A Comparison of Demographic, Social and Economic Conditions of Tharparkar with Canal Barrage Area Sindh (1988-2000): An Introduction

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A COMPARISON OF DEMOGRAPHIC, SOCIAL AND ECONOMIC CONDITIONS OF THARPARKAR WITH CANAL BARRAGE AREA SINDH (1988-2000): AN INTRODUCTION

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Abstract

This is study comparative study of Tharpakar with Barrage area Sindh and introductory chapter of the thesis of Ph.D submitted in 2002. In this chapter background of demographic, social and economic conditions are compared with each other. Purpose of the chapter was to give the complete picture of both areas for proper occlusions and recommendations for policy maker to get the Tharparkar better economically and socially. Mostly secondary data from reliable sources was given in this chapter. This study reveals that Thar is good only for livestock raiser and non-crops (Rangeland plantation). When we touch the educational side then we come to know that at the primary level education in barrage area is much better than Tharparkar. In Middle class and up to intermediate level education ratio of Tharparkar is much better than barrage area of Sindh province. At the graduate and postgraduate level barrage area is little higher in ratio than Tharparkar due to low facilities available in Tharparkar. The Minerals of Tharparkar may prove the better than barrage area. At the level of immediate measure for the development of Thar there is need of improvement of Rangeland, farmlands and races of livestock. The future of Thar is livestock with well-managed natural vegetation.

Keywords: comparative Study; Introductory; Demographic, Social and Economic Conditions; Livestock; Rangeland Plantation
JEL. Classification: d13;d1;h11;i38;j11;j21;j24;o47;p28q12;q15;

CHAPTER-1

INTRODUCTION

I. Thar at a Glance

A. Geography

I. Background

Actually Thar consists of: (i). Bahawalpur (ii). Judhpur (Indian state) (iii). Some parts of Jesalmer (Indian state) (iv). Obaro and Mirpur Mathelo talukas of district Sukkur (v). Eastern part of Khairpur (vi). Some parts of Khipro and Umerkot talukas and (vii). Present Tharparkar. (1)

This study is about present Tharparker, which consists of Mithi, Diplo, Chachro and Nagarparkar.

“Thar is a desert region in the southern part of Sindh province in Pakistan. “Thar” consists of a tract of small hills resembling the waves troubled sea, generally, running east and west and generally, higher in the western than eastern part of the district.

'The ’Parker’ is situated in south-east of Thar. Its length and breath are from north to south, twenty miles, and from east to west thirty miles. In Parkar, ranges of hills composed of hard rocks take the place of the small hills of the Thar. From the south, the Runn separates the Thar and Parker from Kutch.”(2)

“It mainly thrives on rains and it is saying that “Rains are blessing for Thar/desert else it is a fatal and daunting desert. Rains are the only source in the sand desert tract and it is rare, at intervals of 3-4 years and maximum rain fall is recorded up to 3 inches only, with the result that the local Tharies are always in the state of nomad tribes. Besides, uncertain fate, famine is inherited by Tharies. Under the aforesaid desperate local conditions and environments that Tharies have a courage and solitude to survive and meet such desperate conditions boldly as their fate."(3) 'This "aridzone district of Sindh remains one of the country’s disadvantaged regions. Indicators of health, education and other determinants of well-being are invariable at the bottom of national scale, sporadic and scanty rain fall, dwindled water resources, transient and incoherent grazing, and reliance on exploitative economy even for mundance needs are the permanent features of Thari livelihood. Except for substance live stock farming, there are strictly limited opportunities for income generation, barring a few occupations, e.g. Handicraft and carpet production that are more beneficial for the middle man than the actual producers. There are viable economic alternatives. It is common for individuals, as well as, for whole families to migrate to the irrigated area to labour on farms brick kilns at low wages, etc. Compounded by difficulties of access and communication, Tharparker’s economy is characterised by high population growth inspite of relatively high maternal and infant mortality rates. The hardships are further exacerbated by the migration of communities, decreasing socio-economic opportunities based on traditional practices, and above all, rapid and irrevocable deterioration of environmental resources that retains the very survivals of the population.

Tharparkar supports a population of one million spread over 2350 villages pressed on 19,638

square Kilometers. The live stock population is considerably high, i.e about four million heads (in 1993) as compared to the availability of feed resources which are hardly sufficient for half of the live stock population. The area is mainly covered by sand dunes with substantial natural vegetation. The annual rain fall varies from 100 to 300 mm. The rain fall is redoninantly monsoonal and occurs in July-Sept on an average of three moderate years out of each ten. Due to short span of monsoon and inconsistent rains, the agricultural activities are at the very substance level and at times they are at nadir. The dug well is the only source of drinking water in the area. The underground water is largely brackish with limited spots of sweet water. Thedepth of ground water wells ranges from 60 feet in the south-west to 300 feet in the north-east." (4)

"Position and conditions of Thar about income generating sources only those can know who have personally observed Thar. Strangers fell that how the Tharies live there, in such a desert and how they make both ends meet. Tharies are happy in such a condition. There are no big industries and sources of income generation in spite of that they say "who has given the peak, that will give the grain". God is great, he gives "a single grain for aunt and maund (40 kg) for elephant". Fulfilling the requirements of every body. Where there is will there is way. Whole year they are working because of that "Tied lion hunger too" with out moving hands nothing will fall from sky." (5) "Main sources of income is not only agriculture but live stock. There is a saying that "Thar depends upon animals not on crops ". So, for live stock meadows are necessary and every where they are called cow meadows (gauchaar)." (6) According to census report 1998 the population of Thar is 914,291 spread over area of 19,638 square kilometers.

Mostly income generating sources of Thar are livestock, agriculture, small industries, artwork, embroidery and business. Out of them 5.04 % government jobs and 72.96 % self employed, 0.10 auto-employee, 2.26 private employee, 0.39 employer and 17.24 are un-paid family helpers. This collected data is taken from census report 1998. For Thar rain is necessary. When we hear the word desert, it immediately comes to our mind that it is a desert, with no tree, absolutely no water, lacking natural resources and government facilities. But it is not true. In fact, it is an area having sandy heaps and hills running west to east which indicate that originally there was way for water flow in between two sandy heaps (hills). Area in between these heaps is flat on one place and also having very small heaps of sand at another place. This condition is formed by flow of sand due to stormy wind. At some places mud is also rarely found, and it is used by Tharies to make bricks and earthenwares. It is also used for mud plastering for Katcha house. There is also a kind of mud, which is used for burnt bricks and burnt earthen waves. The soil of Thar contains variety of plants in all seasons, whether it rains or not. If it rains the plants become fresh and green but if there is no rain the plant still retain their roots but not fresh as in rainy season. However, there are seasonal plants also which grow when it is rained and dry up at the end of the season. This season is called Vaskaro (monsoon season) by Tharies.

There are three categories of plants. Seasonal plants can remain green without rainfall. Even alternate year's rain is enough for their living and don't depend totally on rains. All plants except seasonal plants can remain alive for some years without rain. In some parts of Thar it rains after an interval of four years and these trees remain alive. In the season of monsoon one can see greenery everywhere and feel himself standing in the valley of Kashmir. But in drought and famine conditions, it gives a real desert look.

2. Boundaries of Thar Desert

"The Thar Desert of District Tharparkar, Sindh, Pakistan lies in the southeastern arid zone of Sindh. It is bounded on the eastern side by the border with India, in the north by district Khairpur (Now Umerkot district) and in the west by the district of Mirpurkhas and Badin. Tharparkar is comprised of the four administrative units (known as talukas) of Mithi, Nagarparkar, Diplo and Chachro and is further divided into union councils and deh (village clusters)." (7)

3. Climate

The district has a tropical desert climate. In summer, when it is too hot during daytime, the nights are remarkably cooler. April, May and June are the hottest months during the day. December, January and February are the coldest months. The mean maximum and minimum temperature during this period are 28°C and 9°C respectively.

There are wide fluctuations in the amount of rainfall from year to year and the yearly average for some areas is as low as 100 mm. Most of the rain falls between July and September, during the south -west monsoon, and is often concentrated in a period of two to three days. The mean maximum and minimum temperature and precipitation recorded at Chhor, is given below:

TABLE-1.1 MONTH WISE THIRTY YEAR'S MEAN MAXIMUM / MINIMUM TEMPERATURE, PRECIPITATION AND HUMIDITY

NAME OF DISTRICT: THARPARKAR STATION: CHHOR				
Month	Mean Temperature °C		precipitation	Relative
	Maximum	Minimum	(millimeters)	Humidity (%)
January	26.49	5.42	0.62	45.52
February	29.16	8.71	1.96	44.45
March	34.52	14.29	4.55	42.55
April	39.12	20.12	3.50	42.73
May	41.49	24.50	2.97	46.81
June	39.72	27.17	19.74	56.40
July	36.19	26.82	79.03	67.23
August	34.51	25.73	74.53	70.15
September	35.70	23.88	22.95	64.76
October	37.12	18.54	2.07	50.78
November	32.98	11.89	3.57	44.58
December	27.95	6.62	0.90	46.84
Annual	34.52	17.84	221.97	52.11

Source: Normals for the period 1961-90, Data Processing Center, Pakistan, and Meteorological Department Karachi.

4. Flora

A TREE OF RUNN OF KUTCH
http://www.tharparkar.sdnpk.org/pic/8.htm

"Since the district lies in al1 arid zone, therefore, sweet water is scarce throughout Thar. Drought recurs and usually there is no rain every third year. The soil is generally infertile because of severe wind erosion, over blown with sand. Vegetation consists of mostly stunted scrub and bush although trees such as the hardy kandi (propos ginerasia) do occasionally dot the landscape. Grasses, which are nutritive and a palatable fodder provide the main natural ground cover for the livestock.

The common plants of the desert are thuhar (euphorbia caducifolia), phog (calligonum polygonoeides), AK (calotropis gigantea). In irrigated tracts babur/babul (acacia nilotica), talhi (dalkagia sisoo), neem (azatriteha indica), jar (Salvadora oleoides) kri (tamarix gallica) are found. Some other plants are given in flora of barrage area.

'In pure sand calotropis procera (Ak) will predominate or Salvadora oleoides (Khabar). Some other plants grow on the sand dunes are:

i). Acacia arabica (babul/babur),	,
ii). Acura psedotomentosa (boor),	xvi). Aristolochia bracteata,
iii). Capparis aphylla (karur),	xvii). Aeura tomentosa (boh),
iv). Coredia rothii (liar),	xviii). Asparagus jacquemontii (Sather),
v). Crotalaria-burhaia (dranu)	xix). Aristida funiculeta,
vi). Euphorbia Caudicifolia (thuhar)	xx). Boerhaavia diffusa,
vii). Grewia populifolia (gangi),	xxi). Citrullus colocynthi
viii). Indigofeera codifolia (magar booti),	xxii). Cleome branchycaopra (dharamkhatri),
ix). Leptadnia spartium (khip),	xxiii). Cressa cretica,
x). Lycium barbarum,	xxiv). Cymbopogon jawarncusa (kathori),
xi). Prosopios spicigera (kandi),	xxv). Cyprus roundus (Nagar motha)
xii). Salvadora oleioides (pilo),	xxvi). Panicum targidm (mert) etc.'(reference 40)
xiii). Sericostama panciflorum,	xxvii) Hanzel/Tooma/Meho)
xiv). Zyzyphus rotundifolia (A littler thorny ber)	
xv). Alternathera nodiflora	

5. Fauna

Wild life has a significant correlation with greenery, verdure and forage. In congruence to the desert nature of the area, this district is blessed with beautiful species of birds and animals. Some times back wild ass, only of its kind in Pakistan were found roaming in Rann of Kutch area. However, the massive social changes in the district have not affected only the culture of the people but also the physical environment of the area. This change, in resultant has diminished and/or vanished many species of the wild life. Even today a number of animals found in the district, which includes chinkara (gazella benetti), desert fox (vulpes Griffithi), jackal (canis aureus), hyaena (hyaena striata) and mongoose (herpestcs).

Among birds the most famous is peacock (Pavo cristatus). The other birds found in the district are partridge (favncolinus pondocerianus menaesis), barn owl (tyto alba), Indian scoops owl (otus bakkamoena), Sindh night jar (caprimulgus mahrattensis), Indian night jar (caprimulgus asiaticus), dove (streptopelia senegalensis), large hawk cuckoo (hierococcyx sparverioides) particularly in Nagarparkar, spotted sand grouse (pterocles senegallus) particularly in Nagar parkar. Among water birds white stork (ciconia) and black ibris (pseudibis papillosia), in Chachro taluka are also in the district dangerous snakes viz. khapar, cobra and others are generally found in the rainy season to a great extent". (8)

B. Changes in Thar Between 1988-2000

1. Physical Changes

a). Demographic Changes

"The increase in the total population of Tharparkar between 1981 and 1991 has been worked out at the rate of 3.2 percents, which is Pakistan national average. The population of urban centre, it is worked out 4.4 percent, which is the average urban growth rate of the country. (Appendix --9: population of District Thar: Growth pattern). In this way the population of Thar has increased form 546000 to 747000 in total. Urban areas population has increased from 25,000 to 39,000. This is major increase and must certainty have put pressure on the desert's economy, given Thar's meagre resources and an enormous fall in the cultivated area in Thar since 1982-83 -1991. (Appendix -10: cultivated Area of Important Crops in Thar)." (9) As the pollution of people is increasing and population of livestock is also increasing which is four million heads in 1993 according to TRDP introduction (leaflet). Population of people is 9,10,686 according to figures of 1992 which is approximately 3.2% (per annum) increase in last ten years, and area of Thar is 21589 square kilomettters. (10) (Both figurs include some areas of Umerkot disrict). From above figures it is clear that population is increasing along with animal population so land and sources will decrease with above ratio and if it continued than there is need of search for the sources mostly for live stocks fodder and its other facilities which will lead Thar into industrial economy.

The population of Thar has increased from1981 to 1998 from 540,985 to 914,291 in area 19,638 square kilo meters .This is the increase at the annaul growth rate 3.13 percent according to Natinioal Census 1998. If the growth rate will remain same then in 2020 it will be double. (11)

Live stock population which was 3.88 millions in 1991 and in 1992 it was 4 millions, which has decreased upto 3.86 millions (38,56,328) in 1996 census.It decreases in growth rate by 0. 51% from 1991-1996, because of droughts and same are the coditions after 1996 to 2000. In 2000 drought animal poppulation has decreased, therefore projection will not be accurate but it will remain in betwwen 3.00 to 3.60 millions approximately.

b). Conditions of Human Settlements

"According to TRDP evaluation report 1993 ' major changes have taken place in the towns and villages of Thar since 1987. In the towns, such as Islamkot and Mithi, a large number of new shops have opened; old katcha (non-metalled) structures have been replaced by pacca (metalled) ones; and a fairly large number of shops and houses have been constructed through encroachments on government land by migrants from the rural areas. These encroachments have been informally promoted by government functionaries and are protected by them.

The shops in the town bazars have a larger volume and variety of city produced and imported consumer goods such as biscuits, soap, henna (hand coulring leaves), textiles, ready-made garments and medicines. An important addition is the availability of newspapers and magazines for sale, which in 1987 was non-existent. Shopkeepers informed the evaluation team that sale of factory produced food stuffs, such as tea, biscuits, ghee (butter oil), powdered milk, was fast increasing and that an increasing number of Tharis were taking to wearing ready-made garments, something very rare in the past. The changes in the physical nature of the bazars certainly pointed to this as well since there was an air of considerable affluence as compared to 1987-88.

However, the towns have become more unhygienic. There is still no sewerage system and almost all neighbourhoods have their cesspools which are increasing in size. The open drains are not maintained and the streets and opens spaces are littered with organic waste and polythene bags. An increase in the number of vehicles, and hence in the services sector to them, is also a major pollutant.

In the rural settlements the picture is not dissimilar. In all the villages visited a few of the residents (their number is increasing) have demolished their Thari huts and replaced them with semi-pacca (semi-cemented), or in some cases, with pacca (metalled) structures. Mud utensils, common in 1987, have to a considerable extent been replaced by aluminium, stainless steel and plastic ones. Most kumaras (potters) now work at other skills and many of them have migrated to the urban areas and have become richer than the higher caste agriculturists of their villages. In addition, a few village shops, non-existent in 1987-88, have come up.

What the future holds for the rural settlements can be seen at the Meghwar para (colony) at the Jogi Marhi village where a large number of pacca (metalled) houses have been built in the last 5 years. Their construction has been financed from remittances from the barrage areas and urban centres and from the wages of children working in the carpet trade." (12)

At this time in 2001 in all the big villages migrant are getting settled from rural villages, when they are settled at big villages or cities of Thar, they make their house better and replace old cultural huts. In Mithi, Chelhar, Diplo and Islamkot number of shops has increased and new rural people are settled over there. They have made their houses, better than previous. Mostly in big villages now a days lot of things which, were not available in 87-88, they are available e.g. eggs, milk etc. In Chelhar, milk is brought from Umerkot by buss. More fresh vegetable are also available in all big towns and villages which are on the route of transport. The standard of living has improved because of changes in thoughts. They accept that change in old thoughts is necessary and there is need of modern thoughts due to this they are more clean in thoughts as well as physically in settlements and them selves.

After the cyclone of 1994 most of the houses of taluka Chachro has demolished or got cracked and were unable for residence. After that much standard of houses has decrease. Every house holder has made a hut (chora) which is safe in rain. Now earth quake of 2001 has made destruction and mostly every house has got cracks and house are not fit for repaire and able for proper use as a safe house ,so every Thari is again making the atleast one hut (Chora) for the safety purpose in emergency in rain and earth quake.

2. Social Services and Civic Amenities

a). Sex and Age composition

(1). Sex ratio

The sex ratio (males per 100 females) of the district in 1998 is 120.6. The sex ratio in rural and urban areas varies at 121.03 and 112.0 respectively. The sex ratio widely differs at various age groups in the district. It is 137.58 at age group 0-4 and there after decrease gradually up to 128.75 at age group 10-14. It again comes down to

104.85 at age group 25-29, which further decline to 101.92 at age bracket 40-44. However, it rises up suddenly at age group 45-49 to 112.16, touches to 118.17 at age group 55-59, thereafter it shows irregular trend and ranges from 101.45 to 118.14 at advanced ages (60+). The fluctuation of sex ratio at various age brackets is the indications of un-even distribution of population, which may be impact of factors like age miss-reporting, comparative under/over reporting of either sex, etc.

(2). Age Composition

According to 1998 Census the population aged below 15 is 50.28 percent of the total population of the District. The percentage bellow 5 years is 18.21, which includes 2.65 percent infants. The population of 65 years and above is 3.73 percent. The proportion of working age groups; i.e. 15 to 64 years comes to 45.98 percent giving an age dependency ratio of 117.48 percent. This ratio is 126.31 and 107.70 percent for males and females respectively. There is a significant variation in the age dependency ratios in rural and at 119.23 percent as against 85.01 percent in urban areas.

TABLE-1.2 POPPULATION BY AGE SEX AND RURAL / URBAN AREAS 1998

	ALL AREAS			RURAL			URBAN		
Age	Both Sex	Male	Female	Both sex	Male	Female	Both sex	Male	Female
Less than one year	2.65	2.94	2.29	2.66	2.96	2.30	2.25	2.46	2.02
Less than 5 years	18.21	19.29	16.91	18.37	19.48	17.02	14.89	15.12	14.63
Less than 10 years	36.41	38.04	34.44	36.71	38.41	34.66	29.64	29.49	29.81
Less than 15 years	50.28	52.33	47.82	50.61	52.73	48.05	43.04	43.02	43.06
18 years and above	44.73	42.54	47.37	44.45	42.18	47.21	50.80	50.87	50.72
21 years and above	38.34	36.66	40.37	38.09	36.32	40.23	43.88	44.33	43.38
15-49 years	39.12	37.37	41.23	38.75	36.91	40.98	47.24	47.81	46.60
15-64 years	45.98	44.19	48.15	45.61	43.74	47.88	54.05	54.32	53.75
65 years and above	3.73	3.49	4.03	3.77	3.52	4.07	2.91	2.66	3.19
Age dependency ratio	117.48	126.31	107.70	119.23	128.61	108.85	85.01	84.10	86.04

Source: District census report of Tharparkar 1998, by population census organization, statistics division, government of Pakistan, Islamabad, September 1999.

The adult population 18 years and above is 44.73 percent for males and 47.37 percent for females. This percentage is 44.45 in rural and 50.80 in urban area. The population eligible to vote i.e. 21 years and above is 38.34, which varies in rural and urban area at 39.09 and 43.88 respectively. The percentage of population by important age groups, sex and rural / urban areas is given in table, figures reflects the age and sex structure of the district. In 2001 the eligible age for vote is 18 years and above.

The district has a broad based population pyramid indicating a high proportion of population under 5, which are 18.21 percent comprising 19.29 percent males and 16.91 percent females. Shape of the pyramid becomes narrower at the adult age groups and then went on to a thin peak showing a smaller proportion of population at advanced age groups.

b). Marital Status

All individuals aged 15 years and above enumerated in 1998 population census were classified according to their marital status, namely, "married", "never married", "widowed" and "divorced ". Out of them 22.53 percent are never married. 72.36 currently married, 5.07 widowed and negligible i.e. 0.04 percent as divorced. The never married amongst males are 28.45 percent, which is much higher than the females at 16.00 percent. This, differential is also reflected through the mean age at marriage, which is 22.46 years for males as compared to 19.34 years for females.

c). Literacy

Literacy in the 1998 Census is defined as the " ability to read a news paper or write a simple letter in any language, the literacy is measured in terms of literacy ratio and computed as percentage of literate persons among the population aged 10 years and above.

The literacy ratio of the district is 18.32 percent. The male literacy ratio is higher at 28.33 percent as compared to 6.91 percent for females in 1998. There are sharp differences in the literacy ratio by sex and area. The ratio in urban areas is 57.27 as compared to only 16.35 percent in rural areas. In rural areas male literacy is five times to female literacy ratio however in urban it is higher for males by 29.5 % points comparison to that for females. Table 1.3 gives literacy ration by sex and rural / urban residences for 1998.

TABLE-1.3 LITERCARY RATIO BY SEX AND RURAL / URBAN AREA 1998

Area	Both Sexes	Male	Female
All Areas	18.32	28.33	6.91
Rural	16.35	26.17	5.14
Urban	57.27	71.14	41.68

Source: District censuses report Tharparkar, 1998, by population census organization Statistics division government of Pakistan Islamabad September 1999.

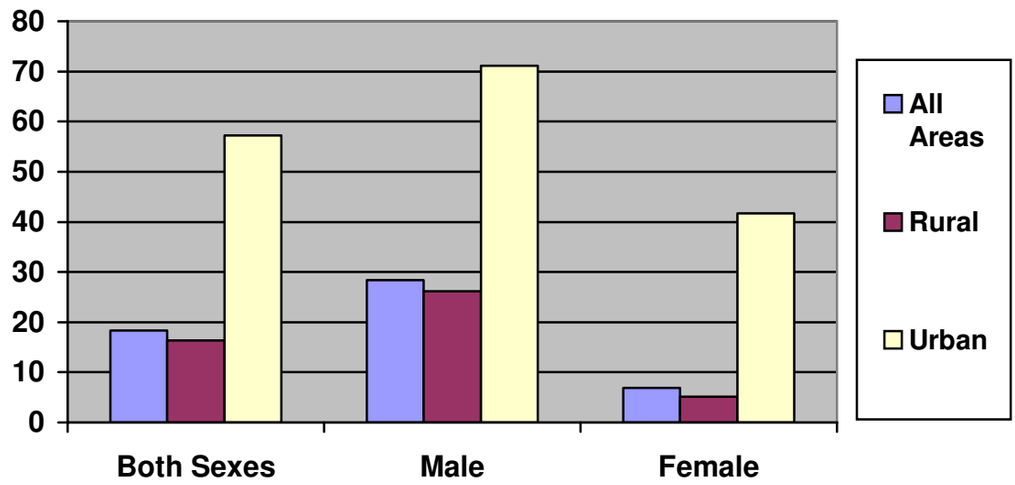

Chart- 1.1

d). Educational Attainments

The percentage of educated persons is 17.93 percent of the population aged 10 years and above, including those below primary. The remaining 82.07 percent either have attained no educational level or never attended any educational institution.

A large variation exists in the ratios of educated persons in rural and urban area as well as for males and females. The percentage of males is 27.89 and for female 6.57. It is 15.95 for rural as against 57.05 for urban areas. Table 1.4 gives the ratios of educated persons by sex and rural / urban areas of Pakistan Islamabad September 1999

A large variation exists in the ratios of educated persons in rural and urban area as well as for males and females. The percentage of males is 27.89 and for female 6.57. It is 15.95 for rural as against 57.05 for urban areas. Table 1.4 gives the ratios of educated persons by sex and rural / urban areas

TABLE -1.4 EDUCATED PERSONS AS PERCANTAGE OF POPULATION 10 YEARS AND ABOVE BY SEX AND RURAL URBAN AREA 1998

Area	Both Sexes	Male	Female
All Areas	17.93	27.89	6.57
Rural	15.95	25.72	4.80
Urban	57.05	70.99	41.37

Source: District censuses report Tharparkar, 1998, by population census organization statistics division government

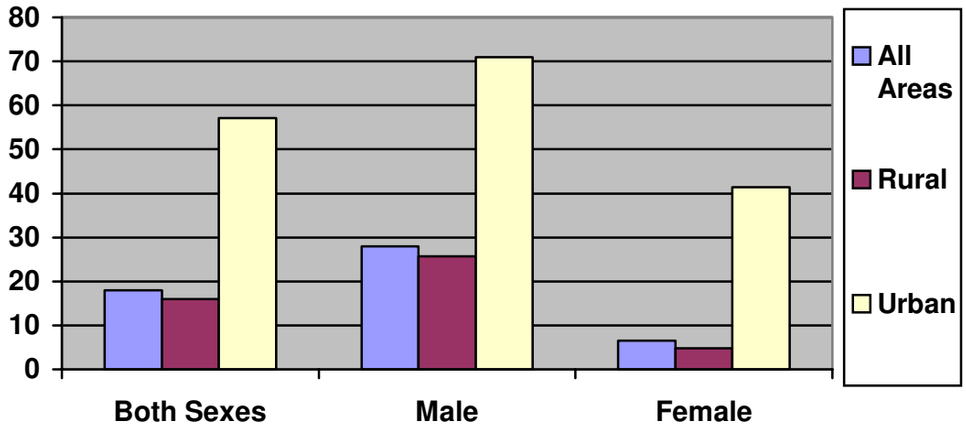

Chart- 1. 2

e). Enrolment Ratio

TABLE -1.5 ENRLOMENT RATIO BY SEX AND RURAL / URBAN AREA 1998

Area	Both Sexes	Male	Female
All Areas	12.56	16.64	7.56
Rural	11.19	15.21	6.24
Urban	42.95	49.95	35.25

Source: District censuses report Tharparkar, 1998, by population census organization statistics division government of Pakistan Islamabad September 1999.

The enrolment ratio measured as percentage of students to population of ages 5- 24 years of the district is 12.56. The enrolment ratio differs sharply from rural to urban areas as well as for males and females. It is higher for male's i.e. 16.64 percent as compared to 7.56 percent for females. The enrolment ratio is much higher in urban areas at 42.95 percent to only 11.19 percent in rural areas. There are also sharp differences between male and female enrolment ratio in rural and urban area. In rural areas the ratio of male is more than double to that of female whereas in urban areas it is higher at 49.95 percent for males as against 35.25 percent for females. Table 1.5 gives enrolment ratio by sex and rural / urban areas.

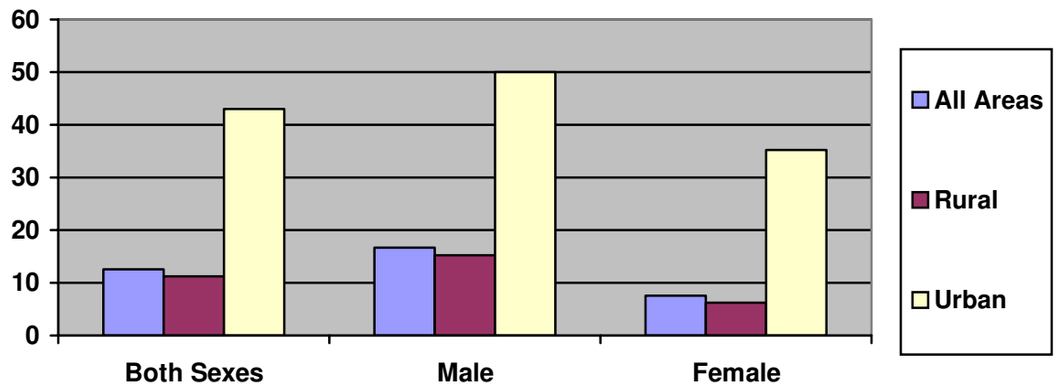

Chart- 1. 3

f). Education

"Between 1985-86 and 1990-91 there has been a major increase in the number of schools and

teachers in the 4 talukas of the Thar district (Appendix - 14: Educational Infrastructure in Thar District). However, there has not been a corresponding increase in the number of students, except for enrolment at the mosque schools. Since 1985-86, the number of female students at the primary level has increased from 1,854 to 6,923 in 1990-91. Although impressive in percentage terms, this figure constitutes no more than 9 percent of all school age going girls in the Thar district. In 1989, this figure was 7 percent.

In 1985-86, there were only 2 girls middle schools in the district. Now there are 7 . However, there are no girls middle schools in the Diplo and Nagar talukas. In addition, the girls high school at Diplo, which was operating in 1987, remains the only one in the whole district. The number of students at the school has fallen from 240 in 1985-86, to 131 in 1991-92. Due to the absence of girls high schools and an acute shortage of girls middle schools in the district, woman teachers and paramedical staff cannot be locally recruited. In addition, the absence of girls middle and high schools also means that the only way women can receive education is by going away from their village to a place where there is a school. This is simply not possible in the vast majority of cases and in the recent past, the law and order problems in the province have created an additional psychological barrier to girls moving away from their village or travelling. This is the reason given for the drop in the number of girl students at the high school in Diplo". (13)

The education department runs primary, middle and secondary schools. However, there are very few middle and high school facilities for girls. In addition, these facilities are available only at the taluka headquarters, which are not very easy to travel for the vast majority of students especially girls. Further there is lack of hostel facilities in the taluka headquarters for students from the countryside. Where schools are available an increasing number of lower caste Hindus and Muslims send their children to them.

A table showing number of institutions and students in the district for the year 1997-98 is as follows:

TABLE-1.6 NO. OF SCHOOLS AND ENROLMENT OF STUDENTS, 1997-98

Institution/Enrollment	Primary	Secondary	High	Degree
Number of Institution	2925	00 43	00 26	0 01
Number of Students	20701	5042	9192	864

Source: District censuses report Tharparkar, 1998, by population census organization statistics division government of Pakistan Islamabad September 1999.

g). Immunization

The question about immunization has been included in the 1998 Population Census for the first time to evaluate the vaccination programme launched by the Government from time to time. It is encouraging to note that 54.69 percent of the children below 10 years age have been reported as vaccinated with considerably higher percentage at 74.91 in urban areas. Those not vaccinated were 15.56 percent leaving the rest i.e. 29.75 percent as not known. The percentage of vaccination among male and female children is 30.54 and 24.16 respectively. Table 2.11 gives details of immunization by sex and area

TABLE-1.7 AREA, POPULATION BY SEX, SEX RATIO, POPULATION DENSITY, URBAN PROPORTION, HOUSELD SIZE AND ANNUAL GROWTH RATE

		Population							1981-98
Admn. Unit	Area (sq. Km)	Both sex	Male	Female	Sex ratio	Population density per sq. Km	Urban proportion	Average h.hold size	Population 1981	Average annual growth rate (% age)
.1	2.	3.	4.	5.	6.	7.	8.	9.	10.	11
Tharparkar district	19,638	914,291	499,859	414,432	120.6	46.6	4.4	5.6	540,985	3.13
Chachro Taluka	6,399	357,757	202,276	155,481	130.1	55.9		5.8	176,567	4.24
Diplo Taluka	4,037	161,880	87,013	74,867	116.2	40.1	6.0	5.5	105,428	2.55
Mithi Taluka	5,340	241,548	129,143	112,405	114.9	45.2	12.5	5.6	154.431	2.66
Nagarparkar Taluka	3,862	153,106	81,427	71,679	113.6	39.6		5.2	104,559	2.27

Source: District censuses report Tharparkar, 1998, by population census organization statistics division government of Pakistan Islamabad September 1999.

h). Situation of Livestock

Rangeland in the desert parts of Sindh represents the main source of livelihood for animal raisers especially the transhumants who are the only dominant group that exists in the deserts of Sindh.

Losses in terms of mortality and forced culling were observed in the order of 10% for cattle, 30 % for sheep and 20% for goats in the worst affected district of Sindh. Domestic production of sheep and goat milk is estimated in the field to be down by 70-80 percent in the worst affected areas. The prices of livestock have declined by 80% for cattle, 75% for sheep and 70 percent for goats. The remaining small ruminants in affected areas are very weak and have limited resistance to incidence of diseases. (14)

i). Water Supply/Source of Drinking Water

"Since 1987, SAZDA and PHED have developed a number of water schemes in the desert and an even larger number are in the process of being developed (Appendix - 11: Completed and Under Construction PHED Water Schemes in Thar; and Appendix - 12: Statement Showing List of Up to date Progress of ADP/SDP Schemes of SAZDA in Thar Region). The schemes consisting of tube wells and storage tanks have brought about considerable relief where the subsoil acquifer was not brackish. Here the consumption of water, according to the residents, has more than tripled. The SAZDA engineers consulted during the field trip were not aware if there was sufficient sweet water in the acquifer to sustain this rate of use. However, no arrangement for waste water disposal near the collection points has been developed, creating unhygienic conditions and wastage of valuable water which could be channelised for the drinking of animals, as is done at traditional hand dug wells.

FETCHING WATER IN THAR DISTRIC THARPARKAR
http://www.tharparkar.sdnpk.org/

So far the SAZDA tube well stations in the desert are well maintained and properly staffed. However, it is too early to tell whether such operation and maintenance (0 and M) can be sustained, given per capita diminishing finances (in real terms) for this activity; an increasing number of water schemes which will require O and M; no community participation in planning, management and financing of the projects; and local bodies that are technically and financially bankrupt.

In two areas where the subsoil acquifer is saline, SAZDA has installed solar desalinisation panels. The one at Vajoto was visited. It had not been functioning for over 40 days because of a minor defect in its pump. The procedure for having it repaired is long and complicated, and hence expensive. While it was in operation it provided 90 matkas (pitchrs) of water to the 3 villages nearby which partly met their needs. Three persons have been employed by SAZDA to look after the plant although one would have been sufficient. The village nearest to the plant has a resident teacher who says that the village can operate the plant and look after its day-to-day O and M at its own expense, provided no major break-down occurs. At present, subsoil water is supplied to the plant through a pump operated by an oil-fed generator. There is need to look into the possibility of using a windmill or a manually operated pump to reduce O and M technical inputs and costs.

SAZDA constructed concrete water tanks in the tarais (water pond). These, however, are not too popular with the villagers. They feel that they will silt up quickly and no one will desalt them since they feel it is SAZDA'S responsibility to do so. The concrete surfaces are of poor quality and will weather bodily, requiring frequent maintenance. In addition, the villagers feel that an additional well in the tarai (water ponds) would have been a better investment.

Harvesting water fo hard days

http://tharparkar.sdnpk.org/

In none of the areas visited, except where water was saline, did people complain of a shortage of water for drinking for humans or animals. In saline water areas , the SAZDA desalinisation plants were appreciated. However, in all areas people complained about the enormous human and animal labour involved in extracting water and were anxious that efficient hand pump or other mechanical means of extracting water should be set up on their existing wells."(15)

The water table depth is falling by 0.5 to 1.0 meter annually and has been affected further due to failure of rains in the last three years, resulting in poor water recharge. Rainfall in the monsoon months is the main source of water to support crop growth, rangeland, livestock and human population. Groundwater is limited and the failure of rains aggravated the situation further. Before the rains, people normally construct small ponds, which are either mud-plastered or cemented to store/conserve rainwater for domestic use and in some cases for animals. The size of these ponds varies from place to place. The stored water is available for a period of from 4 to 6 months.

" Vast" area, which starts from east of Taluka Diplo, ends up to Islamkot. It is
the belt near to Run Katchh. Village Manjhthi, some deh of Bhakuo, Kahri Tapa, and the belt passing near to Runn are called vat. In this area depth of sweet water is 30-40 feet. Near to Runn depth is 3/4 feet. In the season of monsoon the water of rain and sea side rise up in round about 4 miles .By this water small lakes and ditches become full with water and fresh fish also comes over their depending on the size of ponds, prevailing weather conditions and its use." (16)

"The quality of water is generally very poor and it ranges between 5,000 to 15,000 ppm. It is a chronic problem that has affected the soil since quite some time. Water with this salt load is neither fit for crops or for humans or livestock. Due to the continuous drought spell, range grasses, dried up completely. Growth of shrubs and other vegetation was also affected." (17)

The easy access to potable / safe drinking water is one of the basic human needs. According to 1998 Housing Census, the facility of piped water inside the house is quite negligible at 2.3 percent of the housing units in the district. The percentage for urban areas is 33.71 as against only 0.99 percent for rural areas. Availability of Hand pump as a source of drinking water is almost negligible in the District, which is used by only 2.1 percent of housing units. Use of well as inside source of drinking water has been reported as 4.44 percent of housing units. It is percentages are almost at par for urban rural areas at 4.84 and 4.42 of housing units respectively.

Important source of drinking water outside the houses in the rural and urban areas is well with 90.06

and 44.8 percents respectively as compared to the negligible percentages or remaining sources. Water source falling in the category of "Others" has been reported as 2.23 percent in the District. Table 1.8 provides percentage of housing units by source of drinking water by rural/ urban area". (18)

Marvi's Well Assassinated With Famous Folk of Umer Marvi
http://www.tharparkar.sdnpk.org/"

TABLE-1.8 HOUSING UNITS (PERCENTAGE) BY SOURCE OF DRINKING WATER, AND RURAL \URBAN, 1998

Source Of Drinking Water	All Areas	Rural	Urban
All Source	100	100	100
Inside			
Pipe (Nul)	2.3	0.99	33.71
Hand Pump	1.2	0.77	11.55
Well	4.44	4.42	4.84
Outside			
Pile (Nul	0.12	0.09	0.76
Hand pump	0.56	0.57	0.29
Well	88.24	90.06	44.8
Ponds	0.91	0.94	0.02
Others	2.23	2.15	4.04

Source: District census report, Tharparkar, 1998, compiled by population census organization, statistics division government of Pakistan Islamabad September 1999.

TABLE-1.9 NEW PROPOSED SCHEMES PACKAGE (FOR WATER) LONG TERM INVESTMENT PROGRAMME

No.	Water Sector	Project	Time Period	Remarks
1.	Constructing of 15 Nos Recharge	Rs. 24.950	12 months	Gabion-Dam in N.P.Kar area of Thar Region in Sindh Arid Zone
2.	Drinking Water Supply through Pipe line from Pokhan Dhoro to Surrounding villages (25 Kms)	Rs. 55.000	12 months	-Do-
3.	Drinking Water Supply through Pipe line from Parche-ji-Wari to Dudhrio (07 Kms)	Rs. 14.200	-Do-	-Do-
4.	Drinking Water Supply through Pipe line from Umerkot to Jalo-Chanro and adjoining village (70 Kms)	Rs. 161.000	24 months	-Do-
5.	Introduction of Drip Irrigation System in Thar and Kohistan Region	Rs. 10.000	12 months	-Do-
6.	Community Based cactus plantations in Arid Zone of Sindh	Rs. 15.000	36 months	-Do-
7.	Drilling/Installation of. 50 Nos Tube Wells Thar Region (Northern Thar)	Rs. 98.750	24 months	Concept Paper PC-I paper

	PC-I Prepared (through hired Rigs) 1990-93 Thar Region (Southern Thar) (through hired Rigs)			attached
8.	Drilling/Installation of 50 Nos Tube Wells in Thar Region (Southern Thar) (through hired Rigs)	Rs. 98.750	-Do-	-Do-
9.	Feasibility Study of Thar Canal	Rs. 10.000	12months	-Do-
	Total Millions	1,095,992		

Source: BRIEF ON THAR REGION District, Dehs, Villages, Population Affected, Livestock Affected Tharparkar, 159 (166)*. HYPERLINK http://www.un.org.pk/drought/Sindhreport.htm

j). Drainage

The PHED has a number of drainage schemes for Thar (Appendix - 13: On-Going PHED Drainage Schemes in Thar) both in the rural and urban settlements. These schemes consist of open surface drains that dispose into a cesspool. Existing open surface drains, both at Mithi and Islamkot, receive excreta from the toilets of people's houses and are garbage dumps. As such they are health hazards and require intensive maintenance to keep them operational. Underground sewerage lines do not cost more than surface water drains, are less of a health hazard and easier to maintain. In addition, it is not an expensive process to turn cespools into oxidisation ponds. The treated water can then be used for agricultural purposes. This issue was discussed with the notables of Islamkot, and they were of the opinion that there were farmers in Islamkot who would pay for using the 25,000 gallons per day of sullage generated by the town, for agricultural purposes. (19) Exept Mithi, Islamkot, Diplo and Chachro,there is no dranaige system.

k). Health Facilities

"Between 1987 and 1991, there has been a major increase in the GOS provided health facilities in Thar (Appendix - 15: Health Facilities in That District). In addition, the Mithi taluka hospital has been upgraded to a civil hospital, and as opposed to a total of 98 beds available in hospitals, RHCs and district council dispensaries in 987, there are 124 beds available today. Similarly, the number of doctors working at the health facilities has increased from 38 to 69. On the other hand, the number of nurses has increased only from 9 to 11 and the increase in the number of other para-medical and technical staff is not anywhere in relation to the increase in the number of doctors. These statistics do not indicate that there has been much of an improvement in the provision of health services to the Thar district.

However, immunisation coverage has increased in the Thar district from 0.2 - 4.8 percent in 1987 to 22 percent in 1989 to 34 percent in 1992. This is a major achievement.

There has been an increase in the number of private medical practitioners, some of them quacks, in the larger Thar settlements. They prescribe patent medicines and as such there has been, according to the shopkeers that stock these medicines, an over 200 percent increase in their import and use in the last 5 years.

There has been no visible hygiene related improvement in environmental conditions or the attitudes of people. If anything, the conditions in the larger settlements have deteriorated due to pressure of population, generation of solid waste and waste water, and a break up of the social structure."(20)

The health according to 1998 census report is as under:

The health department headed by the District Health Officer operates three taluka hospitals. There are also maternity homes and rural health centers. In addition, there are a large number of district council dispensaries in the desert.

The following table showing the medical facilities available in the district for the year 1997-98 is as follows:

TABLE-1.10 NO. OF GOVERNMENT HOSPITALS & DISPENSARIES 1997-98

Type		No.	Run By
1.	Civil Hospital	01	Provincial Government
2.	Hospitals	02	Provincial Government.
3.	Rural Health Centers	03	Provincial Government.
4.	Basic Health Units	21	Provincial Government

5.	Dispensaries	38	District Council
6.	Maternity Child Welfare Centers	02	Provincial Government.

Source: District censuses report Tharparkar, 1998, by population census organization statistics division government of Pakistan Islamabad, September, 1999.

"There is one hospital bed for every 7,000 people in Tharparkar district. According to the Sindh health department documents, the total number of beds in the district is 150 to cater to the needs of over one million people, which means every 7,190 people in this district are sharing one bed". (See hospital beds for barrage Reference 45))

l). Roads

"There had been no new roads completed in Thar since 1987-93 except for a 3 mile metalled stretch from Mithi to Chachro; a one mile metalled stretch from Mithi to Diplo; and a 2 mile brick paved road from Mithi to Islamkot (Appendix -16: Roads in the Thar District). The only effective metalled road in the desert remained the 32 mile stretch from Naukot to Mithi." (TRDP). (21)

At this time road (2001) from Mithi to Chelhar, Mithi to Diplo, Umerkot to Chelhar, Umerkot to Chachro, Chachro to Islamkot, and Islamkot to Mithi is completed and from Naukot to Chelhar is under construction. According to board of Revenue Sindh, government of Sindh (may, 2000) the long-term plan in Road Sectors on going schemes are given in the table-1.11.

TABLE-1.11 ROAD SECTOR ON-GOING SCHEMES: DISTRICT THAR AND UMERKOT

S.N	Name of Scheme	Cost in Million	Fund required for completion	Target of the Schemes during 2000-2001
.1.	Const: of Road from Umerkot to Chachro via Kantio (69kms)	200.38	62.766	100%
.2.	Const: of Road from Umerkot to Chachro via Ratnour (100kms)	108.217	100.856	100%
3.	. Const: of Road from Mithi to Islamkot (32kms)	94.881	21.000	100%
4.	. Const: of Road from Diplo to Islamkot (70k.kms	160.952	104.413	100%
5.	Const: of Road from Diplo to Ali Bunder (60 kms)	121.088	47.800	100%
	Total Rs.	685.518	RS. 336.835	

Source: BRIEF ON THAR REGION District, Dehs, Villages, population Affected, Livestock Affected. Tharparkar, 159 (166)* HYPERLINK http://www.un.org.pk/drought/Sindhreport.htm

By construction of the following new roads, it will create job opportunities for the people of the project areas, resulting in employment of manpower 999,000 man-months. This will also minimize the migration trend during drought condition and enhance the prosperity of the people.

TABLE-1.12 NEW ROAD SECTOR SCHEMES (DISTRICT THAR AND UMERKOT)		
S.NO. SCHEMES	TOTAL COST	PROJECT PERIOD
1. Const: of Road from Jalo-jo-Chaunro to Ratnour (31kms)	Rs. 93.00 Mil.	3 Years
2. Const: of Road from Chachro to Mubarak-jo-Tar (20kms)	Rs. 66.00 "	-do-
3. Const: of Road Chachro to Khensar (36 kms)	Rs. 118.00 "	-do-
4. Const: of Road Khensar to Ratnour (40 kms)	Rs. 132.00 "	-do-
5. Const: of Road Chachro to Ratnour via Virari (40 kms)	Rs. 132.00 "	-do-
6. Const: of Road Chelhar to Kantio (24 kms)	Rs. 79.00 "	-do-
7. Const: of Road Islamkot to Nagarparkar via Virawah (105 kms)	Rs. 244.00 "	5 years
8. Const: of Road Wango to Diplo via Khetlari (48 kms)	Rs. 158.00 "	3 years

9. Const: of Road Naukot to Dilpo (55 kms)	Rs. 181.00 "	3 Years
10. Const: of Road Chachro to Virawah via Dano Dhandal (110 kms)	Rs. 363.00 "	5 Years
TOTAL Kms 478	TOTAL: RS. 1,578.00 Millions	

Source: BRIEF ON THAR REGION District, Dehs, Villages, Population Affected, Livestock Affected, Tharparkar, 159 (166)*. HYPERLINK http://www.un.org.pk/drought/Sindhreport.htm

m). Electricity

"Seven grid stations for electricity have been provided in Thar at Umerkot, Chachro, Naukot, Mithi and Nabisar. Islamkot and Diplo. A grid station at Nagarparkar was to be completed in 1993 (but could not become completed and it is now completed in before 2000). The capacity of these grid stations is sufficient to meet the domestic and industrial demands of the Thar district for the forsetable future. However, Transmission and distribution systems have yet to be developed. At present, electricity is availabl;e only at the 4 taluka headquarters, Nabisar and the villages of Othabad and Saeen Usar (Appendix - 17: Capacity of WAPDA Grid Stations)". (22)

For electricity sccheme of Chelhar department had installed poles for completing the scheme but unfortunately the work has been left incomplete for reasons best known to senior WAPDA officials but it is not completed till March 2002.

Inhabitants inTharparkar District are not being provided electricity by WAPDA despite the fact that grid stations have been functioning at Mithi, Chachro, Islamkot and Diplo towns since the last couple of years.

In the past, WAPDA had sanctioned schemes for laying 11 kW feeder lines from Mithi to Chachro, Islamkot to Veenjhniari, Mithi to Posorko, Mithi to Bheemaneth and Chachro to Keetar. It had installed poles for completing some of these schemes, but unfortunately the work has been left incomplete for reasons best known to senior WAPDA officials.

Out of 2,350 villages in Thar, WAPDA has provided electricity to five villages: Sanyasar, Misri Memon, Phangario, Harchand Kolhi and Sokhru; while out of eight towns, it has provided electricity to only four: Mithi, Islamkot, Chachro and Diplo."(23)

n). Natural Environment

"In 1987, when the GOS, UNICEF and SCF assessment team visited the desert, the region was drought-stricken; whereas this visit was immediately after one of the heaviest monsoons Thar has experienced in over a decade. Therefore, it is not proper to compare the two situations. However, a number of changes have occurred in the attitudes of the Tharis towards their natural environment and especially towards trees.

In 1987, none of the notables (except one) of the drought afflicted population showed any major interest in tree plantation of reservation. There was a conviction that desertification could only be averted by adopting the agricultural techniques of the barrage areas and for that it was felt that there was sufficient subsoil water at depths that hand dug wells could not reach. This time the emphasis in all

SUN SET OF THAR
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conversations was on protecting trees and gowcher lands. In addition, in large tracks of the areas visited, local pacnchayat (local organization) of baras. (elders) had resorted their traditional roles of protecting and planting trees and of fining persons who felled trees without permission. However, this activity is only taking place in areas where the social structure is still somewhat intact, such as at Mithrio Soomra. In other areas, such as the village of Lunio (outside the Project Area), trees are cut with impunity, although the baras (elders) have tried to impose controls and fines; and at Juglar no attempt to protect trees in the gowchers (cow meadows) is being made.

Whereas on the one hand attempts to protect the trees are being made, on the other hand demand for fuel is leading to the felling of a large number of trees. Previously people used timber from their own farmlands or from small shrubs in the gowchers (cow meadows) as fuel. However, an increasing number of people collect it and supply it sell it at the stalls in the urban settlements. The quantity of timber being used as fuel has increased due to the pressure of population and to a change in eating and cooking habits among an increasing number of Tharis. Previously a normal Thari meal consisted of millet bread and yoghurt. Now an increasing number of people have taken to cooking vegetable curries on the pattern of the barrage areas.

Similarly, while the district administration has discontinued its policy of giving out gowchers (cow meadows) land on lease, the villagers insist that encroachment on gowcher lands for agricultural purposes continues. In the village of Jogi Murhi the residents insist that the gowchers (cow meadows) land had been reduced from about 3,000 acres to less than 150 acres in a period of thirty years and that every variety of tree is felled and used for fuel purposes.

There seems to be considerable weight in what the villagers say because although the cropped area has fallen in the Thar district between 1988-89 and '1990-91, the cultivated area has increased by 11.37 percent in spite of government policy and the fact that Thar has suffered from major droughts for the past 8 years (Appendix - 18: Cultivated Versus Corpopped Area in Thar 1988-91).(24) The district has no Riverine and other type of forest except of rangeland forest of 230,324 acre (Internet).

o). Housing Facilities

(1). Construction Material of Roofs

In rural areas, wood/ bamboo had been the major construction material used for roofs by 92.6 percent, which was much higher as a percentage in comparison to 46.42 percents in urban area. In contrast cement/ iron sheet have been the major construction material used for roofs in urban areas, which is as low as 4.42 percent in rural areas. The use of bonded material with RCC/RDC for construction of roofs in urban areas is also higher at 17.4 percent against only 1.41 percent in rural areas. A percentage of 7.55 housing units have used unspecified category of material for the construction of roofs in urban areas of the district. Table -1.13 details of material used in

construction of roof.

TABLE-1.13 MATERIAL USED IN ROOFS (PERCENTAGE BY RURAL / URBAN 1998

Area	All Areas	Rural	Urban
All Categories	100	100	100
Rcc/Rbc	2.05	1.41	17.4
Cement/Iron Sheet	5.4	4.42	28.63
Wood/Bamboo	90.75	92.6	46.42
Others	1.8	1.56	7.55

Source: District censuses report Tharparkar, 1998, by population census organization statistics division government of Pakistan Islamabad September 1999.

(2). Cooking Fuel Used

Around 96 percent of the housing units in the district use wood as cooking fuel, the percentages of which are almost at par in rural at 95.77 and 93.93 percents in urban areas. Only 3.48 percent housing units use kerosene oil 3.51 in rural and 2.65 in urban areas, Table 1.14 provides percentage of housing units by source of cooking fuel used.

TABLE- 1.14 HOUSING UNITS (PERCENTAGE) BY SOURCE OF COOKING FUEL USED BY RURAL / URBAN, 1998.

Cooking Fuel Used	All Areas	Rural	Urban
All Sources	100	100	100
Wood	95.69	95.77	93.93
Kerosene Oil	3.48	3.51	2.65
Gas	0.48	0.41	2.17
Others	0.35	0.31	1.25

Source: District censuses report Tharparkar, 1998, by Population census organization statistics division government of Pakistan Islamabad September 1999.

(3). Availability of Separate Kitchen, Bathroom and Latrine Facilities.

Around 52 percent housing units in the district have shared kitchen. The percentage of 52.71 of shared kitchen in rural areas is twice as compared to 25.85 percent in urban areas. Facility of separate kitchen has been reported as 28.52 percent in the district, 27.41 percent in rural areas and at 55.08 percent in urban areas. None of the kitchen facility is reported at 19.85 percent housing units in the district with almost same percentages for rural and urban areas.

Separate bathroom facility is available to 41.31 percentages of housing units in the district with 40.98 and 48.99 percents in rural and urban areas respectively. However, 42.04 percent housing units have reported that none of the bathroom facility is available in the district. The percentage of shared bathroom with 25.09 is also higher in urban areas as compared to 16.3 percent in rural areas.

TABLE -1.15 HOUSING UNITS (PERCENTAGE) BY KITCHEN, BATH ROOM AND LATRINE FACILITIES BY RURAL/ URBAN, 1998

Housing Facilities	All Areas	Rural	Urban
Kitchen			
Separate	28.52	27.41	55.08
Shared	51.64	52.71	25.85
None	19.85	19.88	19.07
Bath Room			
Separate	41.31	40.98	48.99
Shared	16.66	16.3	25.09
None	42.04	42.71	25.92
Latrine			
Separate	15.52	14.3	44.59
Shared	6.55	5.87	22.96
None	77.93	79.83	32.46

Source: District censuses report Tharparkar, 1998, by population census organization statistics division government of Pakistan Islamabad September 1999.

Separate latrine facility is available to 15.52 percent housing units with 14.3 and 44.59 percents in rural and urban areas respectively. Only 6.55 percent housing units are using shared latrine facility, 5.87 percent in rural and 22.96 percent is urban areas. About 78 percent housing units, have reported none of the latrine facility

available in the district the figures of which are much higher at 79.83 percent in rural areas compared to 32.46 percent in urban areas.

p). Source of Lighting

The major source of lighting is kerosene oil, which is available to 92.46 percent to the housing units in the District. The percentage in rural areas is higher by more than three times at 95.05, in comparison to urban areas at 30.67 percent. The percentage of housing units using electricity is 6.75 in the District. Its use in urban area is much higher at 68.38 percent of housing units as compared to only 4.17 percent in rural areas Table-1.16 provide percentage of housing units by source of lighting.

TABLE -1.16 HOUSING UNITS (PERCENTAGE) BY SOURCE OF LIGHTING AND RURAL / URBAN 1998

Source	All Areas	Rural	Urban
All Sources	100	100	100
Electricity	6.75	4.17	68.38
Kerosene Oil	92.46	95.05	30.67
Others	0.79	0.79	0.95

Source: District censuses report Tharparkar, 1998, by population census organization statistics division government of Pakistan Islamabad September 1999.

q). Source of Information

TABLE-1.17 PERCENTAGE OF HOUSEHOLDS BY SOURSE OF INFORMATION AND RURAL / URBAN, 1998

Area	Total House Holds	TV	Radio	Newspapers
All Areas	163,147	2.68	11.88	6.84
Rural	156,591	1.97	11.03	5.55
Urban	6,556	19.62	32.18	37.68

Source: District censuses report Tharparkar, 1998, by population census organization, Statistics division, government of Pakistan, Islamabad, September 1999.

The question about source of information has been asked for the first time in the 1998 population Census to assess the media coverage. About 2.0 percent of the households in rural areas have access to television, 11.03 percent radio and 5.55 percent newspapers as a source of information. The coverage of media reached in urban area is relatively higher at 19.62 percent TV, 32.18 percent radio and 37.68 percent newspapers, respectively.

3. Economic Changes

a). Economically Active Population

Economically active population comprises the persons of either sex who are engaged in some work for pay or profit including un-paid family helpers as well as the un-paid persons, who are not working but looking for work as well as laid off, during the reference period. The economically active population of District is 21.71 percent of its total population and 37.14 percent of the population aged 10 years and above. The percentage of children bellow 10 years is 36.41 while 3.87 percent are students and 5.87 percent are others. Among the inactive population 31.24 percent are domestic workers including 27.95 percent housewife. The activity or participation rates, percentage of population by economic categories and unemployment rates are shown in table- 1.18 below:

TABLE-1.18 PERCENTAGE OF POPULATION BY ECONOMIC CATEGORIES, SEX AND RURAL / URBAN AREAS, 1998.

	All areas			Rural			Urban		
Economic category	Both	Male	Female	Both sex	Male	Female	Both sex	Male	Female
Labour force	21.71	36.72	3.61	21.64	36.53	3.63	23.30	41.15	3.32
Not in labour force	78.29	63.28	96.39	78.36	63.47	96.37	76.70	58.85	96.68
Children	36.41	38.04	34.44	36.71	38.41	34.66	29.64	29.49	29.81

Below 10 years									
Domestic workers	31.24	6.02	61.66	31.22	6.23	61.47	31.64	1.26	65.65
Students	3.87	6.92	0.20	3.51	6.27	0.16	11.86	21.55	1.01
All others	6.77	12.31	0.09	6.91	12.56	0.08	3.56	6.56	0.22
Unemployment rate	4.76	5.10	0.61	4.76	5.10	0.61	4.70	4.98	0.80
Labour force participation rate (refined)	34.14	59.27	5.51	34.20	59.31	5.55	33.12	58.36	4.73

Source: District censuses report Tharparkar, 1998, by population census organization, statistics division, government of Pakistan, Islamabad, September 1999.

The percentage of economically active population to the total population i.e. 21.71 is termed as crude activity or participation rate while the percentage among population aged 10 years and above is called refined activity or participation rate, which is 34.14 percent for the district.

The refined participation or activity rate has been used for analysis. There is a wide variation in the activity rates between males and female as it is 59.27 percent for males as compared to only 5.51 percent for female resulting in an overall low participation rate. The activity rates between rural/ urban areas slightly as it is 21.64 percent in rural area as against 23.30 percent in urban areas.

b). Employed Population by Occupations

Of the total employed population in the district, 76.97 percent is in the Major Occupation Group-6 Skilled Agriculture and Fishery Workers. The next higher occupation group, comprising 9.37 percent is of “elementary occupation, " followed by Craft and related trade Workers, constituting 5.135 percent and then Service workers and Shop and Market Sales Workers sharing 3.38 percent

The pattern of occupational status varies significantly between rural and urban areas. In rural areas, most of the employed persons, 79.96 percent are associated with Group-6 Skilled Agricultural and Fishery Workers followed by Elementary Occupation at 8.01 percent. In urban area, more than one third of the employed class 37.06 percent is engaged in ' elementary Occupation' followed by ' Services Workers and Shop and Market Sales Workers' at 18.69 percent and ' Skilled agriculture and Fisheries Workers' at 15.9 percent. (For groups classifications see Appendix-XII)

c). Employed Population by Industry

Half of the working population i.e. 73.15 percent is engaged in ' Agriculture, Forestry, Hunting and fishing' and remaining in non-agricultural industries. In rural areas the most important industry is " Agriculture, Forestry, Hunting and Fishing, which accounts for 75.85 percent. In urban areas 30.80 percent of the working population is associated with the Community, Social and personal Services' followed by 24.68 percent in activities not adequately defined.

d). Employed Population by Employment Status

Among the employed population 72.96 percent is self-employed, 4.26 percent working as private employees, 5.04 percent working as government and autonomous employee and 17.24 percent as unpaid family helper. Table-1.19 gives percentage of working population by employment status.

In rural area majority i.e. 73.74 percent is self-employed followed by 4.15 and 3.18 as government employee and private employees respectively. Almost 18 percent are unpaid family helpers. Similarly in urban areas 57.10 percent are self-employed followed by 23.26 percent government employees, 13.59 percent private employees and 4.74 percent unpaid family helpers.

TABLE -1.19 EMPLOYED POPULATION BY EMPLOYMENT STATUS, SEX AND RURAL/ URBAN AREAS, 1998.

	All areas			Rural			Urban		
Employment status	Both	Male	Female	Both sex	Male	Female	Both sex	Male	Female
All categories	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Self employed	72.96	75.27	45.87	73.74	76.02	47.11	57.10	60.11	17.12
Employee	5.04	5.15	3.79	4.15	4.33	1.55	23.26	20.84	55.41

(govt.)									
Employee (auto)	0.10	0.11	0.09	0.06	0.07	0.00	0.95	0.85	2.26
Employee (private)	4.26	4.58	0.54	3.81	4.09	0.49	13.59	14.48	1.78
Employer	0.39	0.42	0.01	0.39	0.42	0.00	0.36	0.36	0.32
Unpaid family helper	17.24	14.47	49.69	17.86	15.02	50.85	4.74	3.36	23.10

Source: District censuses report Tharparkar, 1998, by population census organization, statistics division, government of Pakistan, Islamabad, September 1999.

e). Un-Employment

The un-employment rate is the percentage of un-employed persons including those not working but looking for work and laid off to the total economically active population in the district. The un-employment rate of the District is 4.76 percent. It varies for males and females as well as for rural and urban areas. The unemployment rate for males is 5.10 and for female 0.61 percent. It is 4.76 percent in rural areas and 4.70 percent in urban areas. A visible sex differential appears regarding un-employment rates within and across the rural boundaries but with varying degree of percentage. (Table-1.18)

f). Transportation

"The most important indicator of social change in the Thar region is the increase in transport activity and its nature. In 1987, there were 3 jeep taxis in Thar. Today there are over 35 and they charge RS 500 per day. They claim that there is no shortage of business and there is room for more taxis. The taxi clients are all locals and often fodder, consumer items and Thari dairy products are transported in them.

There has been no addition to the number of GMCs playing on the katcha (non-metalloid)roads in Thar and nor have any new routes been developed. However, the number of trips on almost all the routes have more than doubled in the last 5 years and fares have increased by an average of 65 percent. Cost of maintaining and operating GMC has more than doubled. The operators feel that they can easily charge higher fares and people can afford to pay them, but this is forbidden by the government (Appendix - 19: GMCs at Naukot).

Discussions with GMS drivers indicate that an increasing number of animals are transported by GMCS was rare.' This study is from 1987-93. (25)

After that uptil 2001 more changes has come. At this time GMC vehicles are mostly converted into buses and transportation is more better than previous years. Direct buses are comig from Karachi, Hyderabad to Mithi and after each hour. At the same time fare is also less in Thar in these places where road is metalled e.g. from Mithi to Naukot, Diplo to Mithi, Mithi to Umerkot via Chelhar. It shows that standard has improved comparatively due to Pacca roads and transportation is becoming more comfortable due to buses, taxies, jeeps etc. Now a day taxies are also availbale in rural areas too and in futher more tranport is expected.

g). Service Sector To Transport

"According to evaluation of TRDP 1993 'workshops, spare part shops for vehicles, hotels and tea shops to serve the transport staff and passengers did not exit in the desert in 1987. Now there are over 40 such establishments in Mithi, and according to the shopkeepers, they have generated over 250 jobs. The average daily wage for such jobs is RS. 30. As kirpal, a waiter in a Mithi teashop put it, “before one had to go out of Thar to earn such a huge amount.”

At the Islamkot truck adda (Stand where staff stays) as well there was a feeling that as electricity was now easily available, welding facilities, lathe works and related activities would soon be established. Everyone at the adda felt that there was a need for such functions." (26)

After 1993 to 2001 more facilities are available. More number of hotels are there in Mithi ,Diplo,Islamkot, Kantio , Chelhar.and Chachro.

More estbalishments are over there comparateively. Even cycles are also in use in Mithi, diplo and Chelhar. In Mithi mechanics for auto and cycles are also available.

h). Carpet Industry

“There were carpet looms at more than 50 percent of the villages visited during the field trip. In all cases the weavers were children who had been trained by a local who had earlier received training at Islamkot when it used to be a major carpet manufacturing centre. According to the relatives of the children working at the

looms, their average earnings are Rs.700 per month. The number of looms is steadily increasing and about 80 percent of the boys who works on them come from the Meghwar community. For example, at the Jogri Marhi settlement there were 2 looms in 1987, 12 in 1988, and 41 in 1990. Over 80 persons work on these looms. In the Lunio settlement, outside the TRDP PA, there are 10 looms with 30 children working on them. The hour of work vary between 10 and 14 per day and the conditions of work are unhealthy because of a lack of light and cross ventilation.

Families whose children are working on the looms, have lost interest in agriculture and the children are quite definite that they will not be agriculturists. In addition, these families are distinctly more affluent than their neighbours.

The looms are all owned by entrepreneurs and middlemen from the urban areas of Thar. Initially, they were installed in the urban settlements, where the children were brought from the rural areas and lived in large groups in one room with grown-ups. Many of them became drug addicts and alcoholics. The move to the villages was made because it cut the middleman's overhead costs and made this activity a more low prolife one, thus reducing government and public awareness concerning it and interference in it." (27)

All above report is upto1993.(TRDP). Carpet manufacturing has decreased since 1993 -1999. Due to low rates, advances problems which middle man were not giving and if giving then not making justice to children by cutting the wages and doing injustice in calculation of wages. People searched after getting low rate of it and started to move to cities of the province eg. Karachi, Hyderabad and other for labour and mostly young children are engaged in ready made garments and earning more than carpet. At present only few carpet manufacturing things are in Thar. Only few labours have taken the advance for bonded labour, but mostly labour is at salary basis and even on dialy wages too in some cases, so trend has changed, manufacturing had decreased.this work but now days, since 2000 it is again going to increase, due to export of carpets. According to survcey of TRDP and RASSTA Development Consultants, in their book in Sindhi " Rata Rang Komayal Bar " 1999 12% of children are working in carpet industry. Other workers are more than 14 years of age. (28)

At his time in 2001 it is observed that some middle man are coming directly to manufacturers and give suitable rates and they export it directly due to this industry is again getting encouragement.

i). Remittance Economy

"Since time 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 lands. This migration was primarily for feeding and watering their animals, selling their dairy products and surviving drought conditions. However, between 1987 and 1992 , and ever increasing number of Tharis are migrating to the urban areas outside Thar to work as masons, tailor masters in garment factories, domestic servants, labour in sugar factories, and as employees in government departments. They earn anything between Rs. 1,000 to 4,000 per month. Villagers claim that families who receive remittance money from the cities have lost interest in agriculture and in many cases let out their land to others rather than cultivate it themselves.

In Jogi Marhi there are over 15 persons working in the cities, most of them as tailor masters in garment factories or as masons, out of a population of about 800. Younger boys are being groomed to leave. Since only the meghwars in Thar possess artisanal skills, and their " low caste" status gives them greater mobility in a decaying social system, the vast majority of skilled out migrants belong to this caste.

In addition to this migration, the Thar elite have also abandoned the desert since 1987. They live in Karachi or Hyderabad with their families where they are engaged in business or "service" and visit the desert in "in season". Many Tharis have also established shops in the cities where they sell Thari handicrafts and employ Tharies as assistants. A number of such shop owners operate through middlemen in the desert, or themselves act as middlemen. According to the Islamkot shop owners there are at least 10-15 such operators in the Islamkot-Diplo area alone." (29)

After 1993 more Tharies have been migrated to barrage areas and cities, at this time major ratio of labour is working in cities as tailors. They are 4000-6000, but due to unestablished market over all in Pakistan this sector also is somewhat influenced. Inspite of that tailors are earning good and their standard of living has improved comparatively. At this time, people those who has, not livestock or business in Thar, depnend upon remittance economy, from barrage area and cities; and this trend is increasing day by day At this time every one who mostly come out from Thar even students and those who are in search of in government job, come forward and join the tailoring and face the drought conditions and pass their time and earn some thing more than those who are low paid government servants. One thing is in common that they waste their income living in cities due to lacke of awareness, mis-using the money and extra expenditure and give less money to home; inspite of that it is at this time better job for Tharis.

j). Increase in Animal Population

"There has been no livestock census in Thar since 1986. The census established a growth rate of 8.4 percent per year. The villagers feel that since 1987 the rate of growth has been much more as people, during the drought period, realised that animal were the only reliable source of income. The TRDP survey of the animal population in the TRDP, PA in 1989 and again in 1992 has established a 258 percent increase between 1989 and 1992. The major increase has been in cows (Appendix - 20: Livestock Population of Thar).

TABLE-1.20 LIVESTOCK POPULATION IN THARPARKAR DISTRICT-

	Livestock	1996 Number	1986 Number
1.	Cattle	0485137	0.55
2.	Buffaloes	0039842	0.19
3.	Goat	1970852	1.33
3.	Sheep	0898542	1.33
4.	Horse	00081320	0.003
5.	Mule	0000537	…..
6.	Camel	01030570	0.015
7.	Ass	0150834	0.020
8.	Domestic Poultry	0199395	
	Total 3.86 Millions	3,856,328	

Growth rate 198-1996 is 112.4%

Source: Livestock Census
In 1986 cencus was 3.43millions (Appendix-20)
In 1991 projected was 3.88 millions. (SAZDA SOURCE)
In 1993 projected was 4 00 millions (An Introduction To TRDP)
In 1996 Census was 3.86 millions (Live stock & Agri., census)
In 2001 projected is 3.00 to 3.47 millions (10 -20 % Loss)

LIVESTOCK OF THAR MEETS MAJOR REQUIREMENTS OF COUNTRY
http://www.tharparkar.sdnpk.org/

If this is true (and there is no reason why it should not be), then the rangeland to live stock ratio for Thar, which was already more than twice of what it should ideally have been in 1987, has gone up (it was 68 per 100 ha when it should be 30 per 100 ha). This means that if the desert has to generate animals, will have to be stall fed and many more trees will need to be planted

Many villagers feel that they could afford to stall feed their animals if there was a market for their dairy products, their animals and a cheaper source of fodder. They point out that the only saleable dairy product is ghee (butter oil), which middlemen buy from them at half the market price. Alternatively, they have to take small quantities of it themselves to the urban areas. The general feeling is that if roads could be constructed, fodder prices would fall and ghee and animal pieces would go up.

Most villagers who owned animals were certain that it was livestock that sustained them and not agricultural activity. It was pointed out, more than one, that a poor man was one who owned no cattle or goats. The valley of Nagarparkar is richer in vegetable growth, which support a large variety of livestock such as cattle, camels, goats and sheep. The table shows the number of livestock in the district is as follows:" (30)

k). Agricultural Activity

"Due to the long drought, agricultural activity in the desert has reduced considerably (Appendix - 21: Area of Important Crops Sown 1980-92). The more aware and vocal villagers feel that agriculture will not go back to the pre 1987 position as people have found alternative sources of income and have started considering it as a subsidiary activity. However, the older generation definitely feels otherwise and has a strong attachment to farming." (31)

TABLE-1.21 AREA, PRODUCTION AND AVERAGE YIELD OF CROPS IN 1997-98

Crop	Area (Acres)	production (Maunds)	
Cotton	3539	42468	Bales
Chilies	407	2442	
Sugarcane	3891	614765	
Wheat	6694	100,410	
Jowar	290990	872970 s	
Bajra	342584	685168	
Others	39,700	9,925	

Source: District censuses report Tharparkar, 1998, by population census organization, statistics division, government of Pakistan, Islamabad, September 1999.

"The district is poor in agriculture as it mostly depends upon rain and wells in Nagarparkar. The soil in Parkar is chiefly having the Dasar variety and yield good types of jowar and bajra (pennisetum typhoideum). A small portion, of the Nagarparkar taluka is not desert but consist of hills and the flat country surrounding them on which cultivation is carried on by confining, rain-water with bunds. Cotton (gossypium genus), Wheat (tritcum sativum). and other garden products are produced in it. The table showing area and production of major crops during 1997-98 is given intable-1.21." (32)

l). Irrigation

"Most of the land is arid and therefore the area is entirely dependent on rainfall. Jowar and bajra are the main crops grown on rainwater and in desert areas where there are no canals, the rains bring moisture to the land. There are seven barrages dehs in the district, which are irrigated by Mithrao canal."(33)

m). Horticulture

Some vegetables and watermelons (citrullus vulgaris) produced in the district for the year 1997-98, the production was as follows:

TABLE-1.22 AREA, PRODUCTION AND A VERAGE YIELD OF FRUITS, 1997-98

	Fruit/Vegetable	Area (Acres)	Production
1.	Water melon	161	1288
2.	Vegetable	3619	39190

Source: District censuses report Tharparkar, 1998, by Population census organization, statistics division, government of Pakistan, Islamabad, September 1999.

n). Artisanal Activity

"Artisanal activity in Thar has increased to cater to the city markets. It is entirely financed and managed by Thari middlemen and increasingly uses city produced raw materials. As a result, the production of khata (blanket) and kharal (wollen rugs) has fallen (in some areas they are not produced anymore), and that of shawls

has gone up .Thareis no longer make thread out of their wool but export in raw .The price of Thari wool has increased from RS. 10 per kg in 1987 to RS 25. Similarly, leather is no longer manufactured or worked in Thar in any substantial quality but hides and skins are sent to Karachi and Hyderabad in increasing numbers." (34)

o). Thar's Mineral Wealth

"The exploitation of Thar's mineral wealth has increased. Since 1987 granite is being extracted in Nagar, and according to transports, the volume of China clay being carried to Mirpurkhas has more than tripled in the last 3 years. However, the general feeling among all Tharis met during the field trip, is that this activity has not benefited the Tharies. The labour employed, both at the China clay and granite mines, is from other parts of Pakistan

It is rumoured that large deposits of coal have been discovered near Bhatian-ji-veri in Thar. Government geologists established camp in that area earlier in 1982 and conducted drilling operations. The people of the area do not believ that there are any coal deposits and, if there are, they sure that they, like to people near the granite mines in Nagar, will not benefit by them. The DC sees no possibility of coal extraction operations beginning in the near future". (35) The above described position is according to TRDP 93 evaluation.

Near to Rann of Katchh there are saltish places where salt can be extracted. There is no major industry in the district. Only one ice factory, five carpet industries and thirty-eight flourmills are available in the district. "At this time it is increasing.

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Karoonjhar Mountains

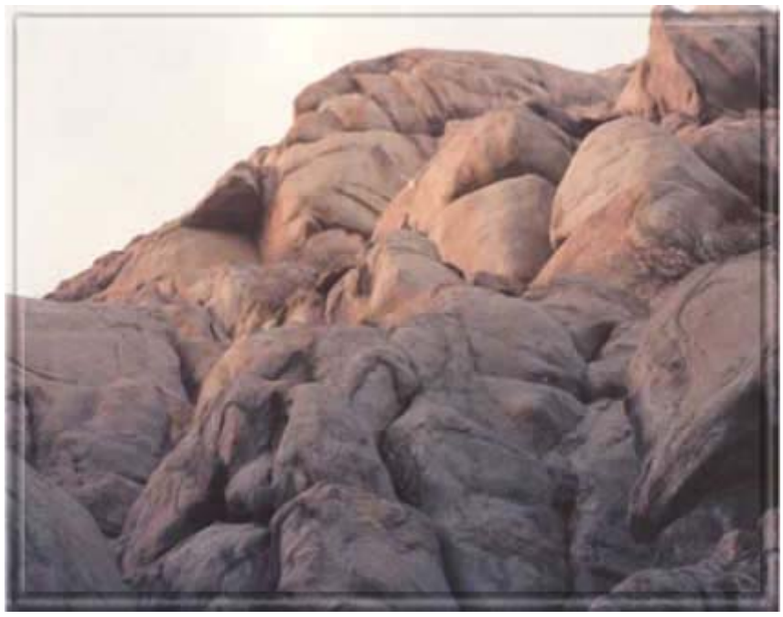
http://www.tharparkar.sdnpk.org/

Mining

"Sulphur deposits are found at Karoonjhar Hills in Nagar Parkar taluka besides granite stone and china clay. Coal deposits have been recovered at Warwai, a small village, near Islamkot. This is one of the 13 places in the district, where coal deposits have been found.

Granite

The Tharparkar district comprised in-exhaustible good quality granite deposits at Nagarparkar on Pak India border. Entire Karoonjhar Range of mountain is granite. Local mining companies are engaged in granite mining and polishing. There is a lot of potential for investment in granite mining and processing". (36)



KAROONJHAR HILLS AT NAGARPARKAR
http://www.tharparkar.sdnpk.org/

Thar Coal Deposits

Tharparkar district is spread over an area of around 20,000 square kilometers. Of this over 9,000 square kilometers is identified coalfield having estimated reserves of around 200 billion tones of good quality lignite, suitable for power generation. The coalfield is located at a distance of around 400 kilometers in north east of Karachi. Thar coal is being developed, as a fuel, especially for power generation, which is enough to meet fuel requirements of the country for centuries arid, would provide a sustainable and reliable power generation programme.

p). Debt Status

"80 percent of the Thari households in the PA are in debt to money lenders. 63 percent of households in Project Area have debts of more than Rs. 4,00 and 65 percent of Thari households in the Project Area pay 3 percent per month as interest on their debts. 75 percent of the households in debt have borrowed money for food and 25 percent for other needs. This situation was established by the TRDP base line survey of 1989. Since there is no previous survey or a survey after that date, the trends in debt cannot be ascertained. However, as average earnings according to the survey are only Rs. 4,954 per year, and about 46 percent of Tharis' is spent on food, there is no way that these debts can be repaid. According to the villagers spoken to during the field trip. The vast majority of these debts were incurred during the previous drought and only those persons who are working regularly in the cities or the barrage areas those whose children (more than one) work at the carpet looms, and those who can sell enough cattle can repay these debts."(37) Its primary data is given in the chapter methods and procedures.

According to survey of" Children working in Carpet Industry" in 1999, round about 81 percent are loaner; out of that 64 percent are able to pay the loan easily. Mostly people are able to pay loan upto Rs. 5000. Amount of loan is from 10-50 thousands as a averrage. Less then 10 percent families are able to pay more then 10 thousands. They are loaner in the following order:

(1). 2% NGOs
(2). 27% Money lenders
(3). 5% Contractors

(4). 7% Relatives
(5). 11%land Lord
(6). 12%Neighbours".(387)

q). Trade and Trade Centers

"The urban centers of Tharparkar and their markets though, have developed and expanded resultantly increased the mechanized transport, yet there is no central place of trade in the district

r). Postal and Telecommunication

The district is inter-connected with Postal and Telecommunication facilities. As requested by the office of Deputy Commissioner, Tharparkar there are 11 telephone exchanges and 3 post offices in 1997-98." (39)

II. SINDH AT A GLANCE (BARRAGE AREA)

A. Geography

1. Back Ground

"Pakistan consists of four provinces. Its second largest province is known as Sindh with its capital in Karachi, which is not only the most populous, metropolis of the country, but also, a commercial hub. The province of Sindh has two gigantic seaports and both are located in Karachi. The biggest international airport of Pakistan is also situation in Karachi and is widely known as Quid-e-Azam airport.

The province of Sindh forms the lower Indus basin and lies between 23 to 35 Degree and 28-30, north latitude and 66-42 and 71-1-degree east longitude. It is about 579 kms in length from north to south and nearly 442 kms in its extreme breadth (281 kms average). It covers 1,40,915 square kms and is about as large as England.

At the time of the independence from the British population in August 1947, the population of Sindh was estimated at 5.5 million. Today, after the passage of fifty years the population of the province stands around 40 million soul, (In census 1998-it is 30.4 millions) a half of whom now live in the urban centers like Hyderabad, Sukkur, Mirpurkhas, Tando Adam, Nawabshah, Larkana, Shikarpur, Khairpur, Badin and other smaller towns. It is basically an agrarian province. The Indus is by far the most important river of the province. The classical name of the river was Sindhu (Sanskrit for an ocean) and Sindh province was created and sustained by the river, without which it would have been a desert. Its length is about 2,880 kilometers and nearly a third of that (about 944 kms) traverses the province.

2. Boundaries

Sindh is bounded: on north by Blochistan and the Punjab, on the east by Rajhistan (India), on the south by the Runn of Kutch and the Arabian Sea and on the west by Lasbela and Kalat district of the province of Blochistan.

3. Climate

Owing to its prevalent aridity and the absence of the monsoons, the climate of Sindh ranks among the hottest and is most variable. The average temperature of the summer months is 35 degrees centigrade and those of inter months 16. But the thermometer frequently rises in summer to 45 and occasionally to50. In the northern part of Sindh the extremes of temperature are strongly marked. Jacobabad boasts of the highest temperature yet recorded at a Pakistan meteorological station i.e. 52 degrees centigrade in June 1919. Sehwan is another hot place while Hyderabad is on the average pleasant due to cool breeze". (40)

4. Flora

"Sindh lies on the borderland of tropical and extra tropical regions and on the path of north and south monsoon, but does not get benefited from both.

The dominant vegetation:

Therefore, is indicative of its hot and dry climate, which is composed of open communities of deciduous, and Zerophytic trees and shrubs.

The study of Sir Joseph Hooker and Thomson from the earlier work of Major Griffith, Major Vaccary and Dr. Stokes manifested that the Sindh soil and climate are suitable for those plants, which grow well in Africa, Arabia and Persia etc.

As regards distribution, it depends upon ecological plant association characteristics found in the different climatic zones of the region; however it is certain that any thing can grow in Indus loam. The growth, however, depends upon the quantity of water present and two or three subsidiary conditions. Along the banks of the Indus and its back water and canals Acacia arabica (babul/Babar) flourishes exceedingly, with the Tamarix diocia (lai) and Tamarix gallica (jhao) on sand banks and giant grasses where the forces of the current does not prevent them establishing themselves.

On plans annually inundated dense forest of Proposes spicigera (Kandi) and of tamarisk spring up, with great tussocks of Kanh grass. In the more arid plains and on the sand dunes a bushy growth is found, varying in character with the quantity of salt in the soil, if salt is abundant it will be salvadora persica, the leafless caper, tamarisk and many small fleshy-leafed plants of the Goose foot order.

Plants associated with Kohistan and hilly region are as follows:

i). Abutilon glaucum,
ii). Abutilon indicum (kapasawal/peeli Booti),
iii). Abutilon muticum,
iv). Acacia arabica (babul/babur),
v). Acacia Senegal (Kombhat),
vi). Aeura pseudotomentasa (boor),
vii). Aeura tomentosa (boh),
viii). Astragalus stocksii,
ix). Capparis aphylla (kirur),
x). Commiphora mukul (gugal/guggar),
xi). Cordia rothii (liar),
xii). Crotalaria burhia (dranu),
xiii). Daemia extansa,
xiv). Euphorbia candifolia (Thor),
xv). Grewia villosa (lanski),
xvi). Lycium barbatum (marira),
xvii). Mimosa hamata (lajwanti/ Choi moi),
xviii). Periploca aphylla (khap),
xix). Rhazya stricat (sewar/ sanoohar) etc.

Plants found in the hilly and rocky regions are:

i). Agarostis spp. Aristida scoparia,
ii). Cleome branchy carpa (dharam khatri),
iii). Euphorabia hirta,
iv). Kicksia incana,
v). Panicum turgidum (mert),
vi). Salvia aegyptiaca (tukhamran etc.

Plants of the gravel soil in the alluvial region are:

i). Acacia arabica (babul/babar),
ii). Acacia fernesiana (villayi kikar/ bawer),
iii). Acura tomentosa (boh),
iv). Alhagi Camelorum (oont katara),
v). Fagonia Cretica (damahoo),
vi) Heliotorpium europaeum (gidar tamako/ Oot charo),
vii). Euphorbia pilufera (kinriwal),
viii). Ricinus cammunis (arand/herun),
ix). Prosopis juliflora (Devi),
x). Cenchrus Cillaris (dhamun),
xi). Delonix regia (gul Mohar),
xii). Aristida mutabibis (lumb),
xiii). Boethavia diffusa (santoori) etc.

The biotic factor associated with human habitation combine to make the flora near villages' etc of especially distinct character. Thus plants found cultivated or wild near the villages in the alluvial tract are as follows:

i). Albizzia lebbeck (sirus),
ii). Azadirchta indica (neem),
iii). Cassia fistula (Amaltas),
iv). Casuarina equisetifolia (kazodina/villayat laoo),
v). Cardia myza (lasora),
vi). Eugenia Jumbolana (Jamun),
vii). Euphorbia triculli,
viii). Magnifera indica (Aam/Amb),
ix). Moringa petery gosperma)
x). Musa Sapientum (Banana),
xi). Parkinsonia Spp (kind of keekar),
xii). Pithicillobium dutce (jungle-jalebi),
xiii). Phoenix syslvestris (dates),
xiv). Prosopis Spicigera (Kandi),
xv). Ficus religiosa (pipal),
xvi). Ficus bengalensis (ber).
xvii). Acacia arabica (Babul/ Babur),

The region is also dotted with ditches and ponds, and seasonal lakes, which abound in plants of aquatic and semi-aquatic habits as follows:

i). Aponogeton Spp,
ii). Ceratophylum demersum,
iii). Coex aquetica,
iv). Convolvulus plunicaulis (gerani),
v). Phargmites Karka (ser),
vi). Ipomaea acquetica (morning glory) etc.

Herbal or medicinal plants found in the province are:

i). Stenogtia orientalus (mameccha),
ii). Tamarix orientalus (sakun),
iii). Anerticum glacum (Saupat),
iv). Solanum jacuinil (aderay-jo-denay),
v). Cocuslus villosus (zamir),
vii). Dhatura Alba (dhatura/thorn apple),
viii). Cassia absus (chawn),
ix). Salonum gracilipis (akhrai),
x). Euphorbia hirta,
xi). Euphorbia hypericifolia,
xii). Typha elephantine (elephant grass/ pan),
xiii). Rheum emodi (rhubarb/revind cheeni),
xiv). Anehusa officinalus) ratanjot) and
xvi). Solanumnigrum (mako).

Near the sea coat the following species are found:

i). Aburopus spp, cyperus spp,
ii). Echinochloa spp,
iii). Phragmites karka (nurua),
iv). Tamarix articulata (amreli or amir)
v). Salsola foetida and others.

The mangroves plants are also follows:

i). Aegiceras majus,
ii). Avicennia officinalis (timar),
iii). Brugiera gymnorhiza,
iv). Ceriops candolleana (chauri/ kirari)
v). Rhizophora mucronata (kumni) and
vi). Rhizophora conjugata.

5. Fauna

The geographical features of Sindh have influenced the distribution of the animal life. The rich plains, on either side of the Indus, flanked by the Kohistan, section of the barren KhirThar mountains, on the west and the sand/ desert belt stretching from Bahawalpur to the Rann of Kutch in the east, have created four main types of animal habitat, the mountains, the riverian plain, the Indus delta and the desert, each having some characteristic fauna. In some respects the fauna of Sindh differs widely from that of other parts of the Indo-Pakistan sub-continent, having members from the Palaeartic and Ethiopian Zoogeographical regions. While the animals peculiar to heavy forest and extensive jungle swamps are practically absent. Sindh is fairly rich in mammals, reptiles and birds, the latter consisting of a large number of seasonal migrants.

The seals, painted pottery and figurines of the period of old Indus Valley civilization depict local animal such as the two-horned rhonoceros, Indian elephant and tiger and thus provide clear evidence that the climate of the Indus at that time must have been moist, with plentiful vegetation, or these animals could not have survived. Early Arab travelers have also written about some animals of Sindh. Unfortunately, the graduals change to an arid climate particularly about A.D. 1000 and the encroachment of sand destroyed more and more of the remaining vegetation. This, coupled with bad agricultural practice during the 19th century and particularly the destruction of indigenous trees to make way for crops and, later, the overgrazing by flocks of goats and camels, burning and faulty irrigation have led to environmental changes. Upsetting the balance of nature and being unfavorable to animal life. The consequences of these destructive practices have vanished some of the animals and few are listed as endangered species.

Among the living forms of 73 mammals 20 belong to Carnivora, 20 to Chiroptera 4 to Insectivora, 15 to Rodentia, 9 to Ungulata, 4 to Cetacea and only one to Pholidota.

It seems the tiger once lived in the Indus riverine plans and the Rohri area was its stronghold. The tiger was shot in Sindh up to 1886. Among other important carnivores the panther (panthera pardus sundica), which once ranged widely in Sindh is now extinct. The fishing cat (fellis viverrina) found in Larkana, Mirpur Sakro and Indus delta area, becoming rare, the desert cat (felis silvestris ornata), the common jungle cat of Sindh (felis chausprateri), and the carcallynx (Felis Carcal Schimitzi) is also becoming rare, with its stronghold in the Thar desert. The Civet cat viverricula indica bengalensis) is fairly common around villages. The honey badger (Mellivora capensis indica) occurs in Sindh. The Hyaena (Hayena strisata) still occurs widely throughout the broken foothill country west of the Indus in Dadu and Larkana districts. In southern Sindh hyenas occurs around the Makli Hills and Khadeji just north of Karachi and also in desert areas adjacent to Rann of Kutch." (41)

B. Changes in Barrage Area Sindh between 1988-2000

1. Physical Changes

a). Demographic Problems

The population of Sindh Province in 1998 population census is 29,991, thousands and in 1981 census it was 19029 thousands. It is increased at the rate of 57.61 percent in next 17 years.

Increase in population in female in 47.95 and in male is 52.41 percent. Population of Sindh rural is 15,329,329 out of which 8,030,598 are male and 7,298,731 are female. Population of Sindh urban is 14,661,832 out of which 7,792,499 are male and 6,869,333 are female. (42)

Population of urban is increasing day by day major increase in population has put pressure on the economy of barrage area. Cultivated area is going to be decreased due to drought and scarcity or riverine water since last ten years. Population of livestock is also increasing which also put pressure on the economy of the area. As population is increasing and land remains same, so land and sources will decrease with the same ratio and if it will continue then there is need of search of sources for livestock fodder and its other facilities, which will lead area for prosperity

b). Condition of Human Settlements

Major changes have taken place in the towns and villages of Sindh since 1988 till 2000. In the cities and town such as Hyderabad, Nawabshah, Sukkur, Larkana, Shikarpur, Mirpurkhas and all others, large numbers of new shops and new houses have increased and standard of living is improved. Old pattern of Katcha houses is changed. Those who have come to cities and town have built their houses pacca and more wells than before. Most houses are made in encroachments, which are informally promoted by government functionaries and are protected by government officers. Mostly people have changed old cultural mud utensils, which were common in 1988. A lot of people are more interested to migrate from countryside to town and cities and search for alternative job of agriculture. Those who have come to cities and towns have become richer than those who were comparatively richer in village or who were their small landlords.

2. Social Services and Civic Amenities

a). Sex and Age Composition

The quality of age reporting in the province is not good enough which could be attributed to illiteracy, general ignorance about age and hesitation on the part of respondents to provide accurate ages particularly of females, young children and elderly people. As usual, there is concentration of population at certain age digits like 0,5 etc. the following table gives percentage distribution of population of Sindh by Sex and five year age group and sex ratio in respect of the last two censuses:

TABLE-1.23 SEX RATIO AND AGE COMPOSITION

AGE GROUP	1981	1998	19981			1998
	MALE	FEMLALE	MALE	FEMALE	SEX RATIO	
0-4	14.4	17.9	14.5	15.4	89.3	104.7
5-9	16.1	17.0	15.4	15.8	104.5	109.2
10-14	12.9	12.1	12.6	12.0	118.7	117.1
15-19	9.5	8.5	10.1	10.7	124.1	104.8
20.24	8.3	7.9	9.2	10.0	115.3	102.0
25-29	7.4	6.9	8.4	7.9	118.7	118.6
30-34	6.0	5.7	7.0	6.1	115.3	127.8
35-39	5.4	5.4	5.0	4.8	109.5	119.5
40-44	4.7	4.9	4.5	4.7	106.1	107.5
45-49	3.8	3.7	3.6	3.5	114.7	114.9
50-54	3.6	3.1	3.1	2.9	127.6	120.0
55-59	1.9	1.7	2.0	1.8	141.8	119.2
60-64	2.6	2.1	1.9	1.8	141.8	119.2
65-69	1.0	0.9	1.0	0.9	126.2	122.3
70-74	1.2	1.0	0.8	0.8	129.0	114.1
75+	1.2	1.2	0.9	0.9	114.2	111.0
All age groups	100	100	100	100	110.7	111.7

Source: Population and housing census 1998, by Population organization, statistics, division, government of Pakistan, Islamabad. (From Census Bulletin, Sindh-9)

The above table would reveal that population is relatively young as its proportion under 15 years age group both for males and females is large, through it has slightly declined in 1998 as compared to 1981. The middle age groups are showing proportional increase for age groups 15-19 to 30-34 and decline for age groups 35-39 to 50-54. Typically the age group 55-59 is showing marginal increase in its proportion. The proportion has again nominally declined for advanced age groups i.e. 60 and over.

The decline in the early age groups population proportion i.e. below 15 could be a positive sign of fertility decline, irrespective of the fact that child mortality might have also improved. However, it is still to be seen that the population has a great potential of growth during the coming period, as young people will grow into adults, a potential source of future births. As regards middle age groups the proportional variation could be attributed to carry over of the population, which was in the younger age groups in the last census. The decline in the proportion of population in advance age groups i.e. 60 and over could be due to relative over statement of ages and over enumeration in these ages groups in the last census or better reporting of ages and enumeration in the census.

The overall sex ratio (males for every 100 females) have increased to 111.7 in 1998 as compared to 110.7 in 1981, which is typical in the sense that it has increased for Pakistan, Punjab and NWFP. Similarly the sex ratio by 5 years age groups are also showing some typical trend in view of the fact sex ratio of age groups 30-34 to 45-49 have also increased, which could be due to errors of age reporting of either sex or coverage in 1981 or 1998. The dependency ratio has also improved to 83.5 percent in 1998, which was 93.9 percent in 1981.

b). Marital Status

The following table gives the comparative picture of marital status distribution of population of Sindh (15 years and above) by sex and rural/ urban areas for the 1981 and 1998 censuses.

From the above it would be observed that proportion of never married population has increased with corresponding decrease in the population proportion of currently married both for males as well as females from 1981 to 1998 census. It is however note worthy that increase in the proportion of never married and decrease in the

proportion of currently married is relatively higher for female. This might cause fertility decline in the long run in view of the fact that incidence of marriage has declined.

The overall divorced proportion is almost comparable during 1981 to 1998 censuses. As far as differentials for sex are concerned the level has gone up for females especially for urban females. The proportion of widowhood has decreased from 5.9 percent to 4.9 percent, which might be due to mortality decline. The proportion of widowhood is significantly higher in females in comparison to males, which might be due to re-marriage of males after widowhood.

TABLE- 1.24 MARITAL STATUS DISTRIBUTION OF POPULATION OF SINDH 9 15 YEARS AND ABOVE) BY SEX AND RURAL/ URBAN AREAS FOR THE 1981 AND 1998 CENSUSES.

MARITAL STATUS	1981			1998		
AREAS						
	Total	Rural	Urban	Total	Rural	Urban
Never Married						
Both Sexes	24.81	20.16	30.41	30.10	23.65	36.06
Male	31.94	28.01	36.48	35.05	28.80	40.54
Female	16.38	11.27	22.86	24.50	18.16	30.72
Currently Married						
Both Sexes	69.14	73.49	63.89	64.82	71.22	58.89
Male	65.25	69.10	60.80	62.32	68.22	57.14
Female	73.74	78.46	67.74	67.64	74.42	60.98
Widowed						
Both Sexes	5.90	6.21	5.53	4.90	5.01	4.80
Male	2.70	2.79	2.59	2.52	2.91	2.19
Female	9.69	10.10	9.18	7.59	7.25	7.92
Divorced						
Both Sexes	0.15	0.13	0.17	0.19	0.12	0.25
Male	0.12	0.11	0.13	0.11	0.08	0.14
Female	0.19	0.02	0.22	0.27	0.16	0.38

Source: Population and housing census 1998, by Population organization statistics division, and government of Pakistan Islamabad. (From Census Bulletin Sindh 9).

If we compare rural / urban differentials the percentage of never married is higher in urban areas both in 1981 and 1998 in contract to the proportion of currently married which is higher in rural areas. The widowed proportion is relatively higher in rural areas in contract to divorce, which is higher in urban areas. The marital status distribution in detail by age and sex is given in Table No.1.24 by which it would appear that number of never married is increasing at younger ages i.e. 15-19, 20-24 both for males as well females with a slight edge for males.

c). Literacy

The literacy in the 1998 Census defined as the ability of a person who can read a newspaper and write a simple letter, in any language. The literacy is measured in terms of literacy ratio and computed as percentages of literate persons among the population of 10 years and above.

The literacy ratio among the population aged 10 years and above of the province is 45.29 percent. It has significantly increased by 13.84 percentage points since 1981 when it was 31.45 percent. It is much higher for male's i.e. 54.50 compared to 34.78 percent for females. There are sharp differences in the literacy ratios of rural areas. There is also a wide variation between male and female literacy ratios in both the areas. In rural areas the ratio of female to male literacy is 1 to 3 and in the urban areas it is 1 to 1.2. Table-1.25 gives literacy ratio by sex and rural / urban residence for the years 1981 and 1998.

TABLE -1.25 LITERACY RATIO BY SEX AND RURAL/URBAN AREAS, 1981 & 1998.

1981				1998		
Areas	Both Sexes	MALE	FEMALE	BOTH SEXES	MALE	FEMALE
All Areas	31.45	39.74	21.64	45.29	54.50	34.78
Rural	15.56	24.54	5.21	25.73	37.89	12.23
Urban	50.77	57.77	42.23	63.72	69.75	56.66

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000

d). Educational Attainment

Education meets the shortage of trained and qualified manpower, which is an important factor for increasing productivity and accelerating economic growth. Data on educational attainment is, therefore, essential for development plans, one source of which is the population census.

The percentage of educated persons like literacy ratio is not high enough. Only 44.76 percent of the population aged 10 years and above, excluding those below primary are educated in the province. The remaining 55.24 percent have never attended any educational institution.

Large variations exist in the ratios of educated persons in rural and urban areas as well as for males and females. The percentage for males is 54.00 and for females 34.21. It is 25.27 for rural as against 63.13 for urban areas. Table-1.26 gives the ratio of educated persons by sex and rural/ urban residence.

TABLE-1.26 EDUCATED PERSONS BY SEX AND RURAL/ URBAN AREAS, 1998

Area	Educated Persons As Percentage of Population 10 Years And Above.		
	Both Sexes	Male	Female
All Areas	44.76	54.00	34.21
Rural	25.27	37.42	11.79
Urban	63.13	69.24	55.96

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

e). Enrollment Ratio

The enrollment ratio measured, as percentage of students to population 5-24 years is 32.78 percent in the province. The enrolment ratio differs sharply by area and sex. It is higher for males, i.e. 37.35 percent compared to 27.70 for females. The enrolment ratio in urban areas is 46.64 percent compared to only 19.60 percent in rural areas. In rural areas the ratio of female to male enrolment is 1 to 2 and in urban areas it is 1 to 1.2 Table 1.27 gives enrolment ratio by sex and rural/urban residence. Education has increased due to awareness in poor farmers and laborers. Numbers of schools and students has increased since 1988 to 2001. Girl's education is increasing. Girls are coming forward due to getting jobs on the basis of education.

TABLE -1.27 ENROLMENT RATIO BY SEX AND RURAL/ URBAN AREAS, 1998

Area	Both Sexes	Male	Female
All Areas	32.78	37.35	27.70
Rural	19.60	25.84	12.55
Urban	46.64	49.59	43.41

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

f). Education

Out of the total educated persons 27.41 percent have passed primary, 19.20 middle and 17.84 matriculations. After matriculation the percentage falls to 9.00 for intermediate, 7.43 for BA/B.Sc., and 2.65 for MA/M.Sc. Table-1.28 gives the distribution of educated persons by sex, educational attainment and rural/urban residence.

TABLE-1.28 DISTRIBUTION OF EDUCATED PERSONS BY SEX, EDUCATIONAL ATTAINMENT AND RURAL/URBAN RESIDENCE

	All Areas			Rural			Urban		
Age Group	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Below Primary	15.56	15.13	16.32	21.36	20.04	25.99	13.37	12.69	14.34
Primary	27.14	26.49	28.31	34.46	35.22	40.83	23.62	22.15	25.75
Middle	19.20	19.08	19.41	15.19	15.43	14.35	20.71	20.89	20.44
Matriculation	17.84	18.17	17.25	14.28	15.37	10.47	19.19	19.57	18.64
Intermediate	9.00	9.02	8.95	6.53	7.16	4.28	9.93	9.94	9.91
Certificate/Diploma	0.61	0.81	0.25	0.34	0.39	0.16	0.72	1.02	0.27
BA/B.Sc. & Equivalent	7.43	7.70	6.95	3.54	3.98	1.98	8.90	9.54	7.97
M.A./M.Sc. & Equivalent Or Above	2.65	3.06	1.91	1.80	2.06	0.88	2.97	3.56	2.12
Others	0.86	0.84	0.65	0.51	0.35	1.05	0.60	0.63	0.56

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000

g). Immunization

The question about immunization has been included in the 1998 Census for the first time to evaluate the vaccination programme launched by the Government from time to time. It is encouraging to note that 63.45 percent of the children below 10 years age have been reported as vaccinated with considerably higher percentage at about 72 percent in urban areas as compared to 57.14 percent in rural areas. Those not vaccinated were 10.05 percent leaving the rest i.e. 26.50 percent as not known. The percentage of vaccination among male and female children is 32.84 and 30.62 respectively (Sindh Govt. official Website) Immunization coverage has increased in whole Sindh and Pakistan due to vaccination.

h). Situation of live stock

"The main source of livelihood of the Thar deserts is livestock. The estimated livestock population for the year 1999 (estimated on the basis of 1996 census) in Sindh was as 27.3 million heads. Among them, the population of cattle, buffaloes, sheep, goats and donkeys was 6.038, 5.575, 4.111, 10.814 and 0.767 million heads respectively. The rangeland areas 0.76 million hectares of Sindh account for 4.4 percent of total land. Assuming a dry matter unit production of 150 kg per hectare, the total availability of dry edible matter output (in normal year) accounts for 0.114 million tones against a feed requirement of small ruminants of 4.42 million tones in the Sindh province." (43)

"In Sindh next to farming, cattle breeding is important economic activity, particularly in Kohistan and the Thar regions and also to a great extent in the fertile plains of the valley. Large herds always tempted the tribes with less resource, therefore cattle lifting and rustling is common. Cattle breeding are more important to the Thar and Kohistan dwellers, being dependents for their sustenance on their livestock.

Different regions catered for different categories of livestock. The Kohistan generally supported large number of goats and sheep though cattle and camel are also reared. The valley and the desert have a large number of cattle while the upper portion of the desert and the valley is well known for their camels.

Buffaloes are found in large numbers in the delta and on the banks of the Indus. The breeds are like that of Delhi, characterized by short, curled laterals horns and are good milkers.

The cattle colony situated in Malir District is considered as the largest dairy farm in the province, where a good number of modern dairy farms are established. The site has been provided all the describable and essential amenities including animal husbandry hospital and breeding centers, wherein all cattle are provided medical treatment and artificial insemination facilities.

In Badin district there is a world famous livestock farm at Luari Sharif, wherein high standard breeding animals are available.

The number of horses in the province is comparatively low as compared to camels. The camels still maintains predominance in transport; where as the use of horse as a mean of transport is minimized with the rise in motor vehicle. The indigenous Sindhi horse is of short height with light bone, weak hocks and lions, flat ribs and of a bad color. Not withstanding these drawbacks they are a hardly race and can travel long distances on very little food.

A number of improved breeds of broilers and layers are available throughout the province. Poultry farming has now attained status of a major industry and million of families are engaged in this business, especially around Karachi and Hyderabad where climate is mild and more favorable. The table below shows number of livestock in Sindh."(44)

TABLE 1.29 : LIVESTOCK POULTATION IN SINDH 1996.

Sr. No	Livestock	Number
1.	Cattle	3873883
2.	Buffalo	3220094
3.	Sheep	2615984
4.	Goat	6755234
5.	Camel	0217853
6.	Horse	0075850
7.	Ass	0500160
8.	Mule	0005372
9.	Poultry	8797905

SOURCE: - Pakistan Census of livestock, 1996-Agriculture Census Organization- Lahore. (From

Census report of Sindh for 1998)

According to agriculture statistics of Pakistan 1999-2000. P.204,

Sr. No.	Livestock	Number 1986	1996
1.	Cattle	3873883	5464000
2.	Buffalo	3220094	5615000
3.	Sheep	2615984	3710000
4.	Goat	6755234	9734000
5.	Camel	0217853	0225000
6.	Horse	0075850	0063000
7.	Ass	0500160	0699000
8.	Mule	0005372	0012000
9.	Poultry	8797905	11549000

These figures show controversy that, the figures of 1986 are same as in 1996; in census report of Sindh 1998.God knows better, both are reports of census.

i). Water Supply / Water For Irrigation / Source of Drinking Water.

Mostly in cities and town water supply is working properly and in the areas where water supply is not available there hand pumps are also available for common use for whole colony. Some times problems become due to lack of electricity etc.

In the barrage area, River Indus is mean source for irrigation; there are canals and stream and watercourse through then water reaches to the land for irrigation. Due to the scarcity of water in Indus the ranges of water decrease influencing the agricultural produce.

People since 1988 to 2001 have installed tube wells due to lack of water of Indus. Another main thing is that big landlords get more share of water than poor landlords, due to their politically pressure and influence; and they are also protected informally by government functionaries. Now in 2001 before rains there is too much scarcity of water in the Indus River. Due to this agriculture is getting affected.

"Easy access to potable drinking water is one of the basic human needs upon which largely depends health status of the people. It also serves as an index of quality living. Availability of drinking water through all sources in the province is shown in table 1.30 as under:

TABLE -1.30 PERCENTAGE OF HOUSING UNITS BY SOURCE OF DRINKING WATER 1980-1998.

	1980			1998		
CONSTRUCTION MATERIAL	ALL AREAS	RURAL	URBAN	ALL AREAS	RURAL	URBAN
All sources	100	100	100	100	100	100
Inside	38.32	26.66	53.17	68.86	56.79	84.71
Pipe (Nul)	20.85	3.76	42.63	37.17	13.53	68.21
Hand Pump	14.86	18.92	9.96	29.29	40.66	14.36
Well	2.60	3.98	0.85	2.41	2.61	2.14
Outside	61.68	73.35	46.82	31.14	43.21	15.29
Pipe (Nul)	19.21	4.90	37.45	453	3.29	6.17
Hand pump	12.99	16.52	5.41	7.23	11.56	1.53
Well	9.88	16.52	1.42	6.14	10.17	0.84
Pond	1.51	2.29	0.51	3.15	5.30	0.33
Others	18.09	30.70	2.03	10.09	12.88	6.43

Due to rounding the figures may not add exactly up to 100.

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

Of the total housing units in the province about 42 percent houses have access to piped water, which is 74.38 percent in urban and about 17 percent in rural areas. Supply of piped water inside the houses in Sindh is available to 37.17 percent housing units 68.21 percent in urban as against 13.53 percent in rural areas showing a significant improvement since 1980 when it was about 21 percent at provincial level 42.63 percent in urban and 3.76 percent in rural areas.

The other commonly used source of drinking water is hand pump, which serves 36.52 percent housing units in the province, with 52.22 percent in the rural as against about 16 percent in urban areas. About 22 percent houses still use well, pond and other sources of drinking water in province." (45)

j). Drainage

The drainage schemes are comparatively better since previous conditions in whole barrage areas of Sindh. In the urban areas drainage is good but in rural areas it is not good. The water of urban areas e.g. Hyderabad, Sukkur, Mirpurkhas, Larkana and all other cities and town can be used for the purpose of agriculture and some part of land can be able for agricultural activity.

k). Health Facilities

There is no totally change in increase in government dispensaries and BRHC but number of doctors has increased in private sector due to in comparison of previous facilities. In spite of this population is increasing and the pressure of population results that these facilities are too little.

In the period of Prime Minister Mr. Muhammad Khan Junejo, the BRHC and other construction work was good. After that no prominent changes are on the screen.

TABLE-1.31 HOSPITAL BED FACILITIES FOR SINDH

Health (Per ten thousand persons)	1987	1988
Doctors (MBBS)	1.59	3.16
Nurses	0.67	0.89
Para Medical staff	3.50	3.23
Beds	7.02	7.67

Source: http://www.Sindh.gov.pk/Sindh_at_a_glance__/sag_new-13.htm (Sindh govt.website)

Hospital Bed Facilities for Sindh

Documents also show that the entire province is having 30,980 beds for the population of over 36 million, which means there is one bed for every 1,116 people. The public sector offers 29,748 beds as compared to 16,777 made available by the private sector. Karachi south has the largest number of beds 4,888. The number includes 2,047 in private sector. In this district, there is one bed for every 533 people for a population of 2.8 million.

Naushero Feroze district has one bed for every 3,876 people, where there are 294 beds for the population of 1.2 million people. The other districts where over 3,000 people share a bed are Umerkot and Badin, followed by Jacobabad (one bed for 2,952 people), Ghotki (2494), Sanghar (2471), Shikarpur (2140), Karachi East (2075). Sukkur and Malir districts are those districts where the lowest number of people shares one bed. Sukkur and Malir district have one bed for every nearly 400 people where the number of beds is 1,803 and 2,403, respectively.

According to experts, there are certain misconceptions in the minds of planners regarding the state of health services, its facilities and its manpower in the province. This has led to actions and plans, which have proved to be, unsuited the province. Unlike the rest of the country, the population of Sindh is not overwhelmingly rural. Roughly, 49 per cent of the population lives in cities. The document points to a sense of despondency amongst the physicians employed. It is often complained that physicians do not go to their places of posting in interior of Sindh giving a reason that there are no facilities for them in those areas. The basic health units and dispensaries are bereft of basic needs, such as availability, support facilities and sanitation. These are far away from towns and usually under the control of area feudal lord or criminals.

Under such circumstances, no newly trained doctor is able to work. The experts are of the view that the solution does not lie in transferring of doctors on a mass scale. It lies in making changes in the pay structure, which is more equitable, giving them opportunities to continue their medical education through on-job training and promotions.

They under score the need for an integrated district health care approach with linkage to hospitals, secondary and tertiary, so those doctors do not work in isolation and do not feel deprived. (46) (Dawn: 19-10-2000).

l). Roads

This table shows that, Pucca roads are being built more than Katcha (non-metalloid) low type roads

TABLE-132 ROADS (IN KM) AND PUCCA ROADS PER HUNDRED Sq.K.M OF GEOGRAPHICAL AREA

ROADS (IN KM)	1997-98	19978-99
Pacca (high type)	20,186	20,610
Katcha (Low type)	04,608	04,233
ROADS	1971-72	1998-99
Pucca Roads Per Hundred Sq.K.M Of Geographical Area	2.78	14.63
Katcha Roads Per Hundred Sq.K.M Of Geographical Area	1.01	3.00

Source: http://www.Sindh.gov.pk/Sindh_at_a_glance

m). Electricity.

The electricity is available in the cities and towns. In rural areas mostly it is available. But it is not to every village.

TABLE-1.33 PER CAPITA ELECTRICITY GENERATION & CONSUMPTION

Electricity (in KWH)	1975-76		1998-99	
Per capita electricity generation	211.59		616.23	
CONSUMPTION	ELECTRICITY (in Mn. KWH)		NATURAL GA (In Mn. Cub. Mtrs.)	
	K.E.S.C. (1990-2000)	WAPDA (1990-2000)	KARACHI (1990-2000)	INDUS (1990-2000)
TOTAL	6,430	5,527	3,895	1,259
DOMESTIC	2,457	1,436	893	302
COMMERCIAL	541	216	134	34
INDUSTRIAL	2,431	1,231	2,868	923
AGRICULTURAL	28	557	..	.-
OTHERS	973	2,087	..	..
ANNUAL DEVELOPMENT PROGRAMME (Rs. In Million)				
Sector	1999-2000		2000-2001	
	Allocation	%	Allocation	%
TOTAL	4,000.000	100.00	4,500.000	100.00
AGRICULTURE	80.60	2.02	91.900	2.04
FOREST & WILDLIFE	50.00	1.25	60.500	1.34
INDUSTRIES, FUEL & MINERALS	1.30	0.03	6.000	0.13
WATER & POWER	425.00	10.63	400.000	8.89
PHYSICAL PLANNING & HOUSING	920.00	23.00	1,082.458	24.06
TRANSPORT & COMMUNICATION	440.00	11.00	430.000	9.56
RURAL DEVELOPMENT	590.00	14.75	705.000	15.67
EDUCATION & TRAINING	890.00	22.25	877.000	19.49
HEALTH	360.00	9.00	393.333	8.74
ALL OTHERS	243.10	6.07	453.809	10.08

Source: http://www.Sindh.gov.pk/Sindh_at_a_glance__/sag_new-13.htm(Sindh govt.website)

n). Natural Environment

"Since 1988-2001 a number of changes have occurred in the attitudes of barrage areas of Sindh province towards their natural environment and especially towards trees. Forests are going to be destroyed. Rangeland is going to be divided to farmers by government and pressure of population is decreasing the rangeland. Near to cities and towns encroachment is increasing causing desertification. Cropped areas are also decreasing. As pressure of population increases the needs of furniture, increase in timber use for the preparing houses in villages. At the same time in Katcha houses the use of much trees and shrubs has also decreased vegetation. At the same time, more needs of fuel which, has also decreased vegetation due to the change in eating habits among an increasing number of people " speaking in a PTV programme, GM WAPDA Ahmed Khan Bhatti said, that the average level of stored water in Tarbella and Mangla lakes recorded on first December (2000) during 10 years was 3.7 million acres feet and over all decline is 60 percent.

This level is on gradual decline from last years and this year (2000) has reached to 1.29 million-acre feet. He also said, the flow of water during the previous 10 years in major rivers was 14 million-acre feet. Last year (1999) this flow was measured 12.8 million-acre feet and trend is continuing. Secretary Irrigation Punjab Javed Majeed said that presently Pakistan is in the grip of repeated dry years. The situation has promoted water shortage conditions to the disadvantage of agriculture sector."(47)

Due to the shortage of water tree plantation and crops are decreasing, increasing desertification.

o). Housing Facilities

1). Construction Material of Roofs

The quality index of construction of roofs indicates that 25.53 percent housing units in the province have standard category of roofs constructed with RCC/ RBC (reinforced concrete/ bricks with cement bonding), which is 5.60 percent in urban areas as against only 6.44 percent in rural areas. The trend of RCC/ RBC construction has increased considerably from about 16 percent in 1980 to 25.53 percent in 1998 indicating an improvement in standard of construction.

About 49 percent were reported as constructed with wood/ bamboo in the 1998 Census, much higher at about 75 percent in rural areas. The use of other unspecified material in the construction of roofs was about 5 percent in 1998 Census as shown in table 3.34.

TABLE-1.34 CONSTRUCTION MATERIAL USED IN ROOFS BY RURAL/ URBAN 1980 AND 1998 (PERCENTAGE).

	1980			1998		
Construction Material	ALL AREAS	RURAL	URBAN	ALL AREAS	RURAL	URBAN
All categories	100	100	100	100	100	100
RCC/RBC	15.94	1.38	34.48	25.53	6.44	50.60
Cement/Iron sheet	57.02	70.37	40.1	20.86	12.18	32.25
Wood/Bamboo	-	-	-	48.91	74.92	14.77
Others	27.04	28.25	25.50	4.70	6.46	2.38

Due to rounding the figures may not add exactly up to 100
Not asked as separate category in 1980 Census.
Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

2). Cooking Fuel Used

More than 60 percent housing units in the province use wood/ brushwood as cooking fuel with about 90 percent in rural and 21.42 percent in urban areas. Gas is the 2nd major source of cooking fuel as its use has extended to more than 32 percent houses in 1998 against 14.65 percent in 1980. It is significantly higher at 70.71 percent in urban areas as against only 3.27 percent in rural areas. On the other hand the use of kerosene oil as cooking fuel has declined considerably at provincial level especially in urban areas as shown in table 1.35

TABLE-1.35 HOUSING UNITS (PERCENTAGE) BY SOURCE OF COOKING FUEL USED BY RURAL/ URBAN 1980 AND 1998.

	1980			1998		
CONSTRUCTION MATERIAL	ALL AREAS	RURAL	URBAN	ALL AREAS	RURAL	URBAN
All categories	100	100	100	100	100	100
Wood	65.58	86.45	39.01	60.19	89.72	21.42
Kerosene Oil	11.30	0.37	25.22	4.18	3.14	5.55
Gas	14.65	0.58	32.59	32.43	3.27	70.71

Others	8.46	12.60	3.18	3.20	3.86	2.32

Due to rounding the figures may not add exactly up to 100.
Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

3. Availability of Separate Kitchen, Bathroom and Latrine Facilities

More than one-third at 34.69 percent of the housing units in the province has separate kitchen, higher at 47.90 percent in urban areas as compared to 24.63 percent in rural areas. Facility of shared kitchen is available by 32.46 percent, higher at 37.65 percent in urban as compared to 28.50 percent in rural areas. None of the kitchen facility is reported by as high as 46.87 percent of the housing units in the rural areas as compared to only 14.44 percent in urban areas of the province.

TABLE-1.36 HOUSING UNITS (PERCENTAGE) BY KTICHEN, BATHROOM AND LATRINE FACILITIES BY RURAL/ URABN, 1998.

HOUSING FACILITY	ALL AREAS	RURAL	URABN
KITCHEN			
ALL	100	100	100
Separate	34.69	24.63	47.90
Shared	32.46	28.50	37.65
None	32.85	46.87	14.14
BATH ROOM			
ALL	100	100	100
Separate	33.94	22.98	48.34
Shared	31.12	21.92	43.21
None	34.94	55.11	8.46
LATRINE			
ALL	100	100	100
Separate	35.36	24.23	49.97
Shared	30.57	20.08	44.33
None	34.08	55.69	5.70

Due to rounding of figure may not add exactly up to 100.
Source: 1998 Provincial Census Report of Sindh, Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

Separate bathroom facility is available to 33.94 percent of the housing units in the province, more than double at 48.34 percent in urban areas as compared to 22.98 percent in rural areas. The percentage of shared bathroom at 43.21 is much higher in urban areas in compared to 21.92 percent in rural areas. None of the bathroom facility is reported much higher at 55.11 percent of the housing unit in rural areas as compared to 8.46 percent in urban areas. Separate latrine facility is available to 35.36 percent of the housing units in the province, about double at 49.97 percent in urban areas as compared to 24.23 percent in rural areas. A percentage of 30.57 of the housing units are using shared latrine facility, much higher at 44.33 percent in urban areas as compared to 20.08 percent in rural areas. More than 34 percent of the housing units have reported none of the latrine facility available in the province, the figure of which is much higher at 55.69 percent in rural areas as compared to only 5.70 percent in urban areas. Table -1.36 provided percentages of housing units by kitchen, bath room and latrine facilities

p). Source of Information

The question about source of information has been asked for the first time in the 1998 population Census to assess the media coverage. About 42 percent of the housing units have access to TV, around 29 percent to newspaper and 29.75 percent to radio in the province. TV viewer ship reported double at 67.46 percent in urban areas as compared to 22.38 percent in rural areas. Similarly use of print media (newspaper) is reported almost three times at 45.34 percent in urban areas compared to 16.25 percent in rural areas. Table-1.37 provides percentage of households by source of information.

TABLE-1.37 PERCENTAGE OF HOUSEHOLDS BY SOURCE OF INFORMATION

AREA	TOTAL HOUSEHOLDS	TV	RADIO	NEWSPAPER
ALL AREAS	5,022,392	41.87	29.75	28.83

Rural	2,850,989	22.38	27.25	16.25
Urban	2,171,403	67.46	33.04	45.34

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

q). Source of Lighting

Electricity is the most common source of lighting in the province. This facility is available to more than 70 percent housing units, 93 percent in urban and about 53 percent in rural areas. A significant improvement has been observed in the use of electricity as it has extended from about 36 percent houses in 1980 to 70.08percent in 1998, particularly in rural areas where the supply has extended up to 52.62 percent during this period.

Kerosene oil is the second important source of lighting. Its use has however declined significantly from 61.50 percent in 1980 to 27.78 percent in 1998. The percentage of use of sources falling in the category of " others" is reported quite nominal at 2.14 percent in the province as shown in table 1.38

TABLE-1.38 PERCENTAGE OF HOUSING UNITS BY SOURCE OF LIGHTING AND RURAL/ URBAN 1980 AND 1998.

	1980			1998		
CONSTRUCTIONMATERIAL	ALL AREAS	RURAL	URBAN	ALL AREAS	RURAL	URBAN
All categories	100	100	100	100	100	100
Electricity	35.92	10.94	67.76	70.08	52.62	9300
Kerosene Oil	61.50	85.83	30.49	27.78	45.02	5.15
Others	2.58	3.23	1.75	2.14	2.37	1.85

Due to rounding the figures may not add exactly up to 100.

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

3. Economic Changes

a). Economically Active Population

Economically active population comprises the persons of either sex who are engaged in some work for pay or profit including un-paid family helpers, persons not working but looking for work as well as those laid off, during there reference period.

No economic development planning can be considered complete without incorporating manpower planning. Beside availability of data from other sources, the population census provides benchmark data for this purpose. However, its scope is limited compared to labour force and manpower survey because of the constraint of the number of questions since a variety of topics are to be covered in the population census. The scope of the manpower data in the 1998 Census is defined as economically active population, which comprises the persons of either sex who are engaged in some work for pay or profit including unpaid family helpers, persons not working but looking for work as well as those laid off during the reference period along with data on their economic activities or industries, occupations and employment status.

Economically active population to the total population also termed as crude activity or participation rate in the province is 22.75 percent. It is, however, 32.73 percent of the population aged 10 years and above. The population not in labour force comprises children less than 10 years, housewives, students and others, the percentages of which to the total population are 30.50 for children less than 10 years, 64.72 for housewives, 8.08 for students and 6.82 for others. Table-1.39 gives the percentage of population by economic categories.

TABLE-1.39 PERCENTAGE OF POPULATION BY ECONOMIC CATEGORIES, SEX AND RURAL/ URBAN AREAS 1998

	ALL AREAS			RURAL			URBAN		
Economic category	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Labour force	22.75	41.20	2.04	21.42	39.30	1.65	24.13	43.16	2.45
Not in labour force	77.25	58.80	97.96	78.58	60.70	98.35	57.87	56.84	97.55
Children below 10 years	30.50	29.98	31.09	34.21	34.12	34.31	26.61	25.68	27.66
Domestic workers	31.85	2.56	64.72	31.86	3.43	63.30	31.84	1.64	66.25
Students	8.08	1384	1.61	5.17	9.47	0.42	11.14	18.38	2.89

All others	6.82	12.43	0.53	7.34	13.67	0.33	6.28	11.14	0.74
Labour force participation Rate (refined)	32.73	58.83	2.96	32.56	59.66	2.51	32.88	58.07	3.39
Un-employment rate	14.43	14.86	4.69	11.95	12.26	3.70	16.75	17.31	5.40

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

There is a wide variation between male and female refined participation rates. It is 58.83 percent for males compared to only 2.96 percent for females, resulting in a very low overall participation rate compared to other countries, though the male participation rate compares favorably with other countries. Generally, labour force participation rate is affected by level of industrialization, agricultural development, educational attainment, socio-economic norms, etc, but in case of Sindh the participation rate is primarily offset by the low level of female participation. The rural/ urban refined activity rates do not differ much as it is 32.56 percent in rural and 32.88 in urban areas.

b). Employed Population by Occupation.

About 35 percent of the total labour force is in Major Group-6 " skilled, agricultural and fishery workers" closely followed by Major Group-9 " elementary occupation", reported at 32.40 percent. The third Major Group-5 " service workers and shop and market sales workers" is reported at 11.25 percent in the province. The percentage distribution of labour force by occupation groups, sex and rural/ urban residence is given in table-1.40.

TABLE-1.40 EMPLOYED POPULATION (PERCENTAGE) BY OCCUPATION, SEX RURAL/ URBAN AREAS, 1998.

	ALL AREAS		RURAL				URBAN		
Occupation group	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Legislators, Senior Officials and Managers	0.57	0.57	0.67	0.26	0.26	0.26	0.88	0.87	0.96
Professionals	5.56	4.72	22.60	1.94	1.71	7.45	9.13	7.73	33.66
Technicians and Associate Professionals	3.45	3.37	4.95	1.97	1.98	1.70	4.91	4.77	7.33
Clerk	2.53	2.46	3.96	0.62	0.62	0.67	4.41	4.30	6.36
Service Workers and Shop and Market Sales Workers	11.25	11.37	8.88	4.08	4.18	1.83	18.32	18.57	14.02
Skilled Agricultural and Fishery Workers	34.84	35.34	25.34	65.56	65.90	57.44	4.52	4.67	1.88
Craft and Related Traders Workers	4.64	4.41	9.17	1.20	0.81	10.68	8.03	8.02	8.06
Plant and Machine Operators and Assemblers	3.0	3.08	1.26	1.23	1.27	0.35	4.74	4.90	1.92
Elementary occupations	32.40	32.89	22.53	22.88	23.02	19.58	41.80	42.78	24.68
Workers not classified by Occupation	1.76	1.82	0.66	0.24	0.25	0.02	3.26	3.39	1.12

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

The pattern of occupation groups varies significantly in urban and rural areas. In rural areas most of the employed persons, i.e. 65.56 percent is engaged in Major Group-6 " Skilled agricultural and fishery workers", followed by Major Group-9 " elementary occupation" at 22.88 percent. In urban areas most of the labour force, i.e. 41.80 percent is engaged in Major Group " elementary occupation" followed by Major Group-5 " Service workers and Shop and Sales workers" at 18.32 percent.

c). Employed Population by Industry

About 39 percent of the working population is engaged in Major Division-I " Agriculture, forestry, hunting and fishing" the next major Division-9 " Community, social and personal services" is reported at 15.39 percent which is closely followed by Major Division-5 " construction" reported at 11.68 percent in the province.

In rural areas most of the employed population is engaged in Major Division-1 "Agriculture, forestry, hunting and fishing", which accounts for about 71 percent. Whereas in urban areas Major Division 9 “community, social and personal services” is reported at 23.51 percent. The next important Major Division-6 " wholesale and

retail trade and restaurants and hotels: reported at 16.67 percent is closed followed by Major Division-3' Manufacturing at 15.80 percent. Table 2.41 gives details of working population

TABLE-1.41 EMPLOYED POPULATION (PERCENTAGE) BY INDUSTRY, SEX AND RURAL URABN AREAS, 1998.

	ALL AREAS		RURAL				URBAN		
Industry group	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Agriculture, forestry. Hunting and fishing	38.95	39.39	29.82	70.90	71.09	66.32	7.40	7.65	3.14
Mining and quarrying	0.11	0.12	0.05	0.14	0.14	0.06	0.09	0.09	.05
Manufacturing	8.94	8.70	13.74	1.99	1.60	11.29	15.80	15.81	15.52
Electricity, gas and water	0.45	0.46	0.14	0.54	0.55	0.12	0.36	0.37	0.16
Construction	11.68	11.96	6.00	8.33	8.50	4.30	14.98	15.42	7.24
Whole-sale and retail, trade, restaurants and hotels	9.95	10.21	4.69	3.14	3.21	1.43	16.67	17.22	7.07
Transport, storage and communications	3.66	3.74	1.89	1.33	1.37	0.35	5.95	6.12	3.02
Finance, insurance, real estate and business services	2.06	2.10	1.22	0.33	0.34	0.11	3.77	3.87	2.03
Community, social and personal services	15.39	14.41	35.22	7.15	7.00	10.75	23.51	21.83	53.11
Activities not adequately defined	8.82	8.90	7.23	6.15	6.19	5.26	11.46	11.62	8.68

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

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d). Employed Population by Employment Status

Among the employed population in the province 50.39 percent is self-employed, higher at 66.12 percent in rural areas as compared to 34.87 percent in urban areas. It is wroth to mention that most of self-employed are males. The next important percentage is employees (private) at 25.54 with almost the similar percentage at 25.93 for males as compared to 17.63 for females. The percentage of employees (govt. has been reported at 12.17, surprisingly higher at 20.36 percent for females as compared to 11.76 percent for males. The percentage of unpaid family helper has been reported at 7.34 in the province, more than five times female at 33.54 percent as compared to 6.05 percent males. The percentages of employees (autonomous) and employer have been reported quite negligible. Table 1.42 gives percentage of working population by employing status.

TABLE-1.42 EMPLOYED POPULATION (PERCENTAGE) BY EMPLOYMENT SEX AND RURAL URABN AREAS, 1998.

	ALL AREAS			RURAL			URBAN		
Employment Status	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Self-Employed	50.39	51.68	24.29	66.12	67.42	34.92	34.87	35.91	16.52
Employee (Govt.)	12.17	11.76	20.36	6.63	6.64	6.34	17.64	16.90	30.61
Employee (Auto)	2.29	2.28	2.56	1.08	1.09	0.86	3.49	3.47	3.80
Employee (Pvt.)	25.54	25.93	17.63	13.03	13.44	3.23	37.88	38.44	28.15
Employer	2.26	2.30	1.63	1.62	1.65	0.99	2.90	2.95	2.09
Un-Paid Family Helper	7.34	6.05	33.54	11.53	9.77	53.66	3.22	2.33	18.83

Due to rounding figures may not add up to exactly 100.

Source: 1998 Provincial Census Report of Sindh. Population Census Organization, Statistics Division, Government of Pakistan, Islamabad, May 2000.

e). Un-Employment

The un-employment rate is the percentage of persons un-employed (those not working but looking for work and temporary laid off) to the total economically active population. It is 14.43 percent reported in the province. The un-employment rate varies for males and females as well as for rural and urban areas as given in table-1.39. The un-employment rate is 14.86 percent for males and 4.69 for females. It is 11.95 percent for rural and 16.75 for urban areas.

f). Transportation

The most important indicator of social change in the Sindh areas is increase in transport activity and its nature. In 1988 transportation was comparatively very little. Today there are taxies, wagons, busses and cars in larger number. They are comparatively increasing day by day. Numbers of trips on almost all routs have more than doubled in the last few years, and at the same time fare has increased too. Expenditure of maintaining of vehicles has increased in spite of that operators feel that they can easily charge fare and people can afford to pay them, but passengers say that fares are too much.

TABLE-1.43 TYPES OF VEHECLES FORTRANSPORTATION ON ROAD

TYPE OF VEHILCES " ON ROAD" (In Nos).	1997-98	1998-99
Total	888,475	921,798
Motor Cars, Jeeps & Wagons	331,670	338,320
Motor Cycles	403,909	413,950
Taxies	13,873	31,073
Motor Rickshaws	22,446	24,153
Buses/ Mini Buses	10,439	11,802
Trucks	11,151	11,802
Tractors	42,009	37,969
Pickups, D. Vans & Others	52,978	53,534

Source: Sindh Govt. Website

g). Service Sector to Transport

Services sector to transport workshop, spare parts shops for vehicles, hotels and teashops to serve transport staff and passengers was less in 1988. Now a days lot of all these facilities are available more than previous exactly comparison is very difficult. These facilities are increasing in spite of that they are not enough for the demand. At the same time it is very difficult to arrange these facilities to everywhere because of denser population per kms. in rural areas. These services have increased the jobs for the poor and facilitators.

h). Carpet Industry.

Carpet loom is not in Sindh barrage areas because of awareness and alternates are available in the shape of other daily wages in farms and in towns and cities. But the same time looms weaving for cloths are in rural areas and in urban areas.

i). Remittances Economy

People of the barrage are now going to cities and do labour work or services in towns and cities like Karachi, Hyderabad and Sukkur. Mostly Karachi is absorbing people in larger number. People come in cities and ladies do the work of mad servant and gents as masons, tailor masters in garment, domestic servants, labour in sugar mills, factories, employers in government departments.

Now a days farmer are leaving the work of farmer and some landlords allowed them to go to cities for work because land is not able for absorbing more farmers due to scarcity of water. Some farmers are taking chances and sending some young people to cities in the search of labour and these earn enough for their limited need. So many people have gone to cities and have got their business and have opened shops in cities. In such a way they earn and send their money to their families in their native's places.

j). Increase in Animal Population

As we know that agriculture activity has decreased due to shortage of water, which is discussed in details in the agriculture activity and natural environment. It is clear that when poor farmers have not got agriculture produce then for the meeting their needs they sell their livestock. Another reason for not growth in livestock is that not availability of fodder is the main factor. These two main factors are general indicator at this time, which is clear from the situation.

k). Agriculture Activity

Agriculture activity in Sindh has deceased in the last ten years. Speaking in a PTV programme, General Manager WAPDA Ahmed Khan Bhatti on Monday 5th December 2000 said, average stock of water in country's reservoirs has registered a record drop. The average record of stored water in Tarbella and Mangla lakes, recorded on the first of December during the previous 10 years was 3.7 millions acre feet. This level is on gradual decline from last year and this has reached to 1.29 million-acre feet. He said that the flow of water in country's major rivers has also marked a rapid decline. The average flow of water during previous 10 years in major rivers was 14 millions acre-feet. Last year this flow was measured 12.8 million-acre feet and the trend is continuing. As we know that for the agriculture in Sindh, riverine water is required, without water this activity decreased automatically. At the same time the rainfall has also decreased.

Secretary Irrigation Punjab Javed Majeed said, presently Pakistan is in the grip of repeated dry years. The situation has promoted water shortage conditions to the disadvantage of agriculture sector. This situation is emerging because country does not have required number of water reservoirs to store maximum amount of water during wet years, which goes waste into sea.

Secretary Irrigation Sindh said to tackle the prevailing water shortage, farmers should opt for sowing crop, which consume minimum amount of water. He said if oil seeds are replaced with sugarcane cultivation, considerable amount of water can be saved. He urged the farmers to adopt a strategy to this effect so that maximum production is achieved by using minimum water. (48)

TABLE-1.44 AGRICULTURAL AREA PRODUCTION AND RELATED PARTICULARS

Crops	Area "000" Hectares		Production "000" M. Tons	
Crops				
Major Crops	1998-99	1999-2000	1998-99	1999-2000
Wheat	1,123.7	144.2	2,675.1	3,00.3
Rice	704.1	690.4	1,930.3	1,123.0
Sugarcane	270.8	230.6	17,050.7	14,290.8
Cotton ("000" Bales)	630.2	633.5	2,134.1	2,377.4
Jowar	110.3	91.1	64.4	55.9
Bajra	175.0	18.0	73.1	8.9
Maize	10.5	8.6	5.5	4.6
Rape Seed & Mustard	92.4	77.6	73.6	63.9
Gram	89.8			
Tractors and Tube wells (In Numbers)		1975	1984	1994
Tractors		3,908	16,542	23,182
Tube wells		7,995	9,481	16,236
Source: Sindh Govt. Web Site.				
Land Utilization ("000" Hectares)		1997-98	1998-99	1999-2000
Reported Area		14,081	14,046	14,051
Total Cultivated Area		5,685	5,647	5,699
Total Cropped Area		3,946	4,111	3,885
Source: Sindh Govt. Web Site.				

Index of Agriculture Production (Base: 1985-86=100)			
Crops	1997-98	1998-99	1999-2000
All Crops	150.50	150.39	155.81
Food Crops	130.30	133.68	144.37
Non-Food Crops	176.40	171.71	170.441
Water Withdrawals (In Mat)	46.47	48.16	45.37
Fertilizer Off Take (In " 000" N. Tons).	603.96	528.06	528.81
Source: Sindh Govt. Web Side.			
Fisheries/ Fish Catch (In "000" M. Tons)	1996	1997	1998
Marine	267.84	285.77	295.65
Inland	91.37	91.90	96.40
Source: Sindh Govt. Web Site.			

For the uplift of agriculture the government is taking step for ward. General Manager WAPDA in an interview, Sunday, September 2000 from Lahore said that WAPDA has prepared an ambitious master plan for Sewhan Barrage complex and to gigantic development projects for river " Reverine area" and rainy Thar Canals, which include remodeling of Guddu Barrage at a huge cost of Rs. 178 billion to benefit million of acres land in Sindh.

General Manager WAPDA Ahmed Khan Bhatti said that six-feeders/ channels/ Canals have been

proposed in Sehwan Barrage on the left and right banks. He also said that riverine project would provide the permanent installation of about 48000 tube wells for reliable irrigation facility. He said that appropriate infrastructure development would also be undertaken through construction of electric lines. He said that tube wells would be given to Harries (farmers) Tailors with subsidized electricity rates. He said that consequently, a big boost would be provided to the economy of Reverine area of Sindh. (49)

l). Irrigation

Within the last 45 years, three irrigation barrages have been constructed across the Indus in the Province. The command areas of the three barrages are: Sukkur barrage 3.12 million hectares, Kotri barrage 1.12 million hectares, and Guddu barrage 1.172 million hectares. (50)

m). Horticulture

"The geographical situation of Sindh, being intermediate between the African sub-continent and south East Asia, the flora thus includes the African, Iranian and Arabian types on one hand and the tropical monsoon (India) type on the other. During the hot summer season, only tropical fruits grow well, while during the cold and bracing winter season with little rainfall extra tropical and European vegetables and fruits thrive.

A new line of horticulture study is carried on in plantation of vegetable gardens and orchards. Such an example is at "Government Farm at Mirpurkhas". The geographical situation of Sindh allows the cultivation of fruits such as dates (phoenix syulvestris, banana (Musa sapientyum), mulberry (Morus Alba), mango (Maginfera indica) etc.

Fruits growing are most successful under perennial irrigation. Given the necessary protection from hot and cold and for winds close period, fruits grow very well."(51)

Forestry/Rangeland/Non-Crops

"The forest of Sindh generally follows the course of the river, and as such great number of these are riverian. These natural forests are supplemented by artificial seeding. Annual inundation is the only source of irrigation for these forests. The survival and growth of these forests depends upon the intensity, duration and frequency of the floods. Construction of barrages and consequent expansion of canal system has greatly altered the Indus River ecosystem. This has reduced river flow and the frequency of high floods resulting in siltation and raise in the level of riverbed.

Due to the meandering nature of the Indus naturally flowing on a bridges, several hundreds hectares are eroded and deposited on either bank flood season annually, when any accretion takes place, sandy silt is initially occupied by tamarix diocia (lai) Saccharum munja (kanh), and Populus euphratica (haban). Once this land is stabilized by regular silt deposition, Acacia nilotica (babul/ babar) comes naturally and is some times artificially regenerated with the passage of time and regular silt deposition, the area becomes highly and occasionally inundated. As a result, climax species such as Prosopis cineraria (kandi). Salvadora oleoides (khabar), Tamarix articulta (lau) etc replace Acacia nilotica (babul). The yield of riverine forest is estimated to be 1.0 m/he/year. With better inputs, these forests have the potential to improve the yield. Riverine forest support thousand of people by providing pasturage, fuel wood, timber, fodder, pods of khabar, gum, honey and flowers for medicine etc.

Canals irrigated plantations of Sindh also known as inland forest were once riverine forest but isolated from Indus flood waters by earthen embankments constructed in the 1930s. Presently, the plantations are irrigated from Sukkur, Kotri and Guddu Barrages irrigation systems. Delbergia sisooShishum) is the main species grown in Upper Sindh plantations, while Acacia nilotica (babul/babar) is raised in the lower Sindh. Eucalyptus camaldulensis (bed-e-mushk) is being increasingly planted in the entire plantation, as it is a fast growing tree used for industrial purposes. Other species grown in the irrigated plantation of Sindh are Salmalia malabaricaum (Samal) Morus Alba (Mulberry), Syzgium eumunii Conocarpus lancifolius (Kou/Ethopeanteak), and leucaena leucocephala) (Ipil Ipil).

Mangroves are at present being developed as important coastal forests with great potential. These forests are located in the deltaic region of Indus River in Karachi and Thatta District. These forests are uniquely adapted to water lagged and Oxygen-deficient tidal mud flats, where no other plant survives. A salt tolerant species a vicennia marina (timmer) constitutes 99% of the total vegetation in these areas. Other main species growing in mangrove forests are ceriops tagal (chaar) and Rhizophora mucronata (kumni). These forests, besides having environmental value, also protect the Karachi and Bin Qasim posts from siltation and erosion. They act as perfect breeding ground for shrimps, and fodder for livestock.

Plants of Thar/ Rocky Kohistan:

The rangeland of Sindh, mainly located in the sandyThar and rocky Kohistan subsist on the scanty and erratic rainfall, where grow many scrub and grass species such as Tecoma undulata (lohirro), Caparis aphylla

(kirir), Salvadora persica, Salvadora oloides (khabar), Acacia Senegal (Kombhat), Acacia seyai, Acacia nilotica (babul/babar), Acacia Jacquemontii (baavri), Caltropis procera (akk), Recinus communics (herun), Prospis juliflora (devi), Prosopis glandlosa (devi), Prosopis cineraria (kandi), Zizyphyus numlaria (olani), Zizyphus maurantiana (ber), Commiphora mukkal (khhkhar), Cenchrus ciliarts (dhamun), Ciliarts biflorus bhart), Citrullus colucynthis (meho), Bilipherous cindicus, Coccinia cardifolia (golarro), Aistida depressa (lumb), Cymbopogass jawarancusa (kathori), Panicumturggidum (gum)and calligonum polygonides (phog). The rangeland support local as well as migratory livestock herds that descend from irrigated areas. The range condition had deteriorated due to extremely low and erratic pattern of rainfall and uncertain land tenure." (52)

n). Artisnal Activity

Artisnal activity in Sindh has increased to cater the city markets. It is entirely managed by middleman, in Sindh embroidery work has increased and at this time it is introduced all over Pakistan. We have personally observed that at Islamabad, Mari, Lahore and Peshawar shops are opened for the arts, e.g. embroidery, Ajrak, Susi, cloth from Halla, different varieties of cloths for ladies use because ladies of cities like these things. At the same time these things are also exported to other countries. Rilli is good products of Sindh. Some leather products like Shoes for ladies are in demand. Earthenware, which is used for showpiece in cities, is also increasing so this activity is increasing day by day. We are unable to differentiate between previous and present situation.

"Through chiefly an agricultural and pastoral province, Sindh has a reputation for textile, pottery, leatherwork, carpets etc. The craftsmanship of the people of Sindh began during the period of Moen jo daro civilization. Their polished ornaments and articles of apparel made out of Muslim and wooden lacquer work have won the praise in and outside the country." (53)

o). The Mineral Wealth

The exploration of these things is increasing day by day since 1988 to 2000 so many oil wells are found in Sindh at the same time other resources are also available. In Sindh there is LCDC Larkana Coal Development Company, a Joint Venture of the Government of Pakistan, WAPDA and the Government of Sindh, has been formed to develop large scale of mining of the Larkhra deposit to supply a proposed WAPDA power plant nearby at Khanote. The LCDC has engaged a Chinese first to prepare a study on mine design and a coalmine and a 200 MW coal fired Power Plant fueled by Larkana Coal Development Company.

TABLE-1.45 MINIG MINERAL PRODUCTION (in "000" Kgs)

MINERAL PRODUCTION (in "000" Kgs)	1998	1999
CLAY (Shale)	415,606	331,119
COAL	1,227,175	1,189,398
LIME STONE	2,315,397	2,204,292
DOLOMITE	74,112	129,817

Source: Sindh govt. website.

p). Debt Status

So many farmers and other household in barrage area of Sindh are in debt to moneylenders and landlords/ landowners.

According to villagers and farmers spoken during field trip for collection of primary data, said that they are not getting much production from agriculture that is why they are unable to repay the debt. (For details see primary data from chapter- VII.)

q). Trade and Trade Centre

Trade and trade centers are in Karachi; each and every thing is available in Karachi. In big towns lower type of centers are there and limited opportunities are over there.

r). Postal and Telecommunication

This table shows that T.V sets are increasing. Post offices are increasing. Radio licenses are decreasing

TABLE-1.46 POSTAL AND TELECOMMUNICATION

TELE-COMMUNICATION SERVICES	1997-1998	1998-99
POST OFFICES	1,805	1,872
RADIO LICENCES	74,923	74,650
TELEVISION SETS	786,796	900,826
V.C.R./ V.C.P. SETS	70,005	.
TBRSA SET	2,966	.
T.V SETS PER"000"HOUSE HOLDS	1970-71 28.89	1998-99 179.36

Source: Sindh govt. website.

III. Purpose of This Study

The purpose to be attained, by writing this study is:

1. To collect facts and figures on the existing conditions of agro-based industry in Thar District.

2. To evaluate the performance of government and NGOs and their impact in Thar and Barrage areas of Sindh, and determine the growth rate of their development.

3. To understand the share of Tharies and Barrage Area people in the achievement of this goal and other related objectives.

4. To make a comparison between the agro-based industries of Thar with Barrage Area and evaluate it with other similar fields.

5. To present a bright vision by enhancing the role of agro-based industry in the economic development of Thar District.

6. To assess the level of income and suggest the ways and means to increase its' existing level as well as create incentives for labor.

7. To enable Planners, Policy Makers, Investors and Businessmen etc contribute in the progress of this industry.

8. To encourage Tharies to participate in this income generating industry.

9.To give a clear vision of development of agro-based industry, leading Thar into an industrial economy.

IV. Scope of This Study

The Agro-based industry, as a sub-sector, plays an important role in the economy of any country. It also provides an ever-increasing number of jobs in both, rural and urban, areas of the country.

The data on agro-based industry, sex, age and marital status services, literacy and educational when compared with other data on economic characteristics, it provides insight into the factors and processes of social, economic and demographic changes. These changes are very important for the formulation of policy/planning and administration of Programmes for economic and social development.

V. Hypothesis

A. The Aim of Alleviation of Poverty Can be Achieved, if Local Organizations (Indigenous Leadership), and Live stocks are Encouraged by Providing Awareness to People of Thar

(Alleviation of Poverty = Local organization + Livestock)

B. Progress and Promotion of Agro-based Industry Would Lead Thar to an Industrial Economy.
(Development of Thar = Local organizations + Livestock + Roads + Electricity)

Following results will be achieved:

1. Land reforms for eliminating rural poverty, being a prime instrument for the development of agro-based industries.

2. Creation of awareness among Tharies to use duly fenced farmlands for the purpose of fodder for livestock.
3. Introduction of micro-financing system for safety nets.
4. Bringing up live stock (animals within species; race, lineage; sort and kind) by producing fissile material and introducing short-term loans, on experimental basis.
5. Steps for conservation of rangeland by planting indigenous and erotic plants and grasses.
6. Training to understand the benefits of non-crops (un-sowed natural vegetation) and mathematical calculations.
7. Thar as an industrial economy.
8. Raising of income level of people
9. Encouragement of Local indigenous skills and know-how.
10. Benefit to poor at grass root level.
11. Vision of a bright future.
12. To provide real assets possession (land, and livestock) to the poor Tharies.
13. Reduction in migration of indigenous leaders, experts, and skilled people having know-how of the work.
14. Boost promotion of agrobased industry.

VI. Research Methodology

Data was collected to achieve the result for the purpose, scope and hypothesis of this study. For the collection of data, there are two types of references and source, primary and secondary.

A. Primary source

The methods for conducting inquiries, in order to collect primary data of agro-based industry, can be of three types:

i. Case Study Method, ii. Statistical Method, and iii. Sample Survey Method.

This study is based upon the random samples survey method and collected data is tabulated in tables and analyzed for the defined purpose covering the period 1988-2000

B. Secondary Source

The Secondary data was collected through different sources such as: Libraries, Newspapers, Magazines, Thesis, Census Reports, Addresses delivered by government officials, Press Releases, SAZDA, Thar Seminar, TRDP, Baanh-beli, and PVDP working in Tharparkar.

It was also collected by websites of: Government of Sindh and Thar, Grameen Bank of Bangladesh, Rural development studies and others.

It is further collected by NGOs and Studies of foreign origin too, such as: similar studies of Denmark, Somalia, Indian Gujarat and Indian Thar of Rajhistan.

VII. Limitations and Deficiencies

As far as the extent of data accuracy of this study is concerned, it has some limitations, due to the following reasons:

1. In most cases, the interviewed persons are uneducated; therefore, they could not appreciate the importance of this study. Some times they were reluctant to share information for fear of taxation or they hesitated for want of financial assistance. Due to this reason the information provided by them may not be accurate.

2. Owners of small and household manufactures do not maintain proper accounts of their business transactions. Therefore, the information relating to the estimated annual income is calculated on the bases of the last month's available figure.

3. The annual income data under different heads of account could not be ascertained due to the fact that they frequently change their business. Therefore, the accuracy of data for the varying types of business done during the year may not be correct.

4. Their mode of business depends on the existing situation and favorable conditions for a business. If condition is favorable then income may increase beyond their expectations.

5. It took many months to complete the questionnaires. The estimated data of income, therefore, is not based on a fixed month. There may also be the influence of seasonal industries, on the accuracy of data. Therefore, the accuracy of data for the varying types of business done during the year may not be correct.

VIII. Conclusion

From the detailed study of the whole chapter we conclude that lot of secondary data related to the subject and necessary for the discussion is given in this chapter. Mostly the data of this chapter is from the census report 1998 for Tharparkar and barrage area of Sindh. That data is more valid and accurate than other sources because of inclusion of every body in the national survey, observing the background we conclude that Thar is more disadvantage region. When we consider upon the demographic, physical, social, economical changes, flora, fauna and livestock, in details then we come to know that barrage area is more advantaged in every respect.

Thar is good only for livestock raiser and non-crops (Rangeland plantation). When we touch the educational side then we come to know that at the primary level education in barrage area is much better than Tharparkar. In Middle class and up to intermediate level education ratio of Tharparkar is much better than barrage area of Sindh province. At the graduate and postgraduate level barrage area is little higher in ratio than Tharparkar due to low facilities available in Tharparkar.

The Minerals of Tharparkar may prove the better than barrage area, if explored and local people are given chances to work and royalty is given. This is long-term measures and depends upon the policy of the government. At the level of immediate measure for the development of Thar there is need of improvement of Rangeland, farmlands and races of livestock. The future of Thar is livestock with well-managed natural vegetation, so we give two formulas for alleviation of poverty and development of Thar.

1. Alleviation of poverty in Thar =Panchayat (local organization) + Livestock and
2. Development = Panchayat (local organization) + Livestock + Roads + Electricity.

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