WATER SCARCITY IN THARPARKAR

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ABSTRACT

Tharparkar district is spread over 19,638 square kilometers and includes the ecological zones of Thar and Parkar. Administratively it is divided into four talukas-Mithi, Diplo, Chachro and Nagarparkar with a population of 9,14000 and density of 46.17 per square kilometer. However, the geo-physical fabric of Tharparkar features various ecological zones, which are different from the administrative set-up: Kha`ur, Kantho, Parker, Samroti, Vango, Vat, Muhrano and Dhat.

Rainfall pattern is not uniform, ranges from 50 mm to 300 mm mostly in the monsoon season. There happens a drought often every four to five years. Rapid growth in population of human as well as animals has exerted pressures on water sources. Only 47 percent of the population has access to the drinking water source, 76 per cent of women travel average 3 km for fetching the water and consume 52 per cent of their working hours.

Back ground-Ecological zones

For administrative purposes, district of Tharparkar is divided into four talukas. However, the geo-physical fabric of Tharparkar features various ecological zones, which are different from the administrative set-up. The ecological zones have their own particular characteristics, which are described in ancient histories and folklore. The natural mechanisms, which predispose the ecological setup also, determine human activity and behaviour. It is therefore easy to understand the basic logic beyond the classification of Tharparkar stipulated by folk wisdom of the area. For pastoral Tharis, Tharparkar is a vast domain with different patches of water, rainfall, temperature, vegetation and soil. To generalize crudely, they have denoted such as Kha`ur, Kantho, Parker, Samroti, Vango, Vat, Muhrano and Dhat.

Kha`ur is roughly spread over 300-400 Sq. Kms north to Chachro approaching Kheensar, Gaddro and the area adjacent to them. The deep-water aquifers are available here below 1200 feet. As a result of small sand dunes flows of runoff water does not approach the plains and therefore minimize the

opportunity for natural methods of collecting the surface water at large scale like in Traies or Tobha`s and smaller dia wells (varies) to tap seepage water. This backdrop also predisposes to less vegetation making a barren outlook of the sand dunes.

Kantho covers 250- 300 Sq. Kms ranging from Hirar union council in south of Chachro to Pillo, Tigusar Chotal and Mamchero union councils in north of Nagarparkar taluka. This zone is blessed with comparatively faviourable physical conditions with aquifer availability on 22- 200 feet, fair precipitation, fertile soil and seasonal vegetation. Thin fresh water layers and lenses often overlay brackish water. Wells of 3 to 4 feet dia found in this area.

Parkar is distinguished from rest of the Thar by presence of *Karoonjher* hills and rocky plains. The monsoon precipitation runoff concentrates in channels and some recharge of aquifer occurs from stream flows. The low depth (10-30 ft) dug wells recharged through such streams provide water for drinking purposes and in some instances irrigate the seasonal kitchen gardening. However, the option of exploiting rainwater by collecting and controlling the surface runoff becomes limited since potential evaporation rates generally exceed precipitation. Wells of 6 to 10 feet dia are found in Parkar.

Dhat forms central part of Thar covering a major portion of Chachro and northern areas of Mithi taluka. Above the main aquifer are up to four discontinuous perched aquifers tapped by many of the shallower dug wells when present. The surface runoff is limited; however, Tarais and Tabhas in low-lying strips provide drinking water following the rainfall.

Vat is a short belt extending from southern parts of Diplo and Mithi to the marsh of Kutch. The better runoff and greater permeability provide a natural substitute for drinking water by recharging the thin fresh water layers on the depth of 20 -50 ft. The surface water percolation associated with different lower aquifer permeability predisposes salinity and thereby contributes the process of silting and salinization along the marsh line.

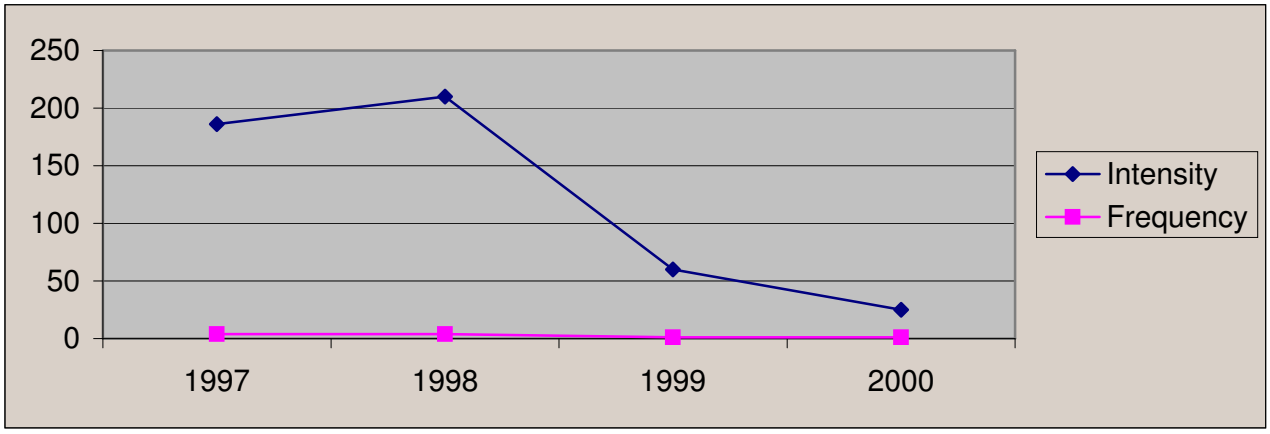
Samroti is a small zone with fertile soil and shallow wells extending from south- west of Mithi taluka to northern Diplo, approaching to Vango. The availability of water and fodder provide better opportunity to the inhabitants to tender large flocks of goats and sheep. The northern portion of samroti is characterized by less precipitation and recharging, resulting in seasonal dearth and lack of fodder. Some times this portion is termed as Vango.

Muhrano in ancient times was the name of area lying along with the shores of Mehran, when it used to flow across the eastern part of old Sindh.

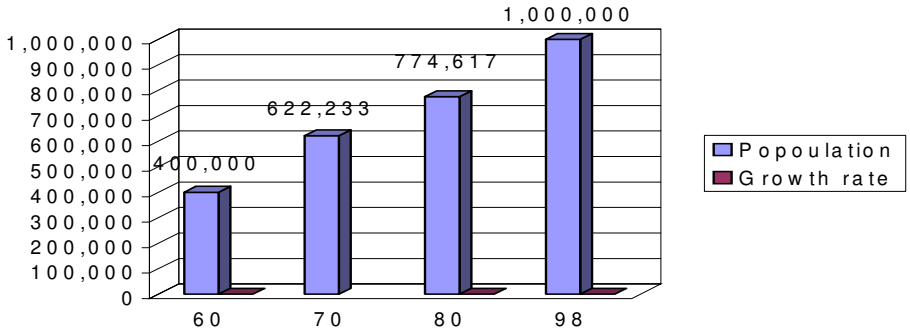
Nowadays Muhrano is a belt between the sandy dunes of Thar and plains of Indus. Centuries ago Mehran went away and did render the area to continuous suffering for water. The deep aquifer inaccessible by traditional methods and less precipitation inspire the inhabitants of Muhrano to innovate and explore the other options in order to survive. The need is there and innovation is continuous.

The pattern and scale of the rainfall

The pattern and scale of the rainfall in Tharparkar can be described in the framework of two parameters; the intensity and the frequency of rain. The rainfall in Tharparkar mostly occurs in monsoon season between June and September and varies between 50 to 300 mm. The main crops in the area are sown immediately after the rain mature in a spell of two to three months. Harvesting, stocking and marketing the crops along with feeding the animals in the grazing lands with dry grass for the rest of the year characterize the post monsoon season. Such a pattern of rainfall in that context also supports the range ands of the arid zone to grow seasonal grasses for the whole year. In addition, it also recharges the thin fresh-water layers and provides an opportunity for collecting the surface water in open ponds. Thus, such a pattern of seasonal calendar offers sole opportunity to the people of Thar for securing their subsistence of the whole year only in four months. This crucial period determines the economic security and social credibility for the people in the arid zone. The unpredictable rains normally vary with in frequency and intensity in terms of area and time. The pattern in the consecutive four years in the central part of Thar has varied between 50 to 186 mm in intensity and 1-5 in frequency. In 1997 the intensity was 186 mm and frequency recorded as 5 within four months from June to October. The frequency decreased in 1998 to 4 showers; however, the intensity was better at 210 mm on average. The year 2000 was distinguished as drought since there were only light showers intercepted with stormy winds in May 1999.



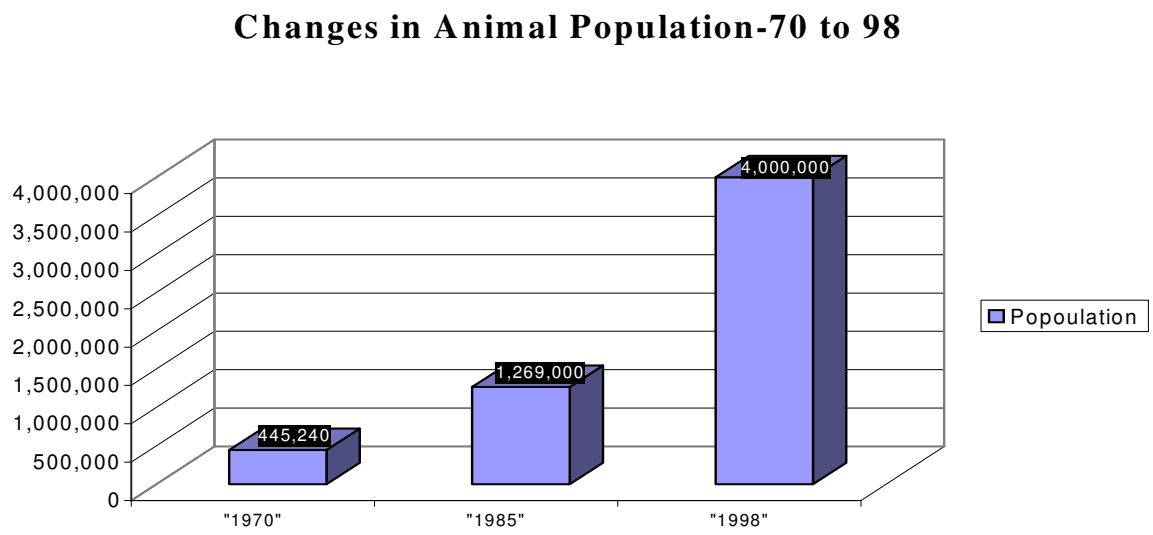
Human Population and Growth rate



Pressure On water sources due to demographic changes

A comparison of four decades from 60s to late 90s reveals a remarkable growth in the human population. In an arid zone with scarcity of livelihood options and limited water resources such a high population growth exerts pressure on sources; consequently, depletion of environment is expected outcome.

The national census- 98 reports the total population of Tharparkar as 907000 (round about 1 million) with growth rate of 3.08 per cent, spread over 19638 square kilometers. The population in 1961 was 396,993 that increased in 1981 to 774,617 at a rate of 4.75 per cent per year [1]. This shows that in 1960, 1 million liters a day at nominal rate of 25 liters per capita per day and in 1998 it increased to figure 25 million liters a day, it climbed 25 times just in 38 years of span against low rain fall.



The animal population has also been increased in relation to the human growth. The census-98 reports total animal population as 3,656,933, however, the animal husbandry department statistics records it as round about four million. The figure from the same department in 1976 reveals the animal population as 445,240 that increased to 1,268,960 by 1986 [1]. Average water requirement of cow in Thar is 57 liters a day and 7.5 liters a day for sheep or goat, it is found from data that in 1970 ratio of cows to goats and sheep was 1:1 and Thar was declared as main cattle region of Pakistan but it turned 1:6 in 1998, it shows that availability of water for animals is also a question.

Water Management in TharParkar and Water use Patterns

Water, in general, is a scare natural resource and drinking water sources are extremely important for the basic survival of human beings as well as livestock in this region. Further more, availability of portable water has its own special significance, as ground water in this region is mostly brackish and not favorable for human consumption. Droughts are quite common in Tharparkar and thus security of water resources assumes special attention. There are various use patterns of water resources like open wells, rain water reservoirs, house cisterns, hand pumps and tube wells.

Wells subsist almost in all villages and are used for both irrigation and drinking water extraction. Wells are usually privately- owned, but commonly –owned and Government-owned are also in place. Big Government –owned rainwater harvesting reservoirs are also found. Tube-wells and hand pumps are installed by Government and usually operated by respective departments but recently Thardeep Rural Development Programme has also installed tube-wells

and deep hand pumps for drinking water with community contribution and is operated by community.

For centuries, the people of Thar have relied on the aquifers of ground water recharging from monsoon rains intermittent with periods of drought. The donkey/ camel power, rubber inner tube fashioned buckets, dug wells and *varies* have been evolved as the indigenous state of art to sustain and rationalize the over exploited and scarce aquifers. There have also been innovations for 'small - scale water resource development' in the form of rainfall harvesting and runoff control. However, following physical facts always result in the acute shortage of water irrespective of the choice of source.

I. Precipitation is critically limited and occurs almost exclusively during the monsoon months of June to September usually with low intensity.
II. Potential evaporation rates exceed precipitation (the mean annual potential evapotranspiration is about five times mean annual precipitation) and open bodies of water experience high losses due to evaporation.
III. Low ground water recharge rates due to irregular precipitation, long period of drought, low percolation rates and non-availability of stream flows.
IV. High costs beyond reach of non-affording majority for developing wells in zones with aquifers at depth.
V. Private ownership of wells with a little choice to dispossessed for getting access in areas where drinking water is a serious problem.

Following data is based on study carried out in Tharparkar by Thardeep Rural Development Programme it shows that:

- 60 % of house holds wait more than one hour on wells for their turn,
- 30% house holds spend 30 rupees a day for two rubber-buckets of water,
- 85% house holds water users get water through camel/donkeys leather organized state.
- 25% households are getting water through buckets on camel/donkeys and 75% on women head.
- 47% of population has access to drinking water source.
- 76% of women travel average 3km for fetching the water.
- It consumes 52% of working hours.

CONCLUSION AND RECOMMENDATIONS

This conclusion is based on the understanding that water management is the key factor to secure the scare water resource in an area like Tharparkar. The study revealed that:

a) Tharparkar is a heterogeneous entity in terms of geophysical fabric.
b) Water resources are under greater pressure due to drought i.e. inappropriate recharging and too high population density.
c) The distribution of water i.e. from water resource to the household is not equal and same. It varies greatly in line with status, class of community and geographical distance.
d) Community participation is one of the factors in the process of designing, planning and sustaining water interventions at grass root level.
e) Women are good water-managers.
f) Hi-tech and sophisticated techniques may cause overexploitation of scare water resources and jeopardize the rationale use.
g) Different sources are available in different ways.
h) Private sectors are cost effective.

Therefore,

- Tharparkar needs to be considered as a composite of heterogeneous ecological zones. The planning and feasibility of water schemes would be different for different parts.

- Artificial ground water recharge assumes especial attention through check dams etc.

- Access of water should be made possible to all classes of community with common property rights.

- All interventions must be done with community participation to sustain the projects in long run.

- Women are needed to be encouraged to participate in all decisions levels for optimal use of resources.

- All the schemes/water interventions need to be design in a way that it can be affordable and accessible to community in terms of cost, maintenance, operation and social acceptance.

- Diversified projects may serve the purpose, rather than relying on one water resource.

- Private sector may be encouraged to support public departments in planning, designing and execution of water interventions.

REFERENCES

[1] Arif Hassan, Philippy Hffinck, Martin and Maureen"Assessment of drought 87"