

## ENVIRONMENTAL MANAGEMENT AND DETERIORATION IN THAR DESERT

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### ABSTRACT

*This study covers the area of Thar, which covers an area of 7478 sq. miles. Its height is 40 feet above sea level and population is 907000 (1998).*

*The area endowed, the plenty of sun shine therefore, there is high rate of temperature: 50°C highest temperature and favourable relative humidity, it's above 80%, which is reduced to 55% due to temperature in the interior. The rainfall varies about 26 to 36 inches. The average height of sand dunes is about 500 ft. above the sea level.*

*The desert is inhabited by nomads. This area is considered to be backward and this is due to extreme aridity and environmental hazards. It is suggested that necessary steps may be taken to manage environmental conditions.*

### INTRODUCTION

The word climate is derived from the Greek word *Kilma*; with refers to the angle of the sun above horizon.

About 12% of total land of Pakistan is arid, out of which Tharparkar covers 7478 sq. miles, (1968) of an area. The word Thar is derived from SANSKRIT language and means dry (barren) land. It is located between 13° degrees to 24 degrees north latitude and 5° degrees to 71 degrees longitude. Tharparkar is bounded on the north by Sanghar district, on the west by Mirpurkhas district, on the south by Rann of Kutch (India) and on the east by India.

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Its elevation is about 40 feet above sea level while its population is 907000 (according to the census report of 1998).

Climatically Tharparker is dry, with cool winter and hot summer. The annual temperature is about 42°C in summer recorded in 1952.

The region is endowed with plenty of sunshine and favorable temperature and humidity during rainy season. The precipitation is limited and occurs exclusively during the monsoon months of June to September, the low percolation rates 0.024% of rainfall.

Geographically Tharparker comprises of two distinct tracts; they are:

- a) Sandy (locally known as DHATT).
- b) Hilly (Regionally Parker).

It includes Nagerparker (The Karoonjhir hill), Tharparker consists of Mithi, Diplo, and Chhachhro talukas.

Ecologically Tharparker is divided into nine zones; every zone has its own peculiarity. It has the following main zones:

1. Dhatt
2. Kayanto
3. Khayar
4. Muhrano
5. Samrooti
6. Vingo
7. Vatt
8. Parker
9. Achho thar (local names)

**TABLE - 1**  
SHOWING ANNUAL RAINFALL OF THAR DESERT 1951-60 (IN INCHES)

1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Average
2.20	2.80	14.36	7.29	8.60	16.74	2.51	4.76	59.26	33.79	15.23

Source: *A Geography of Sindh Province, Pakistan by Mushtaq-ur-Rahman.*

The strong wind from the south –west and west south west blows over the Thar desert and runs up over Rujaputana desert (India) during March, April, May and June, with velocity of 40 miles / hour and it is apparently less violent as compared with day time. Eastern winds are dry since monsoon lost all its moisture, coming up from the Ganges valley and north and west mountain barriers that keep out surface wind.

The relative humidity is 80 %, which is reduced to 55 % due to temperature in the interior. This problem of the significance of climatic change in moldings landforms and controlling the operation of geomorphic process has been heightened in recent years because of widespread concern that deserts are expanding. Climatic classifications, the climate of Thar Desert is according to Koppen Bwhw\* (Arid hot winter dry) Trewarth BswH\*\* (Arid hot) and Thornwaite EA 'da'\*\*\* (Arid Mega)

**TABLE - 2**  
SHOWING ANNUAL RANGE OF CLIMATIC ELEMENTS IN THART DESERT

Temperature	Pressure	Day Humidity %	Rainfall	Actual Bright sun shine			
				Latitude	Per day	Year	Yearly %
14.5	1018	55	0.024%	40	9.2	3089.5	69.6

\* It shows the summer is hot and winter is dry.

\*\* It shows the climate of this region is aridity.

\*\*\* It shows that there is mostly arid condition in this region.

From centuries, the people of Thar relied aquifers of ground water recharging from monsoon rains intermitted with periods of drought. The average heights of sand dunes are about 500 feet (150 meters) above sea level. In the past, the Nara river was regarded as one, once it was the bed of either an independent river or of branch of the Indus, and afterward provided a channel whereby the annual floods from the over reaches of the Kori creek. When measures were taken to restrain the flood, drought succeeded and this vast land became inhabited only by nomad grazers. The course of Nara itself has been described as "a carpet of green grass".

**TABLE - 3**  
**SHOWING CLIMATIC EFFECT ON THE SOIL OF THAR**

Types of soil	Surface percentage	Subsoil percentage
Mechanical Analyses of soil: Thar Desert. Clay and finest	5.23	10.71
Fine silt	0.74	1.44
Medium silt	0.40	0.26
Coarse silt	1.93	2.24
Fine sand	30.41	25.12
Coarse sand	61.29	50.23

Frost is unknown, whilst 12<sup>0</sup> (F) (50<sup>0</sup> Centigrade) are the highest temperature recorded, and that has only been attained in one year. The rainfall varies, in 1899 a year of famine. In 1913 on the other hand 26 to 36 inches rain fell, and was maximum on record. Whenever the rainfall is recorded in last five decades the rainfall recorded in 1959 is 59 inches, which is the highest rate of the century, and 1960 rainfall on record is 33.79 inches. After that, no affective rainfall which is a record in history of rain in the Thar region (showing in Table - 1).

### CHANGING CLIMATIC CONDITIONS OF THAR DESERT

- Thar active fluvial has activity that derives its material by wind action on flood plain.
- Whenever rainfall increases and land covers vegetation, these bring great changes in geomorphologic process on the balance between wind and water and chemical and physical weathering process.
- Climatic change means the water action has been potent in the past periods of pluvial condition.

While desert rainfall totals are low, desert rainfall is highly variable over time, so that individual years may be quite high. This inter annual variability (v) can be expressed as a simple index.

$$\frac{\text{the mean deviation from the average}}{\text{average}} \times 100$$

TABLE - 4

## CLIMATIC APPENDIX OF THAR

## HEIGHT ABOVE SEA LEVEL 30M

Station	No. of years	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Temperature														
Av. daily max:	20	24	27	34	39	42	41	37	36	36	37	32	26	34
Av. daily min:	20	11	13	18	22	26	28	27	26	24	21	15	12	20
Absolute max:	10	31	40	43	45	48	50	44	42	44	45	40	36	50
Absolute min:	10	1	6	10	14	22	23	24	24	22	14	6	6	1
Av. Temp:		17	21	26	31	34	34	33	31	31	29	24	19	28
Av. Rainfall	Clino	4	5	1	2	4	6	69	44	15	8	1	3	157
Probability mth dry %	13-14	100	100	100	100	100	100	54	71	86	100	100	100	
Rainfall	-													
Dispersion														
Absolute min:	-	0	0	0	0	0	0	0	0	0	0	0	0	26
1 <sup>st</sup> quartile	-	0	0	0	0	0	0	2	10	0	0	0	0	78
Median	54	7	0	0	0	0	0	24	47	0	0	0	0	150
3 <sup>rd</sup> quartile	58	9	8	4	1	1	13	109	93	10	0	0	0	275
Absolute max:		49	55	92	86	56	91	402	300	145	10	48	17	537
Mean	-	6	7	5	3	4	12	71	67	16	0.3	2	1	193

Source: PAKISTAN (Book) by B.L.C. Johnson, Professor of Geography Australian National University, Canberra.

Notes: Clino stands for climatologically normal or long-term mean value.

## CLIMATE EFFECT ON ECO-BIOLOGICAL DIVERSITY

### FLORA AND FAUNA OF THAR

The common plants of Thar Desert area are: calliginum, pilygonoeides, calotropis, giganta, Prosopis (Local names are thuhar, phog, Ak, bush, khat, murat, kandi, bawri (Azatritch Bar, piple (ficus religious) and kiris are found. But phog was totally destroyed and thuhar is going to India Sarah, Jar, lai (Tamerix, gallica) and rohiro. In irrigated tracts Baber, Talhi, (Dalbergia, sisso) Nim were destroyed which is beneficial to the cattle e.g. goat. These are affected by unfavorable climatic condition.

### REPTILES

In desert, dangerous snakes viz khapar, cobra, plain, Lundy and other are found in rainy season to a great extent. Snakes especially in Nagarparkar, which track is highly extended with snakes, cause the large number of deaths.

The black scorpion is also found in Thar, and wolf was found in large number especially in Nagarparkar Karoojhir hill. But now-a-days these entirely disappeared due to dry climate.

### CLIMATE AFFECT ON CULTURE, OCCUPATION AND AGRICULTURE

Social and economic changes are possible in their habit of eating for vegetable meat or the diet. In this regard the factory - made biscuit tees may become popular. People used to eat. It may change the diet of people.

The agriculture of Thar depends upon rainfall; in this case rain is scantier. The rain usually falls from June to August. After 1950 due to most dry climatic condition of Thar, the rain is deficient. Some vegetables and water-melon (*citrullus vulgaris*) are produced in the district. The region has no rive, rain and other type of forest except of Range Land Forest of 230,324 acres.

It is observed that majority of population of Thar is living in rural area, hence their dress is not ostentatious but is of austerity. Knowing to creed, social position, there are two fundamental traditions of dress: Shalwar and Kmeez (shirt), in which color, texture, size and design are different according to ecological region. Weather conditions and socio-economic characteristics of the person are involved.

The settlements in the rural areas of the desert are very simple and to some extent similar with the huts found in Africa. The Tharis typical beehive-like-huts with pointed thatched roofs defines the skyline in Thar, called chullnru. These are built on mud-plastered platforms and the conical roofs are covered with scrub and grass. A narrow opening is left for entrance on a side. These huts remain cool in the desert blazing heating. In urban areas particularly at Mithi new buildings are cropping up between small dwellings and houses made out of wood, mud and stone. Due to the lack of rainfall outside the monsoon season, farmers in Thar have seldom produced more than one crop per year. From times immemorial, Tharis have migrated along with their animals to the barrage areas in the dry season, or in periods of drought, to work as farm hands. Resultantly this led to the introduction of a remittance economy in the desert and the mounting lack of interest in agriculture. Other than sale of live stock there are only limited opportunities for income generation in the desert and the ones that do exist are in carpet weaving and the production of handicrafts. Women also help in handcrafting skills from weaving rugs from goat and camel skin and for the extremely beautiful *rillis* that they embroider.

## CONCLUSION

Thar desert is facing a lot of environmental challenges; there is great contrast between kheer Thar, which too is arid. Thar desert cannot be called a typical desert; it is neither entirely barren, nor rainless; it is not completely uninhabitable; cattle vegetation still live in scanty of water. From the geographical point of view the

region is facing almost all the types of environmental hazards, like wise: earthquakes, deficiency of precipitation, and the most prominent environmental challenge is the spell of dry climate (drought). This factor is the main cause in the change in Ecobiological diversity in the region as well as has brought cultural change in the region. The house hold food security and farmers self-reliant are needed to be supportable; that is brought adequate reproductive in live stock in drought period. In this case natural resource should be provided. During Jamine, therefore, the appropriate help to pastoral and agricultural communities may recover quickly their natural hazards viz. drought, earth quakes etc. so, the economic activities may be ensured by establishing an independent and permanent national drought fund.

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