *Sheep and Goat Breeds in India*, FAO Animal Production and Health Paper 30, FAO, Rome, 1982. <http://www.fao.org/docrep/004/x6532e/X6532E01.htm>
- Adams, A., *The Western Rajputana States: A Medico-Topographical Account of Marwar, Sirohi and Jaisalmer*, Junior Army and Navy Stores Ltd., London, 1899.
- Agarwal, Govind, 'Rajasthan ke jan-jeevan aur Lok Sahitya mein Oont' Maru Bharti, vol. XII, 1965-6, pp. 11-29.
- Aggarwal, S. C., *Sambhar Lake Salt Source*, Government of India Publication, New Delhi, 1951.
- Ahmed, 'Origin and the Geomorphology of the Thar Desert', *Annals of Arid Zone*, Vol. 7 (2). pp. 170-180.
- Allchin, B., A. S. Goudie and K. T. M. Hegde, *The Palaeogeography of the Great Indian Desert*, Academic Press, London, 1976.
- Alter, Stephen, *Elephas Maximus: A Portrait of the Indian Elephant*, Penguin Books, New Delhi, 2004.
- Arnold, David and Ramchandra Guha (eds), *Nature, Culture and*

- Imperialism: Essays on Environmental History of South Asia*, Oxford University Press, New Delhi, 2009.
- Balabanlilar, Lisa, *Imperial Identity in the Mughal India: Memory and Dynastic Politics in Early Modern South and Central Asia*, Viva Books, New Delhi, 2013 (reprint 2017).
- Bates, Henry Walter, *The Naturalist on the river Amazons*, introduction by Peter Fleming, Everyman's Library, London, first published in 1864, 1969.
- Beinart, William and Lotte Hughes, *Environment and Empire, The Oxford History of the British Empire*, Oxford University Press, New York, 2007 (reprint 2010).
- Bhadani, B. L., 'The Pastoral Sector in the Economy of Seventeenth Century Marwar' in B. L. Bhadani and Dwijendra Tripathi (eds), *Aspects of India's Social and Economic History (a volume in honour of Shri Govind Agrawal)*, Jaipur, 1996, pp. 227-51.
- , *Peasants, Artisans and Entrepreneurs*, Rawat Publications, Jaipur, 1999.
- , *Water Harvesting, Conservation and Irrigation in Mewar (AD 800-1700)*, Manohar, New Delhi, 2012.
- Bharadwaj, O. P., 'The Arid Zone of India and Pakistan', in *A History of Land Use in Arid Regions*, UNESCO, Paris, 1961, pp. 143-174.
- Bhargava, V. S., *Marwar and The Mughal Emperors*, Munshiram Manoharlal, Delhi, 1966.
- Bhatt, S. C., and G. K. Bhargava (eds.), *Land and People of Indian States & Union Territories*, 36 vols., vol. 23, Kalpaz Publications, Delhi, 2005.
- Bhati, Hukum Singh (ed.), 'Marward ra thikana ri vigat', *Parampara*, Rajasthani Sodh Sansthan, Chaupasani, Jodhpur,
- Bhati, Narayan Singh, (ed.), *Sources of Socio-Economic History of Rajasthan and Malwa (1700-1900 A.D)*, Maharaja Man Singh Pustak Parkash, Jodhpur, 1989.
- , *Jaisalmer ri Khyat*, in *Parampara*, Chopasani Rajasthani Sodh Sansthan, Jodhpur, vol. 57-8, 1981.
- Bhatti, L. Hari Singh, *Ghazni se Jaisalmer (Bhattiyo ka purv Madhiya-Kaleen Itihaas)*, XVII (V), 1998.
- Binford, Mira, 'Mixing in the color of Ram of Ranuja', in B.L.

- Smith (ed.) *Hinduism: New Essays in the History of Religion*, E. J. Brill, Leiden, 1976, pp. 120-42.
- Bishnoi, Krishnalal, *Guru Jambhoji evam Bishnoi Panth ka Itihasa*, 1st edition, Sirsa, 2000, pp. 111-2.
- , 'Kesoji ke Harjas' in *Bishnoi Santon ke Harjas: Mula evam Tika*, 2nd edition, Sirsa, 1997.
- , *Vilhoji ki Vani (Mul evam Tika)*, 2nd edition, Sirsa, 1997.
- Blanford, W.T., *Fauna of British India including Burma and Ceylon*, 2 Vols., vol. 1 (Mammalia), Taylor and Francis, London, 1890.
- , 'Geological Notes on the Great Indian Desert between Sindh and Rajputana', *Record Geological Survey of India*, vol. 10 (1), pp. 1-21.
- Blinkhorn, James, Hema Achyuthan, Michael Petragila and Peter Ditchfield, 'Middle Palaeolithic Occupation in the Thar Desert during the Upper Pleistocene: The Signature of a Modern Human Exit out of Africa?', *Quaternary Science Reviews*, vol. 30, 2013, pp. 1-6.
- Bohra, N. K. and D. K. Mishra, 'Endangered Species of Thar Desert-A review', *MFP News*, vol. XXII, No. 4, 2012, pp. 1-4.
- Boomgard, Peter, *Frontiers of Fear: Tigers and People in the Malay World, 1600-1950*, Yale University Press, New Haven & London, 2001.
- Bose, M.N., 'Plant Remains from Barmer', *Journal Scient. Ind. Res.*, Vol. 11B (5), 1952, pp. 185-190.
- , 'Fossil Plants from Kapuria, Jodhpur', *Journal of Indian Botany Society*, vol. 29 (1), 1950.
- Bose, Purabi & Han Van Dijk, *Dryland Forests: Management and Social Diversity in Africa and Asia*, Springer, Switzerland, 2016.
- Boyazoglu, J., I. Hatiziminaoglou and P. Morand-Fehr, 'The Role of the Goat in the Society: Past, Present and Perspectives of the Future', *Small Ruminant Research*, 60 (1-2), pp. 13-23 and C. Delano Smith, *Western Mediterranean Europe: An historical Geography of Italy, Spain and Southern France*, Academic Press, London, 1979.

- Boyko, H., 'Iran, Israel and Turkey', in *Plant Ecology: Reviews of Research*, UNESCO, Paris, Arid Zone Research, vol. 6, 1955, pp. 40-76.
- Breed, C. S., S. C. Bryberger, S. Andrews, C. McCauley, F. Lennertz, D. Gebel and K. Horstman, 'Regional Studies of Sand Seas using Landsat (ERTS) imagery', in E.D. McKee, *A Study of Global Sand Seas*, Tunbridge Wells, Castle House Publications, Kent, 1980.
- Braudel, Fernand, *La mediterranee*. Translated as *The Mediterranean and Mediterranean World in the Era of Philip II*, 2 vols., New York, 1972.
- Bull, Marcus, *Thinking Medieval: An Introduction to the Study of Middle Ages*, Palgrave Macmillan, New York, 2005.
- Bulliet, R. W., *The Camel and the Wheel*, Harvard University Press, Cambridge, 1975.
- Burman, B. K. Roy, *Indigenous and Tribal Peoples: Gathering Mist and New Horizon*, Mittal Publications, New Delhi, 1994.
- Burns, Robert M. (ed.), *Historiography: Critical Concepts in Historical Studies*, vol. 4 (Culture), Routledge, London and New York, 2006.
- Carter, H. J., 'Summary of the Geology of India between the Ganges, the Indus and Cape Comorin', *J. Bombay brch, Royal Asiatic Society*, vol. 6, p. 161.
- Chandran Charan, *Gugaji Chauhan Ri Rajasthani Gatha*, Bikaner, 1962.
- Chandra, Satish, Raghubir Singh, G. D. Sharma (eds), *Marwar Under Jaswant Singh (1658-1678): Jodhpur Hukumat ri Bahi*, Meenakshi Prakashan, New Delhi, 1976.
- Chattopadhyaya, B.D., 'Irrigation in Early Medieval Rajasthan', *Journal of the Economic and Social History of the Orient*, vol. 16, no. 2/3 (Dec., 1973), pp. 298-316.
- Choudhary, Manisha, *Trade, Transport and Tanda: Shifting Identities of the Banjaras*, Manohar, New Delhi, 2018.
- , 'Setting the Game of Ferocity and Innocence: Hunts of Jahangir', *American Research Journal of History and Culture*, Vol. 4, Issue 1, pp. 1-18.
- , *The Eternal Dastur Craft: A History of Mannerism, Social*

- Groups and Formation of Amber-Jaipur State*, Primus Books, Delhi, 2020.
- , 'The Court Protocol and Social Ordering in Jaipur State', *International Journal of History and Cultural Studies (IJHCS)*, Volume 1, Issue 1, pp. 14-26.
- Coccarri, Dianem, 'Protection and Identity: Banara's Bir Babas as neighbouring guardian deities' in Sandria B. Freitag (ed.), *Culture and Power in Banaras: Community, Performance and Environment 1800-1980*, University of California Press, Berkeley, 1989, pp. 130-46.
- Cohn, Bernard S., 'Regions Subjective and Objective: Their Relation to the Study of Modern Indian History and Society', in Robert I. Crane (ed.), Duke University, Durhan, 1967, pp. 5-37.
- Cragg, G. R., *The Church in the Age of Reason 1648-1749*, Penguin Books, Harmondsworth, 1961.
- Crystal, Jill, *Oil and the Politics in the Gulf: Rulers and Merchants in Kuwait and Qatar*, Cambridge University Press, Cambridge, 1990.
- Cubitt, Geoffrey, *History and Memory*, Manchester University Press, Manchester & New York, 2007 (reprint 2012).
- Dasgupta, Ashim, 'Indian Merchants in the Age of Partnership, 1500-1800' in Dwijendra Tripathi (ed.) *Business Communities of India*, Manohar, Delhi, 1984.
- Dave, T.N., 'The Institution of Bards in Western India', *Eastern Anthropologist*, IV, No. 4, June-August, 1951.
- Davis, J. G., 'Australia' in *Plant Ecology: Reviews of Research*, UNESCO, Paris, Arid Zone Research, vol. 6, 1955, pp. 114-134.
- Devra, G. S. L., 'Orientlists and Historians on the Early Settlements Patterns and History of the Ghaggar Region of Rajasthan', in Rakesh Hooja, Rima Hooja and Rakshat Hooja (eds) *Constructing Rajpootana-Rajasthan*, Rawat Publications, Jaipur, 2010, pp. 82-98.
- Dhali, Rajshree, 'Tracing the Process of Brahmanisation of a Folk Cult during 19th and 20th Century in Rajasthan: A Case

- Study of Goga', *Proceedings of Indian History Congress*, vol. 75, 2014, pp. 783-789.
- Dhir, R. P., 'The Human Factor in Ecological History' in Brian Spooner and H.S. Mann (eds.) *Desertification and Development: Dryland Ecology in Social Perspective*, Academic Press, London, 1982.
- Dickson, H. R. P. Dickson, *Kuwait and her Neighbours*, George Allen & Unwin, London, 1956.
- Divyabhanusinh, *The End of a Trail: The Cheetah in India*, Banyan Books, New Delhi.
- Dixon, C. J., *Sketch of Mairwara*, Smith Elder, London, 1850.
- Driver, Felix, and David Gilbert, *Imperial Cities: Landscape, Display and Identity*, Manchester University Press, Manchester, 1999.
- Edgerton, F., *The Elephant-lore of The Hindus*, Motilal Banarsidass, Delhi, 1985.
- Elphinstone, Mountstuart, *History of India*, 2. Vols., First Published 1841, Atlantic Publishers and Distributors (P) Ltd., New Delhi, 2016.
- Emberger, L., 'Afrique du nord ouest' in *Plant Ecology: Reviews of Research*, UNESCO, Paris, Arid Zone Research, vol. 6, 1955, pp. 219-249.
- Enan, Muhammad Abdullah, *Ibn Khaldun: His Life and Works*, Shaikh Muhammad Ashraf, Lahore, 1941.
- Erskine, K. D., *The Western Rajputana States Residency and The Bikaner Agency*, vol. 1, 1908, reprint Vintage Books, Gurgaon, 1992.
- Fell, Albert Prior (ed.), *Histories and Historians: Selections From History Today*, Oliver & Boyd, Edinburgh, London, 1966.
- Fisher, R. J., *If Rain Doesn't Come: An Anthropological Study of Drought and Human Ecology in Western Rajasthan*, Sydney Studies, Manohar, New Delhi, 1997.
- Fox, R. G., *Kin, Clan, Raja and Rule: State Hinterland Relations in Pre-Industrial India*, University of California Press, Berkeley, 1971.
- Fresh, Seymour, *India and South Asia*, The Macmillan Company, New York, 1965.

- Fuchs, S., *The Aboriginal Tribes of India* Macmillan, Bombay, 1973.
- Gadgil, M. and R. Guha, *This Fissured Land: An Ecological History of India*, Oxford University Press, Delhi, 1992.
- Gahlot, J. S., *History of Rajasthan*, vol. 1, Jodhpur, 1937.
- Glennie, K. W., *Desert Sedimentary Environments*, Elsevier, Essex, 1970.
- Goff, Jacques Le and Pierre Nora, *Constructing the Past: Essays in Historical Methodology*, Cambridge University Press, Cambridge, 1974, reprint 1987.
- Gold, Ann Grodzins and Bhoj Raj Gujar, 'Wild Pigs and Kings: Remembered Landscapes in Rajasthan', *American Anthropologist*, vol. 99 (1), 1997, pp. 70-84.
- Gopal, B. and K. P. Sharma, *Sambhar Lake, Rajasthan*, WWF-India, New Delhi, 1994.
- Goswami, P. & K. V. Ramesh, 'The Expanding Indian Desert: Assessment Through weighted epochal trend ensemble', *Current Science*, Vol. 94, No. 4, 2008, pp. 476-480.
- Gottlieb, Roger S. (ed.), *This Sacred Earth: Religion, Nature, Environment*, Routledge, New York, 1996.
- Geertz, Clifford, 'History and Anthropology', in Robert M. Burns (ed.), *Historiography: Critical Concepts in Historical Studies*, vol. IV (Culture), Routledge, London and New York, 2006.
- Guha, Sumit, *Environment and Ethnicity in India 1200-1991*, *Cambridge Studies in India History and Society*, vol. 4, Cambridge University Press, Cambridge, 1999.
- Gupta, Mohan Lal, *Cultural Tourism in Marwar: Erstwhile Marwar State of Great Indian Desert: A Historical Perspective*, Kindle Edition.
- Gupta, Rajkumar and Ishwar Prakash (eds), *Environmental Analysis of the Thar Desert*, English Book Depot, Dehradun, 1975.
- Gupta, S. P., *The Agrarian System of Eastern Rajasthan*, Manohar, Delhi, 1986.
- , 'Methods of Revenue assessment and Realization in Eastern Rajasthan during the 17th and 18th Century', *Proceedings of Rajasthan History Congress*.

- , 'Reconstructing the Political and Economic Profile of \ Rajasthan', *Proceedings of Indian History Congress*, 55th session, Aligarh, 1994, pp. 159-72.
- Habib, Irfan, 'Merchant Communities in Pre-Colonial India' in James D. Tracy (ed.) *The Rise of Merchant Empire c. 1350-1750*, Cambridge University Press, Cambridge, 1990.
- , *Man and Environment: The Ecological History of India, A People's History of India*, vol.36, Tulika Books, New Delhi, 2010.
- , *The Atlas of Mughal India*, Oxford University Press, New Delhi, 1985.
- , *Akbar and His India*, Oxford University Press, New Delhi, 1997 (2009 edition).
- , *The Agrarian System of Mughal India (1556-1707)*, Oxford University Press, New Delhi, 1963 (revised edition 1999).
- Halbar, B.G, *Lamani: Economy and Society in Change*, Mittal Publication, Delhi, 1986,
- Haraway, Donna, *Primate Visions: Gender, Race, and Nature in the World of Modern Science*, Routledge, London, 1989.
- Harcourt, Max, 'The Deshnoke 'Karni Mata' Temple and Political Legitimacy in Medieval Rajasthan', *South Asia*, vol. XVI, Special Edition, (1993), pp. 33-48.
- Harlan, Lindsey, *Religion and Rajput Women: The Ethics of Protection in Contemporary Narratives*, Munshiram Manoharlal Publishers, Delhi, 1994.
- Hill, Christopher V., *South Asia: An Environmental History*, ABC-CLIO, Oxford, 2008.
- Hiltebeitel, A. (ed.), *Criminal Gods and Demon Devotees—Essays on the Guardians of Popular Hinduism*, Delhi, 1990.
- Hobsbawm, Eric, *On History*, Abacus, Great Britain, 1998.
- Hornaday, William T., *The Extermination of the American Bison*, Government Printing Office, Washington, 1889.
- Hughes, Donald, *What is Environmental History?*, Polity Press, Cambridge, 2006.
- Hughes, Julie E., *Animal Kingdoms: Hunting, the Environment, and Power in the Indian Princely States*, Permanent Black, Ranikhet, 2013.

- Indras, Amit Panday, *Lost Sarasvati*, a typed monograph catalogued in the Library of Indian Institute of Advanced Study.
- Isenberg, Andrew C., *The Destruction of the Bison: An Environmental History, 1750-1920*, Cambridge University Press, New York, 2008.
- Jacob, K., M.V.A. Sastry and V.V. Sastri, 'A Note on the Microfossils of the Impure Gypsum from the Jamsar Mine, Bikaner as on the Possible Origin of the Gypsum', Proceedings of the Symposium on the Rajputana desert, *Bulletin National Institute of Science of India*, vol. 1, pp. 68-69.
- Jacqueline, Beaujeu-Garnier, *Methods and Perspectives in Geography*, Jennifer Bray (trans.), Longman, London and New York, 1976.
- Jain, K. C., *Ancient Cities and Towns of Rajasthan*, Books Treasure, Jodhpur, third edition 2016.
- Jain, K. P., R. K. Kar and S. C. D. Sah, 'A Palynological assemblage from Barmer, Rajasthan', *Geophytology*, Vol. 3 (2), 1973, pp. 15-0-165.
- Jarrige, J. F. and R. H. Meadow, 'The Antecedents of Civilization in the Indus Valley' *Scientific America*, no. 243 (2), 1980.
- Jarrige, J. F. and M. Lechevallier, 'Excavations at Mehrgarh, Baluchistan: Their significance in the Prehistorical Context of the Indo-Pakistani Borderlands' in M. Teddie (ed.), *South Asian Archaeology 1977*, vol. 1, Istituto Universitario Orientale, Seminario di Studi Asiatici, Naples, pp. 463-535.
- Jodha, N. S., 'The Operating Mechanism of Desertification and Choice of Interventions' in H. S. Mann (ed.) *Arid Zone Research and Development*, Scientific Publishers, Jodhpur, 1980.
- Kapur, Nandini Sinha, *Reconstructing Identities: Tribes, Agro-Pastoralists and Environment in Western India (Seventh-Twentieth Centuries)*, Manohar, New Delhi, 2008.
- Kar, Amal, 'Megabarchanoids of the Thar: Their Environment, Morphology and Relationship with Longitudinal Dunes', *The Geographical Journal*, Vol. 156, No. 1, March, 1990, pp. 51-61.

- , 'Origin and Transformation of Longitudinal Sand Dunes in the Indian Desert', *Z. Geomorph*, Vol. 31, pp. 311-37.
- Kaul, K. N., 'A Palm Fruit from Kapurdi (Jodhpur, Rajasthan Desert)', *Current Science*, vol. 20, 1951.
- Kent, Marian, *Oil and Empire: British Policy and Mesopotamian Oil, 1900-1920*, Macmillan, London, 1976.
- Kerr, Ian J., 'On the Move: Circulating Labor in Pre-Colonial, Colonial, and Post-Colonial India', *International Review of Social History*, Vol. 51, SUPPLEMENT 14: *Coolies, Capital, and Colonialism: Studies in Indian Labour History* (2006), pp. 85-109.
- Khan, Dominique-Sila, *Conversion and Shifting Identities: Ramdev Pir and Ismailis in Rajasthan*, Manohar, Delhi, 2003.
- , *Crossing the Threshold: Understanding Religious Identities in South Asia*, I. B. Tauris Publishers, London & New York, 2004.
- , 'The Kamad of Rajasthan—Priests of a Forgotten Tradition', *Journal of Royal Asiatic Society*, Series 3, 6, I (1996), pp. 29-56.
- , 'The coming of Nikalank Avatar: A Messianic Theme in Some Sectarian Traditions of North-Western India', *Journal of Indian Philosophy*, Vol. 25, No. 4 (August 1997), pp. 401-426.
- , 'L'Origine Ismaelienne Du Culte Hindou De Ramdeo Pir', *Revue de l'histoire des Religions*, vol. 210, No. 1 (Janvier-Mars 1993), pp. 27-47.
- Khan, Refaat Ali, *The Kachhwahas under Akbar and Jahangir*, Kitab Publishing House, New Delhi, 1976.
- Kohler, Rollefson Ilse, 'The Raika dromedary breeders of Rajasthan: A pastoral System in Crisis', *Nomadic Peoples*, 30, pp. 74-83.
- Ladurie, Emmanuel Le Roy, 'The History of Climate', in Jacques Le Goff and Pierre Nora (eds.), *Constructing the Past: Essays in Historical Methodology*, Cambridge University Press, Cambridge, 1974, reprint 1987, pp. 81-98.
- Lahri, Nayanjot, *The Decline and Fall of the Indus Civilisation*, Permanent Black, 2000.
- Lakhanpal, R. N., 'Specific Identification of the Guttiferous

- Leaves from the Territory of Rajasthan', *Palaeobotanist*, vol. 12 (3), 1964, pp. 265-266.
- Lal, Pranay, *Indica: A Deep Natural History of the Indian Subcontinent*, Allen Lane, Haryana, 2016.
- Lang, John, *Wandering in India and Other Sketches of Life in Hindostan*, with an Introduction by Ruskin Bond, Rupa Publications, New Delhi, second Impression 2016.
- Lechevallier, M. and G. Quivron, 'The Neolithic in Baluchistan: New Evidence from Mehrgarh' in H. Hertel (ed.), *South Asian Archaeology*, Berlin, 1979.
- Lodrick, Deryck O., 'Rajasthan as a Region: Myth or Reality?', in Karine Schomer, Joan L. Erdman, I. Lloyd (eds.), *The Idea of Rajasthan: Explorations in Regional Identity*, Rudolph, Manohar, 2001, pp. 1-44.
- , 'A Cattle Fair in Rajasthan: The Kharwa Mela', *Current Anthropology*, University of Chicago Press, Vol. 25, No. 2 (April 1984), pp. 218-225.
- Logan, Michael F., *Desert Cities: The Environmental History of Phoenix and Tucson*, University of Pittsburgh Press, Pittsburgh, 2006.
- Long, Jeremy, 'Leaving the Desert: Actors and Sufferers in the Aboriginal Exodus from the Western Desert', *Aboriginal History*, vol. 13, No. ½ (1989), pp. 9-43.
- Lord, A.B., *The Singer of Tales*, Harvard University Press, Cambridge, 1964.
- Lorenz, Chris, 'Historical Knowledge and Historical Reality: A Plea for Internal Realism', in Brian Fay, Philip Pomper and Richard T. Vann (eds.), *History and Theory: Contemporary Readings*, Blackwell, Malden Mass, 1998.
- Lucas, Colin, *Introduction* in Jacques Le Goff and Pierre Nora (eds.), *Constructing the Past: Essays in Historical Methodology*, Cambridge University Press, Cambridge, 1974, reprint 1987.
- Ludden, David, *An Agrarian History of South Asia: The New Cambridge History of India*, Vol. IV. 4, Cambridge University Press, Cambridge, 1999.
- Malleson, Col. G. B., *An Historical Sketch of The Native States of India: In Subsidiary Alliance with the British Government*,

- (Longmans Green and Co., London, 1875), Asian Educational Service, New Delhi, 2005.
- Malhotra, S. P., *Socio-Economic Structure of Population in Arid Rajasthan*, Central Arid Zone Research Institute, Jodhpur.
- Mathur, Durgalal, *Rajasthan ke Chauhan Abhilekh*, Itihaas Anusandhan Parishad, Udaipur, 1967.
- Menariya, *Rajasthani Bhasa aur Sahitya*.
- Mate, M. S., 'The Clay Feet?' *Bulletin of the Deccan College Research Institute*, vol. 49 (1990), pp. 243-49.
- McCrinkle, J.W., *Ancient India: As Described by Ptolemy*, Trubner & Co., London, 1885.
- McGinnies, W. G., 'General Description of Desert Areas' in D. W. Goodall and R. A. Perry (eds.), *Arid-land Ecosystems: Structure, Functioning and Management*, Vol. 1, International Biological Program, 16. Cambridge University Press, Cambridge, 1979.
- McKee, E. D. (ed.), *A Study of Global Sand Seas*, Tunbridge Wells, Castle House Publications, Kent, 1980.
- McNeil, J.R., 'Observations on Nature and Culture of Environmental History', *History and Theory*, 42, 2003, pp. 5-43.
- , 'The Historiography of Environmental History', in Axel Schneider and Daniel Woolf (eds), *The Oxford History of Historical Writing: Historical Writing since 1945*, vol.5, pp. 159-176.
- Meadow, R. H., 'A Camel Skeleton from Mohenjo-daro', in B. B. Lal and S. P. Gupta (eds.), *Frontiers of the Indus Civilization*, Books and Books on behalf of Indian Archaeological Society jointly with Indian History and Culture Society, New Delhi, 1984, pp. 133-39.
- Miles, S. B., *The Countries and the Tribes of Persian Gulf*, Frank Cass, London, 1919 (2nd edition 1966).
- Mishra, Anupam, *Aaj bhi khare hai talab*, Vani Parkashan, Delhi, 2014.
- Mishra, Sheila, M. Jain, S. K. Tandon, A.K. Singhvi, P. P. Joglekar, S.C. Bhatt, A.A. Kshirsagar, Sonali Naik and Arti Deshpande, 'Prehistoric Culture and Late Quaternary Environments in

- Luni Basin around Balotra', *Man and Environment*, vol. 24 (1), 1999, pp. 39-49.
- Misra, Ram Gopal, *Indian Resistance to Early Muslim Invaders up to 1206 AD*, Anu Books, Meerut, 1983 (second edition 1992).
- Misra, S., S. N. Rajguru and S. Ghate, 'Stone Age Jaisalmer: Implications for Human Adaptation to Deserts', *Bulletin of the Deccan College Post-Graduate and Research Institute*, vol. 53, 1993, pp. 260-268.
- Misra, V. N., 'Palaeolithic Culture of Western Rajaputana', *Bulletin of the Deccan College Post-Graduate and Research Institute*, vol. 21, 1962, pp. 85-156.
- , 'Bagor-A Late Mesolithic Settlement in North-West India', *World Archeology*, Vol.5, No.1, Colonization (Jun. 1973), pp. 92-110.
- , 'Two microlithic sites in Rajasthan-a preliminary investigation', *Eastern Anthropologist*, Vol. 24, 1971, pp. 237-290.
- Mitra, D. S. and Balram Bhadu, 'Possible Contribution of River Saraswati in Groundwater Aquifer System in Western Rajasthan, India', *Current Science*, Vol. 102, No. 05, 2012, pp. 685-689.
- Mitra, Sudipta, *Gir Forest and the Saga of the Asiatic Lion*, Indus Publishing Company, New Delhi, 2005.
- Mittre, Vishanu, 'Protohistoric Records of Agriculture in India', *Trans. Bose Research Institute*, vol. 31 (3), 1968, pp. 87-106.
- Moosvi, Shireen, *People, Taxation and Trade in Mughal India*, Oxford University Press, Delhi, 2008.
- Mukhia, Harbans, 'Illegal Extortions from Peasants, Artisans and Menials in Eighteenth Century Eastern Rajasthan', *The Indian Economic and Social History Review*, Vol. XIV, No.2, April-June, 1977, pp. 231-245.
- Nahta, 'Rajasthani Aitehasik Baton va Khyaton ki Parampara', *Parampara*, part 2, 1961, pp. 114-5.
- Nand, Sureshwara, *Art and Architecture of Jaisalmer*, Jodhpur Publishers, Jodhpur, 1990.

- Narang, Hardeep Singh, *The Thar: A Living Desert*, The Spirit of India Publishers, 2004.
- Nash, Roderick F., *Wilderness and American Mind*, Yale University Press, 1967.
- Nath, R. (ed.), *India as seen by William Finch*, The Historical Research Documentation Programme, Jaipur, 1990.
- O'Brien, Anthony Gordon, *The Ancient Chronology of Thar: The Bhattika, Laukika and Sindh Eras*, text available at Chaupasani Sodh Sansthan, Jodhpur.
- Ojha, P. N., *North Indian Social Life During Mughal Period*, Oriental Publisher and Distributors, Delhi, 1975.
- Pareek, H. S., 'Microscopic Study of Palana lignite', Record Geological Survey of India, vol. 87 (4), pp. 823-830, 1960.
- Parkash, Ishwar, 'Extinct and Vanishing Mammals from the Desert of Rajasthan and the Problems of their Preservation', *India For*, vol. 88, 1958, pp. 642-645.
- , 'The Present Status of Caracal', *Journal of Bombay Natural History Society*, vol. 58, 1961, p. 791.
- Parik, Surya Shankar, 'Goga Meri: Ek Atihasik Vivaichan', *Maru-Bharti*, Vol. 4, Jan 1 965.
- Parmanik, S. K., S. P. Hariharan and S. K. Ghosh, 'Analysis of the Climate of the Rajasthan Desert and its Extension', *Indian Journal of Met. Geophys*, vol. 3, 1925, pp. 131-140.
- Patterson, M.L.P., *South Asian Civilizations: A Bibliographic Synthesis*, University of Chicago Press, 1981.
- Paul, Kim, 'Negotiating Sacred Space: The Mandir and the Oran as Contested Sites', *South Asia: Journal of South Asian Studies*, Vol. XVI, Special Issue, (1993), pp. 49-60.
- Prajapati, Sweta, 'Jaislamer Vijnaptipatra: A Socio-Religious Portrait of Jainism' *Kirti Rakshana*, vol. 5, no.5-6, April-July 2010, pp. 11-8.
- , 'Baroda Vijnaptipatra: A Socio-Historical Portrait of Baroda City', *Journal of Oriental Institute*, vol. 61, September-December, 2011.
- Pithawalla, M. B., *Physical and Economic Geography of Sind*, Karachi, 1959.

- Pocock, S.A.J.R. and J. Jansonius, 'The Pollen genus *Classopollis* Pflug', *Micropaleontology*, vol. 7 (4), 1953, pp. 439-449.
- Prakash, Ishwar, *The Amazing Life in the Indian Desert*, Central Arid Zone Research Institute, Jodhpur, 1977.
- Prasad, R. N., *Raja Man Singh of Amber*, The World Press Pvt. Ltd., Calcutta, 1966.
- Puri, G. S., *Indian Forest Ecology: A Comprehensive Survey of Vegetation and its Environment in the Indian Subcontinent*, 2 Vols., vol. 1, Oxford Books and Stationary Co., New Delhi, 1960.
- Raghaviah, V., *Nomads*, Bharateeya Adeemjati Sevak Sangh, Secunderabad, 1968.
- Rajaguru, S. N., Sushama G. Deo and Claire Gaillard, 'Pleistocene Geoarchaeology of Thar Desert', *Annals of arid Zone*, Vol. 53 (2), 2014, pp. 63-76.
- Rajaguru, S. N., Sushama G. Deo and Claire Gaillard, 'Pleistocene Geoarchaeology of Thar Desert', *Annals of Arid Zone*, Vol. 53 (2), 2014, pp. 63-76.
- Raman, T. R. Shankar, 'How a desert was saved from trees', *The Hindu*, November 26th 2017.
- Rana, R.P., *Rebels to Rulers, The Rise of Jat Power in Medieval India c. 1665-1735*, Manohar Publishers & Distributors, New Delhi, 2006.
- , 'Chakar to Raja, The Emergence of Naruka State of Alwar (c.1660-1790)', *Social Science Probing*, June, 2006, pp. 59-79.
- Rangarajan, Mahesh, 'The Raj and the Natural World: The War against 'Dangerous Beasts' in Colonial India', *Studies in History*, vol. 14 (2), 1998, pp. 265-99.
- Rangarajan, Mahesh, 'Imperial Agenda and India's Forest: The early History of Indian Forestry, 1800-1878', *The Indian Economic and Social History Review*, 31/2, 1994.
- Rangarajan, Mahesh (ed.), *Oxford Anthology of Indian Wildlife: Hunting and Shooting*, vol. 1, Oxford University Press, New York, 1999.
- Rangarajan, Mahesh and K. Sivaramakrishnan, *Shifting Grounds: People, Animals and Mobility in India's Environmental History*, Oxford University Press, New Delhi, 2014.

- Rangarajan, Mahesh and Ghazala Shahabuddin (eds), *Making Conservation Work: Securing Biodiversity in this New Century*, Permanent Black, New Delhi, 2007.
- Rao, A. R. & K. P. Vimal, 'Plant Microfossils from Palana Lignite (? Eocene), Bikaner', *Current Science*, vol. 19 (3), 1950, pp. 82-84.
- Rao, S. R. N & S. S. Misra, 'An Oil bearing alga from the Palana lignite (? Eocene) of Rajputana', *Current Science*, vol. 18 (10), 1949, pp. 380-381.
- Rao, Y. Ramchandra, *The Desert Locust in India*, I.C.A.R., New Delhi, 1960.
- Rathor, Mahipal Singh, 'lok devta Pabuji Rathor' in Vikram Singh Bhatti (ed.), *Rajasthan ke lok devta*, Rajasthani Sodh Sansthan in collaboration of Mehrangarh Museum Trust, 2017, pp. 32-43.
- Ratnawat, Shyam Singh, *Rajput Nobility with Special Reference to the Kachhawaha Nobility of Jaipur during 1700-1858 A.D.*, Panchsheel Prakashan, Jaipur, 1989.
- Roonwal, M. L., 'Food Preference Experiments on the Desert Locust', *Schistocerca gregaria* (Forsk.) in its permanent breeding grounds in Mekran, *Journal of Zoological Society of India*, Calcutta, Vol. 5 (1), 1953, pp. 44-58.
- Rosin, R. Thomas, 'Locality and Frontier: Securing Livelihood in the Aravalli Zone of Central Rajasthan', in Karine Schomer, Joan L. Erdman, Deryck O. Lodrick (eds.), *The Idea of Rajasthan: Explorations in Regional Identity*, vol. 2 (Constructions), Manohar, Delhi, 2001, pp. 30-63.
- Sagriya, K. P. (rev. S. S. Negi), *Forests and Forestry*, 5th edition, National Book Trust, New Delhi, 1994.
- Saletore, B. A., *The Wild Tribes in Indian History*, Motilal Banarsidas, Lahore, 1935.
- Sanger, R. H., *The Arabian Peninsula*, Cornell University Press, New York, 1954.
- Sangha, Harkirat Singh, 'The Birds of Sambhar Lake and its Environs', *Indian Birds*, Vol. 4, No. 03 (May-June 2008), pp. 82-97. http://indianbirds.in/pdfs/IB4.3_Sangha_SambharLake.pdf.

- Sankhala, K. S., 'Wildlife Sanctuaries of Rajasthan', *Journal, Bombay Natural History Society*, vol. 61 (1), pp. 27-34.
- Sarda, Harbilas, *Ajmer: Historical and Descriptive*, Fine Arts Printing Press, Ajmer, 1941.
- Sardar, Ziauddin, *Mecca: The Sacred City*, Bloomsbury Publishing Plc. London, 2014.
- Sarkar, J. N., *Thoughts on Trends of Cultural Contacts in Medieval India*, OPS Publisher Pvt. Ltd., Calcutta, 1984.
- , *A History of Jaipur*, Orient Longman, New Delhi, 1984.
- Saxena, R. K., *Rajput Nobility: A Study of 18th Century Rajputana*, Publication Scheme, Jaipur, 1996.
- , *Patta Bahi of Maharana Raj Singh vs 1713*, Saroj Parkashan, Udaipur, 1989.
- , *Apparatus of the Rathors*, Maharaja Man Singh Pustak Parkash Research Centre, Jodhpur, 2006.
- Sikand, Yoginder and Manjari Katju, 'Mass Conversion to Hinduism among Indian Muslims', *Economic and Political Weekly*, vol. 29, No. 34 (August 1994), pp. 2214-19.
- Schama, Simon, *Landscape and Memory*, Vintage Books, New York, 1996.
- Schaller, George B., *The Deer and The Tiger: A Study of Wildlife in India*, The University of Chicago Press, Chicago and London, 1967.
- Schneider, Axel and Daniel Woolf (eds.), *The Oxford History of Historical Writing*, vol. 5, Oxford University Press, Oxford, 2011.
- Schomer, Karine, Joan L. Erdman, Deryck O. Lodrick & Lloyd I. Rudolph (eds.) *The Idea of Rajasthan: Explorations in Regional Identity*, 2. Vols. Manohar, New Delhi, 2001.
- Schwartzberg, Joseph E., 'Prolegomena to the Study of South Asian Regions and Regionalism', in Robert I. Crane (ed.), *Regions and Regionalism in South Asian Studies*, Duke University, Durhan, pp. 89-111.
- Sharma, Dashrath, *Rajasthan through the Ages*, Rajasthan State Archives, Bikaner, 1966.
- Sharma, G. D. 'Gugaji ke samaiy par kinchit aur prakash', *Varda*, no. 4, 1960.

- Sharma, G. N., *Social Life in Medieval Rajasthan*, Lakshmi Narain Agarwal Educational Publishers, Agra, 1968.
- , *Rajasthan Studies*, Lakshmi Narain Agarwal Educational Publications, Agra, 1970.
- Sharma, N.K. *Way of Life in Desert: Camel Safari in Jaisalmer*, Seemant Parkashan, Jaisalmer, 1997 (third edition).
- Siddle, David, 'Goats, Marginality and 'Dangerous Other'', *Environment and History*, vol. XV, no. 4, November 2009, pp. 521-36.
- Singer, Milton, *When a Great Tradition Modernizes*, Pall Mall, London, 1972
- Singh, Chandramani, *Protected Monuments of Rajasthan*, Jaipur, 2002,
- Singh, Dilbagh, *The State, Landlords and Peasants; Rajasthan in the 18th Century*, Manohar Publications, New Delhi, 1990.
- , 'Contesting Hegemony: State and Peasant in Late Medieval Rajasthan' in Rajat Dutta (ed.), *Rethinking Millennium: Perspectives on Indian History from the Eight to the Eighteenth Century*, Essays for Harbans Mukhia, Aakar, Delhi, 2008, pp. 300-314.
- Singh, G., 'History of Post-Glacial Vegetation and Climate of the Western Rajasthan Desert', *Final report of research conducted in collaboration of University of Wisconsin at B. Sabni Institute of Palaeobotany*, Lucknow, 1970.
- Smith, John D., *The Epic of Pabuji: A Study of Transcription and Translation*, Cambridge University Press, Cambridge, 1991.
- , 'An Introduction to the Language of Historical Documents from Rajasthan', *Modern Asian Studies*, vol. 9, No. 4 (1975), pp. 433-464.
- , 'Where the plot thickens epic moments in Pabuji', *South Asian Studies*, 2, 1986, pp. 53-64.
- Somani, Ram Vallabh, *History of Jaisalmer*, Jaipur, 1990.
- Sontheimer, Gunther-Dietz, *Pastoral Deities in Western India*, Oxford University Press, New York & Oxford, 1989.
- Srinivas, M. N. and A. M. Shah, 'The Myth of Self-Sufficiency of the Indian Village', *The Economic Weekly*, 1960, pp. 1375-1378.

- Srivastava, S. K., 'Jurassic Microflora from Rajasthan, India', *Micropaleontology*, vol. 12 (1), 1966, pp. 87-103.
- Srivastava, Vinay Kumar, 'The Rathore Rajput Heroes of Rajasthan: Some Reflections on John Smith's *The Epic of Pabuji*', *Modern Asian Studies*, vol. XXVIII, no. 3, 1994, pp. 597-9.
- Sterndale, R., *Natural History of the Mammalia of India and Ceylon*, Thacker, Spink, and Co., Calcutta, 1884, p. 200.
- Subrahmanyam, Sanjay, *Three Ways to be Alien: Travails and Encounters in the Early Modern World*, Permanent Black, Ranikhet, 2011.
- Sukumar, Raman, *The Living Elephants: Evolutionary Ecology, Behavior and Conservation*, Oxford University Press, New York, 2003.
- Swaraj, Mohan, *Story of Karni Mata*, Deshnoke.
- Talbot, Cynthia, 'Justifying Defeat: A Rajput Perspective on the Age of Akbar', *Journal of the Economic and Social History of the Orient*, Vol. 55, issue 2-3, p. 329-368.
- , 'Becoming Turk the Rajput Way; Conversion and Identity in an Indian Warrior Narrative', *Modern Asian Studies*, Vol. 43, No. 1, Jan. 2009, pp. 211-243.
- Tanwar, Dhaibhai Tulsinath Singh, *Shikari aur Shikar*, Privately Printed, Udaipur.
- Thapar, B. K., *Recent Archeological Discoveries in India*, UNESCO and the Centre for East Asian Cultural Studies, 1986.
- Thapar, Valmiki, Romila Thapar and Yusuf Ansari, *Exotic Aliens: The LION and the CHEETAH in India*, Aleph Book Company, New Delhi, 2013.
- Trautmann, Thomas R., *Elephants and Kings: An Environmental History*, Permanent Black, New Delhi, 2015.
- Truesdell, S.R., *The Rifle: Its development for Big-Game Hunting*, Safari Press, USA, 1992.
- Tyagi, B. K. and Q. H. Baqri, *Changing Faunal Ecology in the Thar Desert*, Scientific Publishers, Jodhpur, 2005.
- Ujwal, K. S. Dan, *Bhagwati Shri Karniji Maharaj*, Universal Printing Co., Jaipur, 1972, pp. 45-7.
- Wadia, D.N., 'Desert of Asia-their Origin and growth in the

- late Pleistocene time', Second Sir A.C. Seward Memorial Lecture, Sahni Institute of Palaeobotany, Lucknow, 1955.
- , *Geology of India*, Macmillan and co., London, 1960 & M.S. Krishnan, 'Geological History of Rajasthan and its relation to present-day conditions', *Proceedings of the Symposium on the Rajputana Desert*, 1952, pp. 19-31.
- Walker, John F., *Ivory's Ghosts: The White Gold of History and the fate of Elephants*, Grove Press, New York, 2009.
- Westphal-Hellbusch, Sigrid, 'Changes in Meaning of Ethnic as Exemplified by the Jat, Rabari, Bharwad, and Charan in Northwestern India', in L. S. Leshnik and G. D. Sontheimer (eds.), *Pastoralists and Nomads in South Asia*, Otto Harrassowitz, Wiesbaden, 1975, pp. 117-38.
- Whittlesey, Derwent, 'The Regional Concept and the Regional Method' in Preston E. James and Clarence F. Jones (eds.), *American Geography: Inventory and Prospect*, Syracuse University Press, Syracuse, New York, 1954, pp. 19-68.
- Wink, Andre, *Al-Hind: The Making of the Indo-Islamic World, Early Medieval India and the Expansion of Islam 7th-11th Centuries*, vol. 1, Oxford University Press, New Delhi, 1999.
- Wittfogel, Karl A., *Oriental Despotism: A Comparative study of Total Power*, Yale University Press, London, 1957 (ninth print 1976).
- Ziegler, Norman P., 'The Marvari Historical Chronicles: Sources for the Social and Cultural History of Rajasthan', *The Indian Economic and Social History Review*, 13 (2), 1976, pp. 219-50.
- , 'Some Notes on Rajput Loyalties during the Mughal Period', in J. F. Richards (ed.), *Kingship and Authority in South Asia*, Maidson, *South Asia Studies*, 1978, pp. 215-250.
- , 'The Seventeenth Century Chronicles of Marvara: A Study in the Evolution and use of Oral Traditions in Western India', *History in Africa*, vol. 3, 1976, pp. 127-153.

Online References

<http://www.bwcindia.org/Web/Awareness/LearnAbout/Camels.html>

- 'Camel price on the rise; numbers on the decline', *The Hindu*, April 29th 2008, <https://www.thehindu.com/todays-paper/tp-national/tp-otherstates/Camel-prices-on-the-rise-numbers-on-the-decline/article15211975.ece>
- Rohit Parihar, *India Today*, May 30, 2005, <https://www.indiatoday.in/magazine/environment/story/19700101-camel-population-declining-drop-in-birth-rate-of-camel-in-india-787548-2005-05-30>
- Maseeh Rahman, *The Guardian*, January 24, 2014, <https://www.theguardian.com/world/2014/jun/24/rajasthan-save-camel-population-legal-protection-india>
- Maneka Gandhi, 'The sinking ship of the desert', *The Hindu*, September 21, 2015, <https://www.thehindu.com/opinion/op-ed/the-sinking-ship-of-the-desert/article7671220.ece>
- <https://rashidfaridi.com/2010/06/27/bishnoi-tribe-in-india/>
- <https://www.speakingtree.in/blog/29-principles-of-bishnoi-religion>
- http://indianbirds.in/pdfs/TB4.3_Sangha_SambharLake.pdf

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Plate 1: Staircase of Tanjore Temple (T.N.)



Plate 2: Elephants and lions at the base level of Kailasa Temple at Ellora Caves.



Plate 3: World Map prepared by Ibn Khaldun and his team.

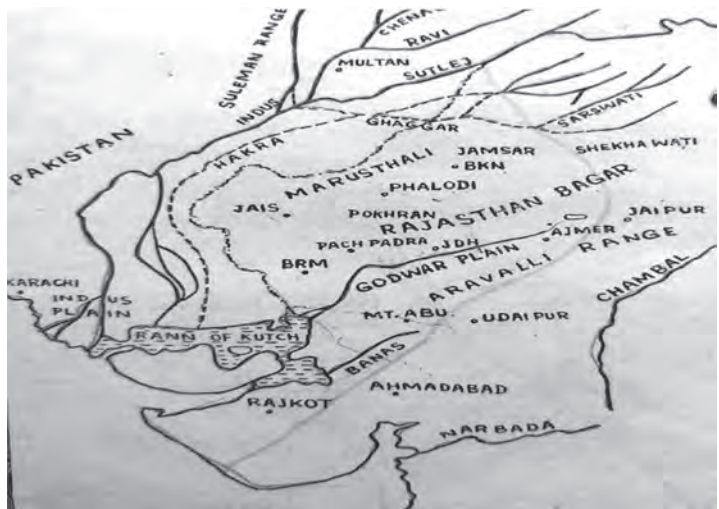


Plate 4: Map of Rajasthan

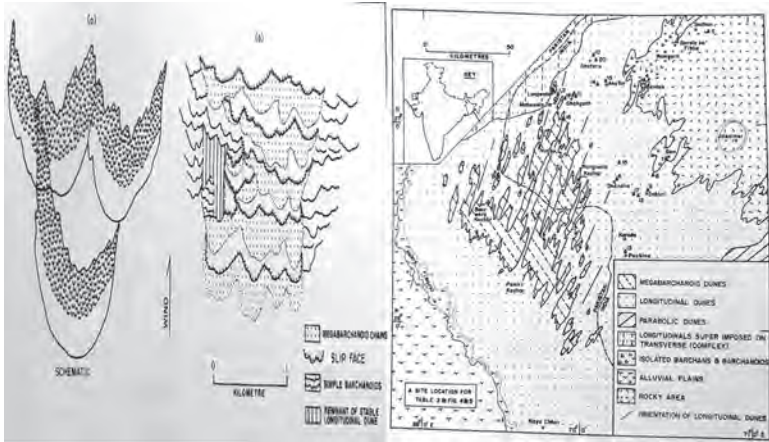


Plate 5: Arrangement of Dunes. Source: Amal Kar, 'Megabarchanoids of the Thar: Their Environment, Morphology and Relationship with Longitudinal Dunes', *The Geographical Journal*, vol. 156, No. 1 (Mar. 1990), pp. 51-61.



Plate 6: A waterbody at the foothill of Mehrangarh fort.
Photo by author.



Plate 7: Mayur Dwar at City Palace, Jaipur

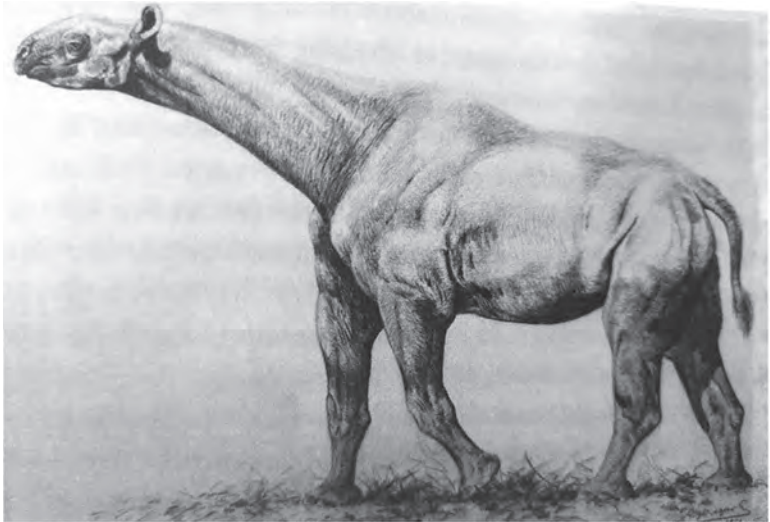


Plate 8: Paraceratherium-largest land mammal. Photo source: Pranay Lal, *Indica: A Deep Natural History of the Indian Subcontinent*, Allen Lane, an imprint of Penguin, Haryana, 2016.

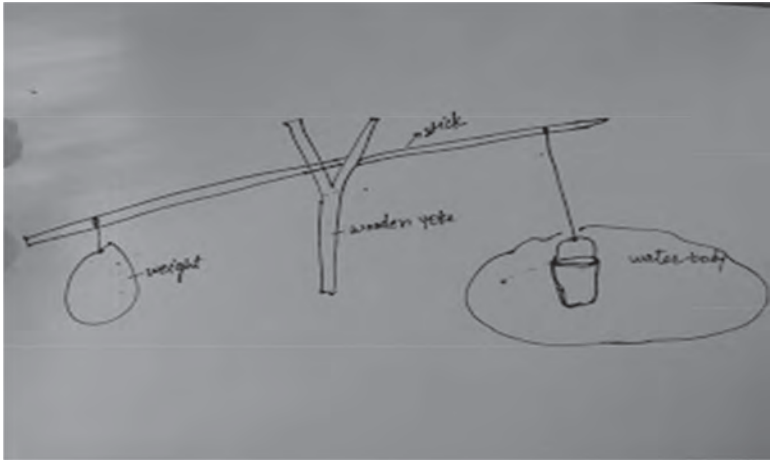


Plate 9: Sketch of *Chanch*. Prepared by author.



Plate 10: A temple in *thal*.



Plate-10: Gogaji carved on stone. Plate 10A: Ramdeo on a stone.



Plate 11: Bishnoi women breast feeding a fawn along with her child.
Credit: Himanshu Vyas.



Plate 12: Game collected at (Marwar) Jodhpur. Source: Adam, Lt. Col. Archibald, *The Western Rajputana States, a medico-topographical and general account of Marwar, Sirohi, Jaisalmir*, Junior Army and Navy Stores Limited, London, 1899.

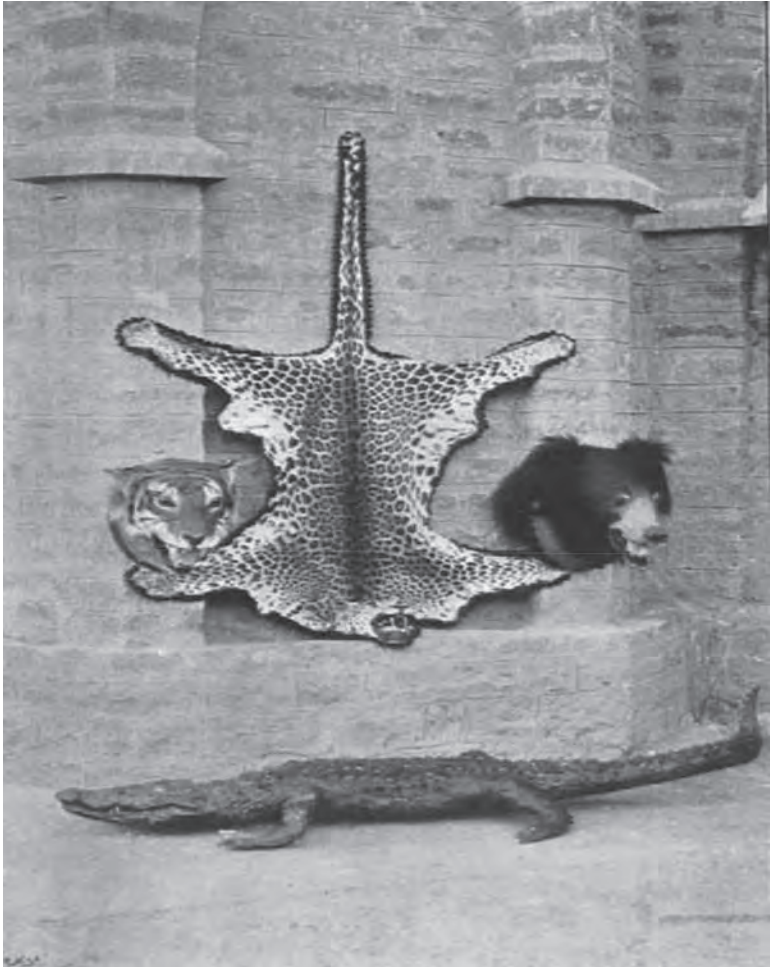


Plate 13: Big Game of Thar Desert. Source: Adam, Lt. Col. Archibald, *The Western Rajputana States: A Medico-Topographical and General Account of Marwar, Sirohi, Jaisalmir*, Junior Army and Navy Stores Limited, London, 1899.