

Socio Economic Assessment Study

Indus For All Programme

(MAIN FINAL REPORT)



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May, 2008

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1. INTRODUCTION AND METHODOLOGY

This chapter briefly describes the background of Indus for All Programme and the rationale & objectives of detailed socio-economic assessment commissioned by the WWF Pakistan in the programme priority areas.

1.1 Indus for All Programme

In 1997, the WWF – International embarked upon a global biodiversity conservation initiative focusing on more than 200 eco-regions, designated as G – 200, under the six specific target driven themes: freshwater, forests, species, toxics, marine and climatic change. Rationale for developing the Indus for All Programme around the poverty-environment nexus, stemmed out of growing abject poverty among communities adjacent to the deteriorating natural resources in the vicinity of Indus river. Its main purpose was to initiate implementation of the Indus Eco-region Conservation Programme, so as to secure selected outcomes in pursuance of the strategic 50- year Biodiversity objectives set by the WWF International.

The overall objective of Indus for All Programme was stated as improved natural resource management. The ongoing six-year program envisages various initiatives and interventions at micro, meso and macro levels. Enshrining a bottom up approach, the Program aims at identifying issues through lesson learning exercises at the household, village, union council, district and provincial levels. Specific objectives and outcomes of were stated as under:

Objective- 1: Community – Based Natural Resource Management in Keti Bunder, Keenjhar, Pai Forest, and Chotiari Reservoir priority areas so as to contribute to improved livelihoods. Expected outcomes under this objective included improved understanding of dependence and priorities of the poor in relation to natural resources; strengthening of community-based institutions; improved natural resource management; improved livelihood security and equitable benefit sharing.

Objective -2: Improved Natural Resources and Livelihoods through mainstreaming of poverty – environment linkages at the policy, planning and decision-making levels. Expected outcomes under this objective included improved forest cover and fisheries; mainstreaming of environment in policies and sectoral development plans; and poverty- environment linkages reflected in district and sub-district level planning.

Objective -3: Improved Institutional Capacity and Awareness for sustainable management at various levels. Expected outcomes were stated as improved capacity and environmental advocacy potential of civil society organizations; improved capacity of local government institutions for environmental management; and enhanced environmental awareness among selected stakeholder groups.

Objective -4: Improved Alignment and Collaboration for Stakeholder Interventions. Expected outcomes under this objective included enabling institutional framework; strategic initiatives implemented by stakeholders and post-project implementation strategy developed in consultation with stakeholders.

The first programme objective provides for improved understanding of the current dependencies and priorities of the poor in relation to natural resources, resulting in improved livelihood security and equitable benefit sharing through better natural resource management practices as envisaged

in objectives 2 and 3 stated above. Subsequently, the mid-term evaluation of the ongoing WWF-P project, entitled Tackling Poverty in Pakistan's Coastal Communities (Whiteside and Tunio, 2006), recommended detailed socio-economic studies based on household survey data.

Shirkat Gah (2007), conducted a snap - shot preliminary baseline study of a purposive sample of 22 villages in the four Indus for All priority areas; namely, Ketu Bunder, Keenjhar, Pai Forest and Chotiari Reservoir. Assessment revolved around selected variables including incomes, land ownership and other assets, dependency on natural resources, vulnerabilities and risks, and social organization. Based essentially on qualitative analysis, the study suggested that a census of the programme area villages and detailed sample survey of households be made a part of implementation design to determine the dependency levels and establish the exact demographic and socio-economic baseline indicators.

The present detailed socio-economic baseline assessment, using a comprehensive descriptive research design including the development of all village profiles, collection of information through secondary data, sample survey of households and qualitative techniques, was thus commissioned to accomplish the objective of perspective planning for the Indus for All Programme and to provide a scientific basis for programme monitoring and evaluation. Ketu Shah riverine forest was subsequently included in the baseline study on the request of Sindh Forest & Wildlife Department.

1.2 Detailed Socio- Economic Assessment

Terms of reference for the socio-economic baseline, adeptly set by the client with explanatory amendments by the MDC consultants, are attached as Annex-1.

Specific objectives of the socio-economic baseline assessment were stated as under:

1. Assess socio-economic conditions of about 66 villages in all four sites of the project using pre-tested questionnaires (30 questionnaires per village or a statistically representative sample there-of);
2. Identify the gaps and opportunities for key livelihoods interventions for Indus for All Programme; and,
3. Use Sustainable Livelihood Model and suggest livelihood interventions with the aim to improve incomes of poor, improved food security, reduce vulnerabilities, influence processes and structure, and sustainable use of natural resources by providing alternatives income sources.

The four priority areas selected for implementation of the identified interventions under the Indus for All Programme of the WWF-P were indicated as follows: Ketu Bunder (coastal mangrove ecosystem) and Keenjhar Lake (freshwater ecosystem) in Thatta district; Chotiari Reservoir (wetland and terrestrial ecosystem) in Sanghar district; and, Pai (irrigated forest plantation) in Nawabshah district. As already stated, the Ketu Shah (river side inundated forest) in Sukkur was included in the survey on the recommendation of Sindh Forest and Wildlife Department. Preliminary details were provided by the client about these priority areas along with their distinct ecological features. Detailed profiles of these sites were included in the TORs of consultants; which were subsequently developed and incorporated in the relevant reports for a clear understanding of macro and meso level indicators of the programme priority areas.

1.3 Descriptive Research Design

There are two paradigms behind social research and assessment studies. The objective of “positive – behaviorist” paradigm (often called “quantitative” approach), is to identify and measure relationships between observable indicators. In contrast, the advocates of “subjectivist – phenomenological” or “constructivist” paradigm (the “qualitative” approach), argue that human behavior and attitudes can be understood only within a particular social context and through the meanings that people attach to particular resources, situations and actions. Researchers in this group prefer a range of qualitative methods and techniques. However, in real practice, a broad range of quantitative and qualitative methods need to be integrated into any holistic design for social research.

Descriptive research is used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. The methods involve structured surveys which describe the status quo about selected socio-economic indicators, the correlation studies which investigate the relationship between variables, and developmental studies which seek to determine changes over time. The descriptive research design was selected because the primary purpose of the present study was to establish the pre-project/programme baseline socioeconomic profile as well as status of human and natural resources for the development of a planning and policy matrix to ensure sustainable livelihoods.

1.4 Sampling Method

Two stage cluster sampling was applied to select a representative sample of households. Cluster sampling has two important advantages over simple random sampling and stratified sampling. First, it is economical and second it is suitable for selecting a sample when the sampling frame of individual elements is not available. Cluster Sampling only needs a list of elements in the clusters sampled (Anderson, Sweeney, and Williams, 1993). In the first stage, villages were purposively selected considering size of villages and location while in the second stage households were selected. Targeted villages were divided into three categories small (< 50 households), medium (51-200 households) and large (201- 500 households) villages.

Prior to data collection, a comprehensive sampling plan was developed where by one-third of the total number of villages at each site were proposed to be selected in the first stage while in the second stage 14 households from small, 36 from medium and 50 from large villages were recommended for selection. In small villages of size less than 15 households known as hamlets, survey team could collect data from one or two households. As a result, the survey ended up visiting more than stipulated villages, to collect the desired sample size of households. As a result, time and financial costs increased in the data collection phase.

1.5 Methodology and Sampling Frame

In general, the baseline studies use the standard statistical sample given in table- 1.

Table 1: Population Size and Statistical Sample for Baseline Studies

S.No.	Population Size (e.g. Total Households)	Suggested Sample
1.	10	10
2.	50	44
3.	100	80
4.	500	217
5.	1,000	278
6.	3,000	341
7.	50,000	381
8.	100,000	385

Source: Samji and Sur. 2006. Developing A high Quality Baseline. World Bank, New Delhi.

Applying these guidelines and keeping in view the client desire to maximize internal and external validity, an extended sampling frame was developed to select a larger household sample for survey and to prepare detailed profiles for all programme area villages.

To determine a representative household sample size, the following equation was used:

$$n = \frac{N\pi(1-\pi)}{(N-1)(C/Z_{\alpha/2})^2 + \pi(1-\pi)}$$

Where n is recommended sample size, N is population size, π is proportion of a characteristic of interest (e.g. literacy rate, poor population, and mortality), C is $\pm$ error rate (confidence interval), and $Z_{\alpha/2}$ is tabulated value for confidence level (Tryfos, 1996). Plugging the proportion of 0.5 (which gives the maximum variance, $0.5*(1-0.5)= 0.25$), error rate (confidence interval) of $\pm 5\%$ and 1.96 tabulated value of $Z_{\alpha/2}$ for 95% confidence level and number of households (population) of the above mentioned sites/areas, sample sizes for each location were estimated. For determining gender - based indicators, a separate sample of 150 purposively selected female respondents was agreed with the client. A sample of preferably at least 30 women respondents was agreed to be interviewed from each programme priority area.

1.5.1 Target Population and Sample Size

Based on the initial village lists and household estimates for each programme site, the recommended sample sizes were determined as follows: 350 for Ketu Bunder, 357 for Keenjhar, 357 for Chotiari, 338 for Pai Forest, and 285 for Ketu Shah. Thus, a total sample of 1687 households was worked out for 17,842 households; the overall error rate decreased to $\pm 2.27\%$ from $\pm 5\%$, decided for each location exclusively, since there was nonlinear relationship between population and sample sizes. Table- 2 presents the household sample size details initially proposed for the quantitative survey.

Table 2: Initially Proposed Household Sample Sizes for Baseline Survey

Site/Area	Villages	Total Households	Maximum Sample Size
Keti Bunder, Thatta	75	3,907	350
Keenjhar Site, Thatta	41	5015	357
Chotiari, Sanghar	63	5000	357
Pai Forest , Nawabshah	26	2820	338
Keti Shah, Sukkur	13	1100	285
Total	218	17,842	1687

The sampling plan was subsequently revised, keeping in view the final list of programme area villages provided by the WWF-Indus for All Programme field teams in October 2007.

Keti Bunder, Thatta

In Keti Bunder, villages were divided into two categories viz. Inland and Creek villages. Since mode of mobility in creek villages was motor boats, therefore high costs on traveling and low status of life was recorded in comparison of inland villages. Data were analyzed based upon inland and creek villages instead of village size. Overwhelming majority (89%) of all the villages Keti Bunder was small. Comparatively more proportion of small villages was recorded in creeks (89%) in comparison of Inland villages (50%). This clearly indicated that creek villages were small settlements.

Table 3: Distribution of Villages in Keti Bunder, Thatta

Location		Size			Total
		Small	Medium	Large	
Creek	N	17	1	1	19
	%	89.4	5.3	5.3	100.0
Inland	N	6	5	1	12
	%	50.0	41.7	8.3	100.0
Total	N	23	6	2	31
	%	74.2	19.4	6.5	100.0

Sampling plan summarizes in Table 3 reveals that there were 19 (61%) and 12 (39%) villages in creeks and Inland respectively. Eight villages were selected from creeks and 9 from inlands. Total number of household surveyed from 8 villages of creeks was 104 and 142 from Inland villages. The error rate at 246 sample size for population of 1844 (Table 5) was estimated to be 5.82%.

Table 4: Sampling Plan for Ketu Bunder, Thatta

	Villages				Households Selected	
	Total		Selected		N	%
	N	%	N	%		
Creek	19	61	8	47	104	42.3
Inland	12	39	9	53	142	57.7
Total	31	100	17	100	246	100.0

The sample for Ketu Bunder was separately handled because of the distribution of villages in creeks and on the inland mass.

Keenjhar, Thatta

In Keenjhar, 39 villages were recorded around the lake. There were 28 (68%) small, 9 (22%) medium and 4 (10%) large villages. Household data were collected from 26 villages with almost the similar proportions (73% small, 19% medium and 8% large) of total number of villages. Total households surveyed in the area were enumerated to be 309. Proportions of households from small, medium and large villages were 41, 34 and 25% respectively. Very small increment of 0.4% was recorded due to selecting 309 households (5.4%) against 357 pre-decided at 5 error rate.

Chotiari, Sanghar

Thirty two villages were recorded around the Chotiari reservoir, Sanghar with a higher proportion (75%) of small villages. Out of these 22 villages, 273 households were selected from 24 villages; categorized as 16 small (67%) villages, 7 medium (29%) and 1 large (4%) . An error rate of 5.8 was recorded for a sample size of 273 households.

Pai, Forest Nawabshah

Pai Forest Nawabshah had larger settlements with a majority of medium villages (42%), followed by small villages (39%) and large village (19%). Socio-economic data were collected from 236 households in 10 villages - 5 small, 3 medium and 2 large. The error rate increased to 6.11 for the sample size of 236.

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**Table 8: Sampling Plan for Keenjhar, Thatta; Chotiari, Sanghar;
Pai Forest, Nawabshah; and Shah Belo, Sukkur**

Keenhjar, Thatta				Small	Medium	Large	Total
	Villages	Total	N	26	9	4	39
			%	67	23	10	100
		Selected	N	19	5	2	26
			%	73	19	8	100
	Households Selected		N	126	106	77	309
			%	40.8	34.3	24.9	100
	Chotiari, Sanghar	Villages	Total	N	22	7	1
%				73	23	4	100.0
Selected			N	16	7	1	24
			%	67	29	4	100
Households Selected		N	86	134	53	273	
		%	32	49	19	100	
Pai Forest, Nawabshah	Villages	Total	N	10	11	5	26
			%	39	42	19	100
		Selected	N	5	3	2	10
			%	50	30	20	100
	Households Selected		N	65	82	89	236
			%	27	35	38	100
Keti Shah, Sukkur	Villages	Total	N	9	3	1	13
			%	69	23	8	100
		Selected	N	9	2	---	11
			%	82	18	---	100
	Households Selected		N	23	6	---	29
			%	79	21	---	100

Keti Shah, Sukkur

During the course of data collection, the site was declared a Safari park by the Sukkur district government. Consequently, it was rendered insignificant from the viewpoint of Indus for All People objectives. Nevertheless, the survey team collected data from 29 households in 11 villages (9 small and 2 medium) of the Keti Shah riverine forest. Separate manual of data analysis was developed for Keti Shah since its survey estimates were somewhat different from the other four sites. The difference could be attributed to different socioeconomic condition and/or a smaller sample size.

1.6 Survey Instruments

Well structured questionnaires were developed to collect detailed data of villages, households and women after intensive review of literature particularly referring to international experiences in the subject matter as well as indicators related to local setting. Attempts were made to formulate closed ended questions considering statistical analysis and data base of a quite large sample. During training of enumerators, certain questions were rephrased to get meaningful estimates about population parameters. The questionnaires for household survey as well as village profile were developed considering the sustainable livelihoods model. The survey instruments are presented as Annexure- C to this report. These questionnaires were discussed with the client and amended accordingly. Further amendments were undertaken in the first phase of the field work at the Keenjhar site, so as to standardize the instruments for future phases of field work at the remaining four priority areas; see survey schedules in the Statistical Annexure.

1.7 Qualitative Techniques

In addition to the structured survey sample described above, information was obtained/ validated by using appropriate qualitative techniques. The PRA techniques were also employed to capture indigenous knowledge and get community perspective on various issues and problems. In this connection, a thorough analysis of secondary data was undertaken from the first step. Nevertheless, the qualitative side of such information was not taken for granted. It was assessed in the light of primary data collected by the consultants to draw objective inferences. Selected qualitative and PRA techniques are briefly treated as follows.

1.7.1 Key Respondent Interviews

Key respondent or In-depth Interviews (IDIs) were conducted by the team leader and senior members of the field team, to get an overall picture of the priority area from local community leaders/ resource persons and the concerned government/ semi-government and NGO functionaries.

1.7.2 Focus Groups

The team leader facilitated focus group discussions at all sites to comprehend community perspective on various issues and to seek suggestions to resolve the identified problems based on local knowledge and experiences. Gender Specialist also managed focus group discussions on women development issues, in addition to filling structured questionnaires from purposively selected respondents in the sample villages. One of the outputs of such discussions was a consensus on community development priorities.

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1.7.3 Delphi Groups

Special interest groups on fisheries, forestry and agriculture/ livestock were organized at different priority area sites to get technical input on specific issues of technical and professional nature being faced by poor people.

1.7.4 Maps, Charts and Calendars

Activity charts for women respondents constituted a part of the female questionnaire. Seasonal calendars for various livelihood activities were also attempted at all sites. Revenue maps were also obtained, specially for the Pai and Ketu Shah forests.

1.8 Statistical Analysis

Statistical Package for Social Sciences was used to analyze the data. Statistical analysis was carried out considering the aim and objectives of the research i.e. to improve incomes of poor, improved food security, reduce vulnerabilities, influence process and structures, and sustainable use of natural resources by providing alternative income resources. Descriptive statistics methods; frequency, percentages, and means were calculated and reported. During report writing process, efforts were made to discuss the estimates collected using qualitative and quantitative research methods and direct observation in the field. Possible reasons had been reported for any significant variations there-of. Statistical tables not discussed in the text, were given in appendix along with important primary and secondary data sets.

Village profiles and women development questionnaires were analyzed separately and data were presented in consolidated secondary tables for interpretation. In all, it was estimated that the total number of survey instruments for statistical analysis were accounted 1413 only - 1093 households questionnaires, 134 village profiles, 136 women development schedules and 50 key respondent checklists.

1.9 Assumptions and Limitations

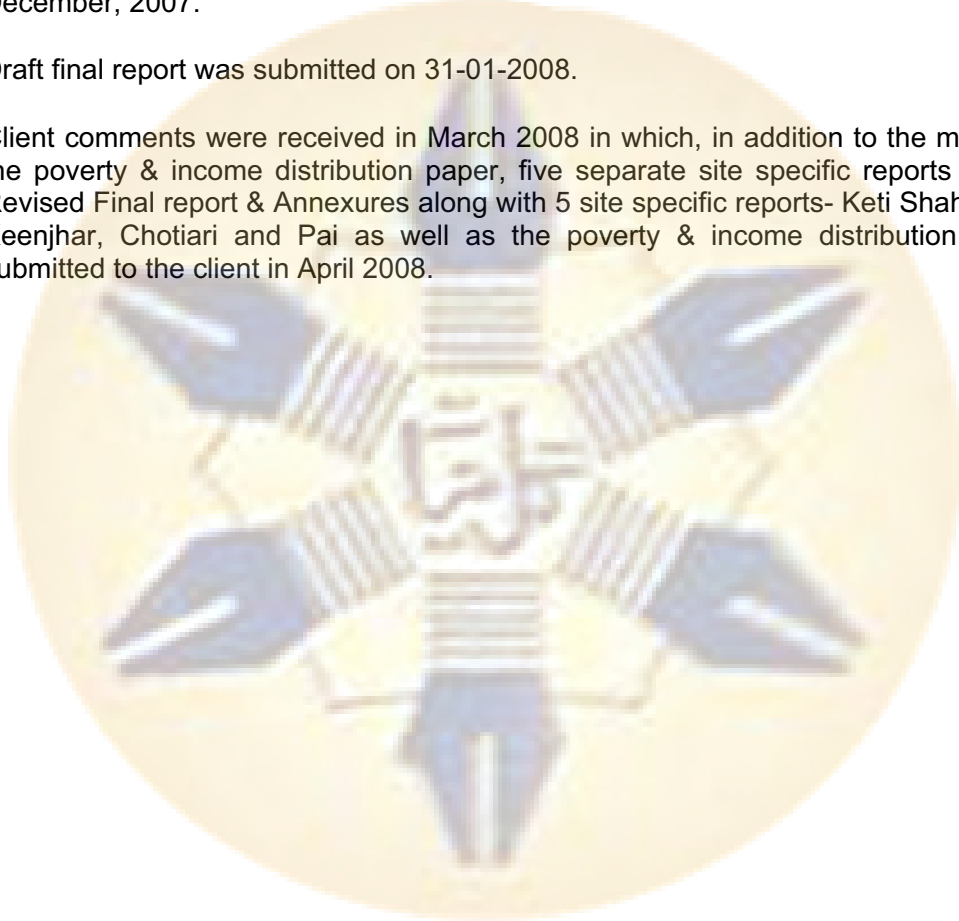
The study team faced the following constraints and limitations:

1. Household data of hamlets ($15 \leq$ HHS) and small villages (16-50 villages) were combined because of small number of filled in questionnaires from hamlets.
2. Variations in income and expenditure were assumed since estimates are based upon recall memory of respondents due of non-availability of documentation.
3. Variations in interpretation and recording of responses were assumed because separate field teams provided enumeration input at different sites.
4. Original plan of work could not be adhered due to initial delays in the start of data collection work, followed by the holy month of Ramadan and the delayed receipt of village profiles from field teams.

1.10 Plan of Work

The revised plan of work is reproduced at Annex-2. Critical deadlines and responsibilities are highlighted hereunder:

- The MDC conducted training of field teams in the third week of July 2007.
- Inception report was submitted by 31-07-2007. In this connection, the survey instruments were already submitted and client input was obtained. Draft inception report was shared with the client for comments.
- Field work initially planned to be completed by October 31, 2007, continued up to 15th of December, 2007.
- Draft final report was submitted on 31-01-2008.
- Client comments were received in March 2008 in which, in addition to the main report and the poverty & income distribution paper, five separate site specific reports were desired. Revised Final report & Annexures along with 5 site specific reports- Ketī Shah, Ketī Bunder, Keenjhar, Chotiari and Pai as well as the poverty & income distribution reports were submitted to the client in April 2008.



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2. REVIEW OF LITERATURE

Selected literature on the Sustainable Livelihoods concept and socio-economic indicators in the context of environment and natural resources, is reviewed hereunder:

2.1 Fundamentals and Indicators of Baseline Study

Samji and Sur (2006), observed that the Baseline is actually fixing the time at the base; i.e. a benchmark from which one may measure the progress. It is a snapshot of all necessary or relevant variables at a given point in time which is mostly before the project/ programme for improvement is implemented. Baseline studies help in:

1. Testing hypotheses of the programme/ project to assess results;
2. Planning for future in terms of refining and targeting the indicators during monitoring of project activities; and,
3. Collecting evidence for planning and policy making at micro, meso and macro levels.

A baseline study has two phases: Design phase in which objectives, hypotheses, measurable indicators and intended outcomes are developed. A clear chain of Inputs, Activities, Outputs, Outcomes and Impacts is agreed upon. Appropriate sampling frame is also developed and survey instrument is prepared to cover related objectives. Data Collection, Analysis and Interpretation phase is then undertaken to accomplish the objectives of baseline and to test various hypotheses as well as make due recommendations to the programme managers, planners and policy makers.

The DFID (2000), defined Livelihood as the combination of capabilities, assets, and activities required for a means of living. Within this livelihoods context, the core analytical framework starts from the so called asset pentagon, which contains the following five categories:

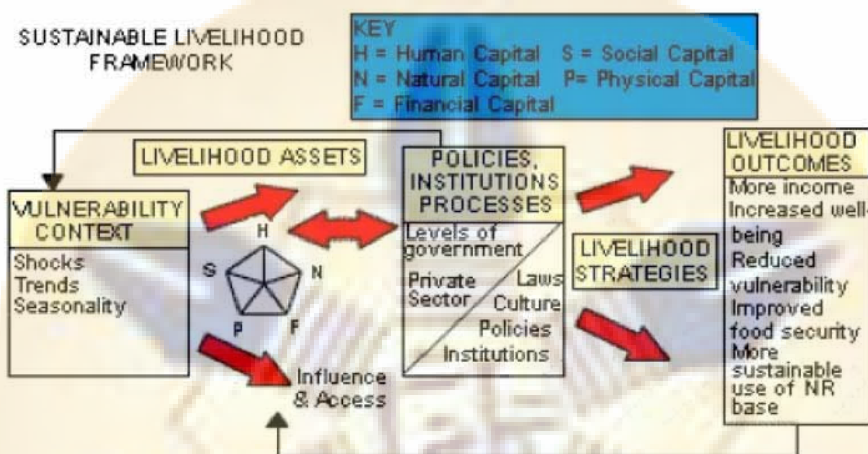
1. Natural Capital;
2. Financial Capital;
3. Human Capital;
4. Physical Capital; and,
5. Social Capital.

Communities and regions achieve desired outcomes by applying strategies that exploit these assets. Indicators or statistics on strategies are difficult to conceptualize, and, typically, the strategy that works for one community or region will not be appropriate for another. However, some indicators or statistics that measure the capacity of community/ region to generate and to implement strategies must be taken into consideration. Finally, the indicators of desired outcomes need to be monitored.

The Wye Group (2005), presented two schemes of indicators for assessment of rural livelihoods. The first is a sectoral scheme comprising of indicators representing various components of rural development; including natural environment, social well being, economic well being, economic geography and population, economic structure, physical infrastructure and communications, markets and institutions, poverty, agriculture and other occupations, natural resources, health,

education, housing, and water supply & sanitation, etc. The second and most widely used scheme from the perspective of livelihoods is the Sustainable Livelihoods Analytical Framework which is based on the pentagon of capitals and invokes Assets and Capacity to design & implement strategies and desired Outcomes for sustainable livelihoods. Figure- 1 depicts the various facets of the framework for analyzing sustainable rural livelihoods.

Figure- 2. Linkages of Sustainable Livelihoods Framework



Source: Institute of Development Studies. 2000. Sustainable Rural Livelihoods: A Framework for Analysis. IDS Working Paper 72, U.K.

The SL approach is now widely used to identify options for a programme to support rural livelihoods. The approach places people at the centre, in an environment where analysis has hitherto focused almost exclusively on resources or institutions. It facilitates a process of stepping back and looking at the wider issues affecting rural development. The framework of SL is a useful tool for structuring a review of secondary information and offers a way of organising various issues and establishing relationships between them. It is useful in answering questions such as:

- Who are the rural poor?
- How do the poor make a living?
- What makes them vulnerable?
- What assets do they have?
- What is the impact of policies and institutions?

Pounds, et. al. (2003), stated that the conventional approach to NRM is based on reducing and controlling variability in order to contain and avoid negative impacts. But experience shows that if variability is reduced and natural patterns of disturbances are disrupted, they accumulate and return at a later stage on a much broader scale. Diminishing variability tends to increase the potential for larger-scale, less predictable and less manageable disturbances, which can have devastating effects on ecosystems. New approaches to adaptive NRM involve social and organizational, as well as technical change. Recent research has highlighted the value of traditional as well as new and modern local institutions to sustainable resource management. This evidence has contributed to a forceful critique of the neglect and destruction of local resource

management institutions by central government interventions, often leading to worsening resource degradation. As a result, decentralization and participation in resource management are widely seen as increasing effectiveness, although for these to be realized, locally accountable representation and power of decision – i.e. a domain of independent local decision-making capacity must be present.

Bosher, et. al. (2007) studied vulnerability of coastal communities in Andhra Pradesh, India, which is prone to tropical cyclones. The research used primary data collected from 300 respondents to construct, essentially through qualitative ranking exercise, a Resource Accessibility Vulnerability Index (RAVI). The index indicated that the 'lower castes' are marginalized to the extent that they lack access to assets, public facilities and opportunities to improve their plight; and, that these poor and powerless lower castes are able to utilize only the informal social networks to bolster their weak resilience, typically by women's participation with CBOs and NGOs.

The study used the definition of vulnerability as a condition or set of conditions which adversely affect people's ability to prepare for, withstand and/or respond to a hazard'. Four main socio-economic determinants of vulnerability and their variables were specified: (1) Access to Assets including ownership of livestock, owned or leased land, saving/ access to credit, ownership of income generating equipment such as boat, ownership of other assets such as cycle and sewing machine; (2) Access to Public Facilities including access to drinking water and medical center, access to cyclone resistant home or shelter, and access to higher than primary education facility; (3) Access to Political Networks such as contacts with UC/ Town/ District/ Provincial Government and networks with village elders, community leaders and political parties; and (4) Access to Social Networks including family members in the same village or neighborhood, links with family members outside the village, being a majority caste in the village, being actively involved in CBO/NGO and having a good worker/ dependent ratio. These factors are actually derived from the pentagon of capitals, which would be focused in the present baseline study.

2.2 Sustainable Livelihoods Strategies

SDG (2007), stated that for a livelihood to be sustainable, it must be adaptive and able to withstand stress. It should also safeguard, rather than damage the natural environment. Sustainable livelihoods put people first. These are about local and self sustaining solutions. However, local contexts often exist within a larger system that can suppress peoples' very real knowledge, abilities, and opportunities. To create sustainable livelihoods, everyone will need to develop ways of living that are not founded on the continued oppression and poverty of the majority. Sustainable livelihoods encompass many locally defined needs and priorities, whether economic, social, political, etc. Working from an area of strength, can empower people to initiate more widespread change and action. Ultimately, the creation of sustainable livelihoods in a community may require a "collection of locally identified strategies" implemented over time (i.e. a long term investment in the community). Some of these strategies may include:

1. Appropriate Technologies, which are socially beneficial and environmentally sound and also promote equity among genders, generations and various social divides.
2. Micro-Enterprise Development, for generating income among the poor enabling them to meet their basic needs.
3. Using Waste (from agriculture & allied professions), as a Primary Resource and as a starting point for livelihood creation.

4. Education and Training can be powerful livelihood tools, specially when these provide job related knowledge and skills.
5. Institutional and System Changes can stimulate livelihood creation, since each person gets involved in enhancing productivity and income.
6. Mixed Strategies which promote an integrated approach.

Each Indus for All Programme has more than one occupational group. Hence, the integrated approach with mixed strategies may provide an answer to the livelihoods question in the Indus Eco- Region.

Lessons from Nepal

Sustainable livelihood studies undertaken in the context of natural resource management (NRM), yielded the following lessons in Nepal:

- Investment in Human resources alone is not sufficient to sustain livelihoods.
- Natural resources could increase economic well being only when associated with access, ownership and participatory management.
- Affordable, appropriate and acceptable technology should be explored, especially to maintain productivity.
- Focus mainly on enterprise development, tourism and agro-based productivity.
- Continue social and community development services.
- Build local management capacity and strengthen Strategic Partners in production, Processing and marketing skills on local products.
- Raise capacity for wise use of wetland and water.

Public Advocacy may be used to contribute in four different forms:

- To make favorable policy provisions maximizing natural resources
- To advocate existing conservation policy in favor of local community (indigenous and marginalized groups)
- To formulate new pro-poor pro-conservation policy and to provide legal support
- To build the capacity of poor in maximizing benefits from available land resource

2.3 Causes of Poverty in Coastal Districts

ADB (2004), observed that poverty in coastal Sindh is caused by household isolation – from information (about markets, rights, and options for change) from economic opportunities, from

communities, and from public services including disaster protection. The following general indicators were established for the two coastal districts of Thatta and Badin:

1. **Socio-economic isolation and gender restrictions:** As many as 90% of households in the project area live in reed shacks known as Katchi Abadis with no cooking or sanitation facilities. Medical facilities are a long way from the coastal populations and the pervasive shortage of clean water adds to the health issues. The average literacy for men is 47% and women 14% and most children are not attending school. There is a traditional, gender-based division of labor in the coastal areas. Despite their significant contribution women have weak bargaining positions in the household, little involvement in local resource management, and are essentially excluded from decision-making both at the household and community levels. Physical isolation due to the distances between roads and villages contributes to a sense of disempowerment for both men and women.
2. **Institutional Constraints:** Households in the coastal zone have not yet received effective Government support, as currently there is insufficient planning, implementation and monitoring capacity to facilitate appropriate service provision. The Coastal Development Authority (CDA) is yet to fulfill its mandate to plan, facilitate implementation and monitor all development of the coastal zone. Coastal area NGOs provide both social services and attention to rights issues, but their capacity is weak, particularly in the areas of project planning, implementation and financial management.
3. **Water:** The 350 kilometers (km) of Sindh's arid coast has been significantly degraded over the past fifty years from a variety of anthropogenic and natural pressures. This has resulted mainly from the substantial reductions of Indus River discharges to the delta, increasing salinity resulting from poor drainage and sea water intrusion. These changes have led to a reduction in the natural resource base, with the most significant impact being on availability of fresh water for drinking and agriculture, mangrove forest coverage, fisheries production and agricultural output.
4. **Mangrove Forests:** The mangrove forest ecosystem and its environmental functions are critically important to the delta and coastal ecosystems. These include: (i) nursery habitats for fish, shrimp, crabs and mollusks; (ii) sustainable supplies of fuel wood and fodder – if properly managed; and (iii) vital protection against coastal and tidal erosion and storms. However, only about 25% of the 263,000 hectares existing in 1977 now remain. This rapid decline can be attributed to: (i) over-harvesting of mangrove trees for fuel wood, fodder and timber; (ii) grazing by camels and to a lesser extent by goats; (iii) major alterations in the freshwater / seawater dynamics of the lower Indus Delta including its maritime near shore components; (iv) non-enforcement of forestry regulations.
5. **Fisheries:** The export of shrimp from the Sindh Coastal area was valued at about \$100 million per year in 1994, but has since declined to less than \$40 million per year. In addition to shrinking shrimp exports the overall fish catch from the Arabian Sea appears to be in decline. The resources on which the fishery depends are being adversely affected by uncontrolled foreign fishing vessels, harmful nets and the contract fishing system.
6. **Agriculture and Land Base:** Seventy percent of the arable land in coastal Sindh is owned by large landholders and governed by crop-share agreements with Haris (tenant farmers). On this land, rice, sugarcane, wheat, bananas, sunflower, pan leaves, onions, tomatoes, and a range of minor crops are cultivated with low yields per acre. Poor households are largely laborers on these lands and get significantly lower wages when

compared to non-agricultural labor. Some households make use of uncultivated lands for collection of fodder, bamboo, reeds and other plants. When possible, poor households acquire livestock as a method of both savings and income generation. As land pressure increases and agricultural land access declines labor demand also drops, cutting off a major source of household income. Pressure on uncultivated lands also increases, with consequent negative impacts on income generating activities, land cover, and livestock options.

2.4 Degradation of Indus Delta

PFF and Action- Aid (2001), undertook a study of degradation of Indus delta and its impact on local communities. It was documented that the economic wealth of coastal zone and offshore areas of Pakistan are derived from five major sources:

1. Products of direct market value (e.g. shrimp and fin fish, which earn millions of US Dollars in foreign exchange, minerals, sand mining, beach recreation and tourism that generate revenue, apart from providing support of livelihood to many rural communities along its productive natural systems).
2. Products of natural systems that are intangible and are not accounted for by the market economy but which are highly valuable for coastal productivity (e.g. supply of rich nutrients to support productivity of biologically diverse fauna and flora, of direct and indirect economic values to humans such as food, firewood, honey; fodder for animals, cattle, wild life upon which depends the livelihood of coastal communities; and the protection from natural disasters).
3. Coast-dependent activities (e.g. transportation and shipping, beach-related activities, ports and harbors);
4. Coast-linked activities (e.g. fish processing, agricultural activities along coastal belt, marine, coastal installation, ship building, power stations, etc.); and
5. Coastal services activities such as real estate, housing, business industries and other professional services.

After situation analysis, the main resource degradation issues were identified as under:

- For the last 20 years or so the rate of fish and shrimp have never raised but the rates of necessary items in fish catching activity like diesel, oil, nets, boats and other fishing tools keep increasing all the time. The result is ever-increasing poverty and awful socio-economic condition of the fishing community.
- The profit-oriented environment of Karachi Fish Harbor has rendered the fishermen poor and deprived of their rights.
- All kinds of licenses and permission which are issued to deep-sea fishing trawlers both foreign and local should be cancelled.

- Despite ban on use of all kinds of destructive nets, these nets are widely used in the creeks of the Indus Delta. Therefore, the government should ensure complete and meaningful ban on use of these nets.
- Over-fishing is also causing loss and damaging the core fish stock of Pakistan coast which will have negative implications on the fisheries resources as well as fishermen, therefore, only indigenous and bona-fide fishermen should have the right to fish and non-fishers should be prevented from fishing activities.
- Mangrove forests provide breeding grounds and nurseries to a number of fish species and shrimps besides these forests also protect land from sea disasters like typhoons, tsunamis, cyclones. Due to lack of fresh water flow downstream of Kotri area, these mangrove forests are rapidly depleting which is causing significant decline of fisheries resources besides enhancing the disaster vulnerability of the coastal communities. It is, therefore, demanded that minimum environmental flow should be allowed to save the deltaic ecosystem.

2.5 Review of Previous WWF Studies

WWF – Pakistan, Karachi Office, has sponsored several studies in recent years generating a mass of socio-economic and environmental information especially about coastal Sindh.

2.5.1 Change Analysis of Mangrove Forests

In addition to a detailed environmental baseline study, which took stock of biodiversity in the Indus for All Programme sites, technical study on Change Analysis of Mangrove Forests was also undertaken in January 2007. The study noted that the total mangrove cover around Ketu Bunder area in the creeks of Hajamro and Chann was 9,498 ha in 1992, out of which dense mangrove cover was about 1,966 ha (20%), medium mangrove cover was about 1,431 ha (16%), sparse mangrove cover was about 3,494 ha (36%) and very sparse mangrove cover was about 2,607 ha (28%). For 2001, The mangrove canopy cover analysis showed that the total cover was about 7,559 ha. Dense mangrove cover was about 1532 ha (20%), medium mangrove cover was about 1265 ha (17%), sparse 2880 ha (38%) and very sparse 1882 ha (25%). ASTER image of 2006 depicted that the total cover was 7968 ha out of which dense cover was about 1569 ha (20%), medium cover 1202 (15%), Sparse cover 2795(35%), and very sparse 2400 ha (30%). In addition, thin/ sparse algal mats covering an area of about 450 ha were also noted.

The study showed that the aerial extent of mangroves was showing a declining trend from 1992 to 2001, whereas increasing trend was observed within the time period of 2001 to 2006. Overall, temporal analysis showed that there was an overall decrease of 20% in mangroves extent from 1992 to 2001. However, the aerial extent of mangroves recovered up to 5% between December 2001 to January 2006. From field visits it was ascertained that the loss during 1992-2001, mostly around Chann creek, occurred due to lack of freshwater and extensive browsing of camels. During 2001 and 2005, the prices of camels recorded steep rise due to high demand in Afghanistan and Iran, reportedly resulting in the sale of over 700 camels. Also, the cost of freshwater transport to the creek increased significantly, thereby shifting the remaining camels to the Kharo Chann area. These two reasons could provide an explanation to an increase in the cover by 5%. Wood cutting has, however, reportedly increased in the meantime.

2.5.2 Socio- Economic Studies on Ketī Bunder

The socio-economic study of Ketī Bunder (WWF, 2006), documented that boat wreck and floods/cyclones are two common shocks experienced by the population. There is no livelihood alternative during the off fishing season leading to a decline in economic situation of the households engaged in fishing. High population growth rate and over utilization of the fish resources were rated as major issues in Ketī Bunder area. Most of the assets belonging to different capitals were assessed to be weak. The survey respondents were found to be heavily reliant on fishing (55%) with little skill set variation, low literacy level (38%) and a high number of dependents (60%). Among physical capital assets there was no direct gas supply and only 12% of the respondents had an electricity connection. The sanitation conditions were found in a dismal shape with only one respondents reporting latrine inside the boundary walls of house. There is a high dependency on natural resources making the natural capital vulnerable to over-exploitation of mangroves and fish stock. The communities live in relative harmony with no political or religious discord. While the status of women is generally low, some females are engaged in fishing. The financial capital is also weak with low income and savings rate of 5%. Boat ownership is also not very high (24%). While there are several laws such as the Sindh Fisheries Ordinance and Deep Sea Fishing Policy which apply to Ketī Bunder, their enforcement in the area is negligible.

Village Development Plan of Ketī Bunder (WWF, 2005), was aimed at establishing a link between poverty and environmental degradation. It was noted that the total population of Ketī Bunder and adjacent creeks is about 12,000, out of which 90% is engaged in fishing, 8% in livestock rearing and only 2% in agriculture. The average monthly income of majority of households is merely Rs. 3000 while only a small number of households earn between Rs. 6000 to Rs. 15,000 per month. About 90% of population was estimated to be illiterate and education among females was non-existent. A list of nine socio-economic issues was prioritized including the lack of livelihood/ income generation opportunities, sea water intrusion, lack of drinking water especially in the creeks, poor health and hygiene, lack of sanitation and drainage, low levels of education, occupation of influential persons/ sea lords on creeks, lack of fishing jetty and exploitative fish marketing system. Action plan was developed for addressing these priority issues and proposals were advanced for the training/ capacity building of local communities.

Shaheed Zulfiqar Ali Bhutto Institute of Science & Technology (SZABIST) (2004), studied the Knowledge, Attitude and Practices of Fisherfolk Communities about Fisheries and Mangrove Resources in Ketī Bunder site and listed the problems and priorities as perceived by male and female respondents. Male respondents of Ketī Bunder settlement and Hajamro and Chann creeks assigned high priority to drinking water shortage, use of harmful nets, reduction in mangrove forest, lower fish and shrimp catch, high commission and interest rates, absence of fish jetty, threat to village protection bund, and lack of education and health facilities. Female respondents of Ketī Bunder settlement assigned high priority to issues such as unpaved streets, lack of gas and electricity, shortage of drinking water, lack of hospital and female doctor, stray dogs and monopoly of sea lords.

2.5.3 Fish Marketing and Economic Analysis

The WWF study on Fish Marketing Chain and Economic Analysis of Indebtedness of Fisher-folk of Ketī Bunder (2006), revealed that poor and middle class households are the most vulnerable amongst all the classes and rely most heavily on loans to make ends meet. Loans are mostly taken from middlemen. Forty two percent of the sample households are under debt in Ketī Bunder with majority of the loans being taken for capital use (73%). The weighted average loan size being taken by a laborer is Rs. 7,695/- and by a boat owner is Rs. 40,730/- which is being repaid over an

average period of 5 years. Usually, the principal amount is paid back by the fishermen by having the middlemen take an extra amount out of the total sale price. Middleman is earning 166% return on Investment (ROI) simply on the investment in advancing loan to the fishermen; while the middleman who is also an agent is earning even more profit (up to 233% return on his investment), as he is making money from both the fishermen and the mole-holders / company he is an agent for. This is a clear indicator of the exploitative role that the middlemen are playing in Keti Bunder where the middleman is making a far greater profit as compared to the investment that he has put in to finance the fishing operations.

It was concluded that the middlemen have manipulated the system in their favor and are exploiting the fishermen of Keti Bunder by charging exorbitant commission rates on the catch, which the fishermen are unable to oppose because of the distance to the market and their indebtedness to the middlemen. A new market system needs to be instituted in Keti Bunder to prevent further exploitation of the fishermen by the middlemen.

It was suggested that a Community Based Organization (CBO) of fishermen be formed which may act as a representative and negotiate for better rights and rates for the fishermen of Keti Bunder. A pool of vehicles to transport the fish catch can be arranged in order to offer the fishermen better access to a larger market. Keti Bunder can also be considered as a site for establishing a fish processing plant where the fish catch from a mile radius can be brought for processing. This will save a major proportion of the fish catch from going to waste while waiting for transportation and also provide a better income to the fishermen who can sell their fish catch directly to the plant. Development organizations such as NRSP can also be encouraged to open a branch in Keti Bunder to provide the villagers with micro-credit loans and other infrastructure improvements.

2.6 Preliminary Socio-Economic Baseline Study

Shirkat Gah (2007), concluded that the preliminary baseline study of Keti Bunder, Keenjhar, Pai and Chotiari, strongly re-affirms the poverty-environment nexus. Lack of opportunities and varied livelihood options as well as the absence of employable skills compels the poor to place greater reliance on natural resources. The resources that used to be easily available traditionally, are no longer free and have a cost attached which in most instances is unaffordable. Alternatively, the reliance is on human physical capital; i.e. labor. It was further stated that all four sites of Indus for All Programme are poor, their natural resource base is under severe threat, and the peoples' health needs are unaddressed. Out-migration and/or displacement of population have not reduced the dependency ratio, as is indicated by big household sizes. Village profiles reveal poor state of physical infrastructure and basic social services. The four sites typically highlight the debt economy of rural poor, which results in their socio-economic bondage to contractors and land owners.

The preliminary baseline study stated that, on the basis of 1998 Census, the total literacy rates stood at 34.1%, 30.8% and 22% in Nawabshah, Sanghar and Thatta Districts respectively. There were marked urban-rural and male-female differentials. In Nawabshah the urban literacy rate was almost twice that of rural areas (54.3% urban vs 26.5 % rural); the ratio in Sanghar District was wider (53% urban; 23.9% rural) and was the widest in Thatta District at almost two and a half times in urban areas (46% urban; 19% rural). Overall the gap between male-female literacy was 21% (Thatta), 25.45% (Sanghar) and 28% (Nawabshah). In terms of ranking Thatta was ranked 20, Sanghar 15 and Nawabshah 13 out of the 21 districts of Sindh.

In the *health* sector, the Total Fertility Rate was reported to be 5.4 in Nawabshah and 4.9% in Sanghar. Nawabshah district had reasonably good health infrastructure, having a BHU/ dispensary

in each UC and two Mother and Child care centres in the entire District. Even then, about 70% of births were not attended by skilled birth attendant. Sanghar District has 88 health institutions and 64 District Council government dispensaries. The health infrastructure in Thatta is scant. In the six coastal Talukas, three do not have any Rural Health Centre or any veterinary dispensary. The BHUs and dispensaries are also in small number. Thatta District is also very poor in terms of the indicator of piped water, which is available to only about 14% of the housing units. About 13% of rural households have hand pumps inside the housing units, while 16% use outside ponds for fetching water and 6% of housing units use dug wells.

2.7 Indus for All Programme Communication Strategy

Latest available publication in the WWF- Indus for All Programme series was the communication strategy in which various issues of the Indus Eco-Region were documented and detailed categories of stakeholders were identified. It was stated that the Eco-region is facing some critical issues which are both natural and anthropogenic in nature. Major issues interconnected directly or indirectly with livelihoods of human population and its impacts on environmental resources in the Indus Eco-Region were listed below:

Environmental Pollution

- Solid waste generation
- Industrial effluents

Natural Resource Management

- Over-exploitation of natural resources resulting in habitat destruction
- Illegal hunting of wildlife
- Invasive species
- Encroachment over natural biota
- Lack of good governance
- Lack of awareness about wise use of natural resources
- Ill-managed protected areas
- Soil degradation
- Lack of the sense of ownership
- Encroachment on the forest lands
- Over-exploitation of fisheries

Water

- Decrease in the flow of Indus river as a result of upstream dams and irrigation schemes
- Sea intrusion
- Desertification
- Scarcity of potable water
- Pollution of Indus due to human activities
- Water logging and salinity
- Over-exploitation of wetland resources

Governance

- Irrational policies regarding natural resource management
- Lack of local level institutions and infrastructure

- Absence of participatory management approaches
- Clash of interest among local leadership
- Institutional deficiencies

Poverty

- Prevalence of poverty in the region
- Lack of technical skills among local people
- lack of adaptation of new technologies
- Lack of gender mainstreaming
- Lack of alternatives of natural resources

Human Settlement (population)

- In-migration from outside areas
- Resettlement of displaced communities

Several of the above issues are relevant to all the four priority areas with varying degree of intensity. Additionally, law and order and local conflicts are also critical issues at Chotiari and Pai sites. Inadequate tourism infrastructure is an issue associated with livelihoods at the Keenjhar and Ketu Bunder sites. Lack of irrigation water is a severe constraint in the rehabilitation of Pai forest.

3. DISTRICT AND PRIORITY AREA PROFILES

The approved WWF- Indus for All Programme involves three districts of Sindh province, namely Thatta, Sanghar and Nawabshah. The four programme sites include Ketu Bunder (coastal ecosystem) and Keenjhar (freshwater lake) in Thatta district; Chotiari Reservoir (wetland in Sanghar district); and Pai Inland Forest Plantation (Nawabshah District. Profiles of the above three districts and four priority areas were developed from secondary sources, so as to comprehend the meso – level indicators in a proper perspective.

3.1 Profile of Thatta District

Thatta district is situated from 23° 43' to 25° 26' north latitude and 67° 50' to 68° 45' east longitudes. The total area of District Thatta is 17355 square kilometers. The district is bounded on the north by Dadu district, on the east by Hyderabad and Badin districts and India, on the South by Runn of Cutch area and Arabian Sea and on the west by Karachi division. The profile of Thatta district was compiled from World Bank (2005), SDSC (2003) and other secondary source materials. Table- 3.1 presents the current administrative structure of Thatta district.

Table- 3.1 Sub- districts and Union Councils of Thatta District

Taluka	No. Of Union Councils.	Taluka Head Quarter
Thatta	13	Thatta
M. P. Sakro	10	Gharo
Jati	6	Jati
Sujawal	6	Sujawal
M P Bhathoro	8	M P Bhathoro
Ghorabari	5	Gharho
Keti Bander	1	Baghan
KharoChann	1	Baghan
ShahBunder	5	Choar Jamali

Note: Taluka Ketibander & Kharochan are also known as union councils

Physical Resources

Total area of Thatta district is 17,355 square kilometers. In its physical aspects the district has very varied features which range from coastal swamps to fresh water marshes and lakes and from river islands to coastal delta. The current terrain of the district consists of the Makli Hills close by the Thatta town. These hills are 32 kilometers in length and are well known on account of the ancient tombs which are located here. The north western part of the district consists of hilly tracts known as Kohistan. Between Sir and Khori Creeks lie the great Sirganda salt deposits which consist of many square kilometers of solid salt.

The most famous lakes in Thatta district are Keenjhar and Haleji. Keenjhar is a reservoir for feeding canals in the Thatta sub-division. During winter it is an ideal spot for fishing and duck-shooting. The lack of water below Kotri has damaged the ecology of the delta. The climate of the district is moderate. The mean maximum and minimum temperature recorded during this month is about 40 degrees Celsius and 25 degrees Celsius respectively. The winter season starts from November when the dry and cold northeast winds replace the moist sea breeze. As a result, there is an immediate fall in temperature. January is the coldest month. The annual average rainfall of the district is about 200 mm.

Human Resources

The population of all nine *Talukas* of Thatta District according to the 1998 Census was 1.113 million. There are six *Talukas* which are coastal and three which are non-coastal. The population of the non-coastal *Talukas* is the most dense. The coastal *Talukas* have large geographic areas and much lower population densities. The rural population of the district was 0.988 million in 1998 constituting 89% of the population. The age structure of the population showed that young persons of 18 years and above were 52 percent of the population; while 68 percent of people were currently married and 47 percent of total females in reproductive age.

Table- 3.2 Population of Thatta District by Talukas- 1998

Admn. Unit	Area (Sq. Km)	Population			Density per sq.km	Urban Proportion	HH Size
		Total	Male	Female			
Thatta Distt.	17,355	1,113,194	589,341	523,853	64.1	11.2	5.1
Ghorabari	1,018	105,482	55,527	49,955	103.6	---	5.2
Jati	3,486	123,957	65,479	58,478	35.5	6.3	4.7
Keti Bunder	771	25,700	13,553	12,147	33.3	9.8	4.9
Kharo Chan	778	25,666	13,794	11,872	33.0	--	4.7
M.P. Bathoro	698	151,915	80,753	71,162	217.6	10.9	4.8
M.P. Sakro	2,958	198,852	105,345	93,507	67.2	11.9	5.0
Shah Bunder	3,074	100,575	53,392	47,183	32.7	13.3	4.5
Sujawal	747	127,299	67,298	60,001	170.4	18.3	5.3
Thatta	3,823	253,748	134,200	119,548	66.4	14.8	5.6

Source: District Census Report, 1998

Islam is the predominant religion (97% people). Sindhi is the major mother tongue spoken by about 96 percent people.

Biological Resources

The flora of the area is governed by the type of soil and the amount of moisture available. Thatta District has a wider range of soil types due to its diverse land forms which include sandy, deltaic, alluvial, gravel, coastal and mountainous. In the Kohistan region, the dominant trees and shrubs are hubul (acacia Arabica), kaneli (prosopis spicegra), Pi (salvadora olioides), karil (capparis aphylla), rhazya stricta, daemia extensa and many others. The dominant trees, shrubs and under shrubs of sand dunes are represented by ak (calotropis precerra), lai (tamerix diocia) besides babul, kandi and karil, etc. The plants found cultivated or wild near villages in the alluvial tracts are neem (azadirachta indica), ber (zizyphus jujube), and serrel (albizzia lebbeck), etc.

The wildlife in the area has been adversely affected by colonization and many wildlife species have either diminished or vanished. At present hyenas and wolves are hardly ever seen. Jackals are fairly common and foxes are seen in the rapidly contracting area of dry waste. Hog deer and pigs through diminished are still found in small numbers. Wild Hare are fairly common in bush forest. The Keenjhar, Haleji and Hadero lakes are located on the international flying routes of the ducks. Among birds, both grey and black partridges are very common in the forest plantations. Geese are also found penetrating the fields of gram and wheat. Kunj are also regular winter visitors. Sand grouse of various kinds and the hubuora bustard visited the district in cold weather, but the expansion of the cultivated area has driven them away.

The total area under forest in Thatta for 1997-98 was 422,00 hectares which produces 76,000 cubic feet of timber and 228,000 cubic feet of firewood. Most of the forests in the Thatta district are

located along the banks of the Indus. There are some forests in other areas as well. Forest growth consists of four chief sorts of trees, namely acacia Arabica or babul, prosopis specigera or *kandi*, populus euphratic or *bahan* and two species tamarisk. Babul has a high economic value. Another tree found occasionally in the forests in dalbergia sisso or *tali*.

The fresh water flow in the Indus in the area has been reduced from the historic 150 MAF to less than 10 MAF per annum below Kotri barrage. However, during most of the year there is no flow below Kotri at all and even agreed 10 MAF is not supplied. There has also been reduction in silt from 100 million tons downstream of Kotri since the last decade. These rich silt deposits were the main factor behind the increased fertility of the area along the banks. However, the dams and barrages upstream now prevents the silt from flowing in the river. Furthermore, the flow of the Indus would prevent sea water intrusion. Many areas have been completely inundated and some of the thriving coastal villages like Shah Bander and Ketu Bunder are barely inhabited.

Agriculture and Livestock

Like rest of Pakistan, there are two main agricultural seasons in the Thatta District. The main crops grown in the district in the Rabi season are wheat, barley, gram and oil seeds. In Kharif, the main crops grown are rice, maize, millet and Jowar. Most common vegetables are grown in all the Talukas in the district. Coconut trees are found in Ketu Bunder, Mirpur Sakro and Thatta Talukas. Bananas are grown in Thatta, Ghorabari and Mirpur Sakro Talukas. Other fruits grown in the district are Papaya, Guava and mangoes. However, the banana crop exceeds the other fruits in terms of the area and production by far. The district is surplus in rice. Besides, bananas of good quality are exported to Iran and the Middle East. The important items of trade in the district are rice, leather and wool. Good breeds of buffalo and cow are found in the district. Sheep, goats, camel, horse, ass and mule are also the main livestock of the district. Livestock in the district suffers in particular from shortage of high quality feed and fodder crops as a result of the overall shortage of water.

Employment

The economically active population is 25 percent of the total population and 37 percent of the population aged 10 and above. A high unemployment rate of 18 percent was recorded in Thatta District in 1998. Of the total employed persons, about two-thirds are engaged in primary occupation namely agriculture, forestry, fishing and hunting.

Enterprise and Industrial Sector

From the industrial point of view, Thatta district has progressed considerably. There are about 30 industrial units established in the district. Apart from the sugar mills all the larger industrial units are located in Dhabeji and Ghoro adjacent to Karachi. Most of the labor in these units is generally non-local and commutes from Karachi.

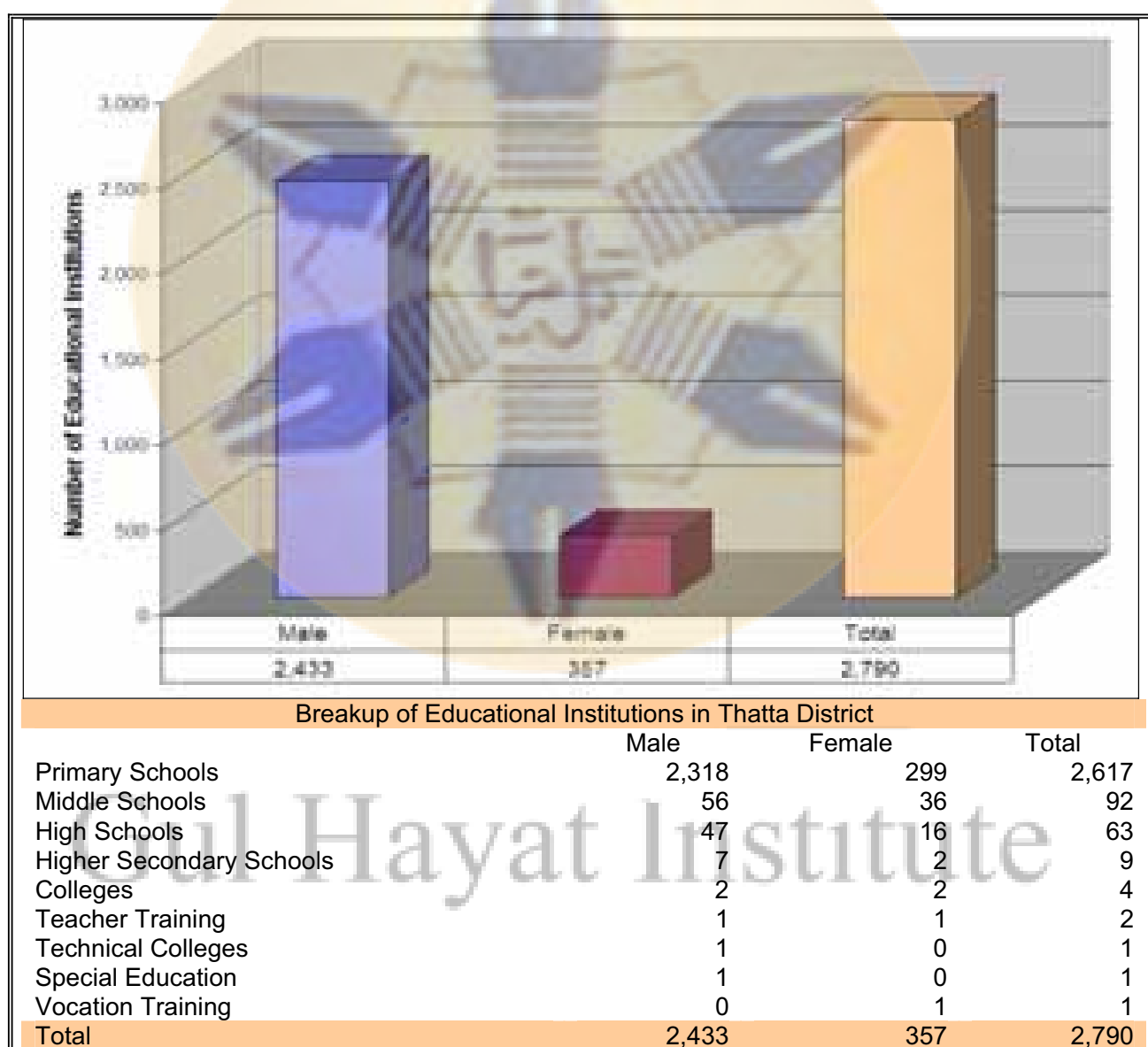
Marketing Infrastructure

The district is linked by road with other districts. National Highway from Karachi to Peshawar passes through Thatta for a length of 200 kilometers. All major towns of the district are connected with metalled roads of 1,585 kilometers length. The main railway line from Karachi to Peshawar also connects the district. The principal railway stations are at Jangshahi, Dhabeji and Jhimpir. The district is also equipped with digital and non-digital telecommunications systems besides postage and telegraph.

Social Sector Services

Literacy rate in Thatta district was reported to be 22 percent in 1998. Male literacy rate was three times higher at 32 percent compared with the female literacy rate of only 11 percent. The literacy rate in urban areas was much higher at 46 percent compared to only about 19 percent in rural areas. There is a wider gap between males and females in rural areas where literacy ratio for males is 28 percent compared to only 8 percent for females. Of the total educated persons, 35 percent have passed primary, 13 percent middle and 13 percent matriculation. After matriculation, the percentage falls steeply to 6 percent for intermediates, 3 percent for graduates and less than 2 percent for post graduates.

Figure- 3.1 Boys and Girls Schools in Thatta District



Source: SEMIS Department Thatta Report, July 2005.

Three out of six coastal Talukas do not have any Rural Health Centre or any veterinary dispensary. The BHUs and dispensaries are also in small number. It is estimated that there is one dispensary with one compounder for about 5,000 people in the coastal talukas. A particular problem of access to health services is the scattered nature of the population. Thus many of the people have no access to health services within a convenient location from their homes.

Table- 3.3 Health Facilities in Coastal Talukas of Thatta District- 1998

S #	Taluka	Rural Settlements 200+	RHC	BHU	Dispensary	Vet. Disp.
1	M.P. Sakro	276	0	7	19	0
2	Jati	208	1	5	7	2
3	Shah Bunder	170	0	4	11	1
4	Keti Bunder	66	1	0	4	0
5	Ghora Bari	177	2	4	19	1
6	Kharo Chan	76	0	1	9	0

Source: Population Census Report, 1998.

Housing and Water Supply

More than 78 percent of the housing units in Thatta District are one room houses. Housing units with 2 to 4 rooms are about 38 percent of the total in urban areas compared to only 19 percent in rural areas. There are about 4 persons per room in Thatta District. Two-thirds of the housing units are constructed with wood and bamboo. Only about 14 percent houses are Pacca in the rural areas. Thatta district is also very poor in terms of the indicator of piped water which is available to only about 15 percent of the housing units, while 16 percent use outside ponds for fetching water and 6 percent of housing units use dug wells. Being at the tail end of the Indus River system, Thatta district is currently facing the worst ever fresh water crisis due to non-release of water downstream Kotri. Drinking water is being purchased at a high cost in most coastal settlements.

Table- 3.4 Indices of congestion in 1981-1998 census reports

Level of congestion	All areas	1981		1998		
		Rural	Urban	All areas	Rural	Urban
Persons per housing unit	6.47	6.48	7.013	5.1	5.00	6.00
Persons/ room	4.31	4.63	3.69	3.92	3.85	3.75
Rooms/ Unit	1.5	1.4	1.9	1.3	1.3	1.6
Units with one room %	77.21	79.51	53.44	78.14	80.02	60.1

Electricity

Electricity is available in 21 percent rural housing units whole kerosene oil is still used in 77 percent of the rural dwellings. Firewood is used as the main cooking fuel in about 91 percent of rural

households and 77 percent of urban houses. Only about 38 percent of the rural households have a separate kitchen facility and about 35 percent have a separate bathroom facility. The resident of units without proper latrine facility use adjacent rural environs.

3.2 Sanghar District

Sanghar district came into existence in 1953. Since 1990, it comprises of the following sub-districts (Talukas): Sanghar, Shahdadpur, Tando Adam, Khipro, Jam nawaz Ali and Sinjhor. It has 55 union councils. Geographically, it is surrounded by Khairpur and Nawabshah districts in the north, Umerkot and Mirpurkas districts in the south, Matiari district in the west and the Jodhpur state of India in the east. The district Sanghar is divided into two broad parts, a green belt in the West and Desert in the East. The main Nara Canal is dividing line of the two parts. The desert comprises on sandy dunes in the eastern part of Sanghar and Khipro Talukas. The desert portion stretches over 1/3rd area of the entire district, which depends on rain, while remaining area is irrigated by Sukkur barrage/Narra Canal.

The main caste groups in Sanghar district are Nizamani, Laghari, Sanjrani, Rind, Chaneeho, Mangrio, Mallah, Kumbhar, Khaskheli, Mari, Wassan and Behan. A substantial number of ethnic Punjabis are also settled in the district. In addition, the scheduled castes such as Kohlis, Bheels, and Meghwars also work as agricultural labor/ tenants in Sanghar district.

Educational Institutions

In the field of education a sufficient number of institutions are functioning to improve the condition of masses in the district:

- Degree colleges 07
- High Schools 51
- Middle Schools 48
- Primary Schools 1026
- Mosque Schools 1016

Livelihood Sources

Livestock is the main occupation in the desert area of district Sanghar which is known as “White Desert” or “Achhro Thar”. A vast tract of Sanghar district comprises of irrigated agricultural land. Industries also play a vital role in the economy of Sanghar district. There are Cotton Ginning factories in all talukas of Sanghar. In Tando Adam, there are Textile mills, Food Industries and Match Industries.

Irrigation and Drainage

Nara canal is massive source of water in this district. The tributaries of Nara canal include Khipro Canal, Jamrao Canal and Mithrao canal. Participatory irrigation management is being practiced on Nara canal through 196 Farmers’ Organizations (FOs) and the Nara Canal Area Water Board (NCAWB). Members of these organizations have received training in project management and networking for productivity enhancement. Sanghar district was a component in the LBOD Stage- I project. It has a vast network of surface drains and drainage tube wells connected with the spinal drain.

Piri Muridi and Social Stratification

The religious institution of *piri muridi* is very strong in Sanghar district. Followers of Pir Sahib Pagara are in majority throughout the district. In addition, due to large landed estates, social stratification on the basis of land ownership is widespread. The curse of bonded labor is also reported in the district.

Major NGOs

Two major NGOs having programmes in the environment sector are: Sustainable Development Foundation (SDF) and Sindh Agricultural & Forestry Workers Coordination Organisation (SAFWCO). Pakistan Fisher Folk Forum (PFF) is quite active on the livelihood issues of the fishing communities. It has a chapter in Phulail village of the Chotiari site. Shirkat Gah has also worked here in the past on the issue of Chotiari Reservoir. There are several NGOs in the health sector including Marie Stopes Society and the HANDS. A list of major NGOs is given at Table- 7, Annexure- A.

3.3 Nawabshah District

Nawabshah District is located between 25°-59' to 27°-15' north latitudes and 67°-52' to 68°-54' longitudes. It is bounded on the north by Naushehro Feroz and Khairpur districts, on the south by Hyderabad district, on the east by Sanghar and Khairpur Districts and on the west by river Indus, Larkana and Dadu districts. Total geographical area of Nawabshah District is 4502 square Kilometers. With the exception of north eastern part of Nawabshah Taluka which is desert known as Gunjo Thar, the rest of the District is a fertile plain formed by the Indus river. The soil is sandy with hard clay loams and has benefited more than any other part of Sindh from the development of irrigation under Rohri Canal.

The northern portion is affected by the desert and hence climatic conditions are extreme. The southern portion enjoys the advantage of Sea Breeze. Summer season commences from April and continues till October. May, June and July are the hottest months. Months of August and September are stuffy and suffocating. December, January and February are the coldest months. Average yearly rainfall in the District is only about five to seven inches.

Flora and Fauna

The number of different kinds of grasses and other plants of low growth is considerable. Forest growth consists of four chief sorts of trees, namely *Acacia arabica* or babul, *Prosopis spicigera* or kandi, *Populus euphratica* or bahan and two species of tamarisk- *Tamarix gellica* and *dioica* called lai and jhao respectively. With the exception of such humble species as the Jackal, wild animals may now be said to be almost non-existent. Both gray and black partridges are very common in the forest plantations. Most of the common kinds of wild Duck water Fowl are met with during the cold season. Geese are also found, penetrating to the fields of green Wheat and Kunj are also regular winter visitors. Fish of many kinds are caught in the canals, particularly in deep pools that are left standing during a closure.

Agriculture and Livestock

Main crops during Rabi are Wheat, Oil seeds, Berseem fodder, Peas and Gram and Cotton, Jowar, Bajri, Goward and Sugarcane in Kharif season. Among fruits, oranges, mangoes and bananas are cultivated. Principle vegetables grown in the district are cauliflower, tomato, peas, carrot, spinach, lady finger and onion. Nawabshah District is entirely under irrigation settlements. Indus river flows along its western boundary for about 90 Kilometers. Irrigation in the District mainly depends on canal-water, tube wells and spill of Indus river. The main canals in the district are Rohri and Nasrat canals providing perennial water supply.

Good breed of buffalo and cow are found in the District. Sheep, goat, camel, horse, ass and mule are also the main livestock of Nawabshah District. The cattle of Nawabshah are among the best in Pakistan. The finest milk cows are found chiefly in tracts, wherever there is grazing and water.

Industry and Trade

There are 18 cotton ginning factories and 3 sugar mills in Nawabshah district. Besides, there is 1 textile mill, 4 flour mills, 1 oil mill, 01 Chemi-Visco Fibre Plant and 1 engineering implements factory. Soap-making factories also exist here. Nawabshah basically is an agricultural District. Therefore, main trade relates to sale and purchase of agricultural products like wheat, sugar cane, cotton, rice, fruits, vegetables, pulses and fodder. Nawabshah, Sakrand and Daulatpur are main trade centers. The important means of transport and communication in the Nawabshah District are roads, railways and water. The District is also linked with other parts of the country by air.

Population size and growth

The Population of Nawabshah District, presently comprising three Talukas, is 1071.53 thousands in 1998 as compared to 813.53 thousands in 1981 recording an increase of 31.71 percent over the last 17 years i.e. from 1981 to 1998. The average annual growth rate of population in 1981-98 has declined to 1.63 percent from 2.44 percent.

Table-3.5 Population of Nawabshah District since 1951

Description	1951	1961	1972	1981	1998
Population (Thousands)	220.50	320.33	663.43	813.53	1071.53
Intercensal increase (Percent)		54.27	107.11	22.63	31.73
Cumulative increase (Percent)		54.27	200.87	268.94	385.95
Average Annual Growth rate (Percent)		3.84	6.44	2.44	1.63

Source: District Development Indicators, Nawabshah, 2000

Among the three Talukas of the District, more than half of the population is reported in Nawabshah Taluka at 51.78 percent followed by 25.18 percent for Sakrand Taluka and 23.03 percent for Daulatpur Taluka. The area of the District is 4502 Square Kilometers yielding a population density

(persons per Square Kilometer) of 238 in 1998. Average house hold size of the District is 6.0 persons in 1998. Average house hold size among the Talukas is almost the same at 5.6 except Nawabshah Taluka where it is higher at 6.4. If we compare rural / urban areas the house hold size is 5.6 in rural and 7.4 in urban areas. The rural population of the District is 789.17 thousands constituting 73.65 percent of the total population in the District in 1998. The average annual growth rate of rural population during 1981-98 is 1.08 percent which has decrease from 2.06 percent during 1972-8. It was 6.32 percent and 3.83 percent during 1961-72 and 1951-61 respectively.

The urban population of the District is 282.36 thousands which constitutes 26.35 percent of its total District population in 1998. The average annual growth rate of urban population has declined to 3.54 percent in 1998 as compared to 4.21 percent in 1981. It has showed tremendous increase of 7.03 percent in 1972 in comparison to 3.87 percent in 1961 census. There are eight urban localities in the District: of which Nawabshah Municipal Locality has a population of 189.24 thousands in 1998.

The literacy rate has been targeted to increase from 37.43% to 80.65% by the year 2015. Around 467 thousands of 10+ age group population will become literates during the period of plan (2003-2015).

3.4 Socio- Economic Indicators

Comparison of selected socio- economic indicators of the three Indus for All Programme districts, based on the Population Census of 1998 and presented in Table- 3.6, indicates that the highest population density of 238 persons per sq km is in Nawabshah district , followed by Skkur and Sanghar. Thatta district has the lowest population density of 64 persons per sq km. In fact, the coastal area of Ketu Bunder has the lowest population density of 33 persons per km while Thatta district with Keejhar site has the population density of 64 density per sq km. Per capita cultivated acreage is quite high in Thatta district but the actual cropped area is highest in Nawabshah depicting almost 100% cropping intensity. Estimated cropping intensities in Sukkur, Sanghar and Thatta were roughly 95%, 85% and 50% respectively. Per capita agricultural production was also noted to be the highest in Nawabshah district. Thatta district had the lowest literacy ratio, specially among rural women. Although Sukkur district had better overall educational indices, Nawabshah appeared to have better ratios in rural areas. Sukkur one again exceeded in health indices in urban areas while Nawabshah had better ratios of doctors and para- medical staff in rural area. It may, however, be noted that Ketu Shah site in Sukkur district does not represent the district development scenario. It has poor law and order situation and the poorest of social development indices in the district.

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Table- 3.6 Selected Development Indicators of the Programme Districts

INDICATORS		Thatta	Sanghar	Nawabshah	Sukkur
1. POPULATION					
	Density (persons/sq. km)	64	135	238	176
2. LAND USE					
	i) Per Capita Cropped Hectares	0.16	0.25	0.26	0.17
	ii) Per Capita Cultivated Hectares	0.33	0.31	0.25	0.18
3. FERTILIZER USED					
	N. Tons per "000" Hect. Of cropped area	0.10	0.20	0.18	0.11
4. AGRICULTURE PRODUCTION					
	i) Per capita wheat production (M. Tons)	0.02	0.24	0.26	0.13
	ii) Per capita rice production (M. Tons)	0.11	---	0.01	0.01
	iii) Per capita cotton production (Bales)	--	0.32	0.24	0.13
	iv) Per capita sugarcane production (M.Tons)	1.56	0.52	1.30	0.28
5. LITERACY RATIO					
i) All Areas					
	a) Both Sex	22.14	30.87	34.13	46.62
	b) Male	31.58	42.88	47.62	59.83
	c) Female	11.40	17.45	19.62	31.22
ii) Urban					
	a) Both Sex	45.92	53.15	54.26	59.76
	b) Male	56.98	64.65	64.95	70.59
	c) Female	33.90	40.55	42.69	46.90
iii) Rural					
	a) Both Sex	18.99	23.94	26.47	31.72
	b) Male	28.31	36.18	41.00	47.40
	c) Female	8.34	10.17	13.78	13.78
6. Education					
	i) Enrollment Participation Rate (primary)	42.68	53.45	76.40	60.28
	ii) Student per school (primary)	31.32	42.63	68.96	84.12
	iii) Students per teacher (primary)	16.26	17.43	31.14	22.79
	iv) Teachers per school (primary)	1.93	2.45	2.21	3.69
7. HEALTH					
	i) Doctors per 10 thousand persons	2.70	1.83	3.81	2.59
	ii) Nurses per 10 thousand persons	0.33	0.37	0.76	0.98
	iii) Paramedics per 10 thousand persons	3.99	3.73	5.77	3.76
	iv) Beds per 10 thousand persons	2.97	2.66	7.18	15.98
8. TRANSPORT & COMMUNICATIONS					
	i) Pacca road/ 100 sq km	9.38	18.34	25.59	12.85
	ii) Katcha road / 100 sq km	1.66	2.94	9.33	2.24
	iii) Car, Jeep, Stn Wagon per "000" households	1.11	4.00	10.39	12.04
	iv) Motor Cycle per "000" households	3.60	16.45	104.62	152.3

Source: District Development Indicators Sindh, 2000.

On an overall basis, Thatta district had the lowest literacy rates while the health indicators were poor in Sanghar district. Reliable official indicators of population and social development are likely to be available in 2009, when the results of population census 2008 are published by the Government of Pakistan.

3.5 Indus for All Programme Sites

3.5.1 Keenjhar Lake

Located in Thatta District is a freshwater lake covering an area of about 14,000 ha. It is a wildlife sanctuary and a Ramsar site. The lake is rich in fish fauna and supports the livelihood of about 50,000 people. It is an important breeding and wintering area for a wide variety of birds. It is located between latitudes 24-15 to 25-30 N and longitudes 67-30 to 68-15 E. It came into existence as a consequence of implementation of the Kotri Barrage Canal Irrigation Project. This artificial reservoir has been formed out of natural depressions called Sonehri and Kinjhar dhandhs (depressions), by closing the gaps in the surrounding hills with earthen embankments having an average height of about 7 meters (25 feet). The lake is 32 km (20 miles) long and has an area of 130 sq km (50 sq miles). The gross storage capacity at its full conservation level (RL 54.00) is 0.52 MAF. Its minimum downstream level is RL 42 and usable storage is 0.37 MAF.

Mangan (2007), stated that Pakistan presently has 19 sites designated as wetlands of international importance, and Keenjhar lake is one of them (RS # 99, 1976). It is located in Thatta district on the national highway, some 122 kilometers from Karachi and 86 kilometers from Hyderabad. Its surface area is 13,486 sq ha. The lake has the length of 32 kilometers, width of 11 kilometers and a storage capacity of 0.53 million acre feet (MAF). Source of freshwater for Keenjhar lake is the Kalri Baghar (KB) feeder which takes off from the Kotri Barrage near Jamshoro.

Keenjhar is a vital wetland area of great ecological, biological, hydrological and economic significance. It has several attributes such as fish, recreation, tourism, wildlife, flood control, ground water recharge, and fresh water supply. This lake is internationally important for breeding, staging and wintering of water birds. Keenjhar, Hadero and Haleji lakes provide refuge to almost 250 different species of birds. Common, among these birds, are grey heron, purple heron, night heron, purple gallinule, water rail, brahmyn kite, black shouldered kite and coucal. Keenjhar is also famous for its extensive reedbeds. The lake has a remarkable cultural status in Sindhi literature because of the legendary romance of Noori and Jam Tamachi. The grave of Noori is located on an island in the middle of the lake.

The primary function of the Lake is to provide domestic and industrial water supplies to the Metropolitan City of Karachi. In addition, the Lake also caters for the irrigation water requirements of 142,600 ha (352,300 acres) perennial and 120,000 ha (297,600 acres) non-perennial area in Thatta district. The lake also serves as a reservoir for the runoff from three major hill torrents- Choher Nallah, Kalu Nallah and Muthan Nallah. These nallahs drain an aggregate area of 1,690 sq km or 650 sq miles, which previously had their outfall in the dhandhs of Sonehri and Keenjhar resort internationally important area for breeding, staging and wintering waterbirds, supporting as many as 140,000 birds, including European Pigeon, Black Coot and Common Pochard.

Located on national highway and being the nearest water body with great scenic beauty, the lake also serves as a tourist resort specially for the urban population of Karachi. It has 12 tourist lodges and a restaurant managed by the Pakistan Tourism Development Corporation (PTDC). More lodges are being constructed currently. There is, however, no suitable arrangement to develop planned tourism and reliable livelihood opportunities based on tourism.

3.5.2 Ketī Bunder

Keti Bunder is one of the major towns in Thatta district along the coastline that is facing environmental degradation and loss of livelihood opportunities for the locals. Both underground and surface freshwater resources have been degraded by sea intrusion. Seawater has encroached into the creeks, delta, and channels causing the soil salinity of adjacent lands to exceed cultivable limits. Eight species of mangroves have been reported to occur in the area but six species have been lost. Only two species have survived and are being re-introduced in the delta. Ketī Bunder North and South is a Wildlife Sanctuary, mainly for the water.

Keti Bunder was formerly a port city and commercial center. In 1845, the population was recorded as 2,542 and the town was given the status of Municipal Committee in 1874. The location of Ketī Bunder has changed thrice during the last century due to sea intrusion. Situated at about 200 km south-east of Karachi, Ketī Bunder taluka/ union council consists of a total of 42 Dehs (settlements) of which 28 have already been engulfed by the intruding sea. There are four major nearby creeks in the area viz. Chann, Hajamro, Khobar and Kangri or Tarchan. The climate is arid subtropical with temperatures remaining moderate throughout the year. Marine fishing is the main source of livelihood. Not all the fishermen own boats. Many of them work as laborers on boats.

The town of Ketī Bunder is spread over 35 acres and surrounded by seawater. Hajamro and Chann creeks which are shallow water channels with small settlements are part of the programme site. The total population of Ketī Bunder town and adjacent creeks is about 12,000 only. However, the population of Ketī Bunder Taluka/ Union Council was reported in 1998 to be 25,000 only. There has been a substantial migration to Karachi and other areas since then. Mangrove forests are the key ecological feature of the area. Dense mangroves cover an area of 2,631 hectares, medium mangroves cover an area of about 1,996 hectares and the sparse mangroves cover an area of 3,588 hectares. The rest of the area comprises of sand dunes, settlements and water channels.

Access to education in the area is very low with 90% of the local population illiterate. The overall literacy ratio in Ketī Bunder town is very low as compared to the district, provincial and national level average literacy ratios. The literacy among the males is 12% whilst that among the females is as low as 5%. A number of diseases are common in Ketī Bunder including Tuberculosis, Hepatitis and Malaria.

Natural Resources

Indus delta region from Dabbo to Seer creek (a total of 13 active creeks instead of 23 in the past), is spread over a total of 752,986 hectares, out of which deep and turbid waters account for 242,220 ha (32.17%) and 38,570 ha (5.12%) respectively. Other uncultivable areas from the perspective of mangrove development include sandy patches (6,420 ha), saline area (46,860 ha), and dry mudflats (183,020 ha). The mangrove stand (dense, medium and poor all included), as per the latest available satellite imagery of 2005, exists on about 10 percent of the delta area, i.e. on only about 75,000 ha. There is a very high potential of plantation of *Timer* (*Avecennia marina*) and *Kumni* (*Rhizophora mucronata*), on the wet mudflats falling adjacent to the present mangrove stands, subject to the availability of sufficient freshwater and silt.

The mangrove forests of Ketī Bunder are categorized as 'Protected Forests' and the land, water lakes and dhoras in Ketī Bunder have been notified as Wildlife Sanctuary. Due to reduction in

fresh water flow in the Indus Delta, the mangrove forests have completely vanished in Turchan creek. In Hajamro creek, mangroves exist on small area. Some mangrove trees also exist in Khobar creek. The major cause of mangrove reduction is the use of mangroves as firewood and for livestock grazing. The scarcity of fresh water has also contributed towards rapid degeneration of natural resources.

Plantation and regeneration of mangroves through various projects and programmes during the last 25 years, has been reported on about 26,000 ha; i.e., averagely on about 1,000 ha per annum only. Natural regeneration and plantation of mangrove saplings is possible to a considerable extent only if the delta receives at least 10% of the basin flows; i.e., around 14 MAF of freshwater uniformly released for 120 days. Historically, however, in 4 out of 5 years this volume of freshwater is not available. In dry years, such as the 2000-2003 period, the average availability of water was abysmally low to the tune of 2.5 million MAF. This flow is also polluted with a variety of industrial effluents, sewage, and solid waste, especially on the right bank of Indus near Karachi city. Ketī Bunder falls within that range where the lack of freshwater and industrial pollutants have caused severe harm to the coastal ecosystem and mangrove forests.

Participatory management through sustainable use of mangrove resources, their protection and conservation is a key priority in coastal eco-region of Indus delta. There is a need to create awareness among planners and to involve the coastal communities in the management of mangrove forests. In the Ketī Bunder priority area (PA-2), the WWF mangrove plantation programme is limited to Hajamro creek only. The list of ongoing plantation projects by the SFD and CDA is given at Annexure. These plantations are limited to Chann creek where the on-going wood cutting in connivance with the officials and camel grazing are causing over exploitation and serious depletion as well.

Agriculture

Prior to 1991, when freshwater was in abundance, red rice was the main agricultural commodity in Ketī Bunder and Kharochan union councils. The area was suitable for growing different kinds of fruits including bananas, coconuts and melons. With the reduction in freshwater flow, the sea has crept in and agricultural lands have either been swept away by the sea or spoilt by water-logging and salinity. Vegetable, betel leaf, sugar cane, wheat and fruits are now grown in the fertile inland areas.

Floral Diversity

Some 39 plant species belonging to 32 genera and 19 families are present in the area. The major plant families contributing to the formation of vegetation in the area are Chenopodiaceae (17.9%) and Poaceae (12.8%) followed by Amaranthaceae (7.6%), Aizoaceae (7.6%), Tamaricaceae (7.6%), Papilionaceae (5.1%), Boraginaceae (5.1%), Tiliaceae (5.1%) and Zygophyllaceae (5.1%).

Fisheries

About 63 fish species and 24 shell species are recorded in the Ketī Bunder area. Fish and shrimp species that have decreased in recent years are Goli, Dangri, Phar and Kiddi, Mato, Lour, Pada, Boska, Bora, Batoon, Ghanghra, Kachik, Paplet, Suo, Dangro, and Sueri, etc. Some fish species such as the Palla fish have nearly vanished.

Wildlife and Marine Animals

Keti Bunder North and South is a Wildlife Sanctuary, mainly for the water birds. About 50,000 birds in a migratory season have been recorded from this area in the past. The migratory birds include pelicans, egrets, herons, waders, raptors, etc. Among terrestrial mammals, Wild Boar, Asiatic Jackal, Fishing Cat and Indian Porcupine are common. Reptiles of the area include cobras, vipers, sea snakes and lizards.

Bottlenose dolphin (*Tursiops truncatus*), Hump-backed dolphin (*Sousa chinensis*), Common dolphin (*Delphinus delphis*), Spinner dolphin (*Stenella longirostris*) Finless porpoise (*Neophocaena phocaenoides*) are the common marine mammals.

Birds

A total of 69 species were recorded in the Keti Bunder area during the ecological assessment in 2006. Among these the majority were migratory such as White Pelican (*Pelecanus Onocrotalus*), marsh sandpiper (*Tringa Stagnatillis*), Green Shank (*Tringa Ochropus*), Red Shank (*Tringa Totanus*), Curlew (*Numenius Arquata*) and Ruff (*Philomachus Pugnax*). Apart from the water birds, some terrestrial species are also found such as Crested Lark (*Galerida Cristate*), Desert Lark (*Ammomanes Deserti*), Small Green Bee-Eater (*Merops Orientalis*), White-eared Bulbul (*Pycnonotus Leucogenys*), Red-Vented Bulbul (*Pycnonotus Cafer*) and the Common Buzzard (*Buteo Buteo*).

3.5.3 Chotiari Reservoir

Chotiari reservoir, located in Sanghar District, occupies an area of about 18,000 ha. The reservoir exhibits a complex of terrestrial and aquatic ecosystems. The aquatic features of the reservoir area comprise diversity of small and large size (1-200 ha) freshwater and brackish water lakes. These lakes are a source of subsistence and commercial fisheries for the local people and habitat for crocodiles, otters, fresh water turtles and feeding and nesting grounds for a variety of resident and migratory birds. Chotiari Reservoir is located in Taluka Sanghar, District Sanghar at a distance of about 30-35 km north-east of Sanghar town. It has a water storage capacity of 0.75 million acre feet (MAF). The main storage of the Reservoir has the Thar Desert on one side and is bounded by sand hills towards north, east and south-east and the Nara Canal towards the west and south. Bunds and dykes surround the reservoir: The Northern Bund (19 km long embankments), Western Bund (14 km), The Southern Bund (16km) and South Eastern Dykes (9km). Land in the vicinity of the embankments is largely waterlogged with reeds growing in it. The area is a rich breeding and nesting ground for birds and stopping place for migratory birds and is equally rich in fish.

Created in a natural depression along the left bank of the Nara Canal its construction began in 1994 and was completed in 2003. The Chotiari Reservoir was designed to store the flood waters of River Indus during the flood season (June to September) and to release them as required in the winter (December to March) or early summer (April to June) season. There are depressions and *dhands* (lakes) in the area that are filled up with rain water and seepage from the Lower Nara Canal as well as the surplus water of Nara Canal. The largest *dhands* are Bakar and Makhi reaching a depth of 45 feet in places. The reservoir lands cover seven clusters of villages (*dehs*) Makhi, Haranthari, Bakar, Phuleli, Akanwari and Khadvari. The population surveyed during the Resettlement EIA by MMP (1993), comprised 7,753 persons in 1,275 households, as per the following details:

Table- 3.7. Population Surveyed in Chotiari Reservoir Area During 1993

S.No.	DEH	VILLAGES	HOUSEHOLDS	POPULATION
1.	Bakar	15	316	1, 847
2.	Makhi	9	164	907
3.	Mithrao- 1	2	44	266
4.	Khadvari	2	34	196
5.	Dubi-2	7	110	720
6.	Haranthari	11	139	895
7.	Akanvari	28	468	2,922

Source: MMP Consultant Surveys, 1993.

The final list of villages provided by the WWF team comprises 30 settlements. Detailed profiles of these villages are given at annexure.

3.5.4 Pai Forest

Pai Forest in Nawabshah district covers an area of 1933 hectares. Due to its ecological importance, the entire area of Pai forest has been declared as a Game Reserve by Sindh Wildlife Department. The forest provides a natural habitat for different wildlife species that include hog deer, partridge, asiatic jackal, jungle cat, porcupine, wild boar, snakes and others. Originally, the Pai forest formed the part of riverine ecosystem which depended on annual inundation of the River Indus; but, due to construction of protective embankments all along both sides of the Indus in early twentieth century, Pai forest was cut off from the riverine tract and it became dependent on sanctioned irrigation water supply which is inadequate and infrequent to sustain the entire forest area. This situation is leading to a continuous degradation of forest and wildlife habitat.

Table- 3.8 Details of Area Notified and Sanctioned Irrigation Water for Pai Forest (Inland Plantation)

S.No.	Deh	Area Notified (ac)	(ha)
1.	6-Marvi	899.35	364.0
2.	18-Sakrand	1128.31	456.6
3.	Tali	3228.41	1,306.5
4.	Morio Lakho	643.29	260.3
5	25-Batho		
	Total	5899.36	2,387.4

Forest	Name of water course	Sanctioned Discharge		Area irrigated ha(ac)
		Kharif	Rabi	
Pai	10- L	10.0	10.0	250 ha (618 ac)
	11- L	10.0	10.0	250 ha (618 ac)
	12- L	10.0	10.0	-

SFD (2000), in the forest management plan for Nawabshah district, documented that the total area of riverine forests is 48,189.5 ac (19,502.0 ha), and of irrigated plantation is 6,926.6 ac (2,803.2

ha). The latter includes 870.1 ha of plantations established in two riverine forests of Ketu Jurio and Mari. Thus, the combined area of all state forests is 55,115.5 ac (22,305.8 ha), which is distributed among 3 forest ranges of Nawabshah Forest Division. Pai irrigated plantation is situated at a distance of about 5 km from Sarkand town with its area falling in 5 *dehs*. The area, as per Forest Department is given in table- 3.8.

Prior to the construction of Sukkur barrage, this forest depended for its water supply on the scanty rainfall and the unregulated water supply from the river through inundation channels. As water supply was not assured, the growing stock was poor both in quality and quantity. The Barrage was constructed during 1931-35, but no provision was made in it initially for supply of water to the Pai inland forest. Raising of tree plantations under agroforestry system was however, started in 1937-38 with the help of irrigation water. As water supply was small, only small areas of 20 to 40 ha were taken up each year for raising tree crops. This arrangement continued till 1946-47, when the Government of Sindh realized the grave situation created by the shortage of fuel-wood and charcoal in the province. As a result, the Public Works Department agreed to provide the required discharges from Rohri canal.

The agreed irrigation water supply is at the rate of 0.86 cusec of perennial water per 100 ac (40.4 ha). Thus sanctioned water of 30 cusecs is sufficient for irrigating 1,212 ha of plantation. But out of sanctioned 30 cusec of water, only about 10 cusec of water is generally received because the plantation is located at the tail end of the irrigation channel which receives only one third of the sanctioned water. In order to overcome the problem, 13 tubewells have been installed in it at different times to irrigate the tree plantations. The prevalent practices of irrigation are very defective. It is known that the plantation does not receive the sanctioned water supplies.

Pai forest, was taken up for systematic conversion into irrigated plantation during 1960-61 under a development scheme titled "Industrial Wood Plantation Phase-I". 506 ha were planted under this scheme. In addition, an area of 174 ha was planted under Industrial Wood Plantation Phase-II in 1988-91 and 455 ha have been planted under SFDP since 1996-97. Most of the areas planted with Shisham during 1960-61 to 1969-70 under first development scheme were invaded by Kandi due to fires and shortage of canal water. Therefore, 13 tubewells were installed in Pai plantation to irrigate the plantation in time of shortage. Presently 1299.2 ha are under Babul, 107.4 ha under *Eucalyptus*, 1044.9 ha under Kandi and 11.7 ha under Shisham crop. Thus total stocked area is 2463.0 ha, which is 85% of its total area. Theft of sanctioned water and unchecked wood cutting have caused serious threat to the Pai forest in recent years.

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4. ANALYSIS OF HOUSEHOLD DATA

This chapter presents the socio-economic indicators generated by the primary data collected during household survey of the four priority areas of Keti Bunder, Keenjhar, Chotiari and Pai Forest.

4.1 Demographic Variables

4.1.1 Household Size

It was found that the average household size was 6.6 members. Comparatively higher family size was recorded at Keenjhar while the lowest was computed at Keti Bunder. Table 4.1 reveals that about one-fifth of households had only 3 members and such households were predominant at Keti Bunder. Majority of households (56.7%) had a family size ranging between 4 to 8 almost synonymous at all sites. Large household sizes of 14 to 18 and above members were conspicuous mainly at Keenjhar and Pai Forest. Average household size at each of the Indus for All programme sites and on an overall basis is depicted in Fig- 4.1.

Figure - 4.1: Average Household Size

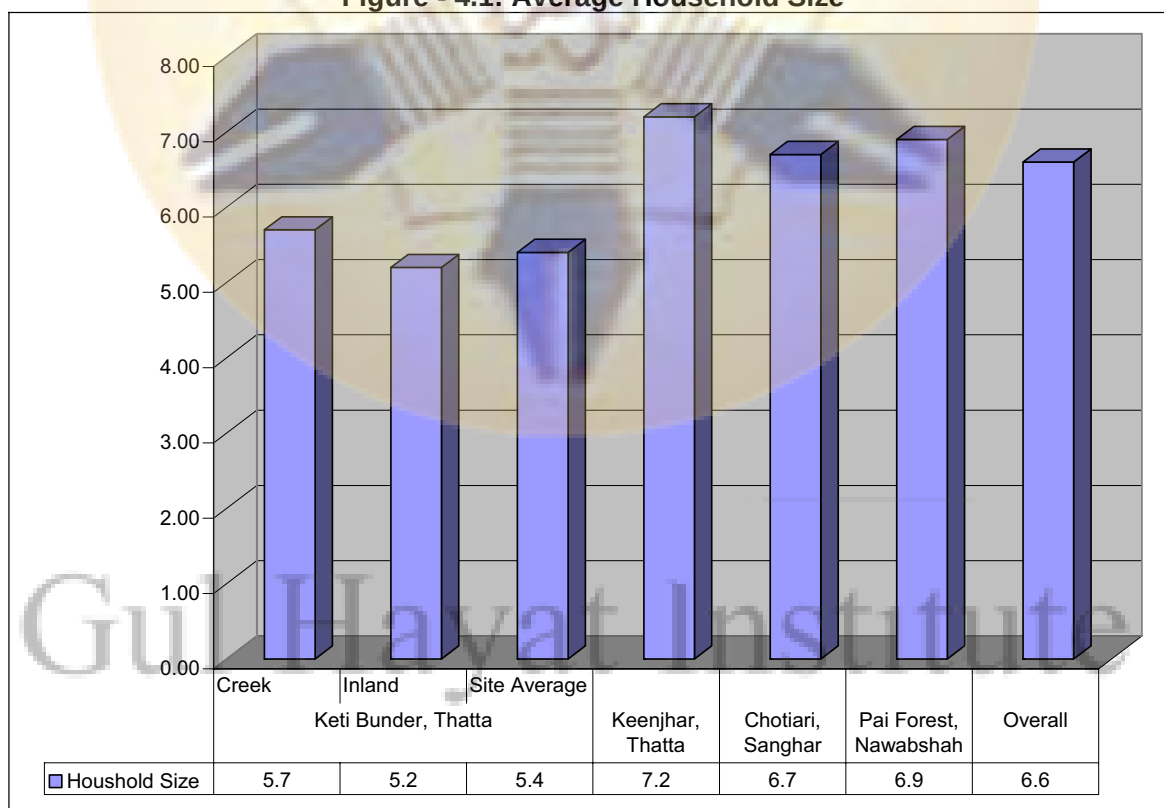


Table- 4.1: Proportions of Households by Family Members

Area/Site	Category of villages	Proportion (%) of Households by Members					
		Up to 3	4- 8	9-13	14-18	19 and above	Total
Keti Bunder, Thatta	Creek	27.2	56.3	15.5	1.0	0.0	100.0
	Inland	33.8	52.1	12.0	2.1	0.0	100.0
	Site Average	31.0	53.9	13.5	1.6	0.0	100.0
Keenjhar, Thatta	Small	20.0	53.6	17.6	4.0	4.8	100.0
	Medium	13.2	58.5	22.6	5.7	0.0	100.0
	Large	14.3	58.4	20.8	3.9	2.6	100.0
	Site Average	16.2	56.5	20.1	4.5	2.6	100.0
Chotiari, Sanghar	Small	25.9	54.1	17.6	2.4	0.0	100.0
	Medium	12.5	55.5	27.3	3.9	0.8	100.0
	Large	12.2	67.3	20.4	0.0	0.0	100.0
	Site Average	16.8	57.3	22.9	2.7	0.4	100.0
Pai, Forest, Nawab Shah	Small	18.8	56.3	23.4	1.6	0.0	100.0
	Medium	10.0	65.0	22.5	0.0	2.5	100.0
	Large	11.6	55.8	25.6	7.0	0.0	100.0
	Site Average	13.0	59.1	23.9	3.0	0.9	100.0
Overall		19.1	56.7	20.1	3.0	1.1	100.0

4.1.2 Age Groups by Gender

Table- 4.2 presents the composition of sample households by age group and gender. It was found that about one fifth of the programme area population was below 5 years of age. Additional 28% of population was between 5 to 15 years of age. Thus, the proportion of young people accounted for about one half of the total population. Old people falling in the age groups 61 and above were only about 3% of the total population, indicating thereby the abysmal state of health and sanitation and incidence of diseases. Young adults of age group 16 to 30 years were 27% of the population while the mid-age active and mature work force between age groups 31-45 and 46-60 years were 13% and 7% only at the three sites. The above age group composition pinpoints to the need of involving young persons in the socio-economic development and environmental protection programmes. Special emphasis in the livelihoods initiatives is obviously due for the age group 16-30 years- most of whom are ready to enter the adult life in a financially insecure and resource poor external environment. The proportion of female population is almost equal to that of males in the teen age and young adult groups. Among children, the number of females was found to be somewhat higher, and more so at the Chotiari site.

Table 4.2: Household Population (%) by Age Group and Gender

		Up to 5		5-15		16-30		31-45		46-60		61-75		Above 75	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Keti Bunder, Thatta	Creek	20.3	18.3	24.1	28.3	27.6	27.5	13.0	13.9	9.2	10.0	5.1	2.0	0.6	0.0
	Inland	18.8	19.6	21.4	24.1	32.3	27.1	13.8	14.0	6.6	11.6	5.8	3.0	1.3	0.6
	Site Average	19.5	19.1	22.7	25.9	30.2	27.3	13.4	14.0	7.8	10.9	5.5	2.6	1.0	0.3
Keenjhar, Thatta	Small	15.0	21.0	31.8	27.0	27.9	29.3	14.4	12.4	7.2	8.3	3.5	1.6	0.2	0.5
	Medium	17.6	22.7	32.4	25.0	29.0	32.5	13.5	12.7	5.7	5.8	1.3	1.3	0.5	0.0
	Large	24.3	18.8	25.6	28.8	27.2	29.2	13.1	14.6	7.2	5.8	1.6	1.5	1.0	1.2
	Site Average	18.3	21.0	30.3	26.8	28.1	30.2	13.7	13.1	6.7	6.9	2.3	1.5	0.5	0.5
Chotiari, Sanghar	Small	16.0	25.9	35.3	31.0	24.7	20.8	14.2	15.7	5.5	4.7	3.6	2.0	0.7	0.0
	Medium	24.7	24.4	30.4	33.5	23.4	24.1	12.5	8.1	7.7	7.7	1.1	1.5	0.2	0.8
	Large	17.4	20.7	33.7	24.7	26.1	32.7	12.5	12.7	6.5	7.3	2.2	1.3	1.6	0.7
	Site Average	20.9	24.2	32.4	31.4	24.3	24.5	12.9	10.9	6.9	6.8	2.0	1.6	0.6	0.5
Pai, Forest, Nawab Shah	Small	17.8	19.7	31.3	30.9	29.6	26.6	12.2	14.4	7.8	6.4	1.3	1.6	0.0	0.5
	Medium	28.5	22.6	27.6	23.0	25.7	28.8	9.3	14.0	7.1	7.0	1.9	2.9	0.0	1.6
	Large	20.5	20.1	26.7	29.8	28.9	26.8	12.1	12.4	8.7	7.4	1.9	2.3	1.2	1.3
	Site Average	22.7	20.8	28.2	27.8	27.9	27.4	11.1	13.4	7.9	7.0	1.7	2.3	0.5	1.2
Overall		20.2	21.3	28.6	28.0	27.6	27.4	12.8	12.8	7.3	7.8	2.8	2.0	0.6	0.6

M = Male & F = Female

4.1.3 Age at Marriage

Average age at marriage was computed to be about 18 years among females and 21 years among males. No significant difference was observed for this indicator at various programme sites. Figure 4.2 presents the survey results about age at marriage.

4.2 Human Capital

Indicators representing human capital at the Indus for All Programme sites were constructed from the primary data and tabulated as follows under various sub-sections.

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4.2.1 Education of Household Head

The worst scenario emerged at Ketī Bunder where 98% of household heads in creek villages were found illiterate, while even the inland household heads were illiterate to the tune of 82% (Figure 4.3). Only 2% household heads had primary education at the creek villages of Ketī Bunder. Keenjhar in Thatta district also had a high ratio of illiteracy of household heads to the extent of 61%. At Keenjhar, however, the ratio of primary education was about 30%, indicating that primary schooling had been available there in recent years. On an overall basis, 60% of the household heads were illiterate, 21% had primary education and about 5% were educated up to the middle school level at the programme sites.

Figure -4.2: Average Age at Marriage

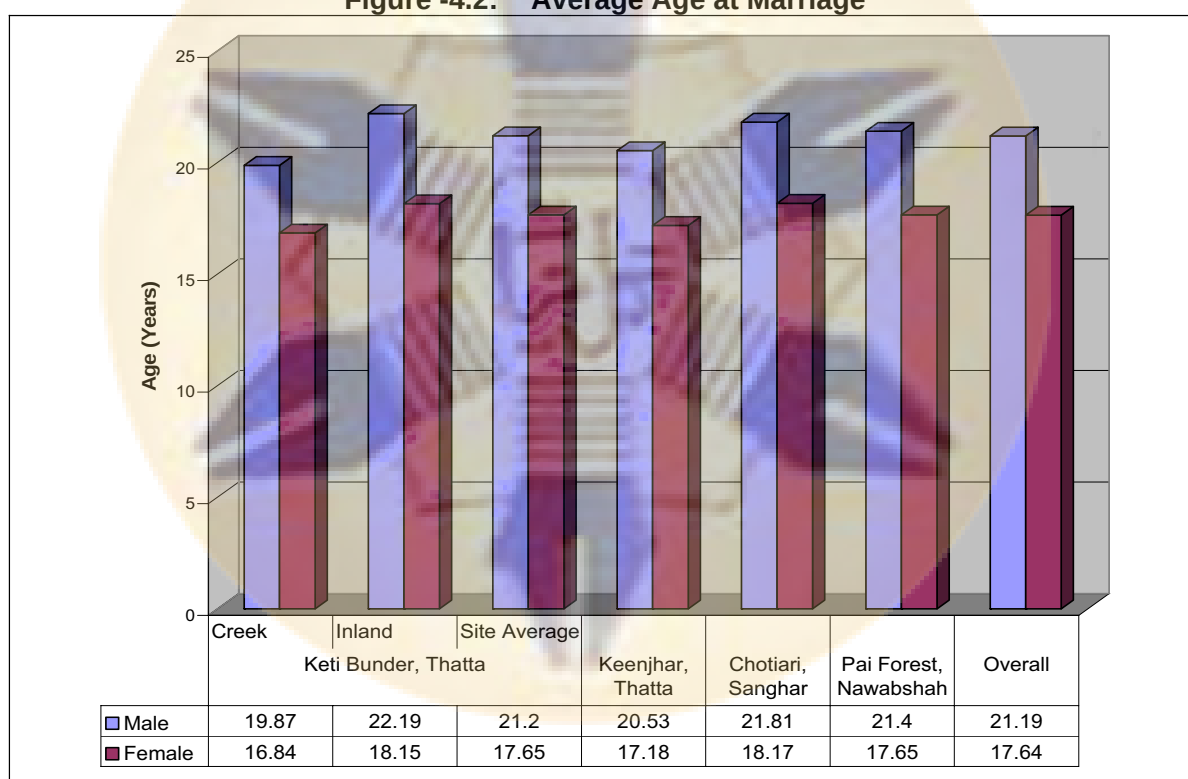
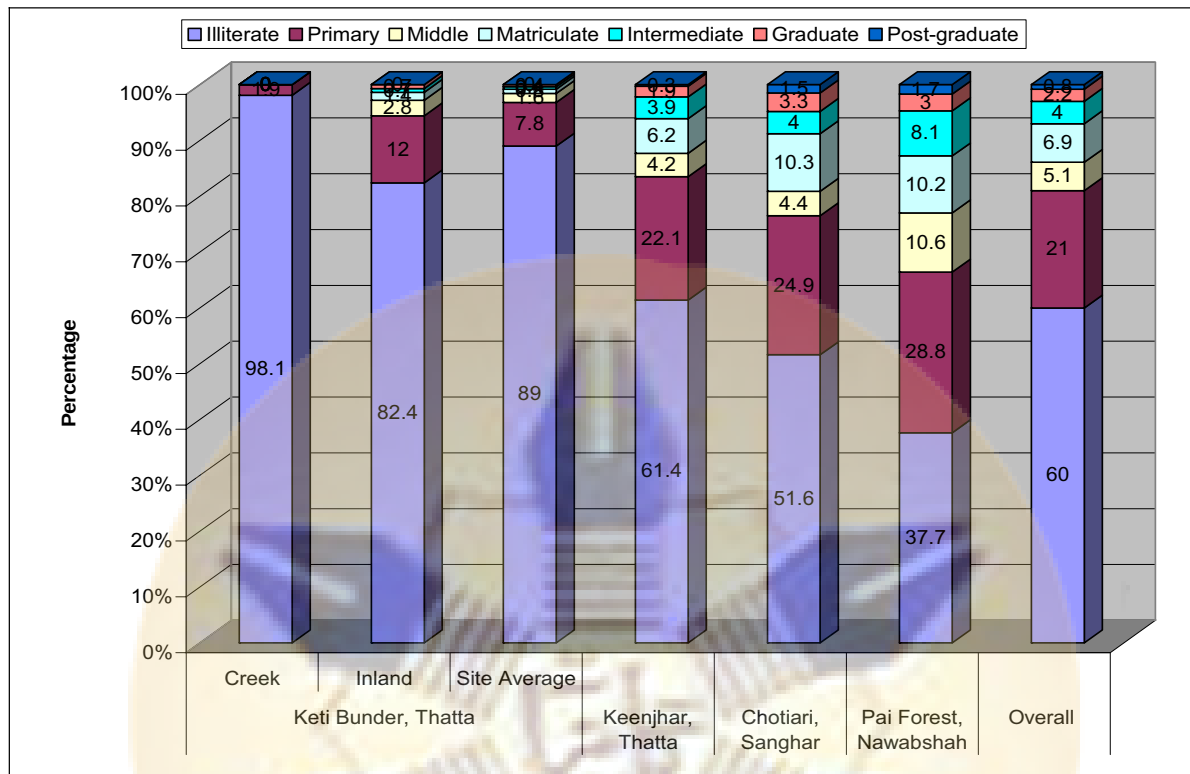


Figure - 4.3: Education of Household Head

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4.2.2 Education of Age Group 15 Years and Above

Education level of age group 15 years and above, was computed to know the human capital of the most potential target group of the WWF interventions. Table- 4.3 presents the ratios computed on gender basis for the 4 priority areas. At Ketu Bunder, the illiterate males and females were about 84% and 96% respectively out of the total population in the age group 15 years and above. At Keenjhar, the illiterate male and female family members of age group 15 years and above, accounted for about 62% and 88% respectively. At Chotiari, the illiteracy ratio was 49% among males and 90% among females in the specified age group. At Pai forest, the situation was found to be somewhat better with 36% illiterate males and 80% illiterate females in the age group 15 years and above.

On overall basis, 58% males and 89% females in the age group 15 years and above, were illiterate. This depicts the poorest state of human capital at the programme sites. Considering the educational status of population, and specially focusing on female education, the sites deserving utmost attention could be prioritized in the order of Ketu Bunder, Chotiari, Keenjhar and Pai forest. In general, the human capital in terms of male matriculate, intermediate and graduate level family members is higher at Pai, followed by Chotiari and Keenjhar respectively; see table- 4.3.

Table 4.3: Education of Household Members of Age Group 15 Years and Above

		Illiterate		Primary		Middle		Matric		Inter		Graduate		Postgrad.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Ketu Bunder, Thatta	Creek	93.3	97.5	4.8	2.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inland	77.1	94.6	12.8	4.2	5.0	0.0	2.8	0.0	1.4	0.0	0.5	0.0	0.0	0.0
	Site Average	84.1	95.8	9.4	3.5	3.1	0.0	1.6	0.0	0.8	0.0	0.3	0.0	0.0	0.0
Keenjhar, Thatta	Small	57.0	88.8	22.4	6.0	4.4	0.5	6.1	1.4	6.1	0.9	3.5	0.0	0.0	0.0
	Medium	71.5	89.4	13.0	9.3	4.1	0.0	6.7	0.6	3.6	0.0	0.5	0.0	0.5	0.0
	Large	55.9	85.8	30.3	8.2	3.3	1.5	9.2	0.7	1.3	0.0	0.0	0.0	0.0	0.0
	Site Average	61.6	88.2	21.3	7.6	4.0	0.6	7.2	1.0	4.0	0.4	1.6	0.0	0.2	0.0
Chotiari, Sanghar	Small	63.4	90.9	20.1	5.5	3.0	0.9	8.2	0.9	3.0	0.0	1.5	0.0	0.0	0.0
	Medium	45.0	94.6	31.5	4.5	8.4	0.9	5.9	0.0	3.8	0.0	4.2	0.0	0.4	0.0
	Large	40.0	80.5	18.9	14.6	4.4	3.7	20.0	0.0	10.0	1.2	5.6	0.0	1.1	0.0
	Site Average	49.4	90.9	25.8	6.7	6.1	1.4	9.3	0.2	4.8	0.2	3.7	0.0	0.4	0.0
Pai, Forest, Nawab Shah	Small	37.6	83.9	21.4	9.7	14.5	2.2	12.8	1.1	7.7	0.0	3.4	0.0	2.6	0.0
	Medium	30.3	81.8	34.5	8.3	10.6	1.5	12.7	5.3	9.2	1.5	0.7	0.0	1.4	0.0
	Large	41.8	76.0	22.4	12.0	7.6	2.7	13.5	8.0	8.8	0.7	4.1	0.0	0.6	0.7
	Site Average	36.8	80.0	26.1	10.1	10.5	2.1	13.1	5.3	8.6	0.8	2.8	0.0	1.4	0.3
Overall		58.2	88.8	20.8	7.0	5.8	1.0	7.8	1.5	4.5	0.3	2.1	0.0	0.5	0.1

M= Male and F= Female ; % of Members.

Table 4.4: Households Sending Children to College/University (Percent)

		College				University			
		Male		Female		Male		Female	
		N(%)	Mean	N(%)	Mean	N(%)	Mean	N(%)	Mean
Keti Bunder, Thatta	Creek	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
	Inland	2.1	1.33	0.7	1.00	0.7	1.00	0.0	0.00
	Site								
	Average	1.2	1.33	0.4	1.00	0.4	1.00	0.0	0.00
Keenjhar, Thatta	Small	15.9	1.70	11.1	1.79	12.7	1.63	9.5	1.83
	Medium	6.6	1.86	5.7	2.00	2.8	2.00	2.8	2.00
	Large	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
	Site								
Chotiari, Sanghar	Average	8.7	1.74	6.5	1.85	6.1	1.68	4.9	1.87
	Small	1.2	1.00	0.0	0.00	0.0	0.00	0.0	0.00
	Medium	1.5	1.00	0.7	1.00	0.0	0.00	0.0	0.00
	Large	3.8	1.00	1.9	1.00	0.0	0.00	0.0	0.00
Pai Foerst, Nawabshah	Site								
	Average	1.8	1.00	0.7	1.00	0.0	0.00	0.0	0.00
	Small	3.1	1.50	0.0	0.00	0.0	0.00	0.0	0.00
	Medium	1.2	1.00	0.0	0.00	0.0	0.00	0.0	0.00
Overall	Large	4.5	1.00	0.0	0.00	2.2	1.00	0.0	0.00
	Site								
	Average	3.0	1.14	0.0	0.00	0.8	1.00	0.0	0.00
		3.9	1.32	2.2	1.03	2.0	0.94	1.4	0.54

Table 4.4 reveals that the number of households supporting college education is currently minimal at all the programme sites. Except for Keenjhar, where 1.87% females were reported as University students, no female was reported obtaining higher education at the University level. It appears that the data obtained from a couple of large settlements of Keenjhar with high literacy ratio have actually given an upper bias to the female education there. Nevertheless, the human capital represented by college and university levels were recorded at Keenjhar were to 3.9% & 2% for males and 2.2 % & 1.4% for female family members respectively. Even these small proportions, as already stated, are in no way representative of all programme sites. The communities adjoining Pai forest and Sakrand town, and those situated nearby the National Highway around Keenjhar lake, appear to be availing higher education specially for female members.

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4.2.3 Incidence of Diseases

A very high incidence of common diseases was reported at all the programme sites.

Table- 4.5: Households Reporting Prevalence of Common Diseases (Percent)

		Diarrhea	Cholera	Typhoid	Jaundice	Malaria	Skin Disease	Eye Disease	Respiratory Disease
Keti Bunder, Thatta	Creek	51.9	18.3	13.5	4.8	23.1	26.0	3.8	7.7
	Inland	59.9	16.2	12.0	16.2	45.1	35.2	3.5	3.5
	Site Average	56.5	17.1	12.6	11.4	35.8	31.3	3.7	5.3
Keenjhar, Thatta	Small	57.1	23.8	15.1	11.9	52.4	32.5	5.6	11.1
	Medium	33.0	12.3	11.3	5.7	72.6	43.4	2.8	4.7
	Large	59.7	16.9	9.1	5.2	64.9	33.8	5.2	7.8
	Site Average	49.5	18.1	12.3	8.1	62.5	36.6	4.5	8.1
Chotiari, Sanghar	Small	45.3	9.3	4.7	1.2	50.0	8.1	0.0	11.6
	Medium	13.4	9.0	1.5	0.7	26.9	9.0	0.0	3.7
	Large	45.3	5.7	1.9	0.0	41.5	7.5	0.0	1.9
	Site Average	29.7	8.4	2.6	0.7	37.0	8.4	0.0	5.9
Pai Foerst, Nawabshah	Small	29.2	0.0	1.5	1.5	40.0	26.2	0.0	24.6
	Medium	40.2	6.1	0.0	2.4	31.7	14.6	0.0	12.2
	Large	27.0	1.1	2.2	1.1	28.1	6.7	0.0	14.6
	Site Average	32.2	2.5	1.3	1.7	32.6	14.8	0.0	16.5
Overall		42.2	11.9	7.4	5.5	43.2	23.3	2.2	8.8

Table 4.5 reveals that Malaria, Diarrhea, and skin diseases were quite common. On an overall basis, their occurrence was reported by 43%, 42% and 23% households respectively. Cholera, Respiratory diseases, Typhoid and Jaundice were also reported by 12%, 9%, 7% and 5% households respectively. Incidence of Diarrhea was highest at Keti Bunder, mainly because of lack of potable water and purchase of water from tankers which fetch water full of impurities. Incidence of skin diseases was found highest at Keenjhar, presumably because of untreated effluents received by the water body from Kotri and Nooriabad industrial estates. Highest incidence of malaria was also found at Keenjhar. Pai forest households had the lowest incidence of common diseases. Nevertheless, diarrhea and malaria was reported by almost one third of the Pai households which also had the highest incidence of respiratory diseases. Table- 4.6 depicts that these diseases occurred more than once each year in the same households. Diarrhea and malaria were reported twice a year. Their highest occurrence was recorded at Chotiari, Sanghar. Recurrence of skin diseases was found highest at the Keenjhar site- about four times a year.

Table -4.6: Average Annual Occurrence of Common Diseases

		Diarrhea	Cholera	Typhoid	Jaundice	Malaria	Skin Disease	Eye Disease	Respiratory Disease
Keti Bunder, Thatta	Creek	1.92	1.94	1.27	1.20	1.86	1.91	1.33	2.00
	Inland	1.86	1.52	1.55	1.67	1.80	1.79	1.50	1.67
	Site Average	1.88	1.69	1.41	1.57	1.82	1.84	1.43	1.91
Keenjhar, Thatta	Small	2.36	2.10	2.06	1.43	2.57	4.08	1.33	3.57
	Medium	2.32	2.25	1.50	1.50	2.14	3.58	1.00	2.40
	Large	2.74	3.25	4.00	2.25	2.26	3.81	2.25	3.25
	Site Average	2.46	2.40	2.46	1.59	2.33	3.84	1.54	3.26
Chotiari, Sanghar	Small	3.05	3.50	2.50	1.00	2.85	3.00	NA	2.67
	Medium	1.88	1.50	1.50	0.00	2.17	2.33	NA	2.75
	Large	2.38	2.00	4.00	0.00	2.82	1.75	NA	1.00
	Site Average	2.60	2.42	2.43	1.00	2.62	2.41	NA	2.57
Pai Foerst, Nawabshah	Small	1.63	0.00	1.00	1.00	1.54	1.06	NA	1.43
	Medium	2.85	2.20	0.00	1.00	1.92	2.25	NA	2.60
	Large	2.74	1.00	1.50	2.00	2.33	3.50	NA	2.73
	Site Average	2.51	2.00	1.33	1.25	1.92	1.89	NA	2.17
Overall		2.31	2.15	2.02	1.54	2.23	2.79	1.50	2.51

Table 4.7 Average Number of Family Members Falling Ill Each Year

		Diarrhea	Cholera	Typhoid	Jaundice	Malaria	Skin Disease	Eye Disease	Respiratory Disease
Keti Bunder, Thatta	Creek	1.94	1.58	1.29	1.20	1.92	2.19	1.25	2.75
	Inland	1.71	1.57	1.18	1.13	1.63	1.60	1.40	1.00
	Site Average	1.80	1.57	1.23	1.14	1.70	1.81	1.33	2.08
Keenjhar, Thatta	Small	2.32	1.37	3.00	1.20	2.62	2.80	2.43	2.50
	Medium	2.57	1.92	1.08	1.00	2.34	1.78	1.67	2.20
	Large	2.20	1.92	3.14	1.00	2.16	2.38	1.50	2.67
	Site Average	2.34	1.63	2.42	1.12	2.39	2.29	2.00	2.48
Chotiari, Sanghar	Small	2.85	1.25	2.00	1.00	1.91	2.57	NA	1.30
	Medium	1.78	2.42	1.50	1.00	2.53	1.42	NA	1.00
	Large	2.67	4.00	1.00	NA	2.23	1.75	NA	2.00
	Site Average	2.56	2.22	1.71	1.00	2.20	1.83	NA	1.25
Pai Foerst, Nawabshah	Small	2.05	0.00	1.00	1.00	2.31	1.94	NA	1.00
	Medium	1.64	2.00	0.00	1.00	2.15	2.67	NA	1.00
	Large	1.92	3.00	1.00	1.00	1.84	2.17	NA	1.08
	Site Average	1.83	2.17	1.00	1.00	2.10	2.23	NA	1.03
Overall		2.12	1.74	1.84	1.12	2.17	2.09	1.74	1.60

Information about the extent of incidence of various diseases was also collected during the household survey. Table- 4.7 depicts that, on an overall basis, two members of each household fell ill each year on account of Diarrhea, Cholera, Malaria and Skin diseases. Extent of incidence was reported to be highest at Chotiari, followed by Keenjhar, Ketu Bunder and Pai.

4.2.4 Health Facilities and Cost of Treatment

The cost of treatment was found to be exorbitant for the poor households mainly because of lack of public health facilities. Figure - 4.4 shows that about 60% of households visited the nearest private clinic to get treatment for the common diseases. Except for Ketu Bunder site, where the treatment was sought from public hospitals and dispensaries in nearby towns, private clinic was found to be the main health avenue available to the households of Pai (76.5%), Chotiari (68.8%), and Keenjhar (58.8%). The scanty health facilities were available at long distances from the programme area communities; see table- 4.8 for details.

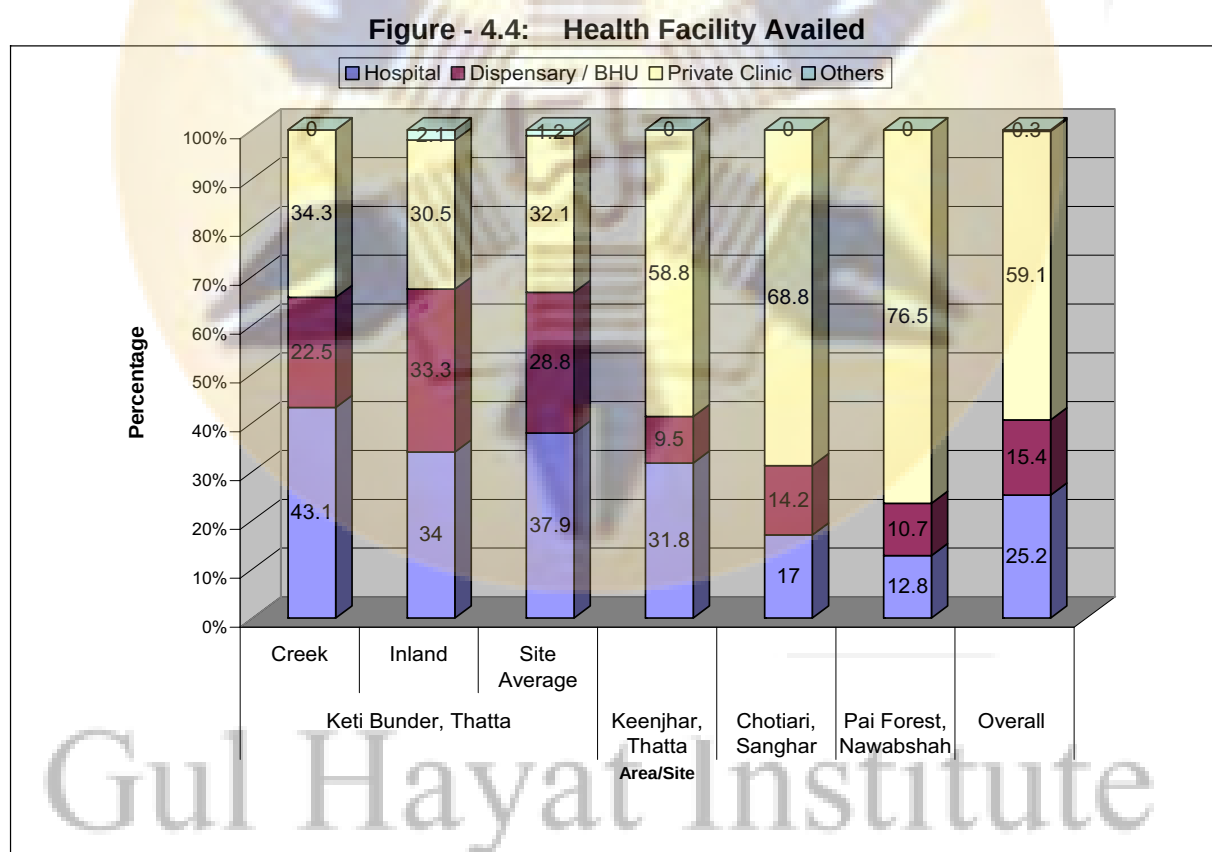


Table-4.8: Distance (km) From Health Facility

Area/Site	Category Of villages	Minimum	Maximum	Mean
Keti Bunder, Thatta	Creek	1	60	6
	Inland	1	40	15
	Site Average	1	60	7
Keenjhar, Thatta	Small	1	70	10
	Medium	1	36	12
	Large	2	36	6
	Site Average	1	70	10
Chotiari, Sanghar	Small	3	40	14
	Medium	2	60	13
	Large	1	27	26
	Site Average	1	60	14
Pai, Forest, Nawab Shah	Small	1	32	6
	Medium	1	27	6
	Large	2	40	13
	Site Average	1	40	8
Overall		1	70	10

It was found that, on an average, the private clinics and other health facilities were available at a distance of 10 kilometers from the communities. However, for some communities, the distance was reported to be as long as 70 kilometers. Longest average distance of health facility from the households, was reported by creek communities of Keti Bunder, followed by Chotiari, Keenjhar and Pai.

Due to the long distances and higher charges at private clinics, the average cost per ailing person as well as the overall annual expenses on treatment were quite exorbitant. Table 4.9 depicts that the average per patient cost of treatment varied for different diseases and was highest for Typhoid (Rs. 1,245 only), followed by skin diseases (Rs. 882 only), Cholera (Rs. 821 only) and Diarrhea (Rs. 753 only).

Table 4.10 presents the annual cost incurred by an average household on major diseases. On an average, the annual cost on major diseases per household was computed to be Rs. 5,166 only. Highest cost was incurred by an average household of Keenjhar (Rs. 7,800 only), followed by Chotiari (Rs. 5,631 only), Keti Bunder (Rs. 3,558 only) and Pai Forest (Rs. 2,976 only). Highest cost at Keenjhar does not necessarily depict that it has the poorest public health infrastructure. It mainly reflects the trend to consult private clinics located at Jhimpir, Sonda and Hilaya settlements.

Table-4.9: Average Cost on Treatment Per Ailing Person

		Diarrhea	Cholera	Typhoid	Jaundice	Malaria	Skin Disease	Eye Disease	Respiratory Disease
Keti Bunder, Thatta	Creek	648	1,017	1,595	880	575	533	200	813
	Inland	646	596	1,118	700	728	570	250	700
	Site Average	647	780	1,357	739	686	556	229	775
Keenjhar, Thatta	Small	599	552	512	547	465	688	407	608
	Medium	970	596	600	1,100	494	639	250	225
	Large	880	1,163	2,917	575	699	369	250	1,150
	Site Average	766	700	1,077	605	541	590	335	638
Chotiari, Sanghar	Small	703	350	1,100	NA	1,289	825	NA	867
	Medium	1,290	2,215	1,000	600	757	5,355	NA	500
	Large	842	267	500	NA	495	438	NA	100
	Site Average	876	1,432	967	600	896	3,013	NA	617
Pai Foerst, Nawab Shah	Small	647	NA	1,500	200	570	519	NA	467
	Medium	952	320	NA	1,150	869	1,648	NA	550
	Large	722	1,000	2,900	3,000	498	580	NA	822
	Site Average	804	433	2,433	1,375	657	938	NA	597
Overall		753	821	1,245	731	665	882	298	641

Table-4.10: Average Annual Cost on Major Diseases Per Household

		Diarrhea	Cholera	Typhoid	Jaundice	Malaria	Skin Disease	Eye Disease	Respiratory Disease	Total Cost
Keti Bunder, Thatta	Creek	1,253	570	353	61	474	580	13	344	3,648
	Inland	1,231	230	245	214	963	575	18	41	3,518
	Site Average	1,237	354	297	151	760	580	16	163	3,557
Keenjhar, Thatta	Small	1,873	378	478	112	1,641	2,554	74	602	7,711
	Medium	1,909	317	110	94	1,796	1,767	12	56	6,060
	Large	3,167	1,226	3,334	67	2,215	1,131	44	778	11,962
	Site Average	2,183	496	789	87	1,883	1,899	46	418	7,800
Chotiari, Sanghar	Small	2,768	142	259	0	3,508	515	0	349	7,542
	Medium	578	724	34	0	1,118	1,595	0	51	4,099
	Large	2,424	122	38	0	1,292	101	0	4	3,980
	Site Average	1,732	646	104	4	1,911	1,116	0	117	5,631
Pai Foerst, Nawab Shah	Small	631	0	23	3	811	280	0	164	1,912
	Medium	1,789	86	0	28	1,137	1,445	0	174	4,659
	Large	1,026	33	96	66	600	295	0	354	2,469
	Site Average	1,189	47	42	29	864	585	0	220	2,976
Overall		1,556	365	342	69	1,390	1,198	17	227	5,166

Table-4.11: Expenditure on Health per Month

Area/Site	Category Of villages	Minimum	Maximum	Mean
Keti Bunder, Thatta	Creek	100	3,000	601
	Inland	40	1,500	383
	Site Average	40	3,000	475
Keenjhar, Thatta	Small	5	3,000	512
	Medium	30	2,500	553
	Large	50	1,300	420
	Site Average	5	3,000	501
Chotiari, Sanghar	Small	100	3,000	659
	Medium	20	2,000	541
	Large	13	5,000	562
	Site Average	13	5,000	581
Pai, Forest, Nawab Shah	Small	50	4,000	661
	Medium	50	3,000	547
	Large	50	2,500	607
	Site Average	50	4,000	600
Overall		5	5,000	547

Monthly expenditure of an average household (table- 4.11), was computed to be Rs. 547 only for the programme sites.

4.2.5 Maternity Facilities and Costs

In general, professional maternity services were not available to the communities. Figure 4.5 reveals that more than 76% births were attended by local Dai while only about 1% births were handled by trained LHVs. Private clinics and public hospitals were also visited for child births to the tune of 12% and 9% only.

Table- 4.12 presents information about deaths during mortality. In 92% of the cases, no mortality was reported. In 7% of the cases, there was child mortality while in 1% of the cases, mother mortality was also reported.

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Table- 4.12: Delivery Related Mortality during Last 5 years

Area/Site	Category of villages	Proportion (%) of Households					
		Mother		Baby		No Mortality	Total
		%	Mean	%	Mean	%	%
Keti Bunder, Thatta	Creek	1.0	1.00	9.6	1.50	89.4	100.0
	Inland	0.0	0.00	7.0	1.70	93.0	100.0
	Site Average	0.4	1.00	8.1	1.60	91.5	100.0
Keenjhar, Thatta	Small	1.6	1.00	15.9	1.35	82.5	100.0
	Medium	0.0	0.00	6.6	1.00	93.4	100.0
	Large	0.0	0.00	5.2	2.75	94.8	100.0
	Site Average	0.6	1.00	10.0	1.45	89.3	100.0
Chotiari, Sanghar	Small	0.0	0.00	3.5	2.00	96.5	100.0
	Medium	0.0	0.00	3.0	1.50	97.0	100.0
	Large	0.0	0.00	1.9	1.00	98.1	100.0
	Site Average	0.0	0.00	2.9	1.63	97.1	100.0
Pai, Forest, Nawab Shah	Small	0.0	0.00	6.2	1.50	93.8	100.0
	Medium	0.0	0.00	7.3	1.17	92.7	100.0
	Large	3.4	1.00	11.2	1.10	85.4	100.0
	Site Average	1.3	1.00	8.5	1.20	90.3	100.0
Overall		0.5	1.00	7.3	1.44	92.1	100.0

Table- 4.13: Expenditure Per Delivery

Area/Site	Category of villages	Minimum	Maximum	Mean
Keti Bunder, Thatta	Creek	500	5,000	1,089
	Inland	500	4,000	1,003
	Site Average	500	5,000	1,036
Keenjhar, Thatta	Small	100	5,000	826
	Medium	200	5,000	872
	Large	30	5,000	757
	Site Average	30	5,000	823
Chotiari, Sanghar	Small	200	8,000	1,540
	Medium	100	6,000	1,363
	Large	200	6,000	1,673
	Site Average	100	8,000	1,475
Pai, Forest, Nawab Shah	Small	300	4,000	1,287
	Medium	200	3,000	763
	Large	200	4,000	1,314
	Site Average	200	4,000	1,105
Overall		300	8,000	1,094

Expenditure per delivery, as reported by the households, was compiled in table- 4.13. Minimum expenditure per delivery was Rs. 30 only at the large settlements of Keenjhar. Maximum

expenditure per delivery at Rs. 8,000 only was reported by households in the small settlements of Chotiari. On an overall basis, the average expenditure per delivery was computed to be Rs. 1,094 only.

4.2.6 Occupations and Skills

Information on respondent occupation/ professions is presented in table- 4.14.

Table 4.14 indicates that, on an overall basis, fishing is the most predominant occupation (43% respondents) mainly practiced at Ketu Bunder, Keenjhar and Chotiari sites; followed by farming/ agriculture (13.4%) which includes landowners (4.7%) and tenants as well as farm labor. Agricultural labor and services were more typical of the Pai forest site. Livestock owners/ herders were 5.1% of the total respondents. These were mainly located at Chotiari, Pai and Keenjhar sites. Various other professions mainly: Carpenter, Tailor, Cabin owner, Private Service, Businessmen, teachers and Pesh Imams constituted about 19%. Stone mining was adapted as an occupation by fishermen and farm labor to the extent of 8.4% respondents at Keenjhar site only.

Table – 4.14: Profession of Respondent (Percent)

Area/Site		Agriculture	Livestock herder	Mat Maker	Teacher	Fishing	Driver	Stone Mining	Labour	Shop Keeper	Other	Total
Keti Bunder, Thatta	Creek	0.0	0.0	0.0	0.0	89.4	0.0	0.0	0.0	1.0	9.6	100
	Inland	0.0	5.6	0.0	0.7	66.9	1.4	0.0	4.2	2.1	19.0	100
	Site Average	0.0	3.3	0.0	0.4	76.4	0.8	0.0	2.4	1.6	15.0	100
Keenjhar, Thatta	Small	5.6	2.4	4.8	4.0	48.0	0.0	20.0	1.6	0.0	13.6	100
	Medium	1.9	0.9	0.0	1.9	61.3	1.9	0.9	11.3	2.8	17.0	100
	Large	3.9	1.3	0.0	1.3	45.5	5.2	0.0	26.0	1.3	15.6	100
	Site Average	3.9	1.6	1.9	2.6	51.9	1.9	8.4	11.0	1.3	15.3	100
Chotiari, Sanghar	Small	17.4	27.9	5.8	1.2	30.2	1.2	0.0	0.0	2.3	14.0	100
	Medium	17.1	4.5	0.7	3.7	55.2	2.2	0.0	6.0	0.0	10.4	100
	Large	11.4	3.8	3.8	5.7	17.0	1.9	0.0	11.3	3.8	41.5	100
	Site Average	16.2	11.7	2.9	3.3	39.9	1.8	0.0	5.1	1.5	17.6	100
Pai, Forest, Nawab Shah	Small	50.8	3.1	0.0	1.5	0.0	4.6	0.0	3.1	1.5	35.4	100
	Medium	29.2	7.3	0.0	1.2	0.0	6.1	0.0	18.3	4.9	32.9	100
	Large	33.7	1.1	0.0	5.6	1.1	4.5	0.0	23.6	6.7	23.6	100
	Site Average	36.9	3.8	0.0	3.0	0.4	5.1	0.0	16.1	4.7	30.1	100
Overall		13.4	5.1	1.3	2.4	43.1	2.3	2.4	8.6	2.2	19.1	100

Table – 4.15 Family Members in Major Occupations (Percent)

		Agricultural Labour	Embroidery	Fishing	Labour	Mat Making	Rilly Making	Shops	Stone Mining	Others	Site Average
Keti Bunder Thatta	Creek	0.0	0.5	92.9	0.5	0.0	0.0	0.5	0.0	5.5	100
	Inland	0.9	0.0	66.7	6.2	0.0	0.0	5.8	0.0	20.4	100
	Site Average	0.5	0.2	78.4	3.7	0.0	0.0	3.4	0.0	13.8	100
Keenjhar Thatta	Small	5.7	5.7	35.5	6.0	5.2	5.5	0.5	23.0	12.8	100
	Medium	25.3	1.4	45.5	10.4	1.7	1.0	1.7	1.4	11.5	100
	Large	31.7	1.8	49.3	7.0	0.4	1.6	1.4	0.6	6.1	100
	Site Average	21.8	3.0	43.9	7.5	2.3	2.7	1.2	8.0	9.6	100
Chotiari Sanghar	Small	55.8	0.4	11.2	0.0	5.8	2.3	0.8	0.0	23.8	100
	Medium	39.7	1.5	30.6	6.2	3.8	1.8	0.3	0.0	16.2	100
	Large	18.3	2.4	15.9	4.9	7.3	2.4	2.4	0.0	46.3	100
	Site Average	43.3	1.2	21.4	3.7	5.0	2.1	0.7	0.0	22.7	100
Pai Forest Nawabshah	Small	64.3	4.9	0.0	2.8	0.0	0.0	0.4	0.0	27.6	100
	Medium	10.7	8.1	0.0	21.5	1.3	2.0	2.7	0.0	53.7	100
	Large	25.5	1.4	0.0	8.2	0.0	0.7	0.7	0.0	63.6	100
	Site Average	35.7	3.7	0.0	8.7	0.2	0.7	0.9	0.0	50.0	100
Overall		25.5	2.0	36.4	5.9	2.0	1.5	1.5	2.3	22.9	100

Proportion of family members engaged in different occupations (table- 4.15), depicts that 78.4% were engaged in fishing at Keti Bunder. At Keenjhar, fishing was the main occupation (44% family members), followed by 22% as agricultural laborers, and 8% engaged in stone mining. At Chotiari, the main occupation of family members emerged to be agricultural labor (43%), followed by fishing (21.4%) and wage labor. Miscellaneous occupations engaged about one half of the family members of Pai households, followed by 36% as agricultural labor. On an overall basis, the main occupations of family members other than the household head, were fishing (36.4%), agricultural and wage labor (32%) and miscellaneous labor oriented services (23%). It is clear from these indicators, that the human capital is quite low at all programme sites. Most people are engaged in primary production sectors of agriculture and fishing and in labor oriented occupations. Low productivity levels in these primary occupations reflected lack of modern technology and advanced skills on the part of households.

4.3 Natural Capital

Several indicators related to natural capital were studied while conducting the base line survey. These included access to natural resources, degradation of natural resources and income losses due to degradation.

4.3.1 Access to Natural Resources

Access to natural resources measured through a scale of 1 to 5, with 1 indicating frequent access, indicated that access to drinking water was generally frequent except for Keti Bunder site. For irrigation water, the overall mean of 2 indicated that the access was not so frequent. At Chotiari,

the households were not sure about their access to fishing mainly because of the influential contractors, while at Ketu Bunder and Keenjhar they had frequent access to fishing. At Pai, the access to the reserve forest resources was not so frequent. Grazing resources were also difficult to access. Tourism was, in general, not accessible to local households. At Keenjhar, tourism was accessible to the households of 5 villages, but it did not form a major livelihood resource for the survey respondents.

For mineral resource mining, medicinal plants, bee keeping, birds and wildlife, the access was occasional and/or rare. The overall rank of 2 for fishing and forest resources, clearly indicates that the households did not have frequent access to the main livelihood resources. The overall rank of 3 or more indicates that the households had occasional access to mineral mining, collection of medicinal plants and hunting.

Table 4.16 (a): Access to Natural Resources

		Water Irrigation		Water Drinking		Fish		Wood Forest		Grazing		Picnic / Tour	
		N(%)	Mean	N(%)	Mean	N(%)	Mean	N(%)	Mean	N(%)	Mean	N(%)	Mean
Ketu Bunder, Thatta	Creek	41.3	3.00	94.2	1.19	87.5	1.05	75.0	1.36	36.5	2.55	30.8	3.00
	Inland	20.4	3.00	90.8	1.17	77.5	1.17	57.0	1.46	31.7	2.27	23.9	3.12
	Site Average	29.3	3.00	92.3	1.18	81.7	1.12	64.6	1.41	33.7	2.40	26.8	3.06
Keenjhar, Thatta	Small	11.9	1.60	77.8	1.00	76.2	1.41	50.8	1.39	38.1	1.71	13.5	2.59
	Medium	2.8	2.00	94.3	1.00	87.7	1.23	50.0	1.45	18.9	1.95	10.4	1.73
	Large	5.2	1.00	90.9	1.03	76.6	1.25	74.0	1.28	31.2	1.75	7.8	3.33
	Site Average	7.1	1.55	86.7	1.01	80.3	1.30	56.3	1.37	29.8	1.77	11.0	2.44
Chotiari, Sanghar	Small	31.4	1.44	59.3	1.10	53.5	2.59	57.0	1.29	44.2	1.34	11.6	3.00
	Medium	41.0	1.49	67.9	1.16	62.7	2.82	75.4	1.52	32.1	1.53	13.4	3.06
	Large	24.5	2.23	71.7	1.11	43.4	3.30	75.5	1.78	32.1	1.94	7.5	3.00
	Site Average	34.8	1.58	65.9	1.13	56.0	2.82	69.6	1.52	35.9	1.53	11.7	3.03
Pai Foerst, Nawab Shah	Small	81.5	1.70	81.5	1.11	36.9	3.21	89.2	2.72	83.1	2.28	33.8	3.23
	Medium	74.4	2.00	81.7	1.09	46.3	3.03	85.4	1.89	78.0	2.33	42.7	3.06
	Large	68.5	2.30	78.7	1.06	61.8	2.96	84.3	1.95	71.9	2.52	55.1	2.94
	Site Average	74.2	2.01	80.5	1.08	49.6	3.03	86.0	2.15	77.1	2.38	44.9	3.04
Overall		35.2	2.12	81.1	1.09	67.6	1.87	68.3	1.64	43.5	2.04	23.3	2.96

Scale used: 1 = Frequently; 2= Sometimes; 3 = Undecided; 4 Rarely; and 5 = Restricted

Table- 4.16 (b): Access to Natural Resources

		Mineral Mines		Medicinal Plants		Bee Farming		Birds		Wild Life	
		N(%)	Mean	N(%)	Mean	N(%)	Mean	N(%)	Mean	N(%)	Mean
Keti Bunder, Thatta	Creek	34.6	2.94	34.6	2.94	34.6	3.00	41.3	3.35	40.4	3.33
	Inland	26.8	2.92	26.8	2.82	26.1	3.05	26.8	3.24	26.8	3.26
	Site Average	30.1	2.93	30.1	2.88	29.7	3.03	32.9	3.30	32.5	3.30
Keenjhar, Thatta	Small	18.3	2.65	23.0	2.10	11.9	2.87	31.7	2.23	28.6	2.64
	medium	13.2	3.43	10.4	2.64	4.7	3.20	53.8	3.35	28.3	2.90
	large	13.0	3.40	13.0	3.00	7.8	2.83	31.2	2.88	31.2	3.17
	Site Average	15.2	3.04	16.2	2.40	8.4	2.92	39.2	2.88	29.1	2.87
Chotiari, Sanghar	Small	12.8	2.91	12.8	2.91	20.9	2.83	23.3	3.75	24.4	4.10
	medium	11.2	3.00	17.2	2.83	23.9	2.69	29.9	2.85	27.6	2.86
	large	3.8	3.00	9.4	3.20	3.8	3.00	26.4	4.00	22.6	4.17
	Site Average	10.3	2.96	14.3	2.90	19.0	2.75	27.1	3.31	25.6	3.46
Pai Foerst, Nawabshah	Small	32.3	3.24	47.7	2.84	55.4	3.86	64.6	3.60	63.1	3.71
	medium	40.2	3.03	46.3	3.18	58.5	3.50	61.0	3.58	61.0	3.60
	Large	58.4	3.02	61.8	3.15	65.2	3.34	68.5	3.62	67.4	3.80
	Site Average	44.9	3.07	52.5	3.08	60.2	3.53	64.8	3.60	64.0	3.71
Overall		24.9	3.01	27.7	2.89	28.5	3.15	40.8	3.26	37.3	3.36

4.3.2 Degradation of Natural Resources

Analysis of respondent perceptions, presented in tables 4.17(a) and 4.17(b), reveals the extent of degradation of various natural resources during the last 5 years. Response rates (percentage of respondents) and their average (mean) perceptions have been reported. The average values indicate the extent to which respondents agreed with the research statement that natural resources sharply degraded during last five years. Likert type scale was labeled as: strongly agree with 1; agree with 2; undecided with 3; disagree with 4 and strongly disagree with 5. Values close to 2 indicated that on an overall basis, respondents agreed with the research statement. For Keti Bunder, average perceived values for drinking water, fish and forest was between 1 and 2; indicating thereby that these resources had depleted during the last 5 years. Low response rate (34%) and average value of 2.73, for irrigation water at Keti Bunder depicted mainly that the majority of households were not related with agriculture profession. On the contrary, overwhelming majority (97.5%) of respondents from the Pai Forest, Nawabshah agreed (mean =1.54) with the statement, that supply of irrigation water has reduced sharply during last 5 years. Likewise, overall response (mean =1.57) in agreement was observed for degradation of forest at Pai.

Table- 4.17 (a): Perceptions about Degradation of Natural Resources During the Last 5 Years

		Water irrigation		Water Drinking		Fish		Forest	
		N (%)	Mean	N (%)	Mean	N (%)	Mean	N (%)	Mean
Keti Bunder, Thatta	Creek	48.1	2.78	86.5	1.43	88.5	1.79	71.2	2.04
	Inland	24.6	2.66	92.3	1.25	85.2	1.47	58.5	1.75
	Site Average	34.6	2.73	89.8	1.33	86.6	1.61	63.8	1.89
Keenjhar, Thatta	Small	19.8	2.28	63.5	2.19	69.8	1.53	43.7	2.25
	medium	3.8	2.25	68.9	1.79	68.9	1.60	38.7	2.05
	large	10.4	2.75	48.1	1.84	57.1	1.55	40.3	2.13
	Site Average	12.0	2.38	61.5	1.97	66.3	1.56	41.1	2.16
Chotiari, Sanghar	Small	55.8	3.04	75.6	2.94	80.2	2.71	69.8	1.98
	medium	53.7	2.71	76.1	3.25	79.1	2.66	66.4	2.84
	large	54.7	2.45	77.4	2.20	62.3	2.55	56.6	2.03
	Site Average	54.6	2.77	76.2	2.94	76.2	2.66	65.6	2.42
Pai Foerst, Nawabshah	Small	93.8	1.43	73.8	3.56	36.9	3.00	83.1	1.67
	medium	97.6	1.61	81.7	3.18	53.7	3.02	98.8	1.57
	large	100.0	1.55	80.9	3.47	61.8	2.95	88.8	1.49
	Site Average	97.5	1.54	79.2	3.39	52.1	2.98	90.7	1.57
Overall		47.8	2.13	75.7	2.43	70.4	2.15	64.0	2.01

Research Statement/Hypothesis: Natural resources sharply degraded during last 5 years.
Scale 1=Strongly agree; 2 = Agree; 3= Undecided; 4 =Disagree and 5=Strongly Disagree

On an overall basis, 48% of respondents agreed that irrigation water resources have depleted; over 70% of respondents agreed that fisheries have declined, while 64% agreed that forest resources have sharply depleted during the last 5 years. About 76% of respondents were also found inclined to believe that drinking water resources have depleted in recent years. Depletion of fisheries, being the primary source of livelihood, was perceived to be highest at Keti Bunder (87% of respondents), followed by Keenjhar (66%) respondents. At Chotiari also, the respondents tended to agree with depletion of fisheries.

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**Table- 4.17 (b): Perceptions about Degradation of Natural Resources
During the Last 5 Years**

		Grazing Lands		Birds Local		Bird Migratory		Forest Animals	
		N (%)	Mean	N (%)	Mean	N (%)	Mean	N (%)	Mean
Keti Bunder, Thatta	Creek	47.1	2.55	35.6	2.86	39.4	2.41	44.2	2.52
	Inland	47.2	2.10	28.2	2.88	28.9	2.44	34.5	2.73
	Site Average	47.2	2.29	31.3	2.87	33.3	2.43	38.6	2.63
Keenjhar, Thatta	Small	40.5	2.06	45.2	2.04	56.3	1.72	40.5	2.24
	Medium	24.5	2.27	37.7	2.25	42.5	1.84	31.1	2.36
	Large	28.6	2.23	22.1	2.06	26.0	2.00	26.0	2.35
	Site Average	32.0	2.15	36.9	2.11	44.0	1.80	33.7	2.30
Chotiari, Sanghar	Small	57.0	1.65	44.2	1.97	46.5	1.95	53.5	1.76
	Medium	44.8	1.95	42.5	2.21	44.8	2.15	50.7	1.93
	Large	35.8	2.00	35.8	1.68	32.1	1.82	37.7	1.95
	Site Average	46.9	1.84	41.8	2.04	42.9	2.03	49.1	1.87
Pai Foerst, Nawabshah	Small	73.8	1.96	76.9	2.40	73.8	2.33	83.1	1.96
	Medium	73.2	2.28	81.7	2.40	82.9	2.29	87.8	1.93
	Large	85.4	2.04	89.9	2.24	86.5	2.23	86.5	1.90
	Site Average	78.0	2.10	83.5	2.34	81.8	2.28	86.0	1.93
Overall		50.0	2.12	47.7	2.33	50.0	2.16	50.9	2.12

Table- 4.17 (b) depicts that, on an overall basis, the means of 2 or less than 2 for grazing fields, migratory birds and wildlife indicated that these natural resources had depleted during the last 5 years. For migratory birds, mean respondent perception from Keenjhar, Thatta was 1.80 which revealed that they were in total conformity with the depletion of resource. These perceptions validate the estimates made by wetland experts and environmentalists, claiming that the number of migratory birds have declined drastically in recent years. The low average values of 1.87 for Chotiari and 1.93 for Pai Forest depicted agreement with the statement that wildlife resources have degraded significantly during the last five years.

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4.3.3 Loss of Income

Perceived loss of income due to the depletion of natural resources, as reported by the survey respondents, is given in tables 4.18(a) and 4.18 (b).

Table- 4.18 (a): Proportion of Respondents Reporting Loss of Income (%) due to Depletion of Natural Resources

		Water irrigation		Water drinking		Fish		Forest	
		N (%)	Mean (%)	N (%)	Mean (%)	N (%)	Mean (%)	N (%)	Mean (%)
Keti Bunder, Thatta	Creek	0.0	NA	43.3	45.44	46.2	57.69	17.3	47.78
	Inland	3.5	66.00	62.7	56.00	54.9	63.21	30.3	46.63
	Site Average	2.0	66.00	54.5	52.46	51.2	61.10	24.8	46.97
Keenjhar, Thatta	Small	4.8	37.50	14.3	32.78	49.2	68.21	15.1	44.74
	Medium	0.0	NA	23.6	39.40	25.5	62.96	14.2	39.00
	Large	2.6	60.00	13.0	53.00	37.7	67.41	7.8	45.00
	Site Average	2.6	43.13	17.2	39.72	38.2	66.81	12.9	42.63
Chotiari, Sanghar	Small	16.3	74.64	5.8	46.00	25.6	41.59	18.6	45.63
	Medium	14.9	45.75	5.2	25.00	23.1	50.32	17.9	41.88
	Large	13.2	46.43	7.5	46.25	9.4	46.00	13.2	42.86
	Site Average	15.0	55.73	5.9	36.88	21.2	46.64	17.2	43.30
Pai Foerst, Nawabshah	Small	58.5	53.29	0.0	NA	0.0	NA	18.5	56.67
	Medium	46.3	53.29	0.0	NA	0.0	NA	32.9	54.44
	Large	44.9	58.75	2.2	50.00	4.5	30.00	30.3	68.70
	Site Average	49.2	55.17	0.8	50.00	1.7	30.00	28.0	60.68
Overall		17.2	54.47	18.8	47.92	28.0	60.16	19.6	49.58

Table- 4.18 (a) depicts that the loss of income due to shortage of irrigation and drinking water and forest resources was reported by about 18 -19% of respondents. Loss of income from depletion of fisheries resources was much more substantial, with 28% of affected respondents. Mean values reveal the perceived income in terms of percentage decrease due to depletion of resources. On an overall basis, more than 60% of income has declined in fishing profession. Site averages unveiled that the highest (66.8%) reduction in income was reported by respondents of Keenjhar and 61% at Keti Bunder, Thatta. The highest reduction in income due to depletion of forests (61%) was reported at Pai, Nawabshah. About half (50%) of income was reportedly reduced due to shortage of irrigation water in agricultural communities adjacent to the Pai forest. For drinking water, the average income reduction was about 53% at Keti Bunder because all communities were buying water from tankers at Keti Bunder and then transporting it to the creeks and villages.

Table -4.18 (b). Proportion of Respondents Reporting Loss of Income due to Depletion of Natural Resources

		Grazing Lands		Birds Local		Bird Migratory		Forest Animals	
		N (%)	Mean (%)	N (%)	Mean (%)	N (%)	Mean (%)	N (%)	Mean (%)
Keti Bunder, Thatta	Creek	8.7	60.00	1.0	20.00	5.8	80.00	8.7	65.56
	Inland	15.5	45.45	2.8	46.25	9.2	58.08	3.5	48.00
	Site Average	12.6	49.68	2.0	41.00	7.7	65.00	5.7	59.29
Keenjhar, Thatta	Small	20.6	48.08	19.0	55.00	27.8	70.43	8.7	63.18
	medium	7.5	60.00	5.7	34.17	18.9	68.75	2.8	75.00
	large	5.2	47.50	2.6	55.00	3.9	63.33	2.6	50.00
	Site Average	12.3	50.53	10.4	51.09	18.8	69.48	5.2	63.75
Chotiari, Sanghar	Small	20.9	63.33	1.2	90.00	2.3	62.50	3.5	80.00
	medium	6.0	40.00	3.0	33.75	1.5	75.00	2.2	56.67
	large	3.8	35.00	3.8	52.50	1.9	50.00	3.8	75.00
	Site Average	10.3	54.64	2.6	47.14	1.8	65.00	2.9	70.00
Pai Foerst, Nawabshah	Small	21.5	31.43	3.1	25.50	1.5	1.00	10.8	76.57
	medium	13.4	27.27	0.0	NA	0.0	NA	2.4	87.50
	large	16.9	49.00	1.1	3.00	1.1	3.00	9.0	76.25
	Site Average	16.9	36.88	1.3	18.00	0.8	2.00	7.2	77.71
Overall		12.5	47.19	4.3	47.32	7.7	66.60	5.0	67.84

On an overall basis, as shown by table- 4.18 (b), the proportion of respondents reporting loss of income due to shrinkage/ depletion of grazing lands, lower level of landing of migratory birds and shrinking of wildlife habitats, was 12.5%, 8% and 5% respectively. Loss of income from migratory birds was found highest (19% of respondents) at Keenjhar lake. Loss of income from wildlife resources was reported to be highest at Pai forest. The above tables highlight substantial loss of income from the degradation/ depletion of natural resources, specially due to inadequate irrigation water, degradation of grazing lands, shrinkage of wildlife and migratory bird habitats. Since the respondents gave multiple responses for each of these resources, it is quite evident that almost all respondents have experienced loss of income during the last 5 years, due to degradation of natural resources at the programme sites in one form or the other.

4.3.4 Natural Disasters

Natural disasters are a facet of the livelihoods of Indus for All Programme communities, specially in the coastal district of Thatta. Table- 4.19 presents information about natural disasters at the Indus for All Programme sites during the last 5 years.

Table-4.19: Disasters during Last 5 Years

Area/Site	Category of villages	Proportion (%)					
		Drought	Floods	Human disease	Storm/ Cyclone	Others	Total
Keti Bunder, Thatta	Creek	0.0	13.3	0.0	51.8	34.9	100.0
	Inland	0.0	9.4	2.1	64.6	24.0	100.0
	Site Average	0.0	11.2	1.1	58.7	29.1	100.0
Keenjhar, Thatta	Small	10.0	7.5	15.0	65.0	2.5	100.0
	Medium	0.0	0.0	7.1	64.3	28.6	100.0
	Large	0.0	3.7	7.4	88.9	0.0	100.0
	Site Average	4.9	4.9	11.1	72.8	6.2	100.0
Chotiari, Sanghar	Small	10.3	51.7	24.1	0.0	13.8	100.0
	Medium	4.2	43.8	8.3	0.0	43.8	100.0
	Large	0.0	16.7	8.3	8.3	66.7	100.0
	Site Average	5.6	42.7	13.5	1.1	37.1	100.0
Pai, Forest, Nawab Shah	Small	0.0	0.0	14.3	57.1	28.6	100.0
	Medium	0.0	10.0	10.0	20.0	60.0	100.0
	Large	0.0	0.0	0.0	5.0	95.0	100.0
	Site Average	0.0	2.7	5.4	18.9	73.0	100.0
Overall		2.2	16.1	6.2	46.5	29.0	100.0

Almost 70% of respondents at Keti Bunder and Keenjhar sites of Thatta district reported rainstorms/ cyclones during the last 5 years. Flood/ rainstorms were reported by 42% of respondents at Chotiari. Other calamities were also reported by about 30% of population on an overall basis. During these disasters, the deaths of human and animals were reported by 2% and 5% of the households surveyed while the average number of deaths, reported by those 2% households, was 2.26 per household. Likewise, averagely 8 deaths of animals were reported by about 5% of the households. Even the most stable of the programme priority areas- Pai Forest, was affected by various disasters including flash floods, storms, drought and human diseases.

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Table – 4.20: Human, Animal and Financial Loss during Disasters

Area/Site	Category of villages	Human deaths		Animals Deaths		Perceived Financial Loss (Rs.)			
		%	Mean	%	Mean	%	Minimum	Maximum	Mean
Keti Bunder, Thatta	Creek	2.88	1.67	2.9	1.67	77.88	2,000	1,000,000	93,333
	Inland	0.00	0.0	2.1	2.33	66.90	500	400,000	61,800
	Site Average	1.22	1.67	2.4	2.00	71.54	500	1,000,000	76,313
Keenjhar, Thatta	Small	3.97	4.00	6.3	9.25	29.37	1,000	550,000	55,419
	Medium	1.89	1.50	0.9	4.00	9.43	10,000	250,000	52,000
	Large	1.30	3.00	0.0	0.0	32.47	5,000	60,000	21,400
	Site Average	2.59	3.25	2.9	8.67	23.30	1,000	550,000	43,132
Chotiari, Sanghar	Small	5.81	1.00	24.4	10.43	31.40	3,000	700,000	99,037
	Medium	2.24	2.33	3.7	4.00	32.09	2,000	250,000	31,198
	Large	1.89	3.00	3.8	2.00	20.75	2,000	50,000	17,182
	Site Average	3.30	1.67	10.3	8.68	29.67	2,000	700,000	51,907
Pai, Forest, Nawab Shah	Small	1.54	2.00	0.0	0.0	7.69	5,000	70,000	20,000
	Medium	1.22	1.00	2.4	2.50	13.41	3,000	120,000	36,455
	Large	0.00	0.0	2.2	4.00	22.47	1,600	50,000	16,080
	Site Average	0.85	1.50	1.7	3.25	15.25	1,600	120,000	22,850
Overall		2.10	2.26	4.7	8.24	35.04	500	1,000,000	58,581

Table- 4.20 compiles the financial loss on account of natural disasters. Average loss per household was reported to be Rs. 76,000 at Keti Bunder, Rs. 52,000 at Chotiari, Rs. 43,000 at Keenjhar and Rs. 23,000 only at Pai Forest. Notwithstanding the upper bias in these reported losses, it is certain that the households have not only sustained income losses but also substantial loss of capital and financial assets during the last 5 years due to natural resource depletion and frequent occurrence of natural disasters.

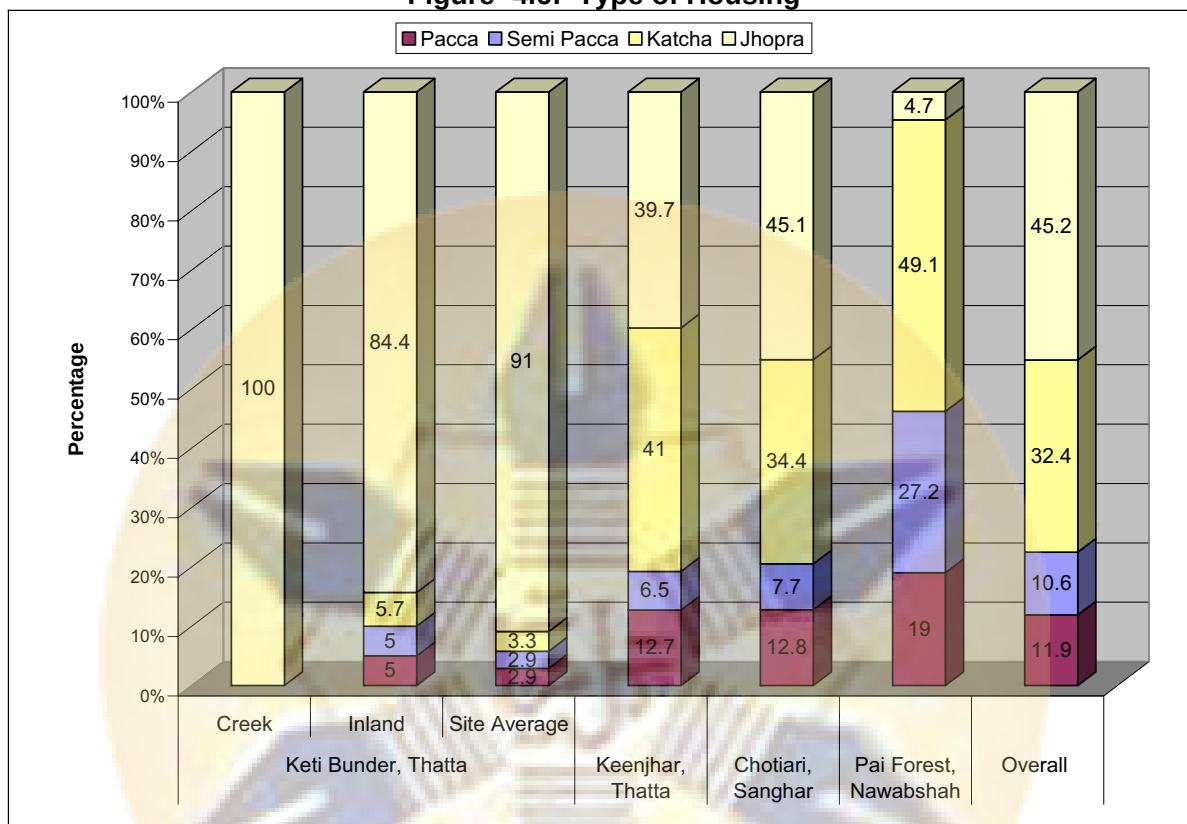
4.4 Physical Capital

The state of physical/ produced capital was assessed during the baseline survey in terms of housing and associated facilities and household & business assets.

4.4.1 Housing Conditions

Figure 4.6 presents the baseline information about the type of housing at various programme sites. Thatched huts of straw and wooden poles (Jhoopra), were the only type of housing reported in the creeks of Keti Bunder. Inland households of Keti Bunder were also mainly the dwellers of wood and straw huts (about 84%), followed by Katcha houses made of earthen bricks and wooden roofs (6%), and semi - Pacca and Pacca (bricked) houses to the extent of 5% respectively.

Figure- 4.6: Type of Housing



Huts of wood and straw (Jhoopra) were the most prevalent housing type at Ketu Bunder (91%) and Chotiari (45%). At Keenjhar, the predominant housing types were Katcha (earthen bricks and wooden roofs) and Jhoopra to the tune of 41% and 39% respectively. At Pai Forest, about half (49%) of houses were Katcha, while a significant proportion of houses (27% and 19%) respectively, were Semi- Pacca (bricks and wood) and Pacca (bricks and iron or RCC structure). On an overall basis, the housing types were Jhoopra (45%), Katcha (32%), Semi-Pacca (11%) and Pacca (12%) respectively.

Almost 70% of housing units at Ketu Bunder, were recorded as 1 room houses. The proportion of 1 room houses was about 55% at Keenjhar and about 47% at Chotiari and Pai sites. The proportion of 2 room houses was 27%, 30%, 41% and 40% at Ketu Bunder, Keenjhar, Chotiari and Pai respectively. Comparatively, better living standard of Pai Forest and Keenjhar was evident, since average number of rooms per house at these sites was higher than the overall average of 1.64 rooms per house (Table – 4.22). Agricultural incomes were presumably associated with better housing conditions both at Pai Forest and Keenjhar lake. Both sites were located close to better communication networks where housing conditions appeared to be better.

Table- 4.22: Average Number of Rooms Per House

Area/Site	Category of villages	Mean	Proportion (%) of Households by Number of Rooms						
			1	2	3	4	5	6	Total
Keti Bunder, Thatta	Creek	1.35	68.0	30.0	1.0	1.0	0.0	0.0	100.0
	Inland	1.42	67.9	25.4	5.2	0.7	0.0	0.7	100.0
	Site Average	1.39	67.9	27.4	3.4	0.9	0.0	0.4	100.0
Keenjhar, Thatta	Small	1.77	48.0	34.3	10.8	5.9	1.0	0.0	100.0
	Medium	1.66	58.8	26.5	8.8	1.5	4.4	0.0	100.0
	Large	1.68	59.7	25.8	4.8	6.5	3.2	0.0	100.0
	Site Average	1.72	54.3	29.7	8.6	4.7	2.6	0.0	100.0
Chotiari, Sanghar	Small	1.79	41.7	43.1	11.1	2.8	1.4	0.0	100.0
	Medium	1.71	49.5	37.6	8.6	2.2	1.1	1.1	100.0
	Large	1.59	47.7	45.5	6.8	0.0	0.0	0.0	100.0
	Site Average	1.71	46.4	41.1	9.1	1.9	1.0	0.5	100.0
Pai, Forest, Nawab Shah	Small	1.76	50.0	36.0	6.0	4.0	4.0	0.0	100.0
	Medium	1.81	40.3	48.4	6.5	1.6	1.6	1.6	100.0
	Large	1.64	50.7	35.6	12.3	1.4	0.0	0.0	100.0
	Site Average	1.73	47.0	40.0	8.6	2.2	1.6	0.5	100.0
Overall		1.64	53.8	34.4	7.5	2.5	1.4	0.3	100.0

Table – 4.23 Type of Toilet Facilities in House

Area/Site	Category of villages	Proportion (%)				
		Non flush toilet / WC	Pit latrine	Open Space	Thatched	Total
Keti Bunder, Thatta	Creek	0.0	1.9	66.0	32.0	100.0
	Inland	2.2	31.4	46.0	20.4	100.0
	Site Average	1.3	18.8	54.6	25.4	100.0
Keenjhar, Thatta	Small	11.2	19.2	69.6	0.0	100.0
	Medium	12.7	17.6	69.6	0.0	100.0
	Large	11.8	28.9	59.2	0.0	100.0
	Site Average	11.9	21.1	67.0	0.0	100.0
Chotiari, Sanghar	Small	1.2	11.8	87.1	0.0	100.0
	Medium	3.0	15.7	81.3	0.0	100.0
	Large	25.0	25.0	50.0	0.0	100.0
	Site Average	6.6	16.2	77.1	0.0	100.0
Pai, Forest, Nawab Shah	Small	12.7	36.5	50.8	0.0	100.0
	Medium	29.6	38.3	32.1	0.0	100.0
	Large	11.4	30.7	58.0	0.0	100.0
	Site Average	18.1	34.9	47.0	0.0	100.0
Overall		9.5	22.4	62.3	5.9	100.0

Table- 4.23 present information on sanitation conditions measured by toilet facilities inside houses. It was noted that open space was used predominantly at Chotiari and Keenjhar lakes for human excreta to the extent of 77% and 67% respectively. At Ketu Bunder, the creek households also had such arrangements mostly in the open space. Pit latrines were used at Pai Forest, Ketu Bunder Inland villages, Keenjhar and Chotiari to the extent of 35%, 31%, 29% and 25% respectively. On an overall basis, 62% households used open space, 22% had pit latrines, 10% had non-flush toilets/ WCs, and 6% housing units had separate thatched straw structures as toilets. This clearly indicated the poor sanitation arrangements at all the programme sites.

Table- 4.24 Availability of Electricity in Housing Units

Area/Site	Category of villages	Proportion (%)		
		Yes	No	Total
Ketu Bunder, Thatta	Creek	2.9	97.1	100.0
	Inland	32.6	67.4	100.0
	Site Average	20.1	79.9	100.0
Keenjhar, Thatta	Small	11.2	88.8	100.0
	Medium	46.7	53.3	100.0
	Large	92.2	7.8	100.0
	Site Average	43.6	56.4	100.0
Chotiari, Sanghar	Small	26.7	73.3	100.0
	Medium	35.1	64.9	100.0
	Large	75.0	25.0	100.0
	Site Average	40.1	59.9	100.0
Pai, Forest, Nawab Shah	Small	84.4	15.6	100.0
	Medium	92.6	7.4	100.0
	Large	79.8	20.2	100.0
	Site Average	85.5	14.5	100.0
Overall		46.6	53.4	100.0

While gas is not available at any of the programme priority area villages, electricity is available in the households to the tune of 86% at Pai, 44% at Keenjhar and 40% at Chotiari. At Ketu Bunder, about one third of inland houses have electricity, while only 3% housing units have electricity in the creeks. In fact, only one village of the Hajamro creek has the facility owing to the installation of wind turbine by the WWF. Another wind turbine located outside Ketu Bunder, in the recently settled village of fishermen, is also a blessing for those who have migrated from Chan, Hajamro and Tarchan/ Kanghri creeks.

4.4.2 Water Supply

Drinking water supply as well as quality of water were found to be highly unsatisfactory at almost all the programme priority sites. On an overall basis, more than 60% housing units had to fetch water from outside. Only 4% of housing units had the public water supply facility, while 35% of housing units had hand pumps. The situation was worse at Ketu Bunder with 95% of housing units fetching water from outside, either from far-off locations or by purchasing water from tankers and transporting it in fishing boats to the creeks and seaside villages. Some of them bring brackish water in boats from the Khobar creek as well.

Table 4.25 depicts that the Keenjhar housing units also relied on outside sources of water in 86% cases. At Pai and Chotiari, however, the hand pumps were available to 85% and 60% households respectively. It was noted that even at Chotiari site, the hand pumps were mostly installed at Chotiari and Bakar settlements, while most of the fishing households fetched water from outside sources.

Table- 4.25: Water Supply in the Housing Units

Area/Site	Category of villages	Proportion (%)			
		Pump	Water supply	Out of House	Total
Keti Bunder, Thatta	Creek	6.7	0.0	93.3	100.0
	Inland	2.1	0.0	97.9	100.0
	Site Average	4.1	0.0	95.9	100.0
Keenjhar, Thatta	Small	0.0	2.4	97.6	100.0
	Medium	0.9	5.7	93.4	100.0
	Large	0.0	41.6	58.4	100.0
	Site Average	0.3	13.3	86.4	100.0
Chotiari, Sanghar	Small	46.5	0.0	53.5	100.0
	Medium	59.0	0.7	40.3	100.0
	Large	86.8	0.0	13.2	100.0
	Site Average	60.4	0.4	39.2	100.0
Pai, Forest, Nawab Shah	Small	84.6	0.0	15.4	100.0
	Medium	85.4	0.0	14.6	100.0
	Large	84.3	0.0	15.7	100.0
	Site Average	84.7	0.0	15.3	100.0
Overall		35.3	4.0	60.7	100.0

Table- 4.26: Quality of Drinking Water

Area/Site	Category of villages	Proportion (%)			
		Brackish	Normal	Sweet	Total
Keti Bunder, Thatta	Creek	0.0	68.3	31.7	100.0
	Inland	0.0	44.4	55.6	100.0
	Site Average	0.0	54.5	45.5	100.0
Keenjhar, Thatta	Small	0.0	43.2	56.8	100.0
	Medium	0.0	44.3	55.7	100.0
	Large	0.0	55.8	44.2	100.0
	Site Average	0.0	46.8	53.2	100.0
Chotiari, Sanghar	Small	2.3	37.2	60.5	100.0
	Medium	0.7	38.1	61.2	100.0
	Large	7.5	58.5	34.0	100.0
	Site Average	2.6	41.8	55.7	100.0
Pai, Forest, Nawab Shah	Small	0.0	9.2	90.8	100.0
	Medium	1.2	25.6	73.2	100.0
	Large	0.0	20.2	79.8	100.0
	Site Average	0.4	19.1	80.5	100.0
Overall		0.8	41.2	58.1	100.0

Table- 4.27: Sources of Water Supply

Area/Site	Category of villages	Proportion (%)						
		Pump	Water Supply	Tanka	Lake	Canal	Others	Total
Keti Bunder, Thatta	Creek	12.8	0.0	2.1	0.0	4.3	80.9	100.0
	Inland	6.7	0.0	38.1	0.7	8.2	46.3	100.0
	Site Average	9.2	0.0	23.2	0.4	6.6	60.5	100.0
Keenjhar, Thatta	Small	0.0	1.6	3.2	84.7	8.1	2.4	100.0
	Medium	0.0	0.0	0.0	98.1	1.9	0.0	100.0
	Large	0.0	27.0	0.0	20.6	44.4	7.9	100.0
	Site Average	0.0	6.5	1.4	75.7	13.7	2.7	100.0
Chotiari, Sanghar	Small	73.3	0.0	0.0	10.0	10.0	6.7	100.0
	Medium	67.3	3.6	0.0	5.5	23.6	0.0	100.0
	Large	100.0	0.0	0.0	0.0	0.0	0.0	100.0
	Site Average	72.0	2.2	0.0	6.5	17.2	2.2	100.0
Pai, Forest, Nawab Shah	Small	100.0	0.0	0.0	0.0	0.0	0.0	100.0
	Medium	88.9	0.0	0.0	0.0	0.0	11.1	100.0
	Large	100.0	0.0	0.0	0.0	0.0	0.0	100.0
	Site Average	96.0	0.0	0.0	0.0	0.0	4.0	100.0
Overall		41.9	2.5	5.8	23.7	9.9	16.2	100.0

Table- 4.26 reveals that, on the whole, the available water was sweet in 58% cases, while normal drinkable quality was reported in 41 cases. Only about 1% households, located at Chotiari, Pai and Keti Bunder sites, reported drinking brackish water drawn from hand pumps. The data indicate that the quality of water was average to brackish in 42% cases.

Table- 4.27 lists the sources of water supply outside house at the programme priority areas. Hand pumps and lakes were the two main sources providing drinking water to 42% and 24% of housing units respectively. These were followed by other sources (mainly tankers) and canals. At Keti Bunder, more than 60% households purchased water from tankers, while at Keenjhar the canals are a major source of drinking water supply. At Pai Forest and Chotiari, the hand pumps provide drinking water to 96% and 72% of housing units respectively. It is thus evident that the drinking water supply arrangements inside the housing units, are better at Pai and Chotiari although the water quality is somewhat brackish. On the whole, the status of potable water supply and its quality is highly unsatisfactory at all the sites.

4.4.3 Ownership of Assets

Household assets included mechanical and electronic equipment as well as mobility and communication items. Table- 4.32 provides the inventory of household assets. It is revealed that only about 7% households at Keti Bunder had sewing machines while practically no household of Pai forest reported having even a sewing machine. Mobile phones were also not reported by the Pai households. This may have some cultural connotations as well. On an overall basis, the ownership of mobile phones was 27.5% at the programme sites. Possession of radio was reported by 35% households, while TV ownership was claimed by 16.5% households. Ownership of cycle and motorcycle was reported by 14% and 12% households respectively.

Among business assets, ownership of fishing nets was widespread among the households of Ketu Bunder (42%), Keenjhar (47%), and Chotiari (33.3%). Motor boats and simple boats were reported by 35% and 6% households of Ketu Bunder respectively. At Keenjhar, the ownership of simple boats by households was 24% and that of motor boats was 20% only. At Chotiari, however, the simple boats were owned by 29% households while the motor boats were owned by only 4% households. After the filling of reservoir since 2005, the perceived need for motor operated boats was reported to be very high but the resources for such an asset were lacking with most of the households.

Table- 4.28: Household and Business Assets

Category of Assets/ implements	Assets		Ketu Bunder, Thatta		Keenjhar, Thatta		Chotiari, Sanghar		Pai Foerst, Nawabshah		Group Site Average	
			N (%)	Mean	N (%)	Mean	N (%)	Mean	N (%)	Mean	N (%)	Mean
Household	Sewing Machine		6.9	1.12	21.4	1.02	28.6	1.01	0.3	1.05	23.6	1.03
	Computer		0.8	1.00	0.3	1.00	1.1	1.33	0.0	1.00	0.9	1.11
Communication	Phone or Mobile		6.9	1.00	29.8	1.27	25.6	1.10	0.4	1.12	27.5	1.16
	Radio		37.8	1.01	39.8	1.07	28.6	1.06	0.2	1.00	35.3	1.04
	TV		11.8	1.00	11.3	1.00	13.2	1.03	0.3	1.03	16.5	1.02
Mobility	Cycle		1.2	1.00	8.7	1.00	19.4	1.02	0.2	1.00	14.0	1.01
	Motorcycle		0.4	1.00	13.9	1.05	9.2	1.00	0.2	1.00	11.6	1.02
	Donkey Cart		0.8	1.00	1.9	1	8.4	1.00	0.2	1.03	6.7	1.01
Fishing	Net		41.9	10.72	46.9	21.92	33.3	25.1	0.0	0.00	32.9	19.21
	Boat	Motor	35	1.14	19.4	1.30	3.7	1.10	0.0	0.00	15.0	1.20
		Simple	6.1	1.07	23.6	1.03	28.9	1.15	0.0	0.00	16.1	1.09
Agriculture	Tractor		0	0.00	1.9	1.00	0.7	1.5	0.0	1.00	1.9	1.05
	Trolley		0	0.00	0.3	1.00	0.4	1.00	0.0	0.00	0.5	1.00
	Thresher		0	0.00	0.0	0.00	0	0.00	0.0	1.00	0.6	1.00
Wood Cutting	Saw		5.3	1.92	1.3	1.50	4.8	2.00	0.0	1.33	3.2	1.85

Ownership of tractor, trolley, and thresher was not reported by any household at Ketu Bunder, Chotiari and Pai sites. At Keenjhar, 2% households reported the ownership of tractor and trolley. It is quite evident from the above analysis, that the programme priority area households possess meager assets both for household use and business productivity. Except for Radio at home and fishing net at business, none of the assets were owned by a significant proportion of the households.

4.5 Financial Capital

None of the poor households reported savings or disposable ornaments. The baseline survey, therefore, concentrated on the indicators associated with loans obtained and paid during 2006 and 2007.

4.5.1 Extent of Indebtedness

Table 4.29 reveals that, on an overall basis, 50% of households had availed production credit/ loan of some type during 2006-07. Highest level of indebtedness was recorded in the creek households

(71%), while the lowest (30%) was found at Keenjhar. Pai forest and Chotiari households were indebted to the tune of 45% and 39% respectively.

Table – 4.29: Production Credit/ Loan Received by Respondents

Area/Site	Category of villages	Proportion (%)		
		Yes	No	Total
Keti Bunder, Thatta	Creek	70.6	29.4	100.0
	Inland	37.6	62.4	100.0
	Site Average	51.4	48.6	100.0
Keenjhar, Thatta	Small	42.7	57.3	100.0
	Medium	24.8	75.2	100.0
	Large	16.9	83.1	100.0
	Site Average	30.1	69.9	100.0
Chotiari, Sanghar	Small	38.0	62.0	100.0
	Medium	45.7	54.3	100.0
	Large	23.9	76.1	100.0
	Site Average	39.4	60.6	100.0
Pai, Forest, Nawab Shah	Small	48.4	51.6	100.0
	Medium	38.3	61.7	100.0
	Large	50.6	49.4	100.0
	Site Average	45.7	54.3	100.0
Overall		40.9	59.1	100.0

4.5.2 Purpose and Amount of Loan

Table- 4.30 provides information about the purpose of seeking credit. It was revealed that, on an overall basis, 45% of households obtained loan to meet the expenses incurred during fishing operations. This was followed by agricultural production (25%) and undertaking other business activities (5% households). The table further shows that 9% households obtained loans to undertake construction/ repairs of houses. More than 6% households borrowed just for consumption purposes.

Fat Keti Bunder and Keenjhar, the loans were mainly obtained for fishing purposes (75% and 66% households respectively). At Chotiari, two main purposes of borrowing were fishing and agricultural production. At Pai, agriculture, livestock and house construction emerged to be the main purposes for obtaining loans.

Table- 4.31 reveals that the minimum and maximum amount of loans varied from Rs. 100 only to Rs. 500,000 only. On an overall basis, the household reporting loans had obtained an average of Rs. 71,247 only at Keti Bunder, Rs. 46,651 only at Keenjhar, Rs. 40,298 at Pai, and Rs. 38,797 at Chotiari. Minimum loan amount borrowed by creek households was significantly higher than that of inland households at Keti Bunder, indicating a priority intervention for micro-credit schemes in the creek villages.

Table- 4.30: Purpose of Loan Availed by Indus for All Programme Households

Area/Site		Agriculture	Livestock	Health	Construction/Repair of House	Food	Business	Fishing (Boats & Nets)	Poultry farm	Mat Making	Tube Well	Total
Keti Bunder, Thatta	Creek	0.0	0.0	3.1	7.7	0.0	3.1	86.2	0.0	0.0	0.0	100.0
	Inland	0.0	0.0	2.0	16.3	16.3	6.1	59.2	0.0	0.0	0.0	100.0
	Site Average	0.0	0.0	2.6	11.4	7.0	4.4	74.6	0.0	0.0	0.0	100.0
Keenjhar, Thatta	Small	7.7	0.0	2.6	7.7	15.4	10.3	53.8	2.6	0.0	0.0	100.0
	Medium	5.9	0.0	0.0	0.0	0.0	5.9	88.2	0.0	0.0	0.0	100.0
	Large	0.0	0.0	16.7	0.0	0.0	0.0	83.3	0.0	0.0	0.0	100.0
	Site Average	6.5	0.0	3.2	4.8	9.7	8.1	66.1	1.6	0.0	0.0	100.0
Chotiari, Sanghar	Small	27.3	0.0	0.0	9.1	0.0	9.1	18.2	0.0	36.4	0.0	100.0
	Medium	44.0	0.0	0.0	0.0	12.0	0.0	44.0	0.0	0.0	0.0	100.0
	Large	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Site Average	35.0	0.0	0.0	12.5	7.5	2.5	32.5	0.0	10.0	0.0	100.0
Pai, Forest, Nawab Shah	Small	50.0	43.8	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Medium	83.3	0.0	0.0	4.2	0.0	4.2	4.2	0.0	0.0	4.2	100.0
	Large	44.4	5.6	22.2	22.2	0.0	5.6	0.0	0.0	0.0	0.0	100.0
	Site Average	62.1	13.8	8.6	8.6	0.0	3.4	1.7	0.0	0.0	1.7	100.0
Overall		24.6	3.1	3.4	9.1	6.4	4.8	45.2	0.5	2.6	0.4	100.0

Table- 4.31: Amount of Loan Received

Area/Site	Category Of villages	Minimum	Maximum	Mean
Keti Bunder, Thatta	Creek	5,000	500,000	82,208
	Inland	700	500,000	56,357
	Site Average	700	500,000	71,247
Keenjhar, Thatta	Small	600	240,000	34,810
	Medium	3,000	300,000	78,077
	Large	3,500	170,000	29,875
	Site Average	600	300,000	46,651
Chotiari, Sanghar	Small	2,000	250,000	39,500
	Medium	1,000	346,000	35,719
	Large	100	200,000	52,827
	Site Average	100	346,000	38,797
Pai, Forest, Nawab Shah	Small	1,300	150,000	32,710
	Medium	2,000	150,000	42,468
	Large	3,000	300,000	43,943
	Site Average	1,300	300,000	40,298
Overall		100	500,000	48,913

4.5.3 Sources of Credit and Interest Rates

At Ketu Bunder, no institutional source of credit was reported. At Keenjhar too, over 90% loans were extended by local lenders, while the remaining 10% were advanced by banks. On the whole, 85% of respondents obtained loan from local money lender/ trader, 12% got institutional credit from banks, and only 3% obtained microfinance from the NGOs. All microfinance loans were reported at Chotiari site. Bank loans were also found significant at the Chotiari and Pai sites; see table-4.32 for details.

Table- 4.32: Source of Credit

Area/Site	Category of villages	Proportion (%)				
		Banks	NGO	Local Lender	Banks & Local	Total
Ketu Bunder, Thatta	Creek	0.0	0.0	100.0	0.0	100.0
	Inland	0.0	0.0	100.0	0.0	100.0
	Site Average	0.0	0.0	100.0	0.0	100.0
Keenjhar, Thatta	Small	13.0	0.0	87.0	0.0	100.0
	Medium	7.7	0.0	92.3	0.0	100.0
	Large	0.0	0.0	100.0	0.0	100.0
	Site Average	9.8	0.0	90.2	0.0	100.0
Chotiari, Sanghar	Small	20.0	0.0	80.0	0.0	100.0
	Medium	20.0	0.0	78.2	1.8	100.0
	Large	40.0	0.0	60.0	0.0	100.0
	Site Average	22.1	0.0	76.8	1.1	100.0
Pai, Forest, Nawab Shah	Small	13.3	40.0	46.7	0.0	100.0
	Medium	9.7	0.0	90.3	0.0	100.0
	Large	20.5	2.3	77.3	0.0	100.0
	Site Average	15.2	12.4	72.4	0.0	100.0
Overall		11.9	2.8	85.1	0.3	100.0

Table 4.33: Interest Rate by Various Sources

Lending institution	Minimum	Maximum	Mean
Banks	9	20	14
NGO	18	20	18
Local Lender	10	60	23
Banks & Local	14	14	14
Site Average	9	60	21

Table- 4.33 provides information about the interest rates charged by various lending sources in 2007. It was revealed that the bank loans are by far the cheapest at 14% interest rate while, on an average, the NGOs and local lenders charged 18% and 23% respectively. The difference is much more obvious when the maximum rate of 60% charged by local money lenders is taken into account, especially at Ketu Bunder and Keenjhar sites.

Table- 4.34 Payment of Installments by Respondents

Area/Site	Category of villages	Proportion (%)		
		Yes	No	Total
Keti Bunder, Thatta	Creek	71.8	28.2	100.0
	Inland	47.1	52.9	100.0
	Site Average	61.5	38.5	100.0
Keenjhar, Thatta	Small	70.5	29.5	100.0
	Medium	61.1	38.9	100.0
	Large	58.3	41.7	100.0
	Site Average	66.2	33.8	100.0
Chotiari, Sanghar	Small	87.5	12.5	100.0
	Medium	86.0	14.0	100.0
	Large	72.7	27.3	100.0
	Site Average	84.7	15.3	100.0
Pai, Forest, Nawab Shah	Small	74.1	25.9	100.0
	Medium	70.0	30.0	100.0
	Large	86.0	14.0	100.0
	Site Average	78.0	22.0	100.0
Overall		72.5	27.5	100.0

Inquiry was also made about the repayment of loans by respondents, measured by regular payment of installments. Table- 4.34 indicated that the repayment rate was quite high at Chotiari and Pai forest sites (85% and 75% respectively). At Keenjhar, two-third of borrowers reported payment of loan installments. Lowest repayment rate was reported at Keti Bunder at 61 percent mainly because of declining incomes and natural hazards.

4.5.4 Impact of Loan on Family Income

Three fourth of respondents (75.6%) perceived no positive impact of loans on family income. Table- 4.35 depicts that about one third of the borrowers at Pai and Chotiari perceived some increase in family income as a result of borrowing for productive purposes, mainly in agriculture and livestock. At Keti Bunder and Keenjhar, a large proportion of respondents (88% and 85% respectively) did not perceive any positive impact of credit on family incomes. At both the sites, loans are mainly obtained for fishing operations. It may, therefore, be inferred that returns on investment in fishing business are lower and irregular in nature.

Table- 4.36 highlights the reasons reported by respondents for lack of positive impact of credit on family incomes. Improper utilization (50% cases), followed by high interest rates (29% cases) and less than needed amount (17% cases), were reported to have minimized the income generating effect of loans. The above analysis reveals that lack of savings and other liquidity, non-availability of institutional credit, inadequate loan amounts and high interest rates were the predominant features of poor financial capital of programme priority area households, most notably at Keti Bunder and Keenjhar sites.

Table- 4.35: Respondent Perceptions about Impact of Loan on Family Income

Area/Site	Category Of villages	Proportion (%)		
		Yes	No	Total
Keti Bunder, Thatta	Creek	16.1	83.9	100.0
	Inland	6.3	93.8	100.0
	Site Average	11.6	88.4	100.0
Keenjhar, Thatta	Small	22.0	78.0	100.0
	Medium	9.5	90.5	100.0
	Large	9.3	90.7	100.0
	Site Average	14.6	85.4	100.0
Chotiari, Sanghar	Small	25.7	74.3	100.0
	Medium	50.0	50.0	100.0
	Large	15.8	84.2	100.0
	Site Average	37.9	62.1	100.0
Pai, Forest, Nawab Shah	Small	45.7	54.3	100.0
	Medium	32.1	67.9	100.0
	Large	29.4	70.6	100.0
	Site Average	35.1	64.9	100.0
Overall		24.4	75.6	100.0

Table- 4.36: Reasons for Lack of Positive Impact of Loans on Family Income

Area/Site	Category of villages	Proportion (%)				
		Low Amount	High Interest Rate	Small Duration	Not Properly Utilized	Total
Keti Bunder, Thatta	Creek	9.8	53.7	2.4	34.1	100.0
	Inland	36.4	45.5	6.1	12.1	100.0
	Site Average	21.6	50.0	4.1	24.3	100.0
Keenjhar, Thatta	Small	12.5	18.8	3.1	65.6	100.0
	Medium	7.1	0.0	7.1	85.7	100.0
	Large	8.3	25.0	8.3	58.3	100.0
	Site Average	10.3	15.5	5.2	69.0	100.0
Chotiari, Sanghar	Small	0.0	25.0	25.0	50.0	100.0
	Medium	40.0	13.3	0.0	46.7	100.0
	Large	0.0	0.0	0.0	100.0	100.0
	Site Average	27.3	13.6	4.5	54.5	100.0
Pai, Forest, Nawab Shah	Small	15.4	30.8	0.0	53.8	100.0
	Medium	10.0	70.0	0.0	20.0	100.0
	Large	6.3	31.3	6.3	56.3	100.0
	Site Average	10.3	41.0	2.6	46.2	100.0
Overall		17.3	28.6	4.2	49.9	100.0

4.6 Social Capital

4.6.1 Family Language and Culture

The programme area communities, in general, comprised of households practicing same cultural norms and speaking same language (predominantly Sindhi). Seraiki language was also spoken by tribes of Balochi origin mainly at the Pai site but the communities were culturally cohesive; table-4.37.

Table- 4.37: Family Language

Area/Site	Category of villages	Proportion (%)									
		Sindhi	Balochi	Siraki	Punjabi	Manghwari	Marwari	Dhatki	Oddki	Jaati	Total
Keti Bunder, Thatta	Creek	99.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Inland	99.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	100.0
	Site Average	99.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	100.0
Keenjhar, Thatta	Small	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Medium	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Large	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Site Average	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Chotiari, Sanghar	Small	86.0	0.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Medium	94.8	0.0	3.7	0.0	0.7	0.7	0.0	0.0	0.0	100.0
	Large	86.8	0.0	0.0	0.0	0.0	3.8	9.4	0.0	0.0	100.0
	Site Average	90.5	0.0	6.2	0.0	0.4	1.1	1.8	0.0	0.0	100.0
Pai, Forest, Nawab Shah	Small	33.8	0.0	66.2	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Medium	65.9	0.0	34.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Large	53.9	0.0	44.9	0.0	0.0	0.0	0.0	1.1	0.0	100.0
	Site Average	52.5	0.0	47.0	0.0	0.0	0.0	0.0	0.4	0.0	100.0
Overall		86.8	0.1	12.0	0.0	0.1	0.3	0.5	0.1	0.1	100.0

On an overall basis, 87% people were Sindhi speaking. At Keti Bunder and Keenjhar, Sindhi speaking families approximated 100%, while at Chotiari, their proportion was recorded to be about 90 percent. Although out-migration was reported at Chotiari, most of the family members and members of same caste/ tribe were found residing at their ancestral villages. Thus the households enjoyed due social support at the level of their villages. Social capital was in no way, a major constraint from the viewpoint of livelihoods analysis, at least at the level of programme area villages and communities.

4.6.1 Participation in Organizations

One weak aspect of social capital at the programme area villages was found to be lack of awareness and community participation in organizations. Only 8% of respondents reported membership in organizations at Keenjhar site. At Ketu Bunder, the ratio of participation was reported to be 16 percent. Maximum participation to the extent of 34% and 32% was reported at Chotiari and Pai sites respectively. The communities at Chotiari were mobilized by various NGOs in the 1990s, at the time of implementation of LBOD Phase-I project when the reservoir was being constructed. At Pai, there are a number of CBOs federated with major NGOs operating in Nawabshah district. Some CBOs have also emerged after the declaration of these two sites as Indus for All programme sites.

Table- 4.38: Households Participating in Organizations

Area/Site	Category of villages	Member of Any Organization			Whether on Any Position		
		Proportion (%)					
		Yes	No	Site Average	Yes	No	Site Average
Keti Bunder, Thatta	Creek	21.2	78.8	100.0	1.9	98.1	100.0
	Inland	12.7	87.3	100.0	9.9	90.1	100.0
	Site Average	16.3	83.7	100.0	6.5	93.5	100.0
Keenjhar, Thatta	Small	6.6	93.4	100.0	5.7	94.3	100.0
	Medium	1.9	98.1	100.0	2.8	97.2	100.0
	Large	20.8	79.2	100.0	9.1	90.9	100.0
	Site Average	8.5	91.5	100.0	5.6	94.4	100.0
Chotiari, Sanghar	Small	27.9	72.1	100.0	7.0	93.0	100.0
	Medium	41.0	59.0	100.0	20.1	79.9	100.0
	Large	26.4	73.6	100.0	9.4	90.6	100.0
	Site Average	34.1	65.9	100.0	13.9	86.1	100.0
Pai, Forest, Nawab Shah	Small	32.3	67.7	100.0	18.5	81.5	100.0
	Medium	40.2	59.8	100.0	11.0	89.0	100.0
	Large	24.7	75.3	100.0	10.1	89.9	100.0
	Site Average	32.2	67.8	100.0	12.7	87.3	100.0
Overall		22.1	77.9	100.0	9.5	90.5	100.0

On the whole, 78% of the respondents were neither members nor office bearers of any organization. Since most of the communities were poor, they hardly had any networking with district and local government officials. Except for Keenjhar, where the Hillaya caste is politically connected, there is hardly any village at other sites which exerts political influence and matters at the district or taluka level. Lack of political participation and influence was, therefore, perceived to be a major constraint for the programme area communities.

4.7. Economic Indicators

4.7.1 Wages Rates and Household Incomes

Wage rates per work day, estimated from primary household data, were found highest in fishing (Rs. 168 only), followed by shop keeping (Rs. 150 only) and wage labor (Rs. 138 only). Agricultural labor also brought Rs. 115 only per day. Other occupations such as embroidery and mat making, where the women were engaged, carried the lowest wage rate.

Table- 4.39: Average Wages Per Day by Major Professions

		Agricultural Labour	Embroidery	Fishing	Labor	Mat Making	Rilly Making	Shops	Stone Mining
Keti Bander Thatta	Creek	NA	180	223	130	NA	NA	200	NA
	Inland	100	NA	186	160	NA	NA	135	NA
	Site Average	100	180	204	157	NA	NA	142	NA
Kenjhar Thatta	Small	95	30	110	78	150	90	130	271
	medium	100	78	164	176	200	70	300	175
	large	110	30	118	105	120	NA	167	NA
	Site Average	100	46	132	118	153	85	205	265
Chotiari Sanghar	Small	134	50	140	NA	103	15	155	NA
	medium	159	138	187	124	100	20	50	NA
	large	117	50	100	150	108	80	85	NA
	Site Average	143	100	169	129	79	38	106	NA
Pai Forest Nawabshah	Small	97	27	NA	116	NA	NA	50	NA
	medium	100	28	NA	142	66	30	127	NA
	large	141	72	NA	118	NA	50	200	NA
	Site Average	120	33	NA	128	66	40	147	NA
Overall		115.5	89.8	168.3	133.0	99.3	54.3	150.0	265.0

Table- 4.39 depicts that stone mining, restricted to north western Keenjhar communities, carried the highest earnings averaging Rs. 265 per day. It was indicated by respondents that earnings from fishing could be enhanced by improving the fishing operations, marketing and rationalizing the middleman margins. This was reportedly possible only when suitable micro - credit programmes are instituted in Keti Bunder, Keenjhar and Chotiari sites. For building the capital assets, such as boats, nets and boat engines, small and medium enterprise financing through institutional sources was also indicated.

Tables 4.40 and 4.41 reveal interesting information about monthly household income and its gender –based break up.

Table- 4.40: Household Income (PKR)

Area/Site	Category Of villages	Minimum	Maximum	Mean	Percentile		
					25 th	50 th	75 th
Keti Bunder, Thatta	Creek	500	40,000	7,911	5,000	6,000	10,000
	Inland	1,200	33,000	6,367	3,900	6,000	7,000
	Site Average	500	40,000	7,008	4,000	6,000	8,000
Keenjhar, Thatta	Small	1,500	41,000	6,414	3,000	5,000	7,750
	Medium	900	19,500	6,093	3,500	5,000	7,500
	Large	600	25,500	5,689	3,500	5,000	6,000
	Site Average	600	41,000	6,122	3,500	5,000	7,000
Chotiari, Sanghar	Small	500	138,000	7,692	3,000	4,750	7,000
	Medium	1,000	20,000	6,123	3,000	5,000	8,850
	Large	1,500	21,500	6,123	3,000	4,500	7,500
	Site Average	500	138,000	6,619	3,000	5,000	8,000
Pai, Forest, Nawab Shah	Small	1,000	23,000	7,380	4,400	6,000	10,000
	Medium	500	100,000	8,740	3,000	6,000	10,000
	Large	1,300	19,500	5,977	3,000	5,000	7,800
	Site Average	500	100,000	7,322	3,300	6,000	9,000
Overall		500	138,000	6727	3,500	5,000	8,000

Average income per household was estimated at Rs. 6,727 only per month. First, second, and third quartiles also known as 25th, 50th, and 75th percentile revealed the distribution of income. Household income arranged in ascending order and all households may be assumed to be 100, the income of 25th household was 3,500, 50th household was 5,000 and 75th household was Rs. 8,000. Economists and statisticians suggest that the median (50th percentile) is a better measure of central tendency (average) when resources/ incomes are not normally distributed. Since there were few rich households among the sample, the income of Rs. 5,000 only per household per month reflected by the measure of central tendency was considered as the overall statistical average.

Table- 4.41 depicts that, on an overall basis, each household had two earning members. Only about 10% women were recorded as earning members and their contribution to the family income was a mere 4.3 per cent. This highlights the need for gender mainstreaming in occupations and income generating activities. Even at Keti Bunder, the women are not involved in fishing operations. At Keenjhar, only the Manchri caste women go for fishing while all other castes forbid their women from fishing and other mainstream income generating activities. At Chotiari also, a similar trend was visible.

Table- 4.41: Earning Family Members and Contribution in Household Income

Area/Site	Category of villages	Mean				Contribution in Household Income (%)		
		No. of Earners/HH		Monthly Income		Contribution in Household Income		
		Male	Female	Male	Female	Male	Female	Total
Keti Bunder, Thatta	Creek	1.49	0.03	5,145	2,000	99.3	0.7	100
	Inland	1.51	0.05	4,193	3,286	97.5	2.5	100
	Site Average	1.50	0.04	4,593	2,900	98.3	1.7	100
Keenjhar, Thatta	Small	1.83	0.33	3,248	1,368	92.9	7.1	100
	Medium	1.58	0.17	3,311	1,494	95.4	4.6	100
	Large	1.65	0.27	3,200	1,086	94.7	5.3	100
	Site Average	1.70	0.26	3,257	1,323	94.1	5.9	100
Chotiari, Sanghar	Small	1.16	0.16	6,766	1,857	96.3	3.7	100
	Medium	1.68	0.17	3,683	1,348	96.4	3.6	100
	Large	1.34	0.23	4,383	1,442	94.7	5.3	100
	Site Average	1.45	0.18	4,587	1,516	96.1	3.9	100
Pai, Forest, Nawab Shah	Small	1.31	0.23	5,656	600	98.2	1.8	100
	Medium	1.39	0.35	5,284	1,384	93.8	6.2	100
	Large	1.43	0.29	3,753	1,488	92.5	7.5	100
	Site Average	1.38	0.30	4,784	1,255	94.7	5.3	100
Overall		1.52	0.20	4246	1722	95.7	4.3	100

Lowest contribution of women in household income was recorded in the creek households of Keti Bunder (0.7%). Comparatively better proportion was recorded in Keenjhar, Thatta (5.9%) and Pai Forest Nawabshah (5.3) mainly due to better educational profile of females and involvement of some women in fishing operations at Keenjhar. At Chotiari, the female members contributed in mat making and agricultural activities but not in the main occupation of fishing.

4.7.2 Per Capita Incomes

Table- 4.42 presents information about the per capita income at Indus for All Programme sites. On an overall basis, accepting the 50th percentile mean as the best measure, the average per capita per month income for all sites was estimated at Rs. 929 only. Thus, the per capita income in dollar terms was about \$ 15 per month or \$ 0.50 per day.

Site specific per capita per day income was estimated in US dollar terms, from the primary household data, as \$ 0.60, \$0.40, \$ 0.40 and \$ 0.50 for Keti Bunder, Keenjhar Chotiari and Pai respectively.

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Table- 4.42: Per Capita Income Per Month at Indus for All Programme Sites

Area/Site	Category of villages	Minimum	Maximum	Mean	Percentile		
					25 th	50 th	75 th
Keti Bunder, Thatta	Creek	167	6,667	1,708	888	1,500	2,379
	Inland	240	5,333	1,386	777	1,167	1,688
	Site Average	167	6,667	1,520	833	1,250	2,000
Keenjhar, Thatta	Small	180	4,000	964	606	866	1,250
	Medium	147	5,000	1,033	583	750	1,229
	Large	150	3,333	899	573	750	1,100
	Site Average	147	5,000	971	583	800	1,200
Chotiari, Sanghar	Small	83	27,600	1,414	500	1,000	1,333
	Medium	200	3,167	963	500	750	1,300
	Large	250	4,300	1,136	567	750	1,500
	Site Average	83	27,600	1,143	500	829	1,342
Pai, Forest, Nawab Shah	Small	125	3,250	1,254	750	1,056	1,650
	Medium	100	33,333	1,604	625	975	1,535
	Large	144	3,375	935	600	800	1,167
	Site Average	100	33,333	1,256	665	894	1,500
Overall		83	33,333	1,205	625	929	1,500

4.7.3 Monthly Expenditure and Family Budgets

Average monthly expenditure, displayed in Figure- 4.7, was found to be the highest at Pai forest (Rs. 6,900 only), followed by Keti Bunder (Rs. 6,621 only), Keenjhar (Rs. 5,376 only) and Chotiari (Rs. 5,186 only). On an overall basis, the average expenditure of households at the four priority areas was Rs. 5,997 or in round figures about Rs. 6,000 only per month.

Figure – 4.7: Average Family Expenditure/ Month

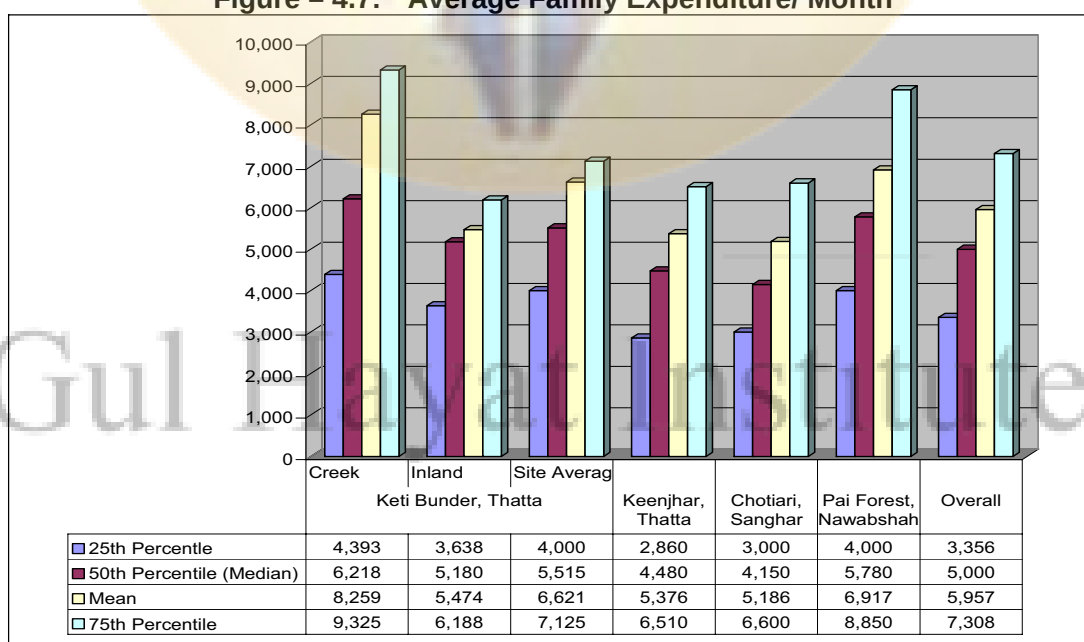
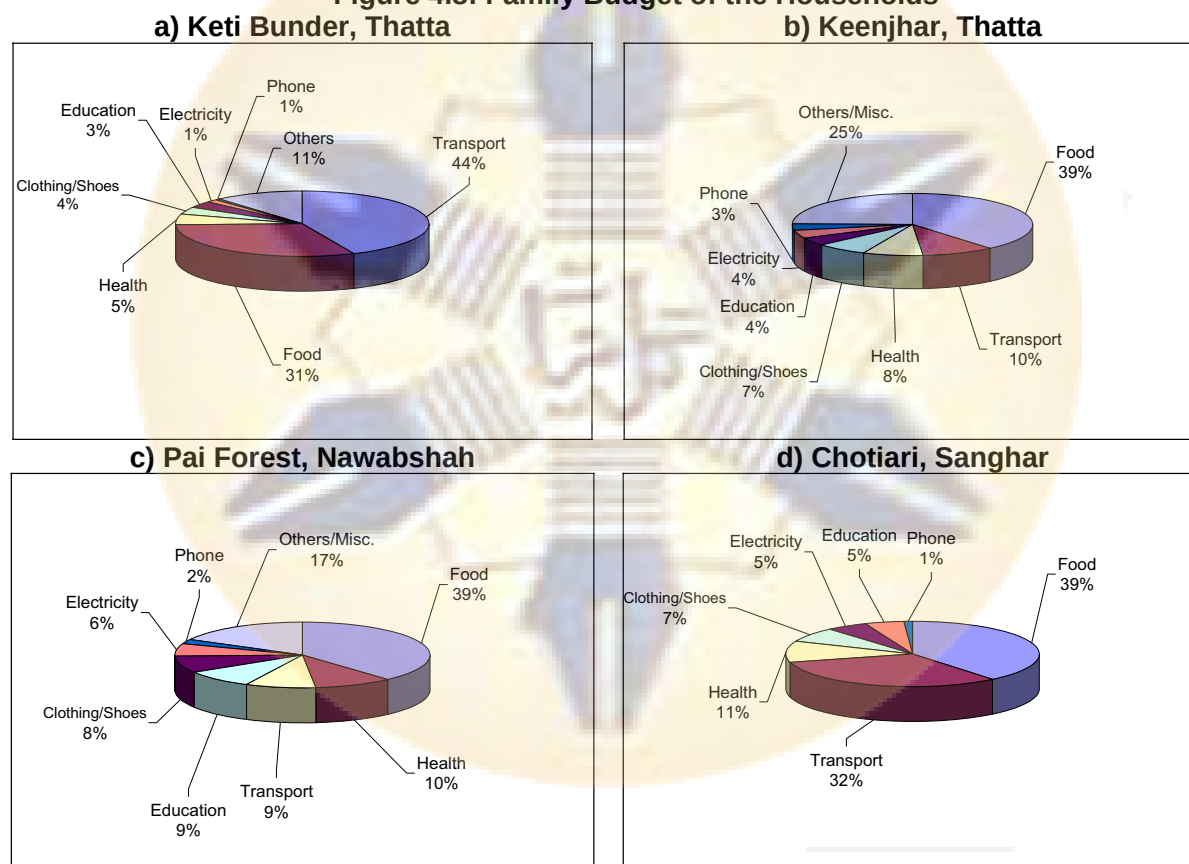


Figure- 4.8 provides detailed break-up of the typical family budgets at the programme sites. It is depicted that about 39% of family budget was devoted to the purchase of cereals and kitchen items at Keenjhar, Pai Forest, and Chotiari. An additional 30% was spent on utilities, clothing and drinking water, etc. Transport, health and education expenses were estimated to be about 11%, 8% and 6% respectively. It may be inferred, therefore, that about 85% of typical family budget was devoted to meet the basic needs of food, clothing and shelter; while only about 15% of family budget remained for social development expenditure. For Ketu Bunder, Thatta a substantial portion (44%) of income was reported on transport while food items contributed about 31% and only 3% was spent on education. These estimates unveiled the reason of low standard of living despite higher average incomes at Ketu Bunder, Thatta in comparison of other priority areas.

Figure 4.8: Family Budget of the Households



4.8 Agriculture and Livestock

Agriculture and livestock is essentially categorized among the natural capital of households. Income from agriculture and livestock was analyzed and discussed in the section on economic indicators. This section provides information on farm size, tenancy status and possession of livestock at various programme priority areas.

4.8.1 Farm Size and Tenancy Status

Farm size reported in table- 4.43 relates exclusively to households with ownership of land assets. At inland villages of Ketu Bunder, the average farm size was only 4 acres, while at Keenjhar it was 10 acres. At Chotiari and Pai, the average farm size was 7 and 8 acres respectively. The overall baseline indicator of farm size at the four priority areas was recorded to be 8 acres only, with a minimum of 1 acre and maximum of 40 acres only.

Table 4.43: Farm Size (Acres)

Area/Site		Minimum	Maximum	Mean
Ketu Bunder, Thatta	Creek	0	0	0
	Inland	4	4	4
	Site Average	4	4	4
Keenjhar, Thatta	Small	2	40	10
	Medium	3	15	8
	Large	1	30	10
	Site Average	1	40	10
Chotiari, Sanghar	Small	1	24	8
	Medium	1	39	7
	Large	3	24	7
	Site Average	1	39	7
Pai, Forest, Nawab Shah	Small	2	40	11
	Medium	1	30	8
	Large	2	25	8
	Site Average	1	40	9
Overall		1	40	8

Table- 4.44: Tenancy Status of Households in Agriculture

Area/Site	Category Of villages	Landlord		Tenant		Landlord cum tenant		Leasee		Sites Average Agriculture	
		N	%	N	%	N	%	N	%	N	%
Ketu Bunder, Thatta	Creek	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Inland	1	0.7	0	0.0	0	0.0	0	0.0	1	0.7
	Site Average	1	0.4	0	0.0	0	0.0	0	0.0	1	0.4
Keenjhar, Thatta	Small	12	9.5	3	2.4	4	3.2	0	0.0	19	15.1
	Medium	3	2.8	1	0.9	1	0.9	1	0.9	6	5.7
	Large	4	5.2	2	2.6	2	2.6	0	0.0	8	10.4
	Site Average	19	6.1	6	1.9	7	2.3	1	0.3	33	10.7
Chotiari, Sanghar	Small	13	15.1	7	8.1	3	3.5	0	0.0	23	26.7
	Medium	13	9.7	20	14.9	6	4.5	6	4.5	45	33.6
	Large	5	9.4	7	13.2	1	1.9	0	0.0	13	24.5
	Site Average	31	11.4	34	12.5	10	3.7	6	2.2	81	29.7
Pai, Forest, Nawab Shah	Small	4	6.2	29	44.6	15	23.1	0	0.0	48	73.8
	Medium	18	22.0	10	12.2	13	15.9	7	8.5	48	58.5
	Large	2	2.2	29	32.6	1	1.1	2	2.2	34	38.2
	Site Average	24	10.2	68	28.8	29	12.3	9	3.8	130	55.1
Overall		75	7.1	108	10.1	46	4.3	16	1.5	245	23.0

Table- 4.44 reveals that 23% of the total surveyed households were involved in agriculture. Out of these, 7% were non- cultivating land owners, and 10% were tenants only. Lease holders of land accounted for 1.5% (mostly located at Pai forest area), while 4.5% households were land owners cum tenants. Highest proportion of agricultural households was recorded at Pai Forest, Nawabshah where 1 out of every second household (55%) reported agriculture as major profession of family members. Highest number of tenant families was also reported at Pai forest villages (28%), followed by Chotiari site (12.5%).

Before the shortage of Indus water in delta, Ketī Bunder was a fertile agro-based economy where Red Rice were cultivated abundantly and exported overseas. Currently, agricultural households have changed their business to fishing. As a result, pressure on fishing has mounted and over-fishing was one of the grievances of the traditional fisher folk families.

4.8.2 Possession of Buffaloes and Cows

Table – 4.45 shows that females buffalos were owned by every 5th household (21%). Since Pai Forest Nawashah is agriculture based area, female buffaloes were found in every 2nd household (52%) while their average number was 2. Milking buffaloes were reported in every 3rd household (35%) while their average number was computed to be 1.43 per household. In Chotiari Sanghar, female buffaloes were found in every 5th household (21%) with the highest average of about 7 buffaloes per household. This indicated that in Chotiari, livestock substantially contributed to about 21% of households. Furthermore, about 12% of households reported their major profession as livestock herders (Table 4.18). Majority of fishing communities at Keenjhar site did not possess any buffaloes.

Table 4.45: Percent of Households Possessing Buffaloes

Area/Site	Category of villages	Buffaloes					
		Male		Female		Milking	
		%	Mean	%	Mean	%	Mean
Ketī Bunder, Thatta	Creek	1.0	1.00	8.7	1.56	5.8	1.17
	Inland	4.2	1.17	12.7	3.00	9.2	2.38
	Site Average	2.8	1.14	11.0	2.52	7.7	2.00
Keenjhar, Thatta	Small	1.6	3.00	4.0	2.80	2.4	3.00
	Medium	0.0	0	4.7	3.20	0.9	1.00
	Large	1.3	2.00	5.2	2.75	3.9	2.67
	Site Average	1.0	2.67	4.5	2.93	2.3	2.57
Chotiari, Sanghar	Small	8.1	2.71	41.9	9.31	23.3	4.25
	Medium	4.5	1.67	10.4	3.57	6.7	2.22
	Large	3.8	2.50	13.2	1.71	5.7	1.00
	Site Average	5.5	2.27	20.9	6.96	11.7	3.38
Pai, Forest, Nawab Shah	Small	16.9	1.18	69.2	2.04	38.5	1.44
	Medium	9.8	1.25	43.9	2.08	39.0	1.56
	Large	6.7	2.83	46.1	1.88	29.2	1.27
	Site Average	10.6	1.60	51.7	2.00	35.2	1.43
Overall		4.7	1.80	20.7	3.41	13.3	2.01

Table-4.46: Households Possessing Cows

Area/Site		Cows					
		Male		Female		Milking	
		%	Mean	%	Mean	%	Mean
Keti Bunder, Thatta	Creek	0.0	0	0.0	0.00	0.0	0.00
	Inland	0.7	2.00	0.7	1.00	0.7	1.00
	Site Average	0.4	2.00	0.4	1.00	0.4	1.00
Keenjhar, Thatta	Small	5.6	2.57	13.5	5.59	8.7	3.55
	Medium	0.0	0	11.3	2.33	2.8	3.00
	Large	1.3	1.00	6.5	1.80	1.3	4.00
	Site Average	2.6	2.38	11.0	3.88	4.9	3.47
Chotiari, Sanghar	Small	11.6	3.40	44.2	17.89	30.2	7.42
	Medium	15.7	2.62	38.1	5.04	23.1	3.90
	Large	7.5	1.50	34.0	2.83	24.5	1.54
	Site Average	12.8	2.71	39.2	9.23	25.6	4.77
Pai, Forest, Nawab Shah	Small	26.2	1.53	30.8	2.75	20.0	1.85
	Medium	11.0	2.67	23.2	2.58	15.9	1.69
	Large	6.7	2.00	14.6	1.69	9.0	1.13
	Site Average	13.6	1.94	22.0	2.42	14.4	1.62
Overall		7.1	2.34	18.2	6.43	11.3	3.68

Table 4.46 depicts that the possession of cows was more significant at Chotiari and Pai Forest where about 39% and 22% of the households reported female cows. The average number of female cows was 7, 3, 3 and 2 per household reporting livestock ownership, at Chotiari, Keenjhar, Keti Bunder (Inland) and Pai respectively. Traditional breeds of cows of Sindh, namely *Thari* and *Kohistani* were reported at Chotiari and Keenjhar respectively. Decline in livestock at Keti Bunder was attributed to shortage of Indus water in creeks; resultantly the saline water has hampered growth of nutritious grasses and caused prevalence of stomach and liver diseases in livestock.

4.8.3 Other Livestock and Poultry

Table 4.47 compiles data on the ownership of other animals and poultry birds at the four programme sites. Goat, sheep, and camel ownership was reported by 22%, 9% and 5% households respectively. Poultry birds were maintained by 16% of the households. Donkeys and horses were reported by 7% and 0.5% households. Camel ownership was reported by about 4% and 3% households at Keti Bunder and Chotiari sites respectively. Horses were owned by about 2% households at Chotiari only. Poultry birds/ farms were reported by 25% households at Pai, followed by 18% households at Chotiari, 13% households at Keenjhar, and 9% households at Keti Bunder.

Table 4.47: Households Possessing Goat, Sheep, Camel, Horse, Donkey and Poultry

Area/Site	Category of villages	Livestock										Poultry	
		Goat		Sheep		Camel		Horse		Donkey			
		%	Mean	%	Mean	%	Mean	%	Mean	%	Mean	%	Mean
	Creek	1.0	10.00	1.9	6.00	1.9	4.00	0.0	0.00	0.0	0.00	11.5	2.92
	Inland	9.2	2.85	0.0	0	4.9	11.43	0.0	0.00	1.4	2.00	7.7	2.82
	Site Average	5.7	3.36	0.8	6.00	3.7	9.78	0.0	0.00	0.8	2.00	9.3	2.87
Keenjhar, Thatta	Small	15.9	4.65	4.0	9.60	0.0	0.00	0.0	0.00	3.2	1.50	22.2	5.79
	Medium	9.4	3.50	0.9	10.00	0.0	0.00	0.0	0.00	4.7	1.40	4.7	5.00
	Large	5.2	1.50	1.3	2.00	0.0	0.00	0.0	0.00	0.0	0.00	10.4	4.88
	Site Average	11.0	3.94	2.3	8.57	0.0	0.00	0.0	0.00	2.9	1.44	13.3	5.51
Chotiari, Sanghar	Small	46.5	6.50	8.1	6.86	9.3	1.75	5.8	1.20	11.6	3.50	16.3	6.50
	Medium	15.7	8.86	1.5	23.00	0.0	0.00	0.0	0.00	6.0	4.63	21.6	6.66
	Large	24.5	3.46	1.9	1.00	0.0	0.00	0.0	0.00	11.3	1.17	9.4	3.40
	Site Average	27.1	6.64	3.7	9.50	2.9	1.75	1.8	1.20	8.8	3.29	17.6	6.27
Pai, Forest, Nawab Shah	Small	60.0	7.21	1.5	20.00	1.5	1.00	0.0	0.00	26.2	1.35	30.8	6.50
	Medium	59.8	4.06	0.0	0	0.0	0.00	0.0	0.00	12.2	1.80	28.0	3.78
	Large	30.3	4.93	0.0	0	1.1	1.00	0.0	0.00	10.1	1.11	18.0	4.38
	Site Average	48.7	5.33	0.4	20.00	0.8	1.00	0.0	0.00	15.3	1.42	25.0	4.86
Overall		22.2	5.42	1.9	9.35	1.8	5.47	0.5	1.20	6.7	2.07	16.1	5.15

4.8.3 Milk Production and Sale

Milk production was reported by about 14% of households at the four priority areas (Table- 4.48). Nevertheless, the sale of milk was reported by 4% households only reflecting thereby the lack of marketing facilities and sale points. Cultural norms were also reported to be a restricting factor in the sale of milk at Chotiari and Pai sites.

4.8.4 Livestock Transactions and Mortality

Data presented in tables 4.49, 4.50, 4.51 and 4.52 reveals the status of animal births, deaths, purchase and sale at the programme sites during 2007. It was reported that only 9 buffaloes were purchased during the year- 6 of them at Pai forest. Likewise, only 7 cows were purchased- 4 at Pai alone. Only 11 goats were purchased by the households- 8 at Pai, 2 at Chotiari and only 1 at Keenjhar. These figures reflect the lack of purchasing power for livestock which is the main coping mechanism of poor families during disasters and other financial hardships.

Sale figures for buffaloes were found to be high, especially at Pai and Chotiari where 11 and 5 buffaloes were sold respectively. In addition to the loss of income due to depletion of natural resources, the main reason for sale of buffaloes may be the high market prices arising out of export of live animals specially the buffaloes and camels to Iran, Afghanistan and middle-east in recent years.

High number of new born animals was reported at Pai and Chotiari sites. On an overall basis, therefore, the livestock wealth of the programme area families appreciated during the reporting year (2006-07).

Table- 4.48: Milk Production, Consumption and Sale

		Buffalo Milk (Liters)				Cow Milk (Liters)			
		N (%)	Production	Consumption	Sold	N (%)	Production	Consumption	Sold
			Mean	Mean	Mean		Mean	Mean	Mean
Keti Bunder, Thatta	Creek	7.7	1.75	1.75	0.00	1.0	1.00	1.00	0.00
	Inland	10.6	5.73	2.67	3.07	0.0	0.00	0.00	0.00
	Site Average	9.3	4.35	2.35	2.00	0.4	1.00	1.00	0.00
Keenjhar, Thatta	Small	1.6	5.00	3.00	2.00	7.1	10.78	7.44	3.33
	Medium	5.7	15.67	6.17	9.50	3.8	7.25	5.25	2.00
	Large	3.9	8.67	3.00	5.67	1.3	4.00	4.00	0.00
	Site Average	3.6	11.82	4.73	7.09	4.5	9.29	6.57	2.71
Chotiari, Sanghar	Small	19.8	4.24	4.18	0.06	30.2	3.04	3.00	0.04
	Medium	9.0	2.83	2.67	0.17	20.9	4.14	4.04	0.11
	Large	3.8	2.75	2.75	0.00	20.8	2.73	2.55	0.18
	Site Average	11.4	3.60	3.50	0.10	23.8	3.46	3.37	0.09
Pai Foerst, Nawabshah	Small	36.9	8.73	7.42	1.31	18.5	5.92	5.75	0.17
	Medium	39.0	4.27	2.77	1.50	14.6	3.58	3.25	0.33
	Large	28.1	6.40	4.96	1.44	12.4	3.00	2.91	0.09
	Site Average	34.3	6.25	4.82	1.43	14.8	4.20	4.00	0.20
Overall		13.7	5.95	4.31	1.63	18.8	4.71	4.28	0.43

Table-4.49: Animals Purchased During Last One Year

		Buffalo		Cow		Goat	
		N(%)	Mean	N(%)	Mean	N(%)	Mean
Keti Bunder, Thatta	Creek	0.0	0.0	0.0	0.00	0.0	0.00
	Inland	0.0	0.0	0.0	0.00	0.0	0.00
	Site Average	0.0	0.0	0.0	0.00	0.0	0.00
Keenjhar, Thatta	Small	0.8	1.0	0.0	0.00	2.4	7.67
	Medium	0.9	1.0	2.8	1.33	0.0	0.00
	Large	0.0	0.0	0.0	0.00	0.0	0.00
	Site Average	0.6	1.0	1.0	1.33	1.0	7.67
Chotiari, Sanghar	Small	0.0	0.0	1.2	1.00	4.7	1.50
	Medium	1.5	1.0	2.2	1.33	0.7	2.00
	Large	1.9	2.0	1.9	1.00	1.9	1.00
	Site Average	1.1	1.3	1.8	1.20	2.2	1.50
Pai Foerst, Nawabshah	Small	7.7	1.2	4.6	1.33	12.3	3.00
	Medium	4.9	1.0	8.5	1.57	7.3	2.67
	Large	6.7	2.0	0.0	0.00	4.5	1.25
	Site Average	6.4	1.5	4.2	1.50	7.6	2.50
Overall		1.9	1.4	1.7	1.39	2.5	0.00

Table- 4.50: Animals Sold During Last One Year

		Buffalo		Cow		Goat	
		N(%)	Mean	N(%)	Mean	N(%)	Mean
Keti Bunder, Thatta	Creek	0.0	0.00	0.0	0.00	0.0	0.00
	Inland	2.1	1.67	0.0	0.00	0.0	0.00
	Site Average	1.2	1.67	0.0	.	0.0	.
Keenjhar, Thatta	Small	0.8	2.00	2.4	4.00	0.8	4.00
	Medium	0.9	2.00	0.9	2.00	1.9	3.00
	Large	1.3	1.00	0.0	0.00	1.3	1.00
	Site Average	1.0	1.67	1.3	3.50	1.3	2.75
Chotiari, Sanghar	Small	11.6	5.20	20.9	6.17	14.0	4.00
	Medium	2.2	1.00	13.4	2.00	6.0	4.50
	Large	1.9	2.00	9.4	1.60	3.8	3.00
	Site Average	5.1	4.07	15.0	3.78	8.1	4.09
Pai Foerst, Nawabshah	Small	15.4	1.60	6.2	1.25	24.6	3.69
	Medium	8.5	1.00	6.1	1.60	18.3	2.60
	Large	10.1	1.33	4.5	1.25	6.7	5.17
	Site Average	11.0	1.35	5.5	1.38	15.7	3.49
Overall		4.4	2.19	6.0	3.05	6.8	3.42

Table- 4.51: Animals Died During Last One Year

		Buffalo		Cow		Goat	
		N(%)	Mean	N(%)	Mean	N(%)	Mean
Keti Bunder, Thatta	Creek	0.0	0.00	0.0	0.00	0.0	0.00
	Inland	0.7	2.00	0.0	0.00	0.0	0.00
	Site Average	0.4	2.00	0.0	0.00	0.0	0.00
Keenjhar, Thatta	Small	0.8	1.00	1.6	2.00	4.0	7.80
	Medium	0.9	1.00	1.9	1.00	1.9	2.50
	Large	0.0	0.00	0.0	0.00	1.3	1.00
	Site Average	0.6	1.00	1.3	1.50	2.6	5.63
Chotiari, Sanghar	Small	15.1	2.92	22.1	3.95	16.3	5.29
	Medium	2.2	2.00	11.9	1.56	9.0	2.17
	Large	0.0	0.00	5.7	1.00	5.7	5.00
	Site Average	5.9	2.75	13.9	2.71	10.6	3.97
Pai Foerst, Nawabshah	Small	9.2	1.00	1.5	1.00	9.2	5.17
	Medium	6.1	1.20	1.2	1.00	13.4	2.00
	Large	2.2	1.00	1.1	1.00	6.7	2.83
	Site Average	5.5	1.08	1.3	1.00	9.7	3.04
Overall		2.9	1.94	4.3	2.51	6.2	3.63

Table- 4.52: New Born Animals During Last One Year

		Buffalo		Cow		Goat	
		N(%)	Mean	N(%)	Mean	N(%)	Mean
Keti Bunder, Thatta	Creek	1.9	1.00	0.0	0.00	0.0	0.00
	Inland	7.7	1.45	0.0	0.00	2.1	1.33
	Site Average	5.3	1.38	0.0	0.00	1.2	1.33
Keenjhar, Thatta	Small	0.8	1.00	1.6	5.00	2.4	2.00
	Medium	2.8	1.00	3.8	2.00	3.8	2.75
	Large	5.2	1.00	1.3	1.00	2.6	1.00
	Site Average	2.6	1.00	2.3	2.71	2.9	2.11
Chotiari, Sanghar	Small	20.9	2.72	30.2	5.12	30.2	3.08
	Medium	7.5	1.50	22.4	2.27	9.0	3.92
	Large	5.7	1.33	13.2	1.57	9.4	2.40
	Site Average	11.4	2.19	23.1	3.37	15.8	3.23
Pai Foerst, Nawabshah	Small	27.7	1.33	13.8	1.33	18.5	6.83
	Medium	17.1	1.14	2.4	1.50	19.5	2.81
	Large	16.9	1.33	7.9	1.29	4.5	2.75
	Site Average	19.9	1.28	7.6	1.33	13.6	4.31
Overall		9.4	1.57	9.1	2.87	9.4	3.60

4.9 Environmental Awareness

Environmental awareness of respondents was gauged by the indicators of waste disposal and willingness to pay for protection services. It was reported by majority of households that the kitchen, household, plastic materials & cans and animal wastes are disposed off on daily basis. More than one third of respondents reported, however, that the waste disposal was made nearby their houses; see table- 4.53. For kitchen and recurring household wastes, the proportion of disposal nearby the housing unit was 40% or more. This indicated an alarming situation and warranted effective environmental education and communication initiatives under the umbrella of Indus for All Programme.

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Table- 4.53 Disposal of Household Wastes Proportion (%)

		Kitchen			House			Animal waste			Glass/Plastic/can		
		Twice	Daily	Alternate Day	Twice	Daily	Alternate Day	Twice	Daily	Alternate Day	Twice	Daily	Alternate Day
Keti Bunder Thatta	Creek	42.3	57.7	0.0	30.1	64.1	5.8	13.3	80.0	6.7	0.0	100.0	0.0
	Inland	43.6	55.7	0.7	24.1	65.7	10.2	21.1	63.2	15.8	3.7	92.6	3.7
	Site Average	43.0	56.6	0.4	26.7	65.0	8.3	18.9	67.9	13.2	2.0	96.1	2.0
Kenjhar Thatta	Small	35.0	64.2	0.8	22.3	63.6	14.0	17.1	80.0	2.9	0.0	93.3	6.7
	medium	54.7	45.3	0.0	44.7	54.4	1.0	53.8	38.5	7.7	0.0	0.0	0.0
	large	38.7	60.0	1.3	35.1	59.7	5.2	21.4	71.4	7.1	0.0	100.0	0.0
	Site Average	42.8	56.6	0.7	33.2	59.5	7.3	25.8	69.4	4.8	0.0	96.3	3.7
Chotiyari Sanghar	Small	46.5	51.2	2.3	33.7	64.0	2.3	14.3	82.5	3.2	0.0	84.6	15.4
	medium	49.3	48.6	2.1	39.7	57.4	2.8	30.4	69.6	0.0	30.0	40.0	30.0
	large	37.3	58.8	3.9	43.4	54.7	1.9	29.4	67.6	2.9	0.0	0.0	0.0
	Site Average	46.2	51.3	2.5	38.6	58.9	2.5	24.4	73.9	1.7	13.0	65.2	21.7
Pai Forest Nawab Shah	Small	34.4	59.4	6.3	26.6	65.6	7.8	23.7	74.6	1.7	13.9	69.4	16.7
	medium	48.4	48.4	3.2	48.4	50.0	1.6	40.4	55.8	3.8	27.3	45.5	27.3
	large	28.7	67.8	3.4	28.9	67.5	3.6	26.6	68.8	4.7	11.9	83.3	4.8
	Site Average	36.2	59.6	4.2	34.0	61.7	4.3	29.7	66.9	3.4	16.0	70.0	14.0
Overall		42.3	55.9	1.9	33.3	61.1	5.6	24.7	69.7	5.6	7.3	82.4	10.2

Table- 4.54: Place of Disposal by Type of Waste

		Kitchen		Household Waste		Animal waste		Glass/Plastic bottle/cans	
		Nearby House	identified place	Nearby House	identified place	Nearby House	identified place	Nearby House	identified place
Keti Bander Thatta	Creek	43.3	56.7	40.2	59.8	42.9	57.1	0.0	100.0
	Inland	44.9	55.1	44.5	55.5	26.3	73.7	11.1	88.9
	Site Average	44.2	55.8	42.7	57.3	30.8	69.2	5.9	94.1
Kenjhar Thatta	Small	30.0	70.0	29.7	70.3	24.2	75.8	13.3	86.7
	medium	30.8	69.2	33.7	66.3	7.7	92.3	0.0	0.0
	Large	26.8	73.2	27.8	72.2	0.0	100.0	0.0	100.0
	Site Average	29.4	70.6	30.5	69.5	15.5	84.5	7.4	92.6
Chotiyari Sanghar	Small	51.2	48.8	52.3	47.7	45.2	54.8	69.2	30.8
	medium	33.1	66.9	33.3	66.7	17.5	82.5	60.0	40.0
	Large	25.5	74.5	24.5	75.5	32.4	67.6	0.0	0.0
	Site Average	37.3	62.7	37.5	62.5	30.1	69.9	65.2	34.8
Pai Forest Nawabshah	Small	43.1	56.9	42.9	57.1	41.4	58.6	52.8	47.2
	medium	46.8	53.2	46.8	53.2	40.4	59.6	61.9	38.1
	Large	47.1	52.9	48.8	51.2	42.2	57.8	59.5	40.5
	Site Average	45.8	54.2	46.4	53.6	41.4	58.6	57.6	42.4
Overall		38.5	61.5	38.6	61.4	28.5	71.5	33.0	67.0

Table- 4.55: Willing to Pay for Environmental Services

Area/Site		Proportion (%)			Amount (Rs. / Year)		
		Yes	No	Area Total	Minimum	Maximum	Mean
Keti Bunder, Thatta	Creek	67.3	32.7	100.0	100	1,000	300
	Inland	68.3	31.7	100.0	10	1,000	100
	Site Average	67.9	32.1	100.0	10	1,000	200
Keenjhar, Thatta	Small	56.5	43.5	100.0	25	1,000	350
	Medium	30.2	69.8	100.0	100	1,000	400
	Large	53.2	46.8	100.0	50	3,000	350
	Site Average	46.6	53.4	100.0	25	3,000	400
Chotiari, Sanghar	Small	55.8	44.2	100.0	20	1,200	200
	Medium	55.6	44.4	100.0	10	1,200	500
	Large	41.5	58.5	100.0	50	2,000	300
	Site Average	52.9	47.1	100.0	10	2,000	300
Pai, Forest, Nawab Shah	Small	72.3	27.7	100.0	30	5,000	200
	Medium	63.4	36.6	100.0	50	5,000	200
	Large	57.3	42.7	100.0	20	1,000	100
	Site Average	63.6	36.4	100.0	20	5,000	200
Keti Shah, Sukkur	Small	52.2	47.8	100.0	500	5,000	1,500
	Medium	100.0	.0	100.0	1,000	10,000	2,000
	Site Average	62.1	37.9	100.0	500	10,000	1,500
Overall		57.1	42.9	100.0	10	10,000	300

Table- 4.55 reveals that about 57% households were willing to pay for environmental protection services. An average amount of Rs. 300 per annum was committed by those households who were willing to pay for environmental services.

4.10 Problems and Priorities

4.10.1 Ranking of Issues

Issues identified by respondents at the four Indus for All Programme sites, are summarized in table- 4.61. It is depicted that human disease, unemployment and flash flood/cyclone were the three priority issues for creek communities at Keti Bunder. For the inland villages of Keti Bunder, unemployment, human disease, flood and drought and excesses of law enforcing agencies were the main problems. Same issues were identified at Keenjhar site as well.

At Chotiari, unemployment, waterlogging and droughts, and human & animal diseases were perceived as the main issues. At Pai, unemployment, human and animal diseases, police injustices and drought were considered as main problems faced by the communities.

On the whole, the priority issues emerged as unemployment, human and animal diseases, flood/cyclone/ droughts and water-logging & salinity. Excesses of law enforcing agencies at all sites (and the influential fishing contractors at Chotiari) were also pinpointed.

Table- 4.61: Ranking of Issues/ Problems Faced

Area/Site	Category of villages	Ranking				
		First	Second	Third	Fourth	Fifth
Keti Bunder, Thatta	Creek	Human Disease	Unemployment	Flood/Cyclone	Drought	Animal Disease
	Inland	Unemployment	Human Disease	Flood	Drought	Police Injustice
	Site Average	Human Disease	Unemployment	Flood	Drought	Police Injustice
Keenjhar, Thatta	Small	Unemployment	Human Disease	Drought	Water-logging	Animal Disease
	Medium	Human Disease	Unemployment	Drought	Police Injustice	Animal Disease
	Large	Unemployment	Human Disease	Drought	Water-logging	Tribe / Family Clashes
	Site Average	Unemployment	Human Disease	Drought	Water-logging	Police Injustice
Chotiari, Sanghar	Small	Unemployment	Water-logging	Drought	Human Disease	Animal Disease
	Medium	Unemployment	Water-logging	Water-logging	Drought	Police Injustice
	Large	Unemployment	Human Disease	Water-logging	Drought	Animal Disease
	Site Average	Unemployment	Water-logging	Human Disease	Drought	Police Injustice
Pai, Forest, Nawab Shah	Small	Unemployment	Water-logging	Human Disease	Animal Disease	Water-logging
	Medium	Unemployment	Human Disease	Drought	Animal Disease	Water-logging
	Large	Unemployment	Human Disease	Drought	Animal Disease	Police Injustice
	Site Average	Unemployment	Human Disease	Drought	Animal Disease	Police Injustice

4.10.2 Ranking of Priorities

The survey respondents were also asked to rank their perceived community development priorities. The information compiled in table- 4.62 indicates that water supply, school, dispensary and institutional credit were identified as priority community development needs at the creek villages of Keti Bunder. Inland communities of Keti Bunder identified water supply, institutional loans, schools and dispensaries as high priority needs. At Keenjhar, the three main development priorities were listed as institutional credit, dispensary and road infrastructure.

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Table-4.62 Ranking of Community Development Priorities

Area	Type of Village	Development Priority				
		First	Second	Third	Fourth	Fifth
Keti Bunder, Thatta	Creek	Water Supply	School	Dispensary	Loan	Road
	Inland	Water Supply	Loan	School	Dispensary	Road
	Site Average	Water Supply	School	Dispensary	Loan	Road
Keenjhar, Thatta	Small	Dispensary	Loan	Road	School	Water Supply
	Medium	Loan	Dispensary	Road	School	Water Supply
	Large	Loan	Dispensary	Road	Water Supply	School
	Site Average	Loan	Dispensary	Road	School	Water Supply
Chotiari, Sanghar	Small	Dispensary	School	Road	Water Supply	Animal Dispensary
	Medium	Dispensary	School	Road	Loan	Water Supply
	Large	Loan	Water Supply	Road/ Drainage	Dispensary	Animal Dispensary
	Site Average	Dispensary	Road	School	Loan	Water Supply
Pai, Forest, Nawab Shah	Small	School	Dispensary	Animal Dispensary	Road	Loan
	Medium	Dispensary	Road	Water Supply	School	Loan
	Large	Dispensary	School	Loan	Water Supply	Animal Dispensary
	Site Average	Dispensary	School	Water Supply	Loan	Road

At Chotiari, the high priority needs were recorded to be the dispensary, road, school, drainage and institutional credit. At Pai forest, dispensary, school, water supply and institutional credit were ranked as the high priority development needs. The above baseline perceptions about problem and development priority ranking can be used for planning appropriate interventions at various programme area sites.

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5. ANALYSIS OF VILLAGE PROFILES

A detailed schedule for preparing all the village profiles was developed and included in the survey plan. This instrument included questions about basic features of each village. Information so collected was analyzed to provide a data base for the programme area villages at the four sites.

5.1 Village Categories

On an overall basis, 65% of the villages (N=81) were small having less than 50 households or a population estimated at about 300 souls. Medium- sized villages (N=37) with 51-200 households were about 30% of the total, while large settlements with 200 or more households and a population estimated at 1500 souls, were only 7 in number or 5% of the total villages surveyed by the field team. The dependence of these large settlements on natural resources was also observed to be quite minimal. These villages were included in the programme priority communities mainly because of their strategic and socio-economic significance.

Table- 5.1: Proportion of Villages in Small, Medium and Large categories

Area		Size of villages			Site Total
		Small	Medium	Large	
Keti Bunder, Thatta	N	21	6	1	28
	%	75.0	21.4	3.6	100.0
Keenjhar, Thatta	N	23	12	3	38
	%	60.5	31.6	7.9	100.0
Chotiari, Sanghar	N	24	6	1	31
	%	77.4	19.4	3.2	100.0
Pai Forest, Nawab Shah	N	13	13	2	28
	%	46.4	46.4	7.1	100.0
Overall	N	81	37	7	125
	%	64.8	29.6	5.6	100.0

Village Categories: Small = > 50 HHs; Medium= 51-200 HHs; Large = > 200 HHs.

Table- 5.1 shows that the highest number of small villages was located at Chotiari followed by Keti Bunder and Keenjhar. Pai forest vicinity has the highest number of large villages, followed by Keenjhar, depicting thereby a more or less permanent settlement pattern.

5.2 Type of Housing

On an overall basis, the Katcha (thatched huts), Pacca (brick and cement) and Wooden or Semi – Pacca houses were found in almost equal proportion of about one-third of each type – 32%, 32%, and 36% respectively.

Table- 5.2 Type of Housing

Area	Village By Size	Proportion (%)				Average Village Size (HHs)
		Katcha	Pacca	Wooden	Total	
Keti Bunder, Thatta	Small	58.3	0.6	41.1	100.0	22.38
	Medium	13.2	0.1	86.7	100.0	135.33
	Large	40.0	30.0	30.0	100.0	1000.00
	Total	34.2	13.3	52.5	100.0	81.50
Keenjhar, Thatta	Small	28.4	33.2	38.4	100.0	26.35
	Medium	35.1	22.0	43.0	100.0	95.25
	Large	31.0	65.3	3.7	100.0	586.67
	Total	31.9	45.7	22.5	100.0	92.34
Chotiari, Sanghar	Small	37.7	8.3	54.0	100.0	24.00
	Medium	30.9	16.5	52.6	100.0	96.00
	Large	15.8	69.7	14.5	100.0	947.00
	Total	26.0	38.3	35.8	100.0	67.71
Pai Forest, Nawab Shah	Small	34.7	47.9	12.3	100.0	15.08
	Medium	47.4	36.3	12.2	100.0	104.46
	Large	26.1	18.1	55.7	100.0	1090.00
	Total	34.3	26.3	37.6	100.0	133.36
Overall		32.1	31.8	35.6	100.0	92.99

The highest number of Katcha houses were recorded at Keti Bunder (almost all in the creek villages), while the highest number of Pacca houses were found in Keenjhar villages (mostly in the two large settlements which have obviously given an upper bias to the indicator). Highest number of wooden houses were found at Keti Bunder and Pai forest – 52% and 38% respectively.

5.3 Occupational Diversity

Based on multiple responses, the proportion of various occupations for the four priority areas was computed to give an understanding of the dependence on natural resources as well as diversification of skills among the communities.

Three main occupations of the Indus for All Programme communities were recorded to be fishing, agricultural wage labor/ tenant and livestock herding- to the tune of 53%, 25% and 16% respectively. Other occupations, especially the service oriented professions such as doctor, LHV and teacher and government servants were all computed in fractions, depicting thereby the lack of education and marketable skills; table- 5.3

Table- 5.3 Proportion of Population Engaged in Different Occupations

Professions	Keti Bunder, Thatta	Keenjhar, Thatta	Chotiari, Sanghar	Pai Forest, Nawabshah	Total
Fisheries	113.61	42.66	60.26	0.07	53.38
Agri. Wage labour	1.75	7.74	20.39	77.89	25.25
Livestock herder	2.21	18.63	14.71	17.71	13.78
Mat Maker	7.14	11.13	8.81	0.00	7.17
Stone Mining	0.00	18.37	0.00	0.00	5.58
Labour	0.00	9.16	0.00	8.68	4.73
Artisan	0.21	3.08	7.26	6.29	4.19
Landlord (< 12.5 acre)	0.04	1.82	5.81	8.89	3.99
Landlord (12.5-25)	0.36	1.08	4.16	2.32	1.96
Landlord (26-50)	0.18	0.00	2.52	1.68	1.04
Landlord(51–100)	0.00	0.00	0.55	0.46	0.24
Landlord (>100)	0.00	0.00	0.32	0.18	0.12
Herder	0.21	1.89	4.39	3.21	2.43
Transporter	2.86	1.32	0.52	4.71	2.22
Teacher	0.43	2.71	0.87	3.79	1.98
Kiryana	0.54	1.74	0.84	3.54	1.65
Wood Cutter	0.11	1.74	0.97	3.61	1.60
Tenants	0.00	0.03	3.23	2.89	1.46
Hotel	0.39	1.42	0.65	2.93	1.34
Cabin	0.43	2.84	0.48	1.04	1.31
Dai	0.61	1.74	1.48	1.04	1.26
Tailor	0.43	1.00	0.23	2.21	0.95
Govt. servant	0.04	1.08	0.94	1.32	0.86

Artisans such as carpenter, barber, well digger, black smith and tailor also formed less than 1% each of the work force, reflecting even the lack of conventional technical skills; and highlighting the need for training and vocational capacity building.

5.4 Primary and Middle Schools

More than one half of the programme area villages do not have any primary school for boys, while 71% of them have no girls primary school. Over 90% villages at Keti Bunder and Chotiari have no girls primary schools. These sites need immediate interventions to enhance the ratio of enrolment of girls in primary education.

Table- 5.4 Primary Boys Schools

Area	Primary Boys School N (%)	If yes, details			If no, distance (km)
		Rooms	Teachers	Students	
Keti Bunder, Thatta	06 (21.4%)	2.16	1.67	33.50	3.22
Keenjhar, Thatta	24 (63.2%)	2.50	3.29	82.56	3.92
Chotiari, Sanghar	15 (48.4%)	2.00	2.36	59.71	5.40
Pai Forest, Nawab Shah	22 (78.6%)	3.00	3.13	111.89	1.00
Overall	67 (53.6%)	2.51	2.87	81.64	3.95

Table- 5.5 Primary Girls Schools

Area	Primary Girls School N (%)	If yes, details			If no, distance (km)
		Rooms	Teachers	Students	
Keti Bunder, Thatta	02 (07.1%)	3.00	2.00	50.00	1.33
Keenjhar, Thatta	14 (36.8%)	2.60	2.50	72.25	3.37
Chotiari, Sanghar	01 (03.2%)	5.00	1.00	15.00	10.90
Pai Forest, Nawab Shah	21 (75.0%)	3.00	2.00	72.43	1.67
Overall	38 (30.4%)	2.92	2.17	69.50	5.44

At Chotiari, the distance of girls schools from the villages were also substantially long- up to 11 kilometers. Poorest ratio of teachers per school was recorded at Keti Bunder. Placement of teachers could, therefore, be one of the low-costs interventions by the WWF- Indus for All Programme at the primary schools of Keti Bunder and Chotiari.

Table- 5.6 depicts that 95% villages had no boys middle school during 2007. Keti Bunder villages had no school while at Pai 85% villages were without the middle school.

Table-5.6 Boys Middle Schools

Area	Boys Middle School N (%)	If yes, details			If no, distance (km)
		Rooms	Teachers	Students	
Keti Bunder, Thatta	0 (00.0%)	---	---	---	5.96
Keenjhar, Thatta	1 (02.6%)	6.00	4.00	50.00	14.88
Chotiari, Sanghar	1 (03.2%)	30.00	NA	NA	7.25
Pai Forest, Nawab Shah	4 (14.3%)	4.50	7.00	164.00	7.95
Overall	6 (04.8%)	4.50	5.50	126.00	5.96

Table-5.7 Girls Middle Schools

Area	Girls Middle School N (%)	If yes, details			If no, distance (km)
		Rooms	Teachers	Students	
Keti Bunder, Thatta	0 (00.0%)	---	---	---	---
Keenjhar, Thatta	1 (02.6%)	6.00	---	---	7.11
Chotiari, Sanghar	1 (03.2%)	3.00	1.00	---	12.71
Pai Forest, Nawab Shah	6 (21.4%)	6.00	7.00	99.33	14.00
Overall	8 (06.4%)	5.50	4.00	99.33	9.28

Table- 5.7 shows that there were no girls middle schools in 94% of villages. Keti Bunder had absolutely no girls middle school while at Keenjhar 97.4% villages were without girls middle school and there was no female teacher in any of the Keenjhar villages. At Chotiari, there was one girls middle school with one female teacher but no student was registered there. Data further revealed that about 96% and 99% villages had no high school for boys and girls respectively.

5.5 Health Facilities

It was revealed (table- 5.8). that 7% of villages had a dispensary, 5% had a BHU and 1% had the RHC while no village had a government hospital. The nearest government hospital was located at an average distance of 22 kilometers.

Table-5.8 Public Sector Health Facilities

Area	Dispensary		Basic Health Unit		Rural Health Centre		Govt. Hospital	
	N (%)*	If no, Distance	N (%)	If no, Distance	N (%)	If no, Distance	N (%)	If no, Distance
Keti Bunder, Thatta	2(07.1%)	15.00	3(10.7%)	NA	1(3.6%)	6.75	0(0.0%)	4.33
Keenjhar, Thatta	2(05.3%)	5.42	2(05.3%)	8.50	0(0.0%)	19.77	0(0.0%)	27.73
Chotiari, Sanghar	1(03.2%)	9.91	1(03.2%)	12.08	0(0.0%)	35.43	0(0.0%)	31.32
Pai Forest, Nawab Shah	4(14.3%)	7.58	1(03.6%)	4.55	0(0.0%)	9.40	0(0.0%)	7.58
Overall	9(07.2%)	7.16	7(05.6%)	8.56	1(0.8%)	19.98	0(0.0%)	22.34

* Facility available in villages NA = Data not available

Table- 5.9 Private Sector Health Facilities

Area	Private Clinic		Hakeem		Maternity Home		LHV/DAI	
	N (%)*	If no, Distance	N (%)	If no, Distance	N (%)	If no, Distance	N (%)	If no, Distance
Keti Bunder, Thatta	0(0.0%)	3.00	1(3.6%)	NA	0(0.0%)	NA	3(10.7%)	NA
Keenjhar, Thatta	0(0.0%)	6.48	1(2.6%)	12.56	0(0.0%)	22.36	10(26.3%)	9.67
Chotiari, Sanghar	1(3.2%)	12.67	1(3.2%)	26.33	0(0.0%)	32.33	5(16.1%)	12.67
Pai Forest, Nawab Shah	2(7.1%)	6.33	1(3.6%)	9.50	1(2.4%)	7.69	9(32.1%)	6.20
Overall	3(2.4%)	7.78	4(3.2%)	16.96	1(0.8%)	21.37	27(21.6%)	9.71

* Facility available in villages NA = Data not available

Table- 5.9 revealed that private clinic of a professionally qualified doctor was not available in any of the villages of Keti Bunder and Keenjhar priority areas. At Chotiari and Pai sites, however, such clinics were available at 3% and 7% villages respectively. Auyor-vedic (Hakeem) clinics were available at 3% of villages. Maternity home was available only at 1 village of Pai site, while trained birth attendants TBAs/ LHVs were available at 21% of villages. Pai and Keenjhar had relatively better health facilities while Chotiari and Keti Bunder had the poorest health infrastructure. In terms of distance, the private clinics were the nearest albeit costly health services that were mostly availed by the programme area households.

5.6 Community Based Organizations

Community based organizations and NGOs were already functional at 57% of villages of Pai site, followed by 35% villages of Chotiari and 32% villages of Ketu Bunder. Local organizations were not so widespread at Keenjhar (21% villages only).

Table-5.10 Community Based Organizations

Area	N	%
Ketu Bunder, Thatta	9	32.1
Keenjhar, Thatta	8	21.1
Chotiari, Sanghar	11	35.5
Pai Forest, Nawab Shah	16	57.1
Overall	44	35.2

The CBO/ NGO programmes at Pai and Chotiari include microfinance, health and education. At Ketu Bunder, specially in creek villages, only the WWF programmes are visible. At Keenjhar, both PFF and KFWS are involved in fisher folk activism. The WWF may be well advised to work in collaboration and through well reputed CBOs already in place. Establishing new project-specific NGOs may not prove to be cost-effective and sustainable endeavor.

5.7 Village Profile Summaries

5.7.1 Ketu Bunder Villages

Table- 5.11 presents salient features of individual villages of Ketu Bunder site.

Table- 5.11 Summary of village Profile of Ketu Bunder, Thatta

S#	Name of Village	HH #	Castes	Major Occupation	Educational Facilities	Health Facilities	Water Supply	Electricity	Local Organization
1	Ali Bux Jat	20	Jat	Fishing	GPBS		No	No	No
2	Ali Dablo	8	Dabla	Fishing			No	No	No
3	Bair Jut	25	Jut	Fishing	GPBS		No	No	No
4	Berum	12	Dablo	Fishing Livestock			No	No	No
5	Bhori	40	Jat, Shaikh, Badala	Fishing Livestock		Private Clinic	Hand Pump	No	No
6	Faqeerani Jat	200	Jat	Fishing			No	No	No
7	Gul Hassan Jat	35	Jat	Fishing			No	No	No
8	Guli Sholani	10	Sholani	Fishing			No	Yes	No
9	Gunb	60	Utradi, Roonjha, Palijo	Fishing	GPBS		No	No	Yes
10	Haji Abu Jat	150	Jat	Fishing Livestock		Disp. RHC	No	No	Yes and AKPBS
11	Haji Aleem Sholani	44	Sholani	Fishing			No	No	No

12	Haji Ali Khan Jat	30	Jat	Fishing			No	No	No
13	Haji Hashim Jat	15	Jat	Fishing	GPBS; PGS		No	No	No
14	Haji Ismail Jat	100	Jut	Fishing		BHU	No	No	Yes
15	Haji Mamoo Dabloo	25	Dablo	Fishing			No	No	No
16	Haji Mosa Jat	18	Jat	Fishing	GPBS	Disp.	No	Yes	No
17	Haji Mosa Katiar	18	Kaatiar	Fishing, Labor			No	No	Yes
18	Haji Sheedi Dablo	11	Dablo	Fishing			No	No	No
19	Hamzo Guggo	15	Guggo	Fishing			No	No	No
20	Haroon Lakhio	6	Lakhio	Fishing	GPBS		No	No	No
21	Hussan Jat	40	Jut	Fishing		BHU	No	No	No
22	Jarho Dablo	5	Dablo	Fishing			No	No	No
23	Kangri	17	Dablo	Fishing	GPBS; GPGS; GHBS		No	No	No
24	Keti Bunder	1000	Memon, Khaskheli, Kazi, Peer, Shaikh, Mallah	Fishing, Trade, Artisans, Services		BHU	No	Yes	Yes
25	Kharioon	35	Dablo	Fishing			No	No	Yes
26	Khuda Bux Jat	25	Jat	Fishing			No	No	No
27	Meerano Jat	30	Jat	Fishing		Private Clinic	No	No	No
28	Meero Dablo	36	Dablo	Fishing			No	No	Yes
29	Misri Rajero	12	Rajero	Fishing			No	No	No
30	Phirt	35	Dablo	Fishing			No	No	Yes
31	Ramzan Lakhio	15	Lakhio	Fishing			No	No	No
32	Siddique Dablo	30	Dablo, Lakhio	Fishing			No	No	No
33	Tippun	102	Dablo	Fishing			No	No	Yes
34	Yousaf Dablo	11	Dablo	Fishing, Net Making			No	No	No

A quick glance at the summary of village profiles indicates the predominance of fishing and net making occupation at most of the Keti Bunder villages. Only at three villages, including the large settlement of Keti Bunder, trade and artisans were reported. While village Faqirani Jat is famous for camel rearing it also has well known artisans who undertake contractual work of boat painting and engine work. Due to out-migration of households from Hajamro and Chan creeks, a new village Meero Dablo (36 HH) has come into existence just outside the Keti Bunder protective bund and in front of the Forest Department jetty. Bhoori village is famous for the buffaloes due to the outgrowth of fodder reeves. Dablo is the major caste group, specially in creek villages followed by Jat camel herder tribe and Sholani Baloch farming tribe reside inland. Trading community is represented mainly by the Memons and Hindus of Keti Bunder.

There is only one high school located at Ketu Bunder. Electricity is available at Ketu Bunder and two inland villages. It is also available at Tippun (a village in Hajamro creek)- thanks to the wind mill installation by the WWF. The area is totally deprived of any water supply system, except for Bhoori village which has 10 hand pumps providing sweet water because the village is located on Khobar creek; which is currently the main course of Indus river falling in the Arabian sea. Due to purchase of water tankers by the communities, the cost of living is quite high when compared to other priority areas. The CBOs at Tippun and Meero Dablu villages have emerged after the WWF interventions. There are some rudimentary local organizations at Ketu Bunder and inland villages, which need concerted effort at capacity building to ensure their maturity and purposeful developmental activity. The AKPBS, a Karachi based NGO, manages physical infrastructure programmes at Ketu Bunder and Haji Abu Jat village. Haji Ismail Jat village has a registered CCB. New CCBs at Ketu Bunder villages could be an important avenue for obtaining development funds from the district government.

5.7.2 Keenjhar Village Profiles

Table- 5.12 containing a summary of village profiles of Keenjhar site, indicates that there is a mix of four major occupations for community livelihood- fishing, stone mining, agriculture and mat making. Teaching and other service occupations were also reported. Several villages have the primary boys and girls schools. There is, however, a dearth of health infrastructure. Only three villages, namely Jhimpir, Jaffaer Hillaya and Sonehri had a dispensary and/or a BHU. Sonehri village has the main local organization, namely the Keenjhar Fishermen Welfare Society. The PFF has branches and individual activists in some villages. The priority area is informally divided into several village clusters, depending on the geographical and occupational features. Sonehri cluster has fishing and tourism related occupations. Road side Hillaya and Chilya stop villages have agriculture, fishing, stone mining and tourism related livelihoods. Moldi Mian and Doulatpur cluster villages have fishing and livestock occupations. Jhimpir cluster has agriculture, stone mining, fishing, and wage labor as main occupations.

Table-5.12 Summary of village Profile of Keenjhar, Thatta

S#	Name of Village	HH #	Castes	Major Occupation	Educational Facilities	Health Facilities	Water Supply	Electricity	Local Organization
1	Abdul Hameed Mancchri	80	Mallah	Fisheries, Matmkaing	GPBS		No	No	No
2	Abdullah Gandhro	100	Gandro	Fisheries & stone mining	GPBS; GPGS		No	Yes	No
3	Adam Bhambhro	90	Kachi	Agri. & stone mining			No	No	No
4	Adam Katiyar	75	Autho, Khaskheli, Katiyar	Agri. & Labour			No	Yes	No
5	Ali Bux Mancchri	90	Janbani, Balwani, Nindwani	Fisheries, Livestock	GPBS; GPGS		Yes	Yes	No
6	Ali Muhammad Soomro	15	Soomra	Livestock, stone mining	GPBS		No	No	No
7	Autha	43		Livestock; Teaching	GPBS; GPGS		No	No	Yes
8	Bakhir Maachhi	150	Pandhiani	Fisheries	GPBS;		No	No	No

				Matmaking	GPBS				
9	Chul Site(Yaar Muhammad Jakhro)	115	Jakhro, Machi, Shaikh	Livestock Stone mining	GPBS		No	No	No
10	Dodo Bhambhro	22	Bhamro, Dhafrani, Mancchri	Matmaking Stone mining			No	No	No
11	Dolt Pur	56	Mallah, Mancchri, Ghathani	Fishries & Artisan			No	No	No
12	Foto Khan Dars	42	Dars, Khaskheli	Agri. & Livestock	GPBS; GPBS		Yes	Yes	Yes
13	Haji Ramzan Mirbhar	95	Sakyain, Chandani, Saindodail	Fishries and labour	GPBS		No	Yes	Yes
14	Haji Rasool Bux Manchhari	6	Mallah	Fishries			No	Yes	No
15	Haji Soomar Mirbhar	100	Mirbhar	Fishries & Labour	GPBS; GPBS		Yes	Yes	No
16	Jaffar Hillayo	50	Hillaya	Agri. Labour	GPBS; GPBS; GMBS; GMGS	Disp. BHU	Yes	Yes	No
17	Jhampir	500		Fishries & Shops	GPBS; GPBS; GHBS; GHGS	BHU	No	No	No
18	Juman Dars	22	Dars, Jumani, Janwani,	Herder & Matmaker	GPBS; GPBS		No	No	Yes
19	Jumoon Jakhro	31	Jakhro, Mallah	Fihries & Stone mining	GPBS		No	Yes	No
20	Khipri	28	Mallah	Fishries			No	No	No
21	Khudaiyo	112	Khaskheli, Khudai,	Agri. Labour	GPBS; GPBS		No	No	No
22	Lal Bux Mancchri	90	Kudhani	Fishires	GPBS		No	No	No
23	Mevo Khan Mancchri	48	Eidhani, Umedhani, Makrani	Mat making & Labour			No	Yes	No
24	Mubarak Palari	15	Palari, Khaskheli	Fishries & Livetock	GPBS		No	No	No
25	Muhammad Rahim Machi	20	Machi	Fishreis & Labour			No	No	No
26	Muhammad Siddique Manchri	20	Mancchri	Fishires & Labour			No	No	No
27	Mumtaz Dandhial	43	Dhandhail	Mat maker & Fishries			No	No	Yes
28	Nabi Bux Palari	44	Palari	Agri. & Matmaker	GPBS GPBS		No	No	Yes
29	New Ghandri	28	Karani, Bachlani, Aryani	Fishries	GPBS; GPBS		No	No	No

30	Rasool Bux Mancchri	16	Pareri, Chakarani	Fishries & carpenter			Yes	Yes	No
31	Shoukat Gandharo	20	Gandhro	Fishires & Shops			No	No	No
32	Sonehri	260	Gandhro	Agri. & Fishries	GPBS; GPGS	Disp.	No	No	Yes
33	Sukhio Autho	35	Autho	Agri. & Labour	GPBS		No	No	No
34	Syed Bachal Shah	11	Syed	Fishiers	GPBS		No	No	No
35	Umar Mancchri	20	Mancchri	Fishries			No	No	No
36	Wali Muhammad Palari	7	Palari, Solangi	Agri. & Stone mining			No	No	No
37	Yaaro Mancchri	20	Mancchri	Fishries & matmaker	GPBS		Yes	Yes	No
38	Yousaf Hilaya	90	Hilaya	Agri. & Fishries	GPBS; GPGS		Yes	Yes	Yes

In general, Gandra, Mirbahar, Mallah, Manchri and Machhi castes are fishermen; Hillaya, Dars, Autha and Katiar are farmers; while Palari and Jakhra castes are herders. Surplus family labor of all tribes is engaged in stone mining. Engine boats possessed by Hillaya and Gandra castes are engaged in tourism near the PTDC lodges. Jhimpir is the largest settlement but Jaffer Hillaya and Sonehri villages are the main political power centers. Almost all castes at the Keenjhar site are Samat Sindhi in ethnic terms.

5.7.3 Chotiari Village Profiles

Fisheries, agriculture, livestock and mat making are the major occupations in the Chotiari villages; see table- 5.13.

Table- 5.13 Summary of Village Profiles of Chotiari Site, Sanghar

S#	Name of Village	HH #	Castes	Major Occupation	Educational Facilities	Health Facilities	Water Supply	Electricity	Local Organization
1	Abdul Karim Mallah	50	Mallah	Fishries			No	No	Yes
2	Abdul Qadir	25	Mallah	Fishries & Livestock			No	No	Yes
3	Abdul Rehman Mallah	5	Mallah	Fishries			No	No	Yes
4	Achar Jamali	25	Jamali	Livestock herder			No	No	No
5	Allah Bux Junejo	50	Junejo	Agri. & Livestock	GPBS		No	No	No
6	Allah Dino	13	Behan	Agri. & Livestock	GPBS; GHBS		No	No	No
7	Bakar	38	Ibu Pota, Behan	Fishires & Artisan	GPBS		No	Yes	Yes
8	Bilawal	57	Mallah, Sayed	Agri. & Livestock	GPBS		No	No	No
9	Chotiaryoon	947	Keerio, Kumbhar Mallah	Agri. & Fishries	GMBS; GMGS	Disp. BHU	No	Yes	Yes

					GHBS				
10	Ghulam Hussain Laghari	15	Leghari	Agri & Livestock			No	No	No
11	Haji Islam Larik	37	Mallah	Fishries & Matmaking			No	Yes	Yes
12	Haji Khan Mahar	15	Mallah	Fishries			No	No	No
13	Imam Din Saandh	50	Sandh, Gaho, Chandio, Behan	Agri. & Fishries	GPBS		No	No	No
14	Kharo Mangrio (Dogriyon)	20	Unar, Bhali, Magsi	Agri.	GPBS		No	No	No
15	Lal Bux Unnar	10	Junejo	Livestock			No	No	No
16	Lal Khan Junejo	8	Junejo, Mangrio	Livestock			No	No	No
17	Lalo Mangrio	28	Wassan, Bheel	Agri. & Livestock	GPBS		No	Yes	No
18	Malhar Wassan	42	Hingoro, Mallah	Agri. & Livestock			No	No	No
19	Mir Muhammad	16	Hingoro	Livestock			No	No	No
20	Muhammad Hussain	4	Junejo	Livestock			No	No	No
21	Muhammad Urs Junejo	40	Behan, Ibupoto	Agri & Livestock	GPBS		No	No	No
22	Muhammad Usman Ibupoto	33	Junejo, Mangrio	Livestock	GPBS		No	No	Yes
23	Pacchario	172	Mallah	Fisheries & Livestock	GPBS		No	No	Yes
24	Phullel	22	Mallah	Fusheries			No	No	No
25	Pir Bux Behan	6	Junejo	Livestock	GPBS		No	No	No
26	Rano	15	Mallah	Matmaking			No	No	No
27	Siddique Mallah	64	Mallah, Hashimani,	Fisheries			No	No	Yes
28	Sobharo Khan Mallah	103	Mallah	Fishereis & Matmaking	GPBS		No	No	Yes
29	Soomar Ji Miaan	110	Mangrio, , Leghari, Kundhani	Agri. & Govt. Service	GPBS		No	Yes	Yes
30	Wali Muhammad Ibo poto	70	Sadhoja, Kalani, Ibupota	Agri. & Livestock	GPBS		No	No	No
31	Wasayo Junejo	14	Junejo	Livestock			No	No	No

Chotiari area has a mix of Samat and Baloch tribes some of whom do speak Seraiki language. Cultural traditions, specially the attitudes towards female education, are quite different from those observed in Thatta district. This could also be seen in the village profiles, where girls schools are almost non-existent. There are no health facilities in the area except for the large settlement of Chotiari.

Mallah is the fishing community with Bakar and Phulail as their main villages. Mangrio, Junejo, Behan, Hingora and Unar tribes are land and livestock owners. Government servants are also sizeable in number. Local organizations and NGOs operate in 10 villages of Chotiari.

5.7.4 Pai Village Profiles

Pai forest area villages also have a mix of ethnic groups including Sindhi Samat castes such as Channa, Keeria and Machhi; Baloch tribes such as Magsi, Leghari, Zardari, Jamali and Jalbani; and Punjabi/ Seraiki castes such as Gudara, Sial, Bhutta, Arain and Gujjar.. The main livelihood sources are agriculture, livestock, and government service. School education infrastructure is widespread but health facilities are sporadic. Water supply through hand pumps is available and so is electricity in most villages. The area also has local civil society organizations and advocacy groups, in addition to the CCBs. Table- 8.15 presents salient features of individual villages surrounding Pai forest.

Table- 5.14 Summary of Village Profiles of Pai Forest, Nawabshah

S#	Name of Village	HH #	Castes	Major Occupation	Educational Facilities	Health Facilities	Water Supply	Electricity	Local Organization
1	Bakhsho Magsi	300	Magsi, Siyal, Channa		GPBS; GPGS; GMBS; GMGS		No	No	Yes
2	Bhudho Wadhan	25	Bhutta		GPBS; GPGS		No	No	No
3	Daud Gudaro	21	Gudaro	Agri & Livestock	GPBS; GPGS		No	Yes	No
4	Ghulam Hyder Bhutto	165	Noonari, Bhutta, Leghari	Agri & Livestock	GPBS; GPGS	Disp.	No	Yes	Yes
5	Gohram Faqeer	20	Zardari	Agri.	GPBS		No	Yes	No
6	Gulsher Macchi	41	Macchi, Brohi,	Agri.			No	No	Yes
7	Haji Ali Bux Chouhan	125	Gujjar, Panhwar	Agri. & Livestock	GPBS; GPGS		No	Yes	No
8	Haji Keerio	84	Keerio, Kumbhar, Arain, Lakha	Agri.	GPBS; GPGS; GMGS		No	Yes	Yes
9	Jaffar Jamali	60	Jamali	Agri.	GPBS		No	No	No
10	Jeando Lund	60	Lund		GPBS; GPGS		No	No	Yes
11	Khan Muhammad Chandio	70	Chouhan Chandio		GPBS; GPGS		No	No	No
12	Majeed Keerio	360	Keerio, Khokhar, Khaskheli	Agri. & Shops	GPBS; GPGS; GHBS; GHGS	BHU	No	No	Yes
13	Mari Alam	120	Jalbani, Soomro, Pechoho	Agri.			No	No	Yes
14	Mari Sabqi	200	Sabqi, Jalbani, Soomro, Chandia	Agri.	GPBS; GPGS; GMGS		No	No	Yes

15	Marri Jalbani	1820	Jalbani	Agri. Livestock	GPBS; GPGS; GMBS; GMGS	Disp.	No	Yes	Yes
16	Morio Lakho	68	Lakha, khaskheli, Gudaro	Agri.	GPBS; GPGS; GMBS		No	No	No
17	Murad Keerio	55	Mangharhar, Solangi	Agri.	GPBS; GPGS		No	No	Yes
18	Mureed Keerio	76	Keerio, Khaskheli	Agri. & Livestock	GPBS		No	No	Yes
19	Nangar Khan Chandio	61	Chandio	Agri. & Govt. Service	GPBS GPGS		No	Yes	No
20	Nazar Muhammad Bhatti	35	Bhatti	Agri. & Livestock			No	Yes	No
21	Pallyo Bhutto	10	Bhutto	Agri. & Labour			No	No	No
22	Punho Gudaro	53	Gudaro, Khoso	Agri. & Livestock	GPBS; GPGS	Disp.	No	No	Yes
23	Rahimo Keerio		Detha, Solangi Jamali	Agri. & Artisan	GMBS GMGS	Disp.	No	Yes	No
24	Rais Ghulam Qadir Jatoi	175	Jatoi, Macchi, Kumbhar,	Agri. & Livestock	GPBS		No	No	No
25	Rasool Bux Keerio	11	Keerio				No	Yes	Yes
26	Rasoolabad	10	Keerio, Solangi, Brohi				No	No	Yes
27	Sahib Khan Lund	67	Lund	Agri. & Livestock	GPBS GPGS		No	Yes	Yes
28	Talli	102	Keerio, Mallah, Jamali,	Agri. & Livestock	GPBS; GP&M GS		No	No	Yes

Marri Jalbani is the largest village, the residents of which are reportedly involved in forest wood cutting and selling. Provision of gas to this village and other nearby communities is likely to reduce the wood cutting intensity to a considerable extent. Livestock ownership in most villages coupled by herds brought by tribesmen from Upper Sindh threaten the irrigated plantation in Pai forest area. Rahimo Keerio is the nearest village which could be effective in participatory management initiatives, since the community enjoys the support of influential political groups of the area. Support for primary education of boys and girls is well deserved by Gulsher Machhi, Mari Alam, and Nazar Mohammad Bhatti villages.

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6. Gender Analysis

Gender discrimination remains pervasive in many dimensions of life-worldwide. This is so despite considerable advances in gender equality in recent decades. The nature and extent of discrimination varies considerably across countries and regions. Gender gaps are widespread in access to and control of resources, in economic opportunities, in power, and political voice. Promoting gender equality is thus an important part of any development strategy that seeks to enable all people-women and men alike-to escape poverty and improve their standard of living. This chapter presents national perspective on gender sensitive indicators and gender analysis of the WWF- Indus for All Programme communities based on primary data.

6.1 National Perspective

According to the 1998 census (carried out by Population Census Organization) the total population of Pakistan was 132,352 thousands (68874 thousands Male and 63478 thousands female), increasing at an average annual growth rate of 2.69%. The current total population of Pakistan is 155648500 (PCO, 2005b). Average household size is 6.8, according to Pakistan Demographic Survey 2003 (PDS-2003). Crude Birth Rate is 26.5 per 1000 persons and general Fertility Rate is 114.5 per 1000 women (97.9 per 1000 in urban areas and 124.5 in rural areas). The Fertility Rates is about 21% higher in rural areas as compared to the urban areas (PCO, 2005c). Crude Death Rate is 7.0 per 1000 person; 7.3 for males and 6.6 for females (PCO, 2005c). Infant Mortality Rate is 76.2 per 1000 live births according to PDS-2003. Thus the Natural Growth Rate of population is calculated in PDS-2003 as 1.95 % per annum. According to the PDS-2003 the Life Expectancy at Birth is 64 years for Males and 66 Years for females.

Social conditions in Pakistan are poor; most of the population is deprived of better health facilities, sanitation and clean drinking water facilities. Literacy rate is 43.92%, for males 54.81% and for females 32.02% (Census 1998) i.e. the status of women's education is lower as compared to males. The value of Human Development Index (HDI) is 0.527 and HDI rank of Pakistan (among 177 countries) is 135, while the value of Human Poverty Index (HPI-1) is 37.1% and the HPI-1 rank of Pakistan (among 103 countries) is 68 (UNDP, 2005)

The gender empowerment measure (GEM) reveals whether women take an active part in economic and political life. It tracks the share of seats in parliament held by women; of female legislators, senior officials and managers; and of female professional and technical workers- and the gender disparity in earned income, reflecting economic independence. Differing from the GDI, the GEM exposes inequality in opportunities in selected areas. Pakistan ranks 82nd out of 93 countries in the GEM, with a value of 0.377. The ratio of women to men in Pakistan remains seriously distorted in men's favor, at 108: 100, reflecting bias against women, female fetuses, girl children and adult women. Between 350 and 500 women out of 100,000 die in childbirth ; there is 30% gap in male : female primary school enrolment; domestic violence against women are rampant ; and a cause for very serious concern – the majority of women do not know their rights and are not aware of the existence of the women's movement.

6.1.1 Women and Poverty

A systematic gender analysis of poverty remains vague in Pakistan due to the absence of gender-disaggregated, poverty-related data. The incidence of poverty in rural areas is

higher than in urban areas according to both income poverty and broader measures. Three quarters of Pakistan's poor live in rural areas. Feminization of poverty is a global phenomenon. Women are the poorest among the poor and the most vulnerable among communities. Poverty in Pakistan has a "woman's face." There are considerable intra-household disparities in food distribution and investment of resources between male and female members. Among poorer households, incidence of chronic mal-nutrition is higher among female children. Women's access and control over productive resources are extremely limited. In addition to suffering from the same deprivations as men, women face additional suffering of unequal opportunities to education, health, and other social services due to patriarchal control over their sexuality and cultural restrictions over their mobility (ADB, 2000). The value of Gender-related Development Index (GDI⁶) in Pakistan is 0.508 and GDI rank (among 164 countries) is 104 (UNDP, 2005).

6.1.2 Education, Health and Employment

In 1996– 1997 the literacy rate in urban areas of Pakistan was 58.3 percent while in rural areas it was 28.3 percent, and only 12 percent among rural women. There are also considerable inequalities in literacy rates among the four provinces, especially disparities between men and women (ADB, 2000). Women lack ownership of productive resources. Despite women's legal rights to own and inherit property from their families, there are very few women who have access and control over these resources. Nearly 57% of pregnant women are deprived of prenatal care. Employment of women in the non-agricultural sectors is only 8.2%, while in agricultural sector this share is 21.1 percent. Of the total employed women, over 50% are the unpaid female family workers.

6.2 Methodology and Sample Distribution

A separate female questionnaire was formulated to have the in-depth understanding of gender perspective; see Annexure –E. The questionnaire was pre-tested by the gender specialist at Keenjhar site. Female enumerators well conversant with local language and having adequate field experience were launched in the fields to collect data from a purposive/ convenience sample of women respondents at each of the 4 programme sites. The distribution of sample is given in table-6.1.

Table-6.1 Sample Distribution

	Number	Percent
Keti Bunder, Thatta	40	29.4
Keenjhar, Thatta	30	22.1
Chotiari, Sanghar	34	25.0
Pai, Forest, Nawabshah	32	23.5
Overall	136	100.0

The table reveals that a total of 136 female respondents were interviewed- 40 at Keti Bunder, 30 at Keenjhar, 34 at Chotiari and 32 Pai Forest.

6.3 Respondent Characteristics

Distribution of respondents was made in four age groups. Table- 6.2 shows that the average age of respondents was about 41 years. Majority of them comprised of younger age groups 16-30 years (33.3%) and 31-45 years (30.4%). Middle aged women (46 to 60 years) formed 25.2% while women aged 61 years and above comprised only 11.1% of the respondents. Average age of respondents at Ketu Bunder was distinctly higher at about 49 years, when compared to respondents at other three sites who were all in their thirties; depicting thereby that aged women were in leadership positions mostly at creek villages.

Table-6.2 Respondent Age

Area	Average Age (years)	Proportion (%)of Respondents				
		Age (Years) Group				Total
		16-30	31-45	46-60	Above 60	
Keti Bunder	48.49	20.5	28.2	30.8	20.5	100.0
Keenjhar, Thatta	37.90	46.7	23.3	16.7	13.3	100.0
Chotiari, Sanghar	36.44	38.2	32.4	26.5	2.9	100.0
Pai, Forest, Nawabshah	39.22	31.3	37.5	25.0	6.3	100.0
Total	40.90	33.3	30.4	25.2	11.1	100.0

Table – 6.3 depicts that most of the respondents (75%) were married, followed by an almost equal number (12%) of unmarried women and widows. The proportion of divorced women was only 0.8% of the respondents and all such cases were encountered at the fishing villages of Ketu Bunder.

Table- 6.3 Marital Status (%)

Area	Single	Married	Widow	Divorced	Total
Ketu Bunder, Thatta	2.9	82.9	11.4	2.9	100
Keenjhar, Thatta	23.3	66.7	10.0	0.0	100
Chotiari, Sanghar	16.1	71.0	12.9	0.0	100
Pai, Forest, Nawabshah	7.1	78.6	14.3	0.0	100
Overall	12.1	75.0	12.1	0.8	100

Average family size was computed to be about 8.5 members- the highest being 9 at Keenjhar and the lowest being about 7.5 at Ketu Bunder; see table- 6.4

Marriage Age

Early childhood marriages in girls as well as boys was reported at all sites. The minimum girl's age observed for marriage was seven while ten years old boys got married at the sweet will of their parents. The maximum marriage age for females was reported to be 42 years while for males it was 50. In some cases parents decide their daughter's fate even before she is born. Late marriage mainly occurred in families practicing exchange marriages among relatives.

Table 11: Marriage Age

Area	Age of Respondent at Marriage			Age of Husband at Marriage		
	Minimum	Maximum	Mean	Minimum	Maximum	Mean
Keti Bunder, Thatta	13	33	17.68	15	50	23.34
Keenjhar, Thatta	10	42	16.09	10	45	19.5
Chotiari, Sanghar	8	23	16.41	12	30	20.79
Pai, Forest, Nawabshah	7	37	17.63	12	50	22.03
Total	7	42	17.06	10	50	21.64

Table- 6.4 Family Size of Female Respondents

Area	Family size	Adults		Children	
		Male	Female	Male	Female
Keti Bunder, Thatta	7.65	2.6	2.55	1.38	1.13
Keenjhar, Thatta	9.00	2.87	2.93	1.87	1.33
Chotiari, Sanghar	8.29	2.26	2.32	1.76	1.94
Pai, Forest, Nawabshah	9.13	2.53	2.47	2.19	1.94
Overall	8.46	2.56	2.56	1.77	1.57

Majority of the families were categorized as nucleus (57%); see table- 6.5. Joint families were 43 %, with highest concentration at Keenjhar site. Highest proportion of nucleus families (71%) was recorded at Keti Bunder.

Table- 6.5 Family Type

Area	Type of Family		Total
	Joint	Nucleus	
Keti Bunder, Thatta	29.0	71.0	100.0
Keenjhar, Thatta	60.0	40.0	100.0
Chotiari, Sanghar	44.1	55.9	100.0
Pai, Forest, Nawabshah	40.6	59.4	100.0
Overall	43.3	56.7	100.0

6.4 Housing Indicators

Most of the houses (60%) were katcha while only (13%) were pakka structures. In Keti Bunder, Thatta, most of the houses (83%) were jhoopras; see table- 6.6 below.

Table- 6.6 House Type

Area	House Type			Total
	Katcha	Pacca	Jhoopra	
Keti Bunder, Thatta	13.9	2.8	83.3	100.0
Keenjhar, Thatta	73.3	6.7	20.0	100.0
Chotiari, Sanghar	91.2	8.8	0.0	100.0
Pai, Forest, Nawabshah	65.6	34.4	0.0	100.0
Overall	59.8	12.9	27.3	100.0

Most of the houses had only one room (45.4%), followed by two and three room houses which were 36.2% and 14.6% respectively. If we would compare the accommodation with number of family members, we could imagine the congestion

Table- 6.7 Rooms Per House

Area	Mean	Rooms (%)					Total
		1	2	3	4	5	
Keti Bunder, Thatta	2.00	36.8	36.8	18.4	5.3	2.6	100.0
Keenjhar, Thatta	1.80	37.9	44.8	13.8	0.0	3.4	100.0
Chotiari, Sanghar	1.52	58.1	32.3	9.7	0.0	0.0	100.0
Pai, Forest, Nawabshah	1.72	50.0	31.3	15.6	3.1	0.0	100.0
Overall	1.77	45.4	36.2	14.6	2.3	1.5	100.0

There is trend prevailing to give separate room to married couples (37%), which is noticeable at all sites. Nevertheless, separate rooms for children or young unmarried males and females are not generally available; see table- 5.8.

Table- 6.8 Houses with Separate Room (%)

Area	Children		Young Unmarried		Married Couples
	Male	Female	Male	Female	
Keti Bunder, Thatta	2.5	2.5	0.0	0	48.7
Keenjhar, Thatta	3.4	3.4	0.0	0	3.4
Chotiari, Sanghar	0.0	0.0	14.7	14.7	35.3
Pai, Forest, Nawabshah	12.9	10.0	30.0	20.0	54.8
Overall	4.5	3.8	10.6	8.4	36.8

Most of the houses in Pai Forest (88%) have electricity. At other sites, the housing units having electricity are less than 30% of the total. On an overall basis, only 21% of housing units have water supply/ source inside their premises, while the keti bunder houses are totally deprived of it. Both Keenjhar and Keti Bunder are deprived of sewerage facility. Only 27% houses have the general toilet facility, while a meager number (2%) have separate toilets for women. There is a trend to ease the nature in open areas outside the homes, mostly in nearby identified spaces.

Table 6.9: House Facilities (%)

Area	Electricity	Water Supply	Sewerage	Toilet	
				General	Separate for Women
Keti Bunder, Thatta	20.00	0.0	0.0	27.5	5.1
Keenjhar, Thatta	26.70	16.7	0.0	24.1	0.0
Chotiari, Sanghar	29.40	26.5	8.8	9.1	2.9
Pai, Forest, Nawabshah	87.50	43.8	18.8	46.9	0.0
Overall	39.70	20.6	6.7	26.9	2.2

Information about household assets, presented in table- 6.10 depicted that Radio and TV were owned by 32 and 22 percent respondents respectively. Pai forest households had the highest number of TV sets (47%) and washing machines (30%), since most of the houses (88%) had the

electricity there. No washing machine was reported at the lake communities of Keenjhar and Chotiari.

Table-6.10 Ownership of Household Assets (%)

Area	Radio	TV	Washing Machine
Keti Bunder, Thatta	30.0	5.0	2.5
Keenjhar, Thatta	33.3	13.3	0.0
Chotiari, Sanghar	35.3	26.5	0.0
Pai, Forest, Nawabshah	29.0	46.9	30.0
Overall	31.9	22.1	7.5

6.5 Social Indicators

6.5.1 Dress

Shalwar qameez is the common dress for women along with dupata . Married women also wear jewellery including: necklace, rings in the fingers of hands as well as feet, earrings (walian , nasbi,top, jhala, leelam), bangles (kangan, chora), pazeab, nose pin (phulli) and nose ring (nath). Young unmarried girls mostly wear earrings and bangles only. Ear and nose pinking is done at childhood. Women prefer to use dark colored silk clothes instead of cotton because they are cheaper in rates , durable and easy to maintain in the mode of work they do; for instance agriculture activities, and fire wood collection. Dark blue, yellow, shocking pink and parrot green colors were commonly used in dressing. Most women use common chapels made of rubber which are easily available in the market, while newly married women use chapels with shine and glitter. Black color chapels having thick soles were found common at all sites.

6.5.2 Purdah and Mobility

The purdah (veil) restrictions were reported to be more stringent for young girls. The restrictions on mobility varied with marital status and age of women as well from community to community. Married and relatively older women were more free to attend marriage, death and birth ceremonies in other villages. A married woman had to seek permission for a social visit from her husband or mother in law and was usually accompanied by husband or sister in law. All women had to take dupata on their heads even inside their homes and during household chores. For outdoor activities of fire wood collection and agriculture, as well as visits to relatives for marriage & death ceremonies and doctors, women wear *Ajrak* or big embroidered dupata/ chadar. Shopping or recreational visits were not found common.

6.5.3 Social Norms

Marriages are endogamous (marriage within the family). The paternal cousins are given Preference by the elders. The preference of girl is never sought. Engagement or *mangni* is held before marriage which symbolically represents the fixation of matrimony and marriage. Keenjhar , Thatta is apparently more advanced in getting the consent for marriage from females (74%). Exchange marriages were common among the communities at three sites except for Keti Bunder.

Rate of divorces and remarriage of divorced or widows is reportedly increasing. Karo Kari cases were reported at Chotiari and Keenjhar sites.

Table- 6.11 Social Customs (%)

Area	Consent During Marriage	Exchange Marriage	Marriage of Divorced /Widows	Divorce	Karo Kari
Keti Bunder, Thatta	8.3	25.6	7.9	10.3	0.0
Keenjhar, Thatta	74.1	78.6	26.9	14.8	14.3
Chotiari, Sanghar	37.0	76.7	48.1	13.0	12.5
Pai, Forest, Nawabshah	10.0	93.1	40.0	31.0	0.0
Overall	30.0	65.1	28.9	16.9	5.8

6.5.4 Cultural Traditions

Exchange marriages (96%) and piri muridi (86%) were found to be strong traditions adhered to by women at all sites. Dowry was observed to be quite high at Pai forest (91%). Karo Kari was reported to be a tradition at the Keenjhar and Pai sites. Hospitality was found to be a declining tradition except for Keenjhar.

Table- 6.12 Rural Traditions (%)

Area	Piri Muridi	Child Marriage	Exchange Marriage	Spiritual leader	Grand child rearing	Karo kari	Dowry	Hospitality
Keti Bunder, Thatta	100.0	62.5	95.0	0.0	5.0	0.0	0.0	2.5
Keenjhar, Thatta	70.0	80.0	93.3	76.7	33.3	20.0	30.0	63.3
Chotiari, Sanghar	91.2	17.6	94.1	0.0	2.9	11.8	32.4	14.7
Pai Forest, Nawabshah	78.1	46.9	100.0	6.3	9.4	21.9	90.6	6.3
Total	86.0	51.5	95.6	18.4	11.8	12.5	36.0	19.9

Child marriage was also mentioned as a tradition by over 50% of respondents; table- 6.12.

6.5.5 Gender Discrimination

Female respondents had strong feelings of discrimination, especially in family decisions (49%) and education (34%). Males were preferred in clothing and diet, (table- 6.13).

Table- 6.13 Gender Discrimination (%)

Area	Attitude	Education	Dietary	Work	Dress	Mobility	Property	Land Management	Family decision
Keti Bunder, Thatta	25.0	5.0	20.0	2.5	17.5	10.0	10.0	7.5	32.5
Keenjhar, Thatta	76.7	80.0	66.7	66.7	103.3	13.3	53.3	26.7	93.3
Chotiari, Sanghar	0.0	17.6	17.6	2.9	8.8	0.0	2.9	0.0	23.5
Pai Forest, Nawabshah	9.4	43.8	6.3	3.1	3.1	0.0	15.6	15.6	53.1
Total	26.5	33.8	26.5	16.9	30.9	5.9	19.1	11.8	48.5

Discrimination was more pronounced for female education at Keenjhar and Pai villages. In general, the Keenjhar women were found more sensitive about discrimination in family decisions, work related attitudes, dress and property ownership.

6.6 Economic Indicators

6.6.1 Wage Rate

Table- 6.14 depicted that, on an average 2 males and 1 female were the earning members in each household. Male members earned averagely Rs. 150 per day while females earned Rs. 75 per day.

Table- 6.14 Earners, Wages and Household Income

Area	Number of Earners		Wages/day		Household Income
	Male	Female	Male	Female	
Keti Bunder, Thatta	2.3	0.33	217	79	6188
Keenjhar, Thatta	2.27	1.33	147	80	5564
Chotiari, Sanghar	1.88	1.03	111	61	8214
Pai, Forest, Nawabshah	1.84	1.00	141	82	8731
Overall	2.08	0.88	163	75	7259

Highest ratio of female earners was found at Keenjhar because of the women fisher folk at Manchri villages. At Keti Bunder, women were less engaged in earning activity because of the rough nature of marine fishing operations and difficult household chores on creeks.

6.6.1 Gender Preference for Employment

One of the basic reason of more earning of males than females is the preference to males (93%) for employment by family, society as well as employers. Keenjhar, Thatta was found to be relatively flexible regarding women employment; see table- 6.15.

Table- 6.15 Gender Preference for Employment

Area	Yes	No	Total
Keti Bunder, Thatta	5.1	94.9	100.0
Keenjhar, Thatta	23.3	76.7	100.0
Chotiari, Sanghar	0.0	100.0	100.0
Pai, Forest, Nawabshah	3.2	96.8	100.0
Overall	7.5	92.5	100.0

At Keti Bunder, as already stated, the marine fishing as well as livestock rearing are literally impossible at Hajamro and Tarchan creeks, while camel herding is also a painstaking exercise due to far-off distances of mangroves and fetching sweet water for animals. At Chotiari, there was no social acceptance for female employment.

6.6.2 Women in Fisheries

A small proportion of women were found engaged in fisheries at Keenjhar (13%) and Chotiari (10%). A vast majority of them (94%) were either not willing to be engaged in fish catching or were dissatisfied (95%) with their wages. Women in handicrafts were deprived of satisfactory facilities of raw material or marketing of handicrafts; table- 6.16.

Table- 6.16 Fishing Facilities and Wages

Aera	Engaged in Fish Catching			Facilities of raw material /marketing of handicrafts			Satisfied with Wages		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Keti Bunder, Thatta	0.0	100.0	100	5.9	94.1	100	0.0	100.0	100
Keenjhar, Thatta	13.0	87.0	100	18.2	81.8	100	5.90	94.10	100
Chotiari, Sanghar	10.5	89.5	100	22.6	77.4	100	0.0	100.0	100
Pai, Forest, Nawabshah	0.0	100.0	100	17.6	82.4	100	100.0	0.0	100
Overall	6.2	93.8	100	15.4	84.6	100	4.7	95.3	100

6.6.3 Monthly Income

Along with household chores, women pass their free time making different handicrafts including *Rali* (17%) ,comforters called *sour*, *sagi*, *agath* and embroidery (11%)on shirts, bed sheets, pillows, handkerchiefs and table covers . *Rali* making is a tradition for women and the skill is passed from generation to generation. *Rali* is traditional apparel used as a mat or quilt. A simple *rali* takes about 1.5-2 months to prepare. The use of bright colors is the main feature of all types of *ralis*. They earn Rs. 400 to Rs. 600 per month from these sources. A small number of women is involved in agriculture and livestock, the income from these sources is higher as compared to the sewing endeavor; table- 6.17

Table- 6.17 Monthly Income

AREA	Sewing		Rilly Making		Embroidery		Livestock		Other	
	N (%)	Mean	N (%)	Mean	N (%)	Mean	N (%)	Mean	N (%)	Mean
Keti, Bunder Thatta	5.0	800	7.5	500	10.0	425	2.5	3000	22.5	3500
Keenjhar, Thatta	10.0	933	26.7	650	13.3	538	---	---	33.3	1215
Chotiari, Sanghar	5.9	1650	17.6	596	11.8	425	---	---	29.4	1465
Pai Forest, Nawabshah	9.4	1000	18.8	517	9.4	367	3.1	3000	28.1	863
Total	7.4	1070	16.9	582	11.0	443	1.5	3000	27.9	1739

6.6.4 Property Ownership

About 15% females possessed land. Most of those owning the land (71%) inherited the asset while rest of them had purchased it (table- 6.18). At Chotiari, the origin of land ownership was more recent as two-third of owner respondents had purchased it.

Table- 6.18 Land Ownership

Area	Possessing Land (%)	Origin of Land		
		Inherited	Purchased	Total
Keti Bunder, Thatta	2.5	100.0	0.0	100
Keenjhar, Thatta	13.3	75.0	25.0	100
Chotiari, Sanghar	8.8	33.3	66.7	100
Pai, Forest, Nawabshah	37.5	77.8	22.2	100
Overall	14.7	70.6	29.4	100

Most of the respondents at Keti Bunder and Keenjhar were found highly dissatisfied with the laws and practices of property inheritance, while those at Chotiari and Pai Forests expressed satisfaction mainly because of feudal modes of agricultural production; table- 6.

Table- 6.19 Satisfaction about Property Law Enforcement

Area	Proportion (%)		
	Yes	No	Total
Keti Bunder, Thatta	0.0	100.0	100
Keenjhar, Thatta	20.0	80.0	100
Chotiari, Sanghar	100.0	0.0	100
Pai, Forest, Nawabshah	80.0	20.0	100
Overall	20.8	79.2	100

It was observed that the lands were mostly managed by husbands, fathers and brothers. Only at Pai, the women directly managed their holdings by engaging male managers to supervise agricultural operations on their behalf.

Table- 6.20 Proportion (%) of Relatives Managing Land

Aera	Brother	Husband	Father	Manager	Son	Total
Keti Bunder, Thatta	0.0	0.0	100.0	0.0	0.0	100.0
Keenjhar, Thatta	40.0	0.0	40.0	0.0	20.0	100.0
Chotiari, Sanghar	0.0	50.0	0.0	0.0	50.0	100.0
Pai, Forest, Nawabshah	14.3	57.1	14.3	14.3	0.0	100.0
Overall	20.0	33.3	26.7	6.7	13.3	100.0

6.6.6 Energy and Fuel Wood

Except Keti Bunder, at most of the locations female and children are responsible to fetch the fuel wood. At Keti Bunder, men brought or purchased the fuel wood from Chann creek in Horas (motor boats). The women and children brought wood in small boats from the nearest distance; see table- 6.21.

Table- 6.21 Fuel Wood Collection

Area	Collected By			Total
	Male	Female	Children	
Keti Bunder, Thatta	75.7	18.9	5.4	100
Keenjhar, Thatta	23.3	70.0	6.7	100
Chotiari, Sanghar	31.3	50.0	18.8	100
Pai Forest, Nawabshah	50.0	30.0	20.0	100
Overall	46.5	41.1	12.4	100

In general, the fuel wood collection was done once a week at Keti Bunder and Keenjhar. Daily wood collection was prevalent mainly at Chotiari and Pai locations. Average fuel wood consumption was determined to be 16 kg per day; see table- 6.22.

Table- 6.22 Fuel Wood Consumption (kg)

Area	Daily	Weekly	Fortnightly
Keti Bunder, Thatta	6	90	120
Keenjhar, Thatta	12	11	---
Chotiari, Sanghar	23	48	80
Pai Forest, Nawabshah	20	36	---
Total	16	40	112

Considerable time (about 3 hours per day) was spent by women in fire wood collection. The households purchasing fuel wood, spend an average amount of Rs. 132 per month only.

Table- 6.23 Fuel Wood Collection Time and Cost

Area	Time (hours)		Cost (Rs./Month)	
	N (%)	Mean	N (%)	Mean
Keti Bunder, Thatta	70.0	4.15	65.0	190.77
Keenjhar, Thatta	100.0	2.65	---	---
Chotiari, Sanghar	88.2	3.36	38.2	60.38
Pai Forest, Nawabshah	81.3	2.36	56.3	101.94
Total	83.8	3.14	41.9	132.98

6.7 Education and Health

6.7.1 Educational Status

Most respondents (86%) at all sites were illiterate. Those with primary education and matriculation, were 6% and 3% respectively; table- 6.24.

Table- 6.24 Educational Status of Respondents

	Illiterate	Primary	Middle	Matric	Intermediate/ Graduate	Madersa	Total
Keti Bunder, Thatta	90.6	6.3	0.0	3.1	0.0	0.0	100.0
Keenjhar, Thatta	86.2	10.3	0.0	0.0	0.0	3.4	100.0
Chotiari, Sanghar	83.9	6.5	3.2	3.2	3.2	0.0	100.0
Pai, Forest, Nawabshah	84.4	0.0	0.0	6.3	3.1	3.1	100.0
Overall	86.3	5.6	0.8	3.2	2.4	1.6	100.0

Female literacy was much lower than male literacy. Female enrolment in schools was found low and their dropout rates were high. Respondents elicited the following reasons for lack of female education:

- The first priority for any family is earning livelihood. This task is the responsibility of male members and female members in spite of their support are given low preference in education because no returns are expected. For males it is believed that education may increase chances of access to better livelihood.
- The daily life of a women is busy and the mothers prefer to use their daughters in daily household chores.
- There is not enough money to educate both sons and daughters.

- Girls get married starting from an average age of 15 years and they are taught household chores. Young girls look after homes and younger brothers and sisters.
- It is believed that it will be difficult to find a good match for an educated girl.
- People believe that education will make girls rude and independent.
- Separate schools for girls are far off from villages and due to low mobility girls cannot reach there easily.
- Unavailability of teachers is a major reason of the non functionality of girl schools. Local educated people prefer to work in the towns instead of their villages.

6.7.2 Health Facilities

Girls at the programme sites were married soon after they reach puberty or some times even before attaining puberty. The result is a long childbearing career for the average woman, perhaps from the age of 15 to that of 49, and an average of about 6 children per woman. Awareness on family planning and mother and child health is poor and so are the facilities for the same. Women come to motherhood with a history of malnutrition and overwork. Pregnant women get assistance during deliveries from midwife or *dai*. Most of the dais are untrained and have gained knowledge through experience.

Childbearing is seen as a natural phenomenon to whose risk women should resign. Women also have strong belief on spiritual healing and hence rely on *Dum*, *Darood*, and *Taveez*. Physical health of women is poor because of household activities, child bearing and low nutrition food. Almost all women suffer from anaemia. Fever, Malaria, Tuberculosis, respiratory tract congestion, asthma, sugar, blood pressure, diarrhea, vomiting, Hepatitis- B, and kidney stone are the common reported diseases in women and children. Women neither use any pad nor take bath during the periods. They think that it would slows down the periods, which will result in other complications. There is critical need for health awareness programmes for women.

The average distance from sample villages to the nearby government hospital is 16 kilometers. It is obvious from table- 6.25 that the Ketu Bunder women face more problems regarding access to health facilities.

Table- 6.25 Distance from Government Hospital (km)

Area	Minimum	Maximum	Mean
Ketu Bunder, Thatta	2	115	42.29
Keenjhar, Thatta	2	35	11.53
Chotiari, Sanghar	1	27	12.4
Pai, Forest, Nawabshah	1	30	7.04
Overall	1	115	15.83

Frequently available female health care staff in the village is untrained midwife, as shown in table- 6.26. At Chotiari, in one third of the cases, trained LHV is accessible.

Table- 6.26 Female Health Facility (%)

Area	Midwife	Trained Midwife	Frequent Visit by LHV
Keti Bunder, Thatta	32.3	2.6	0.0
Keenjhar, Thatta	86.2	3.3	14.3
Chotiari, Sanghar	12.1	0.0	37.5
Pai, Forest, Nawabshah	71.0	45.2	35.7
Overall	49.2	15.0	16.8

It is only at the Pai villages that trained midwife and/or LHV is frequently accessible. The average number of children per woman was reported to be five, while the maximum number of children exceeded ten; see table- 6.27.

Table- 6.27 Fertility Rate

Area	Male Children		Female Children		Total Children	
	Maximum	Mean	Maximum	Mean	Maximum	Mean
Keti Bunder, Thatta	6	2.50	5	1.83	9	4.33
Keenjhar, Thatta	7	3.00	4	1.85	9	4.85
Chotiari, Sanghar	7	2.88	6	2.88	11	5.77
Pai, Forest, Nawabshah	6	2.89	6	2.43	10	5.32
Total	7	2.78	6	2.24	11	5.02

The average gap between children varies from seven months to two years; table- 6.28

Table- 6.28 Birth Spacing

Area	Maximum		Mean	
	Year	Months	Years	Months
Keti Bunder, Thatta	7	7	3	3
Keenjhar, Thatta	9	0	2	3
Chotiari, Sanghar	5	5	2	2
Pai, Forest, Nawabshah	12	0	2	5
Total	12	7	2	7

Infant Mortality Rate (28%) and miscarriage rate (21%) were quite high when compared to the available district health indicators; table- 6.29. It shows poor physical health of mother and child due to malnutrition, improper health facilities and no birth spacing.

Table- 6.29 Miscarriage and Mortality of Infants

Area	Miscarriage		Mortality			
			Infant		Adolescent	
	N (%)	Mean	N (%)	Mean	N (%)	Mean
Keti Bunder, Thatta	20.0	2.25	12.5	3.60	0.0	0.00
Keenjhar, Thatta	36.7	3.00	36.7	2.45	16.7	4.0
Chotiari, Sanghar	5.9	3.50	29.4	2.70	8.8	1.00
Pai, Forest, Nawabshah	25.0	2.25	37.5	2.58	3.1	1.00
Total	21.3	2.62	27.9	2.71	6.6	2.67

Most of the villages were deprived of any family health facilities (table-6.30). There was literally no family health facility at Ketu Bunder and Chotiari.

Table- 6.30 Family Health Facilities

Area	Family planning clinic / facility in village			Visited by LHV or any other functionary of family planning department		
	Yes	No	Total	Yes	No	Total
Ketu Bunder, Thatta	0.0	100.0	100	0.0	100.0	100
Keenjhar, Thatta	0.0	100.0	100	9.5	90.5	100
Chotiari, Sanghar	0.0	100.0	100	0.0	100.0	100
Pai, Forest, Nawabshah	14.8	85.2	100	14.3	85.7	100
Overall	3.5	96.5	100	5.4	94.6	100

Females were also found suffering from not only health and adverse social conditions but also their byproduct in the form of anxiety (72%). Most of them have the anxiety of health (54%) and social issues (30%). At Keenjhar, the anxiety emanates also from lack of employment and financial capital; see table- 6.31.

Table- 6.31 Perceptions about Anxiety

Area	Suffering from anxiety			If yes, type of problem			
	Yes	No	Total	Unemployment & Financial	Health	Social	Total
Ketu Bunder	2.50	97.50	100	0.0	100.0	0.0	100
Keenjhar, Thatta	56.00	44.00	100	35.7	57.1	7.1	100
Chotiari, Sanghar	41.20	58.80	100	7.1	35.7	57.1	100
Pai, Forest, Nawabshah	25.00	75.00	100	0.0	75.0	25.0	100
Overall	28.20	71.80	100	16.20	54.1	29.7	100

Most households preferred to visit private clinics for the treatment of females (68%), in comparison to midwives or spiritual treatment (table- 6.32). Due to long distances and lack of transport facilities, most women are given local household treatment at Ketu Bunder.

Table- 6.32 Treatment Mode (%)

Area	Private Clinic	Public Disp./Hospital	Household Treatment	Spiritual Treatment	Midwife
Keti Bunder, Thatta	50.0	40.0	67.5	0.0	2.5
Keenjhar, Thatta	80.0	50.0	3.3	43.3	6.7
Chotiari, Sanghar	73.5	8.8	0.0	14.7	0.0
Pai Forest, Nawabshah	71.9	34.4	0.0	15.6	0.0
Overall	67.6	33.1	20.6	16.9	2.2

For children, the preferred mode of treatment is once again the private clinic as in the case of females; see tables 6.32 and 6.33.

Table- 6.33 Mode of Treatment for Children (%)

Area	Private Clinic	Public Disp./Hospital	Household Treatment	Spiritual Treatment
Keti Bunder, Thatta	27.5	30.0	37.5	2.5
Keenjhar, Thatta	76.7	50.0	3.3	33.3
Chotiari, Sanghar	73.5	8.8	0.0	11.8
Pai Forest, Nawabshah	68.8	34.4	0.0	12.5
Overall	59.6	30.2	11.8	14.0

6.8 Awareness and Decision Making

In most cases, the household males are decision makers in all family matters from matrimonial to health as well as all business matters regarding fish marketing, livestock management, sale of agricultural production and property ownership. Females have some role to make decisions regarding household management (table- 6. 34).

Table- 6.34 Gender Role in Decision Making (%)

AREA			Household Management	Family Matter	Land and Crop	Health	Matrimonial	Property Ownership	Livestock Management	Marketing of Fish	Sale of Agri. Production
Keti Bunder, Thatta	GENDER	Male	9.8	86.5	100	84.6	50	57.1	50	100	100
		Female	14.6	10.8	0.0	12.8	50	42.9	50	0.0	0.0
		Both	75.6	2.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0
	Total		100	100	100	100	100	100	100	100	100
Keenjhar, Thatta	GENDER	Male	64.5	96.4	100	96.6	100	100	94.1	100	100
		Female	29.0	0.0	0.0	3.4	0.0	0.0	5.9	0.0	0.0
		Both	6.5	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total		100	100	100	100	100	100	100	100	100

Chotiari, Sanghar	GENDER	Male	27.3	74.2	33.3	78.1	87.5	100	73.3	100	0.0
		Female	66.7	9.7	66.7	15.6	8.3	0.0	20	0.0	0.0
		Both	6.1	16.1	0.0	6.3	4.2	0.0	6.7	0.0	0.0
	Total		100	100	100	100	100	100	100	100	0.0
Pai Forest, Nawabshah	GENDER	Male	23.3	76.7	100	82.8	90	78.6	50	100	100
		Female	53.3	0.0	0.0	6.9	6.7	0.0	20	0.0	0.0
		Both	23.3	23.3	0.0	10.3	3.3	21.4	30	0.0	0.0
	Total		100	100	100	100	100	100	100	100	100

At Ketu Bunder and Pai, the decision making pattern for livestock management and family matters depicts significant involvement of women. Electronic media appeared to be influential in promoting awareness among women at all programme priority areas. Authentic source of information is either radio (40%) or the family head. However, at Pai the TV was also mentioned as a major source of information; see table- 6.35.

Table- 6.35 Information Sources

Area	Radio	Family Head	Neighbor	TV	Newspaper	Educated Children	NGO Worker	Letter
Ketu Bunder, Thatta	75.0	65.0	22.5	20.0	17.5	2.5	2.5	0.0
Keenjhar, Thatta	60.0	23.3	3.3	23.3	13.3	23.3	0.0	3.3
Chotiari, Sanghar	14.7	17.6	50.0	26.5	20.6	0.0	2.9	0.0
Pai Forest, Nawabshah	6.3	31.3	56.3	56.3	25.0	0.0	3.1	0.0
Overall	40.4	36.0	33.1	30.9	19.1	5.9	2.2	0.7

6.9 Development Priorities and Proposals

On an overall basis, drinking water, health facilities, electricity, employment and education were perceived by the Indus for All Programme site women as their development priorities, in that order. Drinking water was ranked as the first priority at Ketu Bunder and Pai locations, while employment was top priority at Keenjhar. At Chotiari, the road infrastructure was given first priority by women respondents; see table- 6.36.

Table- 6.36 Development Priorities

Area	Priority				
	1 st	2 nd	3 rd	4 th	5 th
Ketu Bunder, Thatta	Drinking water	Electricity	Health Facility	Transportation	Education
Keenjhar, Thatta	Employment	Health Facility	Education	Electricity	Drinking water
Chotiari, Sanghar	Road	Drinking water	Credit	Electricity	Health Facility
Pai, Forest, Nawabshah	Drinking water	Education	Sanitation	Electricity	Health Facility
Overall	Drinking water	Health Facility	Electricity	Employment	Education

During discussions, the female respondents highlighted that:

- There is need to launch a comprehensive training programme/ establish vocational training centers for females in livestock management, sewing, embroidery and other skills according to modern marketing requirements.
- The state may launch the projects of road construction, electricity and sewerage.
- Civil society needs to raise awareness campaign regarding girl enrollment, tree plantation, health and hygiene issues, and cultural and traditional restrictions.



Gul Hayat Institute

7. Qualitative Inferences

This chapter presents qualitative inferences drawn from focus group and delphi group interactions and in-depth interviews conducted at the four Indus for All Programme priority areas. Observations made by the Shirkat Gah Consultants (2007), in their report on preliminary assessment of the four Indus for All Programme sites are also taken into account and critically analyzed, for an in-depth understanding of overall issues as well as potential interventions at selected villages.

7.1 Perspectives on Ketī Bunder

The focus group and key informants stated that there are a total of about 1,000 fishing boats owned and operated by local communities- 200 large boats (30-40 feet long), 200 medium size boats (20-30 feet long) and 600 small boats (10-20 feet long). The large boats go to the open sea for all kinds of catch, the medium boats most usually operate in shallow water for fish catch, while the small boats are used mainly for shrimp and crab catch inside creek waters. They observed that, due to lack of freshwater downstream Kotri, the sea intrusion has accelerated in recent years. Consequently, the open sea which used to be at least 12 km away from Ketī Bunder town, is now at a distance of 3 km only causing serious threat to the protective bund. The quantum of fisheries catch had declined and the mangrove cover has shrunk drastically.

The Aga Khan Planning and Building Services (AKPBS) was recognized as the main developmental agency, undertaking various infrastructure works in the Ketī Bunder vicinity. In addition to the newly formed Hajamro Mahol Dost Committees at Tippun, Kharioon, Phirt and Meero Dablo, sponsored by the WWF, the United Community Development Organization (UCDO) was considered as an important local CBO having some project implementation experience. The UCDO was reported to be in the registration phase. Three CCBs were also reportedly registered in the target villages- Roshan CCB at Haji Moosa Katiar, Umar Jat CCB (at village Haji Ismail Jat), and Haji Abu CCB. These villages have received the bulk of AKPBS projects, due mainly to their proximity to Ketī Bunder town and the influence of their community leadership. Gunb village is also receiving infrastructure support from the AKPBS. Current WWF interventions include mangrove plantation (a total of 40 ha), sanitation drive in Ketī Bunder (killing of dogs and vaccination), wind mills in two villages, fuel efficient stoves and cold storage in 8 boats.

There is no bank and no formal fisheries market at Ketī Bunder. Main sources of information for the population are radio, newspapers (Kawish and Jang) and friends & relatives. Political leadership of the area is claimed by two rival groups- Sheerazi Group of Thatta and the Malkani Group of Jati. Influential inland groups include Memon, Sholani Baloch and Jat castes; while Dablo caste is the main group inside Chhan and Hajamro creeks, and Jat community in the Tarshan (Kangri) and Khobar creeks.

7.1.1 Issues and Options

Participants and respondents from creek communities identified the lack of drinking water, recurring disasters, depletion of mangroves and creek fodders, human disease, high cost of fuel and ration, low catch, exploitative middlemen and low rates of fisheries as the main issues to be

addressed. Inland communities pinpointed shortage of drinking water as well as irrigation water, lack of fodder and grazing areas due to sea intrusion, floods and disasters, protective bunds for villages, unemployment, poor roads and transport and diseases as their main issues. The following options and suggestions were advanced:

- Poultry feed mills be established in the area to provide local market for leftover fish and Gand (very small fish).
- NBP branch, now closed, be reopened and institutional credit facilities be provided. Microfinance programmes may be initiated.
- Natural beaches at Hajamro and Chan creeks be developed and tourism facilities be established.
- Wherever feasible at inland villages, hand pumps be installed.
- Subsidies on POL for fishing boats be given to the extent of 40%, as admissible in India and Iran.
- New markets be explored for shrimp, Pamphret and other sea food.
- Hospital and Maternity home be established at Ketu Bunder and Juho- a large and developed settlement of Ghora Bari taluka which is in close proximity to Hajamro and Chan creeks.
- Road infrastructure be strengthened, specially the road from Ketu Bunder to Juho.
- Mangrove plantation by the WWF be managed through the communities and not through non-local contractors.
- Dai training be imparted specially in creek villages.
- Eye camps are needed.
- Well developed jetties be constructed at selected sites.
- Fiberglass water tanks be provided to the families, on soft loan basis.
- Harmful nets and large fishing trawlers be effectively banned.
- Increasing number of illegal fishermen from other provinces and countries may not be issued licenses.
- Mangrove wood cutting for sale in connivance with the SFD staff may be controlled, specially from the chan creek.
- Health awareness be provided so as to minimize smoking and drug use/ choora consumption- drug added beetle leaf and nuts.
- Influential contractors have installed harmful nets on the creek mouths, causing life threat to the poor fishermen. Pouch of Gujo net is disastrous. Import of such nets from Bangla Desh should be banned. .
- Eco-tourism in Chann creek to visit mangroves and algae sites.
- Fresh water be released to enhance fish production and mangroves regeneration.
- Shrimp and fish farms be established near Ketu Bunder shore.
- Poultry farms be established for employment.
- Ketu BUnder shore is suitable for mangrove plantation.
- Compensation for lands engulfed by sea intrusion may be given.
- Girls Middle School be established at Ketu Bunder.
- Shrimp cleaning center be established here for increasing income of women.
- The abolished project of Ketu Bunder Harbor/ Port may be re-initiated.

7.1.2 Community Development Priorities

In general, school, dispensary, credit and drinking water were expressed as priority needs in the target villages. Specific needs of poor villages were compiled as under:

- Hand pumps at village Alam Sholani could provide good quality drinking water for 3 nearby villages. Other places in the vicinity have brackish water.
- Faqiriani Jat village needs a protective bund on priority basis. Nearby villages have been given the project on political basis. The villagers feel neglected by all the agencies. It is a low cost project for the consideration of the WWF.
- Village Mamoon Dablo also needed a protective bund.
- Village Meero Dablo needs a road to connect the community to Ketu Bunder.
- Mangrove plantation was emphasized by village Kharioon community.
- Ice boxes were mentioned at Village Ali Dablo.
- For priority interventions by the WWF- Indus for All Programme, the following very poor communities could be recommended: Berum, Alam Sholani, Gul Hassan Jat, Guli Sholani, and Siddique Dablo.

7.2 Keenjhar Perspectives

The Consultants noted several issues and threats including water pollution, shortage of fish, illegal fishing and unchecked recreational activities. The lake has great potential for eco-tourism but at present the lake is losing its beauty and attraction due to mismanagement. Its banks are full of garbage and outgrowth of grasses. Facilities provided to the tourists are not sufficient, neither the trees are planted on the banks nor are there any other sources of amusement for tourists. There are 12 huts operated by Sindh Tourism Development Corporation, which are not in good condition. A dozen new huts are being constructed at the same congested place. Lack of rescue teams and overloaded old boats have caused loss of lives in recent years.

Quantity and quality of fish in Keenjhar has decreased because substantial quantum of water is diverted for agricultural and drinking uses and it drains away fish seed to the fields and private fish ponds. Many fish species like Ruhu, Mirgal, Theli, Seengharo, Sole, Barim, and freshwater shrimp are no more available for local consumption and exports. Fishing at Keenjhar is now under the License system at Rs. 561 per boat and Rs. 111 per helping hand. Issue of license to all fishermen has yet to be completed. Influential contractors, some private concerns from Karachi and the Rangers force have occupied portions of lake for private purposes due to which the access of fisher folk is denied at various points.

Raise in the embankment of Keenjhar is also an emerging issue. To fulfill the growing needs of drinking water for Karachi, the Government has decided to increase the storage of water in the lake; which may potentially submerge large areas in Jhampir and Sonda Union Councils near Jhampir mountains, dislocating poor communities. The area around the lake is already affected by water logging and salinity and embankment of the lake can trigger this problem. There is a growing concern that various threats to Keenjhar lake may affect its ecological and livelihood functions. In spite of important contribution to provincial economy, the lake seems to have been undervalued and ignored. Keenjhar lake wetland system needs to be protected to ensure the livelihoods of adjoining villages and a direct beneficiary population well above 2000 households living under abject poverty.

Potential new livelihood opportunities include stone/ lime stone mining, coal mining, industrial labor opportunities in Nooriabad, 250 or so fish farms, and emerging poultry farms around the lake. Tourism development is the key to higher income opportunities for local communities, especially on the National Highway side around Chilya, Hillaya and Sonheri clusters. Irrigated agriculture on the eastern and northern embankments, arid agriculture and livestock & poultry development on the western mountainous range could also offer ample employment opportunities for the poor communities. Water discharge at proper timings, interventions to restrict the outflow of fish seed in various channels and establishment of separate hatchery for Keenjhar, near the lake itself, are seen as necessary measures to restore the degraded fish resources.

7.2.1 Issues and Options

The main issues mentioned were as follows:

1. Water quality of Keenjhar is not good since it gets pollutants from Kotri and Nooriabad, which kill fish and vegetation.
2. Nets have been removed from the outlets, due to which fish seed is diverted to KB Feeder and other channels.
3. Chilya Hatchery is selling the seed to private fish farms, rather than putting it into the Keenjhar lake. Mortality rate for their small size seed is quite high.
4. Fish seed is caught illegally from Keenjhar and sold to private fish farms, as a means of livelihood.
5. Tourism facilities are inadequate.
6. Control of influential persons and rangers.
7. Issue of licenses and compensation for displacement of villages.
8. Drought, disease and unemployment on Jhimpir side.
9. Lack of fishing and tourism accessories on Sondha side.

The input of Delphi group on fisheries development and the key respondents is highlighted below:

- Polluted industrial water be treated before discharging in the lake.
- Nets be installed on the outlets.
- Illicit sale of fish seed from Chilya Hatchery to private fish farms be banned. At least 1.0 million fish seed be put into Keenjhar annually.
- Use of Boola net for catching small fish be effectively banned at Keenjhar.
- Tourism be promoted through a ring road and parks all around the lake.
- Skill training in fisheries, livestock and poultry farming.
- Limestone be utilized in cement factories by utilizing local labor.
- Arid agriculture and livestock be promoted on Jhimpir side.
- Jobs be given to local people at the nearby Nooriabad industrial site.
- Small dams be constructed in the mountainous area for rain water harvesting.
- Coal mining be promoted on the northern side of the lake.
- Quality work be done on the extension of protective bund.
- Drainage project be associated with the project of raising/extension of bund.
- District Fisheries office should be strengthened and corruption should be eliminated.
- Licenses should be issued to active fisher men and monitored.
- Speed boats should be provided for tourism purposes.
- Jetties at main landing centers, namely, Sonehri, Chilya, Khambo and Jhimpir.
- KB Feeder fall providing natural entry of fish may be redesigned.

- Water discharge in Keenjhar must be made available in May, June and July to promote fisheries reproduction and growth.
- Drainage be provided in Sonehri and other villages that will come under water logging due to elevation of level of reservoir.
- Separate hatchery for Keenjhar be established close to the lake; there is government land east of lake suitable for this purpose.
- Compensation be given to the villages affected by the new extension project.
- Keenjhar fishermen be trained properly. So far, only 3 training events have been organized in which real fishermen have not been invited.
- Control of Rangers from Gadhbari island of Keenjhar be released.
- Portions of lake controlled by influential people from outside be got released.
- Theft of nets be controlled to save the poor fishermen from financial loss.
- Chilling plant be established to provide cold storage for the catch.

7.2.2 Community Development Priorities

In general, the fishing communities in Jhimpir cluster are also involved in mat making and stone mining. Members of herder families work as railway labor and wage workers in the Nooriabad industrial area. Communities near picnic point and the Hillaya stop are partly engaged in tourism and services. Expressed priorities of village leaders are summarized below:

- At the Jhimpir cluster villages, namely Lal Bux Manchri, Bakhar Machi, Hameed Manchri, New Ghandhri, Photo Dars, Ali Bux Manchri, Nabi Bux Palari, Sadiq Manchri, Sukhio Autho, Khudaya and Mubarak Palari, the main issues raised were unemployment and human and livestock diseases. Dispensary, veterinary hospital, jobs in Nooriabad, and loans for livestock purchase were community development priorities. Among these, the typically poor villages, deserving WWF livelihood and environmental interventions were identified as Sadiq Manchri, Bakhar Machhi, New Ghandhri, Ali Bux Manchri, Lal Bux Manchri, Yaroo Manchri and Abdul Hameed Manchri. Women development programmes can also be initiated at all Manchri caste villages, where the women are directly involved in fishing.
- The Sonehri cluster including Sonehri, Bachal Shah and Khipri villages identified drainage, disease and unemployment as main issues. Road, dispensary, electricity and loans for livestock and fishing were identified as development priorities. Sonehri village has a CCB registered and various on going initiatives of HANDS and NCHD. The Keenjhar Fishermen Welfare Society is active here and at most villages of the Hillaya and Chilya cluster. Khipri is the poorest village in this cluster, while Sonehri is significant from civil society activism point of view.
- At the Chul site, village Yar Mohammad Jakhro does not directly depend on the lake resources. Mumtaz Dhandail could be the main target village, being the center of PFF activism and also because of its strategic location for installation of sieves/ nets on the outlets.
- Village Abdullah Gandhro at the Khambo center, being a large settlement and involved in fisheries and tourism, could form the main entry point for environmental and vocational training interventions.
- Hillaya stop village leaders identified unemployment as the major issues. Vocational center for girls, tourism infrastructure and water supply & electricity were expressed needs at

villages Jaffer Hillaya, Yousif Hillaya, Adam Katiar, and Haji Soomar Solangi. Village Jaffer Hillaya is the political hub of UC Sondha but its suitability from the viewpoint of WWF activism needs careful consideration. From tourism point of view, village Yousif Hillaya needs emphasis.

- Dolatpur, Umar Manchri, Dodo Bhambhro and Moldi Mian villages of Chilya Cluster, are all poor communities where unemployment and disease are main issues. School, dispensary, and loans for fishing accessories and purchase of animals are needed. These communities were also found concerned about illegal hunting of water fowls and pollution of lake through car washing and garbage.
- Jhimpir could be an awareness, coordination and tourism center. Direct WWF interventions at Jhimpir may, however, be carefully examined in terms of their relevance for poor communities of Jhimpir and Moldi clusters, that have direct livelihood dependence on Keenjhar lake.

7.3 Chotiari Reservoir Perspectives

Originally a stronghold of freedom movement launched by the Hurs during 1930s and early 1940s, the Makhi forest area and the Chotiari- Bakar wetland system comprising 80 small and large lakes was converted into an irrigation water reservoir in the 1980s under the Left Bank Outfall Drain Phase-I Project; at a total cost of Rs. 2.9 billion. The reservoir area is 45,000 acres while it is meant to irrigate about 0.3 million acres in three districts. Due to full storage in the dam area to the extent of about 0.75 MAF, the grazing area within the embankments is mostly sub-merged since 2005. This has caused relocation of periphery villages and difficulties for fishing boats which are not properly equipped. Compensation and resettlement issues have not been resolved for many communities as yet. Since 1990s, several civil society organizations have advocated the cause of Chotiari communities. Among these are the Dharti Dost Sangat, Sustainable Development Foundation (SDF), Makhi Welfare Organization, Chotiari Development Organization, Rural Women development Organization (RWDO), Sindh Agriculture and Forestry Workers Coordinating Organization (SAFWCO), and Thardeep Rural Development Programme (TRDP).

The Ranto canal escape is the inlet for filling the reservoir area from Mundh Jamrao Canal. Down below the inlet, the north-western area of Awadh is still the natural habitat of crocodile, partridge and hog deer. This heavily waterlogged area is under tight control of spiritual lords of Sindh, who have protected game reserves managed by their followers. Akanwari pumping station drains the seepage water back into the reservoir there. Outlet canal is located adjacent to Bakar and Phullel villages which are the main fish landing sites. It irrigates some land in Sanghar district but it is mostly meant for irrigation in Umarnkot district. Baqar also has a local fish market. This is the potential tourism site near Chotiari town. The reservoir has another escape from Nara canal near Achar Jamali village for water discharge. There is no sieve/ net on the outlet causing loss of fish seed.

On both sides of the Nara Canal here, due to severe water logging and already existing embankments of Nara and reservoir, several new fish farms are being established. Thus, in part, the fishing communities displaced by the reservoir are finding livelihood in mat making and working at fish farms. Separation of Baqar lake system from the reservoir area, has spoiled the water quality and depletion in these small lakes and depressions. Likewise, the seepage of reservoir has depleted the adjoining grazing lands in Achro Thar (north eastern area), reducing the livestock resources.

More than 500 fishing boats of traditional make are reported here. Only a few have the motors installed. There is no Boolo Gujo net in this area which is a blessing. In spite of government policy of issuing licenses to active fishermen, the terror of influential fishing contractors of Nizamani tribe reigns supreme. Fishing license fees fixed at Chotiari is higher when compared to Keenjhar. There is ongoing PFF activism against the contract system and there are also some court cases filed by the parties against each other. Phullel village is the center of such activism.

7.3.1 Issues and Options

The following issues were highlighted by the focus group participants and IDI respondents the MDC consultant's field visits:

1. Since the reservoir has started full operation since 2003-04, the communities have been in effect displaced recently. The issue of compensation and resettlement needs immediate attention.
2. Sale of seedlings to fish farms by local fishermen and contractors.
3. Contract system and lack of access to the natural resources.
4. Depletion and illegal hunting of Chinkara, hog deer, crocodile, ludhra, fish, partridge, huboura bustard and water fowl.
5. Water logging and spoilage of rangelands.
6. Poor quality works on dam and its embankment.
7. Lack of social services and animal health facilities.

Depletion of natural resources was reported by the focus group to be extensive. The status of 7 dehs (smallest revenue units) in and around the reservoir area, was assessed by the group as under:

1. Baqar is totally inside the reservoir except for the village and nearby lakes.
2. Most of the Akanwari deh is submerged. The agricultural lands are water logged with lowest productivity.
3. Part of Khadwari is under the reservoir. One third is fertile and cultivated while about one third is water logged.
4. One fourth of the Mithrao revenue unit is sub-merged and an equal area is waterlogged. Western part of deh is under fish farms.
5. Haranthari deh has suffered heavy loss of livestock and vegetation. It is under the dam since last three years.
6. Dubi- 2 is partly under reservoir while its biodiversity rich habitat of Awadh is waterlogged. Trees and vegetation have disappeared.
7. Makhi is partly inside the reservoir. The forest has been cut for settlement of new land owners. No land has been allotted to the displaced communities. It is also receiving heavy seepage from Nara canal and reservoir.

Participant input on various options was recorded as under:

- Improper implementation on Pati Pota Resettlement Plan has left many families without regular villages and compensation based on market prices. Re-assessment of losses and regularization of villages is the most crucial need now that the reservoir is functional. More than 500 households have reportedly not received the compensation.
- Issuance of fishing licenses to active fishermen is urgently urged.
- Control of influential fishing contractors may be got vacated.
- Social development and road infrastructure is needed for awareness and livelihood opportunities.
- Drainage system may be constructed through a supplementary project, specially in the areas submerged near Nara canal, outfall drain near Baqar and escapes in the north western zone.
- Small escape from the dam is needed for improving the water quality and fisheries in Baqar lake system.
- Crocodile, hog deer and partridge can be multiplied through technical support in the Awadh zone. Crocodile and hog deer farms were also suggested by the key respondents.
- Partridge is being sold in open market at Rs. 150 per bird. It is also being over- hunted without any check by the staff of Game Department. Awareness and effective ban on illegal hunting is needed.
- Due to poor workmanship, the reservoir bund is in a deplorable condition. New work on its expansion and level raising is of poor quality. Strict supervision and quality assurance is needed to save the area from an eminent disaster.
- Tree plantation is needed around the reservoir embankment to stabilize the soil and to compensate for excessive wood cutting that has occurred since 2004-05.
- Erosion of mounds inside the reservoir area is causing an irreparable loss of biodiversity. Interventions are needed to save the smaller species and shift them to the nearby Achhro Thar area. A museum could also be established near Juneja Marion (old architecture houses) in the desert for tourist attraction.
- Due to continuous operation of Awadh pumping station, which drains the saline effluent in the reservoir, the water quality is increasingly becoming unsuitable for fish and agricultural productivity. It is not even suitable for drinking purposes any more. Innovative engineering options are needed to rescue the area from total disaster.
- Sanghar drain networking can provide relief from water logging to the Makhi, Khadwari, Mithrao and Akanwari dehs.
- Government scheme for installation of 100 tube wells around the reservoir area may be started urgently.

- Tourism infrastructure and motor boats be provided at the Baqar/ Phullel point. Desert safaris can also be arranged in Accchro Thar.
- Vocational, fish farm/ aquaculture, agricultural and other skills be managed through training programmes.
- Institutional credit for boats & fishing accessories and microfinance for livestock and other purposes be provided.
- Rangeland improvement programme be initiated.
- The whole site should be declared as a Protected Area. Specific areas be reserved for the conservation of crocodile, Ludhro, and hog deer.
- Experienced wildlife/ game warden be given employment for protection and multiplication purposes.
- Hatchery project of Fisheries Department may be expedited and fish seed should be exclusively put into the reservoir and lakes for attaining the target of 4000 tons of fish, as originally planned.

7.3.2 Community Development Priorities

In general, the village leaders demanded reduction in the reservoir level to manage seepage and water logging issues. Most villages expressed the need for dispensary, veterinary hospital, drainage system, road, employment and tree plantation. Tourism infrastructure was needed at Baqar and Phullel villages. Village Laloo Mangrio has no road exit to the mainland. Village Phullel can be connected to the mainland through a low cost project which may also provide for a protective bund surrounding the settlement. It is the nerve center of fisher folk activism and could also be the main tourist attraction if protected in its natural environs.

The poorest villages are Mallah communities, namely Abdul Rahman Mallah, Siddique Mallah, Haji Khan Mallah and Sommar ji Mian.

7.4 Pai Forest Perspectives

Out of a total of 5,982 acres notified in 1883 under Pai Riverine forest, only 4,726 acres are officially designated now as irrigated plantation on allocated irrigation water and tube wells. The remaining area, with the exception of 300 acres of Agriculture Department's Seed Farm, is mostly under the control of Pakistan Army; which has leased it out to a private party for cultivation. Some 300 acres are also reported under encroachment. The net area under the administration of DFO Nawabshah is only about 3,446 acres.

In general, the access to forest resources is restricted but it is open for influential people and those who undertake illicit wood cutting in connivance with the SFD personnel. Illegal and over-hunting of partridge is rampant. High level government and army functionaries as well as local politicians, often break the sanctioned hunting limit and cause serious threat to the wildlife in Pai. The present game warden lives in Nawabshah city and does not command local influence in Sakrand area. Forest lands under encroachment have not been vacated in spite of three official campaigns and cases lodged with the NAB during the last five years.

Nawabshah district has 300 registered CBOs/ NGOs, out of which some 80 organizations are active. Several local organizations are active in the target villages as well. SAFWCO is the main microfinance agency which has also installed arsenic removal plants. SPO, SEF and TVO have different interventions. An impressive number of 325 CCBs have been formed in Nawabshah district, out of which 5 CCBs are also active in the priority area villages. Shah Latif Welfare Association is registered in village Ghulam Hyder Bhutto.

7.4.1 Issues and Options

Five major issues were highlighted:

1. Shortage and theft of irrigation water sanctioned for the forest plantation.
2. Illicit wood cutting for commercial use in brick kilns and sale in towns.
3. Extensive reliance of communities on fire wood and overgrazing.
4. Encroachment by adjoining land owners.
5. Excessive billing by the HESCO on tube- wells meant for forest irrigation.

Participants of focus group and key respondents advanced the following options and suggestions to check depletion and re-establish the bio-diversity:

- Provision of gas in Marri Jalbani and other larger settlements can reduce the wood cutting by communities.
- Strict vigilance on wood cutting meant for brick kilns and other commercial purposes by high officials, since it is done in connivance with the district forest officials.
- New influential game warden may be designated.
- Skill training for youth and women to ensure gainful employment.
- New water course be sanctioned for Pai forest from the Shahbaz minor, which provides water to the Army lands.
- Special supervision of Chowkris 80, 81,82, 62, 35 to 39 and 42 to 44 may be undertaken involving local communities of Tilli and Rahmoon Keerio to protect valuable wildlife.
- Shortage of wildlife staff and licensed arms may be provided.
- NO hunting licenses be issued in reproductive season. Partridge hunting should only be allowed during November to January. Heavy fines must be imposed on those who are found in illegal hunting of hog deer and birds.
- Sanctioned bag limits must be strictly enforced for those hunting on seasonal permits. Only 2 -3 permits be given each year.

7.4.2 Community Development Priorities

Most village leaders identified lack of irrigation water, illicit wood cutting, unemployment and diseases as major issues. They expressed the need for dispensary, gas, school, water supply, electricity, veterinary hospital and production credit as well as microfinance. Some also suggested skill training, jobs for youth and tree plantation. Two villages were distinctly noted for local CBO activity and organizational experience- Ghulam Hyder Bhutto and Rasool Bux Keerio. Two very poor villages were identified as Gulsher Machhi and Rahmoon Keerio. Villages Rahmoon Keerio and Talli were suggested for involvement in wildlife conservation.

7.5 Summary Notes on Indus for All Programme Target Villages

Summary notes on the main occupations, identified issues and perceived development priorities for all Indus for All Programme villages of four sites, is presented hereunder for ready reference.

I. Keti BUnder

1. Haji Moosa Katiar. Roshan CCB. Fisheries & agriculture. Water shortage for agriculture; fodder shortage for livestock, low rates for fisheries. Disease and floods. Drinking water and dispensary are priorities.
2. Haji Moosa Jat. Diseases, unemployment and floods. Water, road and school.
3. Haji Alam Sholani. Poor village. Road, school, dispensary and water supply needed. Irrigation water, fodder, diseases and floods are challenges/ issues.
4. Gunb. AKPBS support for embankment and Latrines. Fishing accessories are costly, while rates are lower. Issues are drinking water and diseases. Priorities are school, electricity, dispensary and water supply.
5. Village Faqiriani Jat. Fishing and Mat making main skills. Also engine overhaul & boat painting. Low rates of fisheries is the main issue. Water supply, school and protective bund are the priorities.
6. Village Hamzo Guggo. Fodder shortage is the main issue. School, dispensary and drinking water are main priorities.
7. Haji Mamoon Dablo. Low catch and low fish rates are the main issues. Increasing number of fishermen from outside. Also flood, drinking water and unemployment. Protective bund needed.
8. Kharioon. Hajamro Mahol Dost Committee by WWF. Skills are fishing, net making and carpenter. Low rates of fisheries. Protective bund, water and dispensary needed. Institutional credit and mangrove plantations as well.
9. Tippun. Net making and boat making are skills. Hajamro Mahol Dost Committee. Experience of mangrove plantation thru WWF. Wind mill. Flood, disease and unemployment are main issues. Trader exploitation also. Training and Loans needed.
10. Yousif Dablo. Fishing, net making and carpenter are skills. Low rates and exploitation by traders are issues. Maternity home and electricity needed. Also mangrove plantation, water supply, loans and school.

11. Ber Jat. AKPBS programme. Harmful nets, low rates and exploitative loans are main issues. Protective bund, road and school are priorities.
12. I Hassan Jat. Harmful nets, low rates and lack of markets in fisheries. Very poor village. Flood and diseases are main issues. Water supply, dispensary and school needed. Exploitative loans are a challenge. Institutional credit needs.
13. Ali Dablo. Ice boxes, high cost of fuel and lack of market main issues of fisheries. Flood and diseases. Water supply, school and dispensary needed.
14. Guli Sholani. Very poor. Flood and unemployment are challenges. School, water supply, loan and dispensary needed.
15. Haji Ali Jat. Transport, market and low share are problems in fisheries. Electricity, school and dispensary are basic necessities.
16. Haroon Lakhio. Low catch, low rates, lack of market, floods and unemployment. School, dispensary, loans and drinking water needed.
17. Haji Sheedi Dablo. Water supply main issue. Flood and unemployment also. School and water supply needed.
18. Hassan Jat. Harmful nets and lack of market. Flood and diseases. Water supply, dispensary, and electricity perceived needs.
19. Haji Ismail Jat. CCB Muhammad Umar Jat. Influential leadership. AKF working here. Have protective bund. Girls school and dispensary needed. Mangrove plantation, environment awareness and training needed.
20. Ketu Bunder. UCDO and Ketu Women development Organization. WWF has NRM programme while AKPBS have social development, physical environment, education and health programmes. Training in CCB formation by WWF and in Organizational Management by the AKPBS. Middlemen exploitation and low rates problems. Rural credit scheme, gas, bank, jetty, vocational training needed.
21. Meero Dablo. AKPBS has erected protective bund. WWF wind Mill. Unemployment, road and disease issues. Water supply, road and school needed.
22. Ali Bux Jat. NHA has approved the road. Flood, unemployment and diseases. Road, water supply, bank and protective bund needed. Also mangrove plantation. Education and skills training emphasized.
23. Bhoori. Exploitation by middlemen, poor fish and wood resources and unemployment issues. School, dispensary, water supply and road access needed.
24. Berum. Low rates of fisheries is the main issue. Drinking water brought from Ketu Bunder (10 km). Very poor. Water supply, food and transport are needs.
25. Ramzan Lakhio. High fuel prices, lack of market and low catch are issues. Flood, unemployment and diseases. School, water supply and market needed.

26. Khuda Bux Jat. Poor village. Middlemen, transport, low price are issues. Road, protective bund and drinking water needed. Training on NRM.
27. Phirt. Hajamro Mahol Dost Committee. WWF programme on NRM. CCB training by WWF. Ration, fuel rates and low fish rates are issues. Water supply, school, and loan are priorities. Harmful nets and illegal wood cutting be banned.
28. Siddique Dablo. Poor village. Drought and human disease. School, loan and water supply are the priorities.
29. Haji Hashim Jat. Lack of market, harmful nets, and exploitative middlemen. Flood, unemployment and human disease issues. Water supply, school, road and dispensary needed.
30. Haji Abu Jat. CCB Haji Abu Jat. Influential leadership. AKPBS road project. Fodder, drinking water and livestock dispensary needed. Low rates, transport, flood, unemployment and theft problems. Girls school, road, protective bund and drinking water needed.

II. Keenjhar

1. Lal Bux Manchri (Jhimpir). Fisheries, Livestock, Labor. Fish and grazing resources depleted. Drought, unemployment and human diseases are issues. Teacher, road and loans needed.
2. Bakhar Machhi (Jhimpir). Fisheries, railway laborers, and mat makers. Diseases, lack of market for mats/ handicrafts, and lack of livestock fodder. Poor village. Unemployment is major problem. Loan and dispensary needed.
3. Haji Khamiso Khaskheli. Sondha UC. Fisheries, agricultural labor/ tenants, and livestock. Some families seasonally migrate to Hyderabad district. Unemployment, flood and diseases are challenges. Water supply scheme, road and loans needed.
4. Abdul Hameed Manchri (Jhimpir). Government scheme of road. Lack of fishing accessories and low catch. Poor village. Unemployment and disease. Dispensary, loans, fishing accessories & modern skills needed.
5. Abdullah Gandro (Khambo center). Shaukat Gandro is the leader. It was first located at the current picnic point. Largest village in terms of HH. Fisheries, Tourism, Stone Mining, Poultry. KFWS activism here. Unemployment, loan, fishing accessories main issues. Substantial seasonal migration (200 families) to Ibrahim Hyderi and Balochistan coasts. Credit, dispensary, tourism infrastructure and school needed.
6. Mumtaz Dhandail (Chul site). PFF activism. Poor village. Unemployment, human disease and timely water discharge in the lake are issues. Loan, provision of nets, dispensary and school, net on outlets and regularization of village are expressed needs.
7. New Ghandhri (UC Jhimpir). Poor village. Health initiative by NCHD. Education programmes by UNICEF and Paiman. Training on Teaching Methodology by ESRA.

Unemployment, diseases and police injustice are issues. Electricity, water, dispensary and loans needed.

8. Khipri (Soenhri, Sondha). Very poor village. Fishing is the only occupation. Road project of government. Fish and wood resources have depleted. Drought, unemployment, and diseases are issues. School, dispensary, and loans priority. Well grown seed in lake demanded. Also net on the outlets.
9. Sayed Bachal Shah (Sonehri, Sondha). Fisheries, Livestock/ Poultry and wage laborers. Training on teaching methods by UNCHD. Unemployment and diseases. Dispensary, road, electricity and loans are priorities.
10. Sonehri. Fisheries, Livestock/ Poultry, Stone Mining, Agriculture, Services and Handicrafts. Sonehri Development Organization and Keenjhar Fishermen Welfare Society. CCB is registered. NCHD medical camp and educational initiative. Training by HANDS. Membership in local government. Disease, drainage and education main issues. Schools, road, dispensary and livestock/ poultry and tourism trainings needed. Nets demanded on outlets.
11. Photo Khan Dars (Jhimpir). Agriculture, livestock, stone mining. Kohistan Keenjhar Development Organization. Human disease and unemployment issues. Girls school, dispensary and job skills training needs.
12. Ali Bux Manchri (Jhimpir- Doulatpur). Fishing. Poor Village. Disease and unemployment issues. Loan, road and dispensary needed.
13. Dodo Bhambhro (Chilya, UC Jhimpir). Wage Labor, Livestock/ Poultry and Mat making, Fish seed sale. Livestock/ poultry disease, loan and security are issues. Poor village. Unemployment major issue. Livelihoods training, loan and road needs. Outlets should have nets.
14. Yousif Hillaya (Hillaya Stop, Sondha). NCHD training on teaching methods; Fisheries, wage labor, services and tourism. Disease and unemployment issues. Loans, dispensary, road and drainage priorities.
15. Nabi Bux Palari (Jhimpir)Paiman, NCHD and ESRA interventions. Agricultural wage labor/ tenants, mat makers, artisans and livestock. Unemployment, disease, drought issues. Out migration to Nooriabad for labor and grazing areas. Electricity, road and drinking water supply needed. Suggest ban on water fowl hunting and small fish catch.
16. Juman Jakhro (Chilya stop). Fisheries, wage labor and herders. Poor Village. Unemployment, disease (human and animal), and drought. Dispensary, roads and loan for animal purchase needed.
17. Lal Bux Manchri (near Moldi, Jhimpir UC). Fisheries main occupation, livestock. Poor village. Unemployment, harmful nets, and disease are issues. Loan for animals and fishing accessories, road, outlet nets, and dispensary. Small fish and water fowl hunting should be banned.

18. Autha Village (Moldi Mian, Jhimpir UC). Livestock, railway workers and wage labor. NCHD programmes. Unemployment and disease issues. Loan, dispensary, school, and drinking water needed. Fish farm skill training demanded.
19. Sadiq Manchri (near Jhimpir). Fisheries and Mat making. Very poor. Unemployment and disease. Loans for animal purchase and fishing accessories and dispensary needed. Nets at outlets, ample fish seed and ban on hunting.
20. Adam Katiar (Hillaya Stop, Sondha UC). Livestock, wage labor, services. Disease and unemployment. Loan for animals, dispensary and water supply.
21. Jaffer Hillaya (Hillaya stop). Land ownership, livestock, tourism and services. Unemployment and lack of tourism infrastructure are the issues. Loans for animals and Vocational skill center for girls needed. Tourism center.
22. Haji Soomar Solangi (Hillaya stop). Fisheries, wage labor, services and handicrafts. Unemployment, disease and flood. Loan, dispensary, jobs.
23. Shaukat Gandhro (Hillaya stop). Fisheries and Tourism. Unemployment and disease. Drinking water supply, school, loans and electricity needed. Privatization of tourism and regularization of villages demanded. Ban on Hunt.
24. Sukhio Autho (near Jhimpir). Wage labor and herders. Handicrafts. Poor village. Unemployment and disease. Dispensary, drinking water, school, loans.
25. Wali Mohammad Palari (near Jhimpir but Sondha UC). Wage Labor, Stone Mining and herders. Poor village. Unemployment and disease. School, dispensary, loans needed.
26. Khudaya (Jhimpir UC). Wage labor, livestock herders and stone mining. Unemployment. Middle school, dispensary, water supply and road needed.
27. Mubarak Palari (Jhimpir). Fisheries, Livestock, wage labor. Unemployment and disease. Electricity, road, dispensary and loans needed. Nets at outlet, skill training in fish farms, tree plantation, ban on fisheries. Vehicle washing ban.
28. Yar Mohammad Jakhro (Chul site, near Sondha). Land owners, Stone Mining, Livestock and labor. Unemployment major issue. Dispensary, road, school, water, loan needed. Ban on hunting.
29. Adam Bhambhro (near old Paper Mill, Chilya bus stop). Poultry farming, livestock, wage labor and services. Unemployment and poultry diseases. Dispensary, school and loans needed. Factory jobs demanded. Stop pollution.
30. Haji Ramzan Mirbahar (New Chilya stop). Fisheries is main occupation. Very poor village. Unemployment and Lack of access due influential fish contractors. Loans, fish nets and boats needed. Illegal fishing be stopped. Net on outlets.
31. Yaroo Manchri (Dhor Mian, Jhimpir). Very poor village. Fishing main occupation. Mat making. No teacher. No transport. Unemployment, disease and no fishing accessories. School, dispensary, loans and road. Nets on outlets.

32. Mohammad Rahim Machhi (near Jhimpir). Fisheries, railway and wage labor. Very poor village. Unemployment. School, loan for fishing accessories needed.
33. Mevo Manchri (near Jhimpir). Fisheries and mat making. Very poor village. Unemployment issue. School, loan and livestock support needed.
34. Rasool Bux Manchri (near Jhimpir). Fisheries, boat makers, mat makers and labor. Poor village. No job for boat makers due to overall poverty. Unemployment. School, loan and livestock support.
35. Umar Manchri (on hill, Chilya stop). Fisheries and labor. Poor village. Unemployment and diseases. School, dispensary and loans. Stop small fish and bird hunting; do not put garbage in the lake.
36. Jhimpir Town. Trade, livestock, Services, labor. Law and order for Hindu population is the issue. Diseases. Dispensary, Maternity home, road and loans. Picnic point demanded.
37. Dolatpur (near Chilya stop). Fishing and artisans. Poor village. Unemployment, famine and disease. School, dispensary and loans.
38. Haji Rasool Bux Manchri (near Jhimpir). Small poor village. Fisheries, handicrafts. Unemployment, disease, and drought. Loan and school needed.

III. Chotiari Reservoir

1. Sohno Fakir Umrani (UC Mian). Agricultural labor/ tenants and land owners. Sukar VDO in education, infrastructure and health. Road in progress. Unemployment, disease, and water-logging. Water supply and dispensary needed. Rice mill demanded.
2. Haji Khan Laghari, UC Mian. Land owners, tenants and herders. Unemployment, water - logging and diseases. Dispensary and electricity needed.
3. Dur Mohammad Laghari (UC Mian). Land owners, wage labor and drivers. Unemployment, water - logging and disease are issues. Water supply, electricity and dispensary needed.
4. Jani Khan Junejo (UC Chotiari). Livestock, land owners and wage labor. Animal and human diseases, unemployment and police excesses. Dispensary, drainage system, and school needed.
5. Soomar ji Mian. Fisheries and mat making. PFF active in social development. Contract system is major issue. Poor village. Social injustice, unemployment and disease are issues. Fisheries Licenses, loans, dispensary, girls school needed.
6. Tharo Mangrio (Dogrioon), UC Chotiari. Land owners, tenants and services. Sustainable Development Foundation active here. Unemployment, water logging and seepage, animal and human diseases. Brackish underground water. Water supply, girls school, dispensary needed. Drain demanded.

7. Wasayo Junejo (Deh Baqar, UC Shah Sikandarabad). Land rent and Livestock. Fodder issue for buffaloes. Unemployment is issue. Seepage and water logging. Drain, dispensary, school and road needed.
8. Wali Mohammad Ibupoto (Akanwari, Shah Sikandarabad UC). Livestock, fisheries and wage labor. NCHD education programme. Water logging, unemployment and animal diseases. Drainage, skill training in carpet weaving and black smithy needed.
9. Sobharo Mallah (haranthari, Shah Sikandarabad UC). PFF activism. Fisheries and mat making. Poor village. Unemployment, contract system and drought. Loans, school and fishing license needed. Reduction in reservoir level demanded.
10. Siddique Mallah (Makhi, UC Mian). Small very poor village. Mat making and fishing. Unemployment, water logging, disease, police injustice. Housing, road, school and dispensary needed.
11. Rano Junejo (Baqar, UC Shah Sikandarabad). Livestock herders. Small village. Unemployment, water logging and drought. Road, dispensary and school needed. Livestock training, rangeland development, tree plantation around reservoir and reducing its level proposed.
12. Pir Bux behan (Haranthari, UC S.Sikandarabad). First located inside reservoir area. Livestock herders. Poor now. Drought, unemployment, water logging and diseases. Land for settlement, dispensary and school needed. Reduction of level.
13. Phullel (Baqar, S. Sikandarabad). Fisheries is the only occupation. Mat making and handicrafts Largest fishing village. PFF active here. Report writing and community organization training conducted. CCB Phullel registered but no project as yet. Poverty, unemployment, health and future of settlement are issues. School, dispensary and road are needed. Tourism facilities demanded.
14. Padario (Bakar). Herders. SDF Sanghar active. Drought, waterlogging and unemployment issues. School, road, dispensary needed. Livestock management training. Reduction in water level at Chotiari.
15. Usman Ibupoto (Akanwari, S. Sikandarabad). Herders, landowners, wage labor/ tenants. Unemployment, water logging, disease issues. Road, dispensary, vet hospital needed. Drains and reduction of dam level demanded.
16. Uris Junejo (Baqar, S. Sikandarabad). Small village of herders, 4 HH. Water logging, unemployment, diseases. School, road and dispensary needed.
17. Mohammad Hussain. Makhi, UC Mian. Herders and Beldars. Waterlogging, unemployment and disease. School, road and dispensary. Drains and Babool plantation suggested.
18. Meer Mohammad. Bakhero, UC Mian. Mat Making, herders, fisheries and agri. Labor. Waterlogging, unemployment and disease. School, road, dispensary and LHV needed. Seed for fish farms, drain, reduction of level, jobs demanded.

19. Malhar Wassan. Janib Dhoru, S. Sikandarabad UC. Land owners, herders, wage labor/ tenants. Water logging, grazing land and unemployment issues. Girls primary school, dispensary, Vet hospital and water supply needed. Drainage.
20. Laloo Mangrio. Baqar, UC S. S. Abad. No road access. They travel by boat to Awadh road. Herders small village. Water logging, diseases issues. School, dispensary and road access needed. Reduction of dam level demanded.
21. Lal Khan Junejo. Baqar. Herders small village. Unemployment, water logging and diseases. School, dispensary, vet hospital needed. Rangeland development demanded and digging of wells in Achro Thar (White desert).
22. Lal Bux Unnar (Akanwari, S. S. Abad). Land owners, herders, and wage labor. Water logging, unemployment and disease. School, road and dispensary needed. Training in livestock management. Hog deer farming and reduction in level.
23. Imamdin Sandh (Dub-2, S. S. Abad). Herders and wage labor/ tenants. Water logging and unemployment. Dispensary, road and school needed. Teacher, drains, and saline tube wells needed.
24. Haji Khan Mallah (Akanwari, S. S. Abad). Fishing. Poor. Unemployment and disease. School, dispensary and loans needed. Fishing accessories needed. They can do the farming of crocodile and Ludhro and hog deer.
25. Haji Islam Larik (Baqar,). PFF active here. Fishing, mat making and herders. Very poor village. Unemployment and disease. School, road and dispensary needed. Tourism development and easy marketing of mats demanded.
26. Chotiarioon. Wage labor/ tenants, artisans, services and fisheries. Large settlement. Chotiarioon development Organization and Citizens Action Committee. Unemployment, water supply, female education issues. Girls school, dispensary and water supply needed.
27. Ghulam Hussain Laghari, UC Jhuingi. Small village. Herders and land. Water logging, unemployment and disease. School, dispensary and vet hospital needed. Training in fish farming. Ludhro sited here.
28. Bilawal (Akanwari, S. S. Abad). Land, Herders and wage labor/ tenants. Poor village. Water logging, unemployment and disease. Dispensary, vet hospital and loans needed. Drains and rangelands demanded.
29. Baqar (UC Shah Sikandarabad). Fisheries and artisans. Chotiarioon Development Organization and the PFF. Licenses for fishing, unemployment issues. Contractor menace. School, dispensary and fishing licenses needed. Voc Training center, reduction in level demanded.
30. Allahdino Behan (Akanwari, UC S. Sikandarabad). Small village. Land and herders. Water logging and unemployment. Drains, dispensary and vet hospital.
31. Allah Bux Junejo (Akanwari). Herders, land and wage labor. Very poor village. Water logging and unemployment. Dispensary, vet hospital and loans needed. Drainage schemes and grazing lands.

32. Achar Jamali (Makhi, UC Mian). Livestock herders. Water logging, unemployment and diseases. Resettlement, grazing area and training in LM.
33. Abdul Rahman Mallah (Haranthari, S. S. Abad). PFF active. Small fishing poor village. License and unemployment issues. Loan, dispensary and school needs.
34. Abdul Qadir (Baqar). Fishing and herders. Water quality in Baqar lake is the main issue. School, dispensary and road needed. Freshwater in the lake and seed.
35. Abdul Karim Mallah. Haranthari. PFF active here. Poor village. Unemployment, water logging and disease. School, dispensary and loan needed. Fishing licenses demanded. Fish fodder needed in the dam.

IV. Pai Forest

1. Haji Keerio. Land owners and wage labor/ tenants. SAFWCO loans. Unemployment and disease. Dispensary, loans and vet hospital needed. Implement legislation about Pai forest.
2. Marri Jalbani. Land owners, tenants, herders, services. NCHD programmes. IN general poor people. Lack of irrigation water, unemployment and diseases. Gas, water supply, dispensary and drainage system needed for the settlement. New minor demanded from the river for this area.
3. Marri Sabqi. Land owners, wage labor/ tenants and services. Water supply and diseases issues. Dispensary, school and vet hospital needed.
4. Marri Alam. Land owners, wage labor/ tenants. Water supply, disease and police excesses are issues. School, dispensary and vet hospital needed. Employment is suggested and skill training, tree plantation.
5. Jaffer Jamali. Wage labor/ tenants. Drains, school, water supply needed. This village is against the forest reserve altogether.
6. Haji Ali Bux Chohan. Livestock and land lease, tenants. Community Development Foundation working on education. Lack of irrigation water, unemployment, and diseases. Dispensary and Gas needed. Gas demanded.
7. Gulsher Machhi. Land and wage labor. Small poor village. Sindhri Welfare Association here. SAFWCO loans for livestock. Unemployment issue. School and gas needed. Vocational training and tree plantation suggested.
8. Gohram Faqir. Land owners and peasant proprietors. Irrigation water shortage. Dispensary, school and road demanded. Illicit wood cutting be stopped.
9. Ghulam Haider Bhutto. Herders and handicrafts. Shah Latif Welfare Association Registered. Unemployment, drought/ lack of irrigation water and diseases. Dispensary, Girls School teacher, water supply and gas needed. Voc Training , micro credit, irrigation methods, tree plantation/ social forestry suggested.

10. Daud Gudaro. Herders and land. Unemployment issue. School teachers needed. Irrigation for forest and ban on illicit cutting.
11. Talli. Wage labor, herders, artisans, services. Wood brought from forest. Unemployment, gas and water supply issues. Gas, water supply, dispensary, Boys middle school and vet hospital needed.
12. Sahib Khan Lund. Land owners and wage labor/ tenants. Handicrafts. Labor on Brick kilns. SAFWCO, SPO, Asia Foundation, First Microfinance Bank interventions. Lack of irrigation water, disease and unemployment. Handicraft marketing, girls school and dispensary.
13. Rasool Bux Keerio. Herder and wage labor and services. Sindhri Welfare Association, SAFWCO loans, Asia Foundation and WWF medical camp. Unemployment and police injustices. School and gas needed.
14. Rahmoon Keerio. Herders, Wage labor/ tenants and services. Marvi CCB, Village Development Association/ ADB projects. Poor village near forest. Unemployment, diseases and drought issues. Girls school and loans for livestock. Hog deer and partridge farming suggested. Tree plantation.
15. Ghulam Qadir Jatui. Land and wage labor/ tenants. Unemployment. School, dispensary, road and irrigation needs. Cotton factory suggested for jobs. Illegal and over- Hunting be stopped. Tree plantation.
16. Punhoon Gudaro. Land and wage labor/ tenants, transport. Sindh Gudaro Welfare Association. Disease and tribal clashes issues. Gas, dispensary, school staff and road needed. Vocational training, livestock loan, tree plantation and ban on illegal hunting suggested.
17. Palyo Bhutto. Land and wage labor. Unemployment and diseases. Water supply, electricity and dispensary needed. Sugar and cotton mills suggested for jobs.
18. Nazar Mohammad Bhatti. Herders, wage labor. Lack of irrigation water, unemployment and disease. School, dispensary and loans needed. Illicit cutting be stopped and ban on hunting.
19. Nangar Khan Chandio. Herders, land and wage labor. SCHWA active. Water shortage, Unemployment and diseases. Gas, School teacher and road needed. They cut wood from forest for sale.
20. Mahmood Keerio. Land owners, wage labor/ tenants and transport. SAFWCO active here. Unemployment, disease, police injustices. Girls school, dispensary staff and employment needed. Factories for jobs. Nursery for social forestry and irrigation water theft be stopped for conservation.
21. Morio Lakho. Land, wage labor/ tenants, herder, services. Animal disease is issue. Gas, dispensary, vet hospital and school staff needed.

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Annex-1

Purpose of Consultancy

The purpose of consultancy was to establish detailed socio-economic assessment using participatory rural appraisals in and around the above mentioned projects sites. The survey will use Sustainable Livelihood Model and use both qualitative and quantitative methods for assessment. The baseline will determine key livelihoods interventions of Indus for All Programme by identifying the gaps and opportunities.

Key Outputs

1. Preparation of survey plan, questionnaire based on extensive literature review and Sustainable Livelihood model;
2. Hiring of survey team and its training;
3. Collection of socio-economic data using primary and secondary sources;
4. Preparation of a detailed baseline report covering all sites;
5. Preparation of Human Development Index of each site; and,
6. Poverty assessment of each site.

1.2.1 Sustainable Livelihoods Model

The study was commissioned to revolve around the DFID – promoted model of sustainable livelihoods framework analysis. It was stated in the TORs that the baseline design must revolve around the SL framework of analysis; and cover, but may not be limited to the following socio-economic indicators:

A. Assets:

- **Human Capital:** Detailed profile of education levels in both male and female, technical skills including computer, leadership potential and health status. Nutritional level, food intake and sources.
- **Natural Capital:** access to land, possession of livestock, access to forest, availability of water, access to fish resources, access to biodiversity, soil fertility, water quality etc.
- **Physical Capital:** Availability of schools, health centers, water & sanitation facilities, roads, transport, shelter, clean & affordable energy and source of information. May include farm equipment.
- **Social Capital:** formal community organizations, networks, connectedness, relationship of community trust, level of cooperation enjoyed.
- **Financial Capital:** Saving, household assets easily convertible to liquidity, transfers from state, remittances, access to credit.

B. Trends:

- **Demographic Trends:** Detailed gender segregated survey of population, age groups, ethnicity, religion etc.
- **National Economic Trends:** This will define micro, macro link and may include crop prices, subsidies, economic growth, inflation, social sector spending, trade deficit, unemployment etc.
- **Governance Trends:** Democracy, transparency, corruption, devolution, access to information, justice system and peoples participation in decision making.
- **Technological Trends:** Production technologies available, access to new production techniques, etc.
- **Resource Trend:** Changing use of resources, resource sharing and control, conflicts over resources.

C. Shocks:

- **Policy Shocks:** How policies have changed, this may include water policy, education & health policies and policies to access and control resources.
- **Health Shocks:** Chronic illness, death of income earner etc.
- **Natural Shocks:** Disasters including flood, fire, drought etc.
- **Economic Shocks:** reduction in crop prices, fish loss, rise in input cost etc.
- **Conflicts:** Community tension, conflicts, court & police cases and tribal fight.
- **Crop and Livestock Health Shock:** loss of crop or animals.

D. Structures and Processes:

- **Institutional Arrangement and performance:** An assessment of current institutional structure and management of the resources.
- **Laws:** Existing laws of resources controls, benefit sharing
- **Policies:** Sectoral policies and their focus.
- **Culture:** May include work ethics, honesty, respect and societal values.
- **Private Sector:** existence and influence of private sector both positively and negatively.

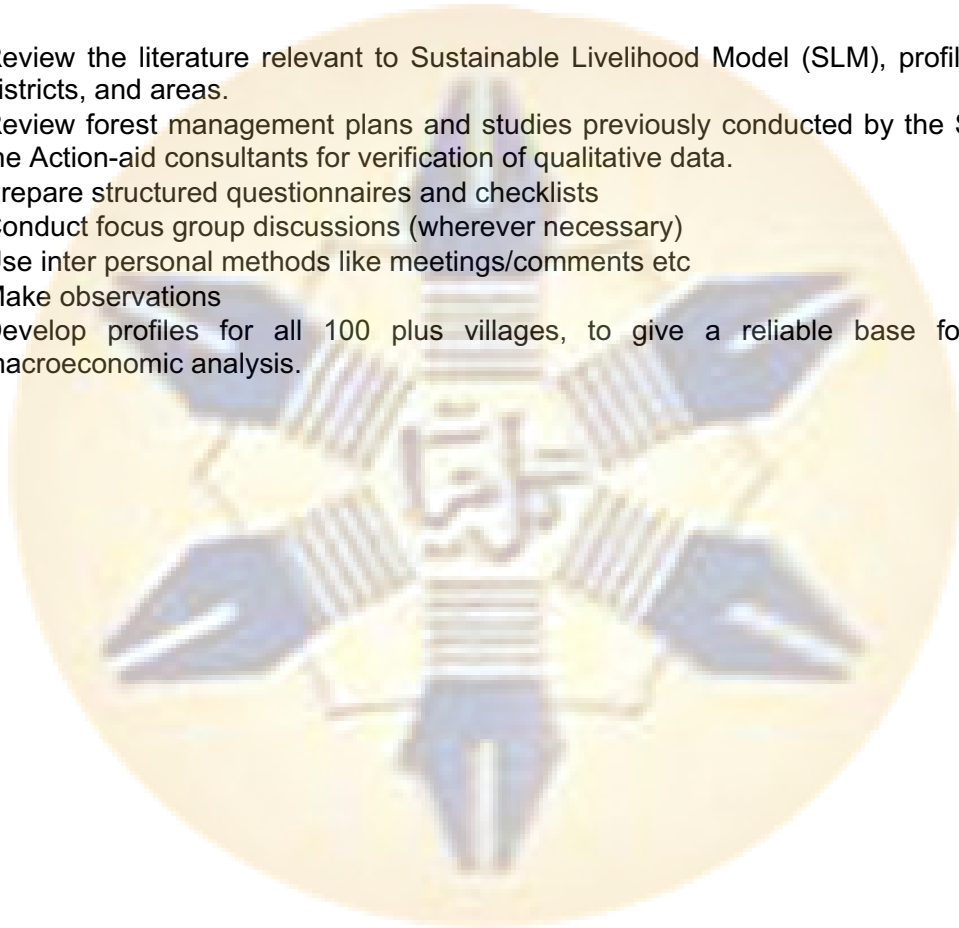
E. Level of Poverty and dependence on natural resources

- **Measurement of poverty:** Household income and expenditure must include gender segregated information. Source of income such as farm, fishing, forest, labor, wildlife, off farm employment. Also mention expenditure patterns including food, energy, medicine, cloth, cultural/recreational activities.
- **Productive resources/equipments:** access to seed, household owned farm equipments, fishing equipments etc.
- **Dependency on natural resources:** Preliminary assessment of households' dependency on natural resources.
- **HDI:** Preparation of human development index (using UNDP's HDI index methodology) for all the sites.

F. Recommendations: It was stated that the survey must come up with and suggest livelihood interventions with the aim to improve incomes of poor, improved food security, reduce vulnerabilities, influence processes and structure, and sustainable use of natural resources by providing alternatives income sources.

1.2.2 Consultant tasks

- Review the literature relevant to Sustainable Livelihood Model (SLM), profiles of relevant districts, and areas.
- Review forest management plans and studies previously conducted by the SZABIST/ and the Action-aid consultants for verification of qualitative data.
- Prepare structured questionnaires and checklists
- Conduct focus group discussions (wherever necessary)
- Use inter personal methods like meetings/comments etc
- Make observations
- Develop profiles for all 100 plus villages, to give a reliable base for site-specific macroeconomic analysis.



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1.10 Plan of Work

TIME FRAME AND WORK PLAN

	JULY				AUG.				SEP.				OCT.				NOV.				DEC.				JAN. 2008				FEB. 2008			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
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Keti Bundar Site Specific Final Report

Indus For All Programme



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May, 2008

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Acronyms	
AKPBS	Aga Khan Planning and Building Services
BHU	Basic Health Unit
CCB	Citizen Community Board
HH	House Hold
IUNCN	
LHV	Lady Health Visitor
MDC	Management and Development Center
NDFC	
NGO	Non-Governmental Organization
NRM	Natural Resources Management
POL	Petroleum, Oil, & Lubricants
TBA	Traditional birth Attendants
UCDO	United Community Development Organization
WWF-P	World Wide Fund for Nature for Pakistan

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BASELINE INDICATORS OF KETI BUNDER

SITE SPECIFIC REPORT

This report presents site specific baseline indicators for Keti Bunder priority area of the WWF-Indus for All Programme.

1. Background Information

Keti Bunder is one of the major towns in Thatta district along the coastline that is facing environmental degradation and loss of livelihood opportunities for the local communities. Keti Bunder was formerly a port city and commercial center. In 1845, the population was recorded as 2,542 and the town was given the status of Municipal Committee in 1874. The location of Keti Bunder has changed thrice during the last century due to sea intrusion. Situated at about 200 km south-east of Karachi, Keti Bunder taluka/ union council consists of a total of 42 Dehs (revenue settlements) of which 28 have already been engulfed by the intruding sea. There are four major nearby creeks viz. Chann, Hajamro, Khobar and Kangri or Tarchan. Marine fishing is the main source of livelihood.

The town of Keti Bunder is spread over 35 acres and surrounded by seawater. The total population of Keti Bunder town and adjacent creeks is about 12,000 only. However, the population of Keti Bunder Taluka/ Union Council was reported in 1998 to be 25,000 only. There has been a substantial migration to Karachi and other areas since then. Mangrove forests are the key ecological feature of the area. Dense mangroves cover an area of 2,631 hectares, medium mangroves cover an area of about 1,996 hectares and the sparse mangroves cover an area of 3,588 hectares. The rest of the area comprises of sand dunes, settlements and water channels.

The mangrove forests of Keti Bunder are categorized as 'Protected Forests' and the land, water lakes and dhoras in Keti Bunder have been notified as Wildlife Sanctuary. Due to reduction in fresh water flow in the Indus Delta, the mangrove forests have completely vanished in Turchan creek. In Hajamro creek, mangroves exist on small area. Some mangrove trees also exist in Khobar creek. In the Keti Bunder priority area (PA-2), the WWF mangrove plantation programme is limited to Hajamro creek only. The dense mangrove forests are limited to Chann creek where the on-going wood cutting in connivance with officials and camel grazing are causing over exploitation and serious depletion.

The description of other natural resources is given below:

Agriculture

Prior to 1991, when freshwater was in abundance, red rice was the main agricultural commodity in Keti Bunder and Kharochan union councils. The area was suitable for growing different kinds of fruits including bananas, coconuts and melons. With the reduction in freshwater flow, the sea has crept in and agricultural lands have either been swept away by the sea or spoiled by water-logging and salinity. Vegetables, betel leaf, sugar cane, wheat and fruits are now grown in the fertile inland areas.

Floral Diversity

According to the environmental baseline study conducted by the WWF- Pakistan, some 39 plant species belonging to 32 genera and 19 families are present in the area. The major plant families contributing to the formation of vegetation in the area are Chenopodiaceae (17.9%) and Poaceae (12.8%) followed by Amaranthaceae (7.6%), Aizoaceae (7.6%), Tamaricaceae (7.6%), Pipilionaceae (5.1%), Boraginaceae (5.1%), Tiliaceae (5.1%) and Zygophyllaceae (5.1%).

Fisheries

About 63 fish species and 24 shell species are recorded in the Keti Bunder area. Fish and shrimp species that have decreased in recent years are Goli, Dangri, Phar and Kiddi, Mato, Lour, Pada, Boska, Bora, Batoon, Ghanghra, Kachik, Paplet, Suo, and Sueri, etc. Some fish species such as the Palla fish have nearly vanished.

Fauna and Marine Animals

Keti Bunder North and South is a Wildlife Sanctuary, mainly for the water birds. About 50,000 birds in a migratory season have been recorded from this area in the past. The migratory birds include pelicans, egrets, herons, waders, raptors, etc. Among terrestrial mammals, Wild Boar, Asiatic Jackal, Fishing Cat and Indian Porcupine are common. Reptiles of the area include cobras, vipers, sea snakes and lizards. Bottlenose dolphin (*Tursiops truncatus*), Hump-backed dolphin (*Sousa chinensis*), Common dolphin (*Delphinus delphis*), Spinner dolphin (*Stenella longirostris*) Finless porpoise (*Neophocaena phocaenoides*) are the common marine mammals.

2. Methodology and Household Sample

Descriptive research is used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. The methods involve structured surveys which describe the status quo about selected socio-economic indicators, the correlation studies which investigate the relationship between variables, and developmental studies which seek to determine changes over time. The descriptive research design was selected because the primary purpose of the present study was to establish the pre-project/programme baseline socioeconomic profile as well as status of human and natural resources for the development of a planning and policy matrix to ensure sustainable livelihoods. In general, the baseline studies use the standard statistical sample given in table- 1.

Table 1: Population Size and Statistical Sample for Baseline Studies

S.No.	Population Size (e.g. Total Households)	Suggested Sample
1.	10	10
2.	50	44
3.	100	80
4.	500	217
5.	1,000	278
6.	3,000	341
7.	50,000	381
8.	100,000	385

Source: Samji and Sur. 2006. Developing A high Quality Baseline. World Bank, New Delhi.

To determine a representative household sample size, the following equation was used:

$$n = \frac{N\pi(1-\pi)}{(N-1)(C/Z_{\alpha/2})^2 + \pi(1-\pi)}$$

Where n is recommended sample size, N is population size, π is proportion of a characteristic of interest (e.g. literacy rate, poor population, and mortality), C is $\pm$ error rate (confidence interval), and $Z_{\alpha/2}$ is tabulated value for confidence level (Tryfos, 1996). Plugging the proportion of 0.5 (which gives the maximum variance, $0.5*(1-0.5)= 0.25$), error rate (confidence interval) of $\pm 5\%$ and 1.96 tabulated value of $Z_{\alpha/2}$ for 95% confidence level and number of households (population) were estimated.

In Keti Bunder, villages were divided into two categories viz. Inland and Creek villages. A total of 30 villages was designated as target villages for the WWF- Indus for All Programme. Overwhelming majority (89%) of all the villages in Keti Bunder are small.

Table 2: Sampling Plan for Keti Bunder, Thatta

	Villages				Households Selected	
	Total		Selected		N	%
	N	%	N	%		
Creek	19	61	8	47	104	42.3
Inland	12	39	9	53	142	57.7
Total	31	100	17	100	246	100.0

Eight villages were selected from creeks and 9 from inland as sample for the baseline study. Total number of sample household surveyed from creeks was 104 and 142 from Inland villages.

3. HUMAN CAPITAL

3.1 Household Size

The average household size, enumerated from survey data, is 5.4 members (Table 3). This estimate clearly indicates that average household size at Keti Bunder is relatively smaller as compared to the national figure of 7 for rural households. About 31% of the households had up to 3 members. About 54% of the households were recorded having between 4 to 8 members. Proportion of households with members between 9 to 13 was 14% and those with 14-18 members were only 2% while none of households were recorded with more than 18 members.

3.2 Age Groups

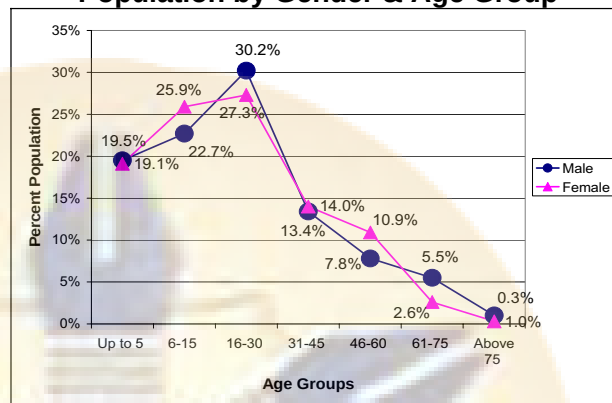
Figure 1 shows that one-fifth (19%) of the population was up to 5 years of age. Majority of the population (52%) was recorded for two groups: i) from 6 to 15 years and ii) 16- 30 years; about 26% for each group. Proportion of population of age group 31-45 years was around 14%; 46-60

years was 9%; 61-75 years was 4% and above 75% was less than 1%. Differences between male and female members in various groups ranged between 1 to 3 percent.

**Table 3:
Household Size**

Average Family Size		5.4
Distribution (%) of families by members	Up to 3	31.0
	4-8	53.9
	9-13	13.5
	14-18	1.6
	19 & above	0.0
	Total	100.0

**Figure 1:
Population by Gender & Age Group**



3.3 Average Age at Marriage

Figure 2 divulges that average age at marriage for male was 21 years and for female it was about 18 years. Child marriage was also observed in some cases. Minimum age of male at marriage was about 8 years for boys and 2 years for girls (the age at which the girl was verbally assigned to a boy of younger age or in exchange to some adult). The maximum age for male and female marriages were 60 and 40 years respectively. In certain cases, only religious (*nikah*) rituals are performed during marriage of immature couples. Significantly higher ages of educated couples were recorded in comparison of their illiterate counterparts in Sindh Province. However, due to lack of education at Ketī Bunder, ages at marriage of males and females were found clustered around averages.

**Figure 2:
Age at Marriage**

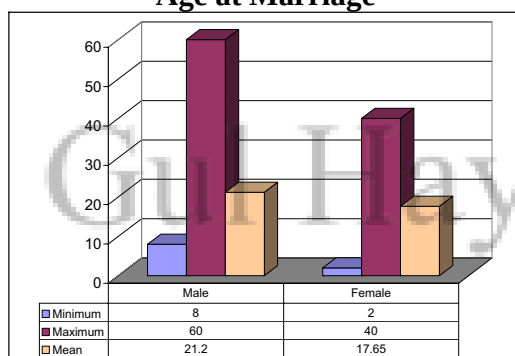
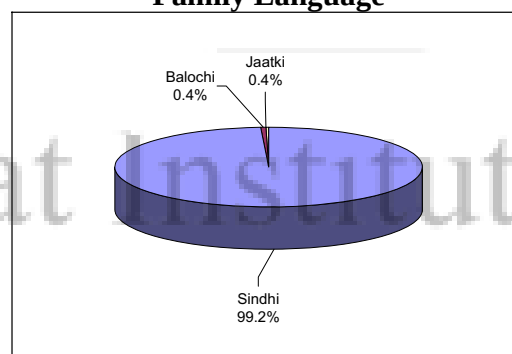


**Figure 3:
Family Language**



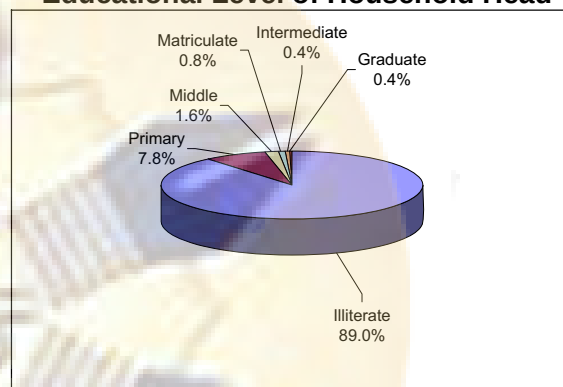
3.4 Family Language

Figure 3 reveals that Sindhi was family language of overwhelming majority (99%). Two other languages were recorded in fractions of 0.4% and 0.6% only; i.e. Jatki and Balochi. Jat, a tribe of Sindh and Balochistan, having traditional profession of raising camels are found at Ketu Bunder, Thatta some of whom still speak Jatki in their homes. Balochi is spoken at some of the Sholani Baloch households.

3.5 Education of Household Head

Figure 4 reveals educational level of household head. Unfortunately, very small proportion (11%) of the household heads was recorded to be literate. Compiled data further reveals that 7.8% of the household heads had education up to primary, 1.6% middle, 0.8% matriculate, 0.4% intermediate, and 0.4% graduates. These estimates reveal more illiteracy ratio at Ketu Bunder, in comparison of Sindh province where about 66% rural male population was recorded to be literate (NFDC, 2002). Educated population was segregated as: under matric, intermediate, graduate and postgraduate were 29%, 23%, 11% and 3% respectively.

Figure 4:
Educational Level of Household Head



3.6 Education of Household Members

Data on household members of age more than 15 years segregated by gender, reveals remarkable difference in educational level (Table 2). Only 4% of the females were educated against 16% males. All the educated females were primary pass. Gender biases in educational estimates pinpointed to the need for emphasis on female education.

Table 4:
Educational Level of Family Members

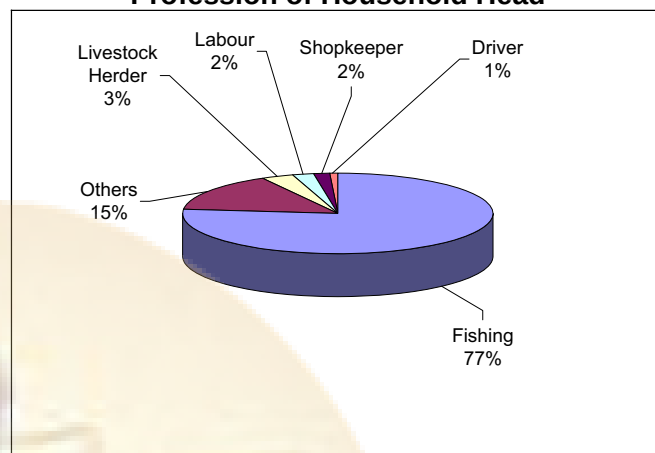
	(%)	
	Male	Female
Illiterate	84.1	95.8
Primary	9.4	4.2
Middle	3.1	0
Matriculation	1.6	0
Intermediate	0.8	0
Graduate	0.3	0
Postgraduate	0	0

3.7 Profession of Household Head

Figure 5 reveals major profession of household heads. Fishing was reported to be major profession of more than three-fourth (77%) - 89% of the household heads reported fishing as major profession in creek villages against 67% in the inland villages. During rough season (from May to September) when fishermen do not go in open sea, fishing was reported in creeks and shallow waters only. Proportion of livestock herders was 3%; labor was 2%; shopkeepers 2%, and drivers 1% only.

Regarding provision of sustainable livelihood to the inhabitants of Keti Bunder, key respondents reported that measures be taken to ban trawlers and over fishing in the area. Harmful nets and so called water lords be effectively checked. It was also reported that due to loss of agricultural lands in the area, tribes traditionally linked with agriculture and livestock rearing, have switched over to fishing as their major profession. Although very small proportion of households indicated their profession as engine mechanic and boat painting, there is considerable room to promote the business if effective training programmes are imparted at Keti Bunder.

**Figure 5:
Profession of Household Head**



3.8 Prevalence of Common Diseases

Figure 6 shows proportions of households reporting various diseases and their occurrence by number of times per year. The highest proportion (57%) of households reported diarrhea as a common disease with average occurrence of about 2 times per year. Malaria was reported to be the second common disease, reported by 36% of the households with annual occurrence of 1.82 times. Skin diseases were reported by 31% of households (1.84 times per year). Typhoid and jaundice were reported by 13% and 11%, respectively while their average occurrence was 1.41 and 1.57. Respiratory and eye diseases were reported by 5% and 4% respondents while their average annual occurrence was 1.91 and 1.43 respectively.

**Figure 6:
Prevalence of Common Diseases**

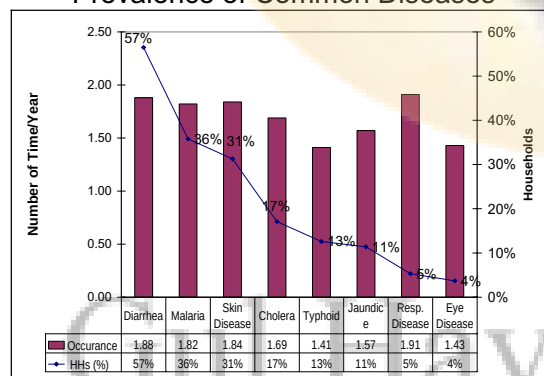
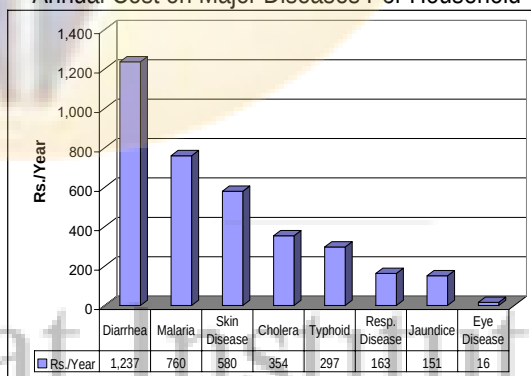


**Figure 7:
Annual Cost on Major Diseases Per Household**



3.9 Annual Cost on Major Diseases per Household

Figure 7 displays the annual cost on major diseases per household. The common grievances of poor households were high costs of medicines, doctor fees, and laboratory testing fees for diagnoses of various diseases. Although most of the medicines are locally produced in Pakistan, sky rocketing prices are mostly attributed to inflation, which is as high as 7% to 10%. As reported

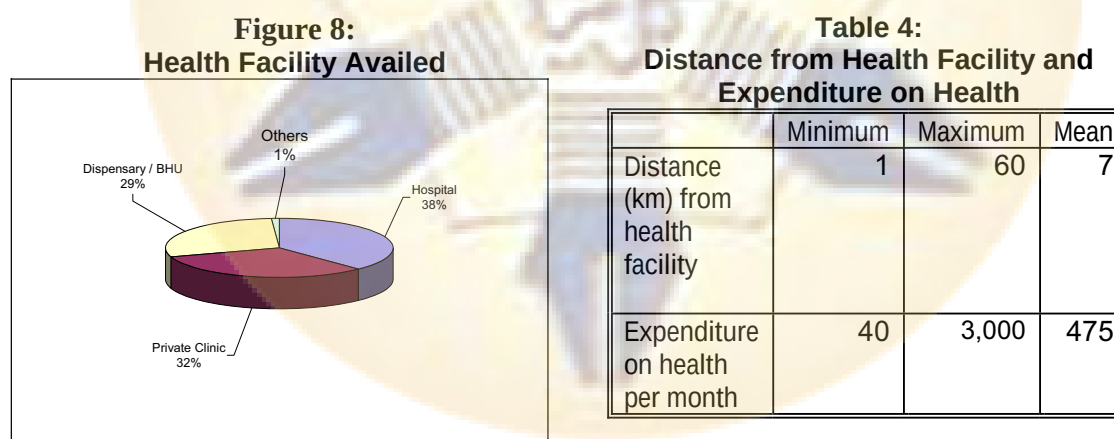
by respondents, the average annual expenditure was about Rs.1,237 for diarrhea , Rs.760 on malaria, Rs.580 on cholera, Rs.354 on Typhoid, Rs.297 on respiratory diseases, Rs.163 on Jaundice and Rs. 16 on eye diseases.

3.10 Health Facility Availed

Figure 8 reveals the health facility availed for the treatment of diseases. It is displayed that 67% respondents preferred public sector health institutions for treatment of diseases mainly because of low cost. Segregated data reveals that 29% preferred dispensary / BHU and 38% households went to taluka/district hospitals. About one-third (32%) of the respondents stated that private clinics were visited for treatments purpose. Despite higher costs at private clinics, respondents were of the opinion that better care and effective medicines are served at private clinics.

3.11 Distance from Facility and Expenditure on Health

Table 4 reveals distance from health facility and expenditure on health. The minimum distance was about 1 km while the maximum was about 60km to reach the health facility while the average was 7 km. Expenditure on health varied from Rs. 40 to 3,000 only. The average expenditure was about Rs. 475.



3.12 Place of Child Delivery

Figure 9 reveals that overwhelming majority (79%) births were attended by local Dai (TBA). Only about 2% births were handled by trained LHVs. This may establish the need for training programme for the capacity building of local dais. Public hospitals and private clinics were also visited for child births to the tune of 11% and 7%, respectively.

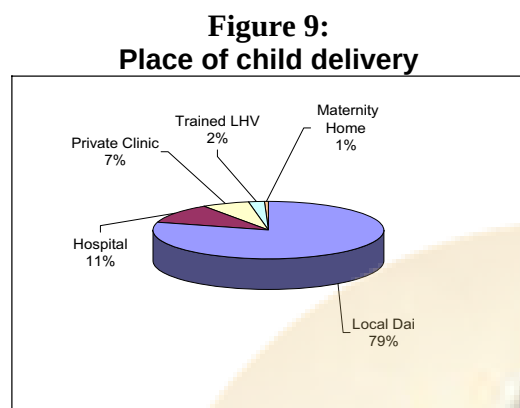


Table 5:
Expenditure and Delivery Related Mortality

Expenditure Per Delivery (Rs.)	Minimum		500
	Maximum		5,000
	Mean		1,036
Delivery related mortality during last 5 years	Mothers	% of HHs	0.4
		Mean	1.0
	Baby	% of HHs	8.1
		Mean	1.6

3.13 Expenditure per Child Delivery

Expenditure per delivery is presented in table 5. Minimum expenditure per delivery was reported to be Rs. 500 only while maximum expenditure per delivery was Rs. 5,000 only. On an overall basis, the average expenditure per delivery was Rs. 1,036 only.

3.14 Delivery Related Mortality

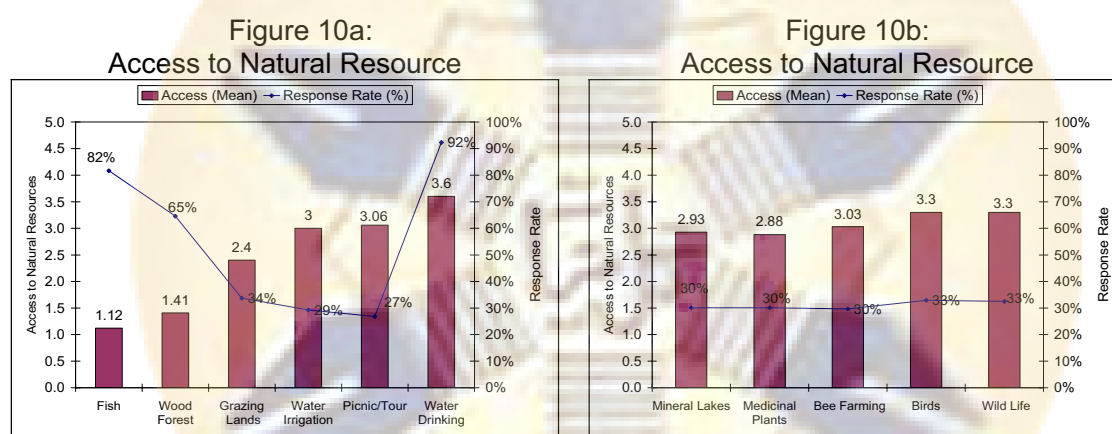
Delivery related mortality was also summarized in Table 5. The table reveals that about 0.4% of the households reported mothers' mortality during last 5 years. The average number of those household was computed to be 1. About 8% of the households reported child mortality while the average number was estimated at 1.6. On an overall basis, per 100 households, about 13 children died during last 5 years. In other words, about 2.6 children died out of 100 households every year.

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4. Natural Capital

4.1 Access to Natural Resources

Figure 10 displays response rate (%) and average value of perception about frequency of access to the natural resources. The Likert type scale used was 1 means frequently; 2 means sometimes; 3 means undecided; 4 means rarely; and 5 means restricted. The more response rate (%) and the lower perceived average value indicated frequent access of households to the natural resources. Fish was identified to be most accessible natural resource. Fishing in creeks were reported to be cheap and easily accessible by the households at Ketu Bunder.



Scale used: 1 = Frequently; 2 = Sometimes; 3 = Undecided; 4 = Rarely; and 5 = Restricted

Wood forest with 65% response rate and average value of 1.41 was adjudged to be inaccessible. Timber forest (mangroves) were traditionally found in plenty at Ketu Bunder, Thatta. However, due to intrusion of sea water attributed to low level flow of Indus water, timber forest have degraded sharply and are available mainly at the Chann creek. The least accessible natural resource was drinking water with substantially high response rate of 92%. Figure 10b reveals, that the respondents were undecided/ unaware about their access to medicinal plants, bee farming, birds and wild life.

4.2 Degradation of Natural Resources

Analysis of respondents' perceptions presented in Figure 11a and 11b, reveals the extent of degradation of various natural resources during the last 5 years. Response rates (percentage of respondents) and their average (mean) perceptions have been reported. The average values indicate the extent that the respondents agreed with research statement about sharp decrease/ degradation of particular natural resources. Likert type scale was labeled as: strongly agree with 1; agree with 2; undecided with 3; disagree with 4 and strongly disagree with 5. Values close to 2 indicates that on an overall basis, respondents agree with the research statement.

Figure 11a:
Degradation of Natural Resource

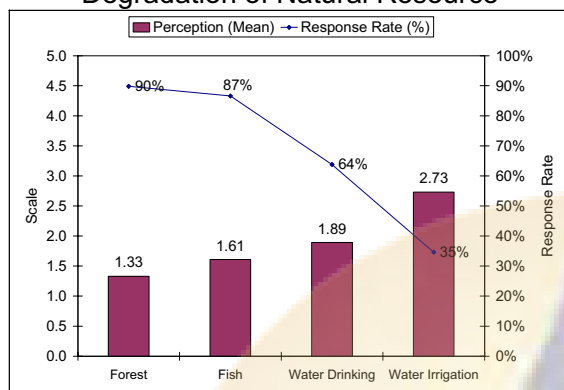
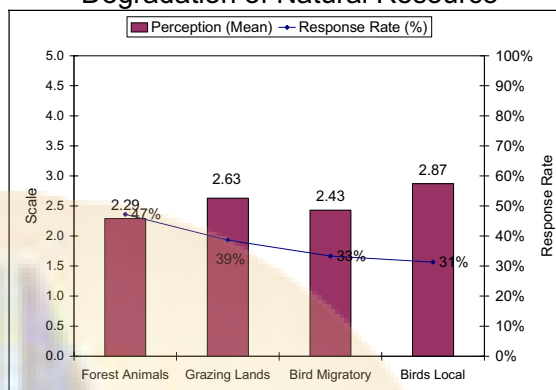


Figure 11b:
Degradation of Natural Resource



Research Statement/Hypothesis: Natural resources sharply degraded during last 5 years.

Likert Type Scale: 1=Strongly Agree; 2 =Agree; 3=Undecided; 4=Disagree and 5=Strongly Disagree

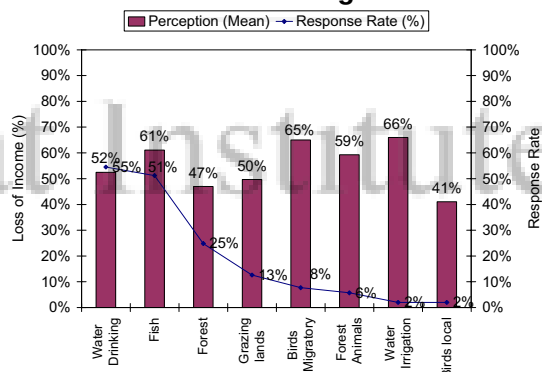
Overwhelming Majority (90%) of respondents from Ketu Bunder, Thatta agreed (mean =1.56) with the statement, that forests have reduced sharply during last 5 years. Likewise, 87% and 64% of the respondents recorded their responses (mean =1.61 and 1.89) in agreement with the research statement that production/catch of fish and the availability of fresh drinking water has reduced during the last 5 years. Due to poor supply of Indus water, proportion of sea water has increased disproportionately at many sites and caused undrinkable water even for livestock. Figure 11b revealed that, on an overall basis, respondents were undecided/ unaware about forest animals, grazing lands and migratory as well as local birds.

4.3 Income Loss due to Depletion of Natural Resources

Figure 12 displays response rate (%) and loss of income (%) due to degradation of natural resources over the last five years. About 55% of households reported that due to degradation of drinking water, their average income has reduced to the tune of about 52%. A substantial amount of Rs. 500 to 1,000 was claimed by the respondents in creek villages on buying a water tanker on monthly basis. As the price of diesel increased, cost on fetching water also increased.

Loss of income (51%) was reported by 61% of the households for reduction in production/catch of fish. One-fourth (25%) of respondents reported loss of income to the tune of 47% due to depletion of forests. Although small proportion of respondents (13% for grazing lands, 8% for migratory birds, 6% for forest animals, 2% for water irrigation, 2% for birds local) reported loss of income, the decline of income ranged from 41% from local birds to 66% for irrigation water. These estimates revealed the contribution of various natural resources to livelihood of inhabitants at Ketu Bunder, Thatta.

Figure 12:
Income (%) Reduced due to Depletion of Natural Resource during Last 5 Years



5. Physical Capital

5.1 Housing Type

Figure 13 presents the baseline information about the type of housing at Ketu Bunder, Thatta. *Jhoopra* (thatched huts) were found dominant with proportion of 91%. Almost all the houses (100%) were *jhoopra* in creek villages against 84% in inland villages. *Pacca* (bricks and iron or RCC structure) were recorded to be 3% only. Semi *pacca* and *katcha* houses were only 3% each. It was inferred that housing condition was very poor since overwhelming majority of houses (93%) were either *katcha* or *jhoopra*.

Figure 13:
Type of House

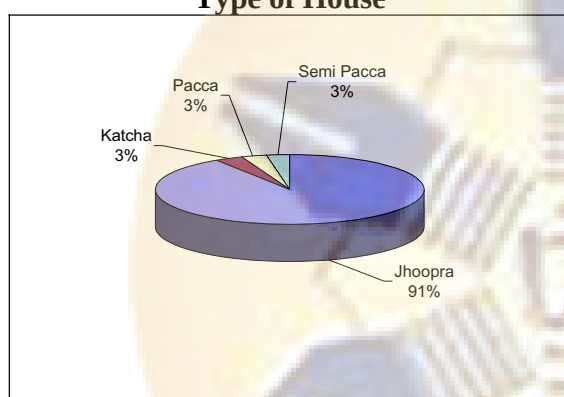
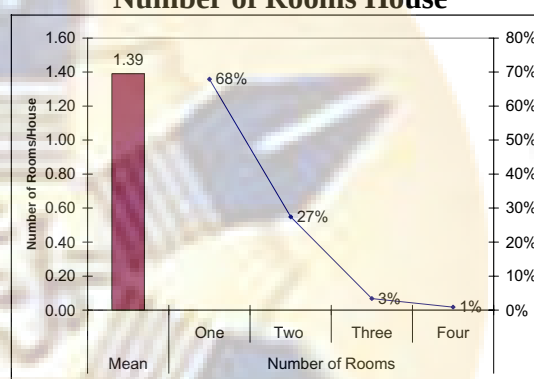


Figure 14:
Number of Rooms House



5.2 Number of Rooms per House

Figure 14 displays that the average number of rooms per house was 1.39 only. The highest proportion of houses (68%) was recorded with only 1 room while proportion of houses with 2, 3, and 4 rooms were 27%, 3%, and 1% respectively. The figure unveils significant difference in proportions of 1 and 2 room-houses. Based upon average household size (5.4 members per house) and number of rooms per house (1.39); average number of household members per room was calculated to be about 4, which speaks volumes about the congested living conditions.

5.3 Type of Toilet Facility in House

Figure 15 presents information on sanitation conditions measured by the toilet facilities inside houses. It was noted that open space was used predominantly (55%) at Ketu Bunder, Thatta. One out of every fourth (25%) household was observed with thatched toilet. About one-fifth (19%) houses surveyed had pit latrines. Very small proportion of 1% was enumerated to be houses having non-flush / WC toilet facility. Thus, sanitation arrangements were very poor at Ketu Bunder, Thatta.

Figure 16 reveals that 20% of the households have electric facility. Segregated data by villages reveals that 3% creek villages and 33% inland villages have electricity. In fact, only one village of

Hajamro creek had electricity owing to the installation of wind turbine by the WWF. Due to wind energy at coastal areas, wind turbines were observed to be successful and cheap source of generating electricity. Most of the respondents demanded wind turbines for their village. Since size of villages was small, one wind mill per village was observed to be sufficient. The cost of wind turbine was reported to be around Rs.125,000 (About \$ 2,000) only.

**Figure 15:
Type of Toilet Facility in House**

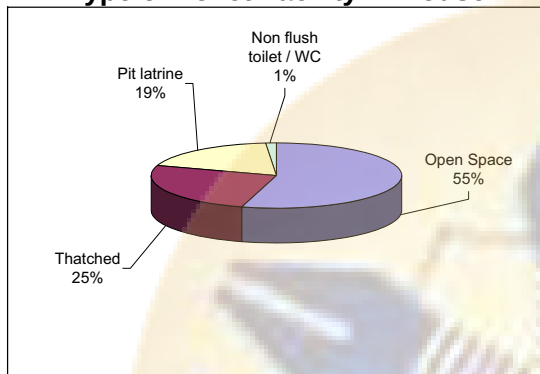
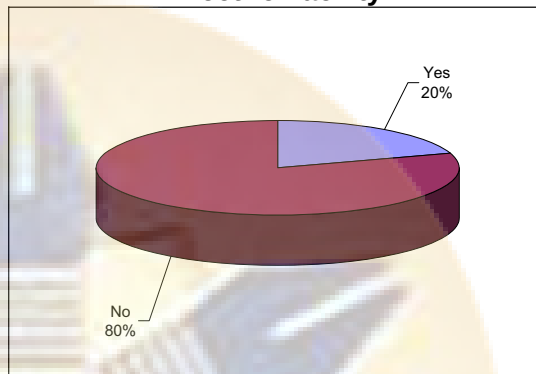


**Figure 16:
Electric Facility**



5.4 Sources and Quality of Water

Figure 17 indicates that only 4% of the houses have hand pumps installed in houses while overwhelming majority (96%) collected water from outside. Drinking water was pronounced to be one of the major problems at Ketu Bunder, Thatta. A significant proportion of the household budget was reportedly incurred on fetching water and the same was termed as cost on transportation (Figure 23). A significant proportion of households in creek villages purchased water from Ketu Bunder, town and the same was transported by motor boats. Regarding quality of water, 46% of respondents categorized it as sweet while 54% reported that it is a normal drinking water. Contamination of water was another issue mostly discussed by respondents which caused many water borne diseases including major diseases viz. diarrhea, cholera, jaundice, skin and eye diseases. Significant portion of household budget was reportedly used on treatment of above diseases which untimely reduced the proportion of income on food and other heads contributing to living standards.

**Figure 17:
Sources of Water**

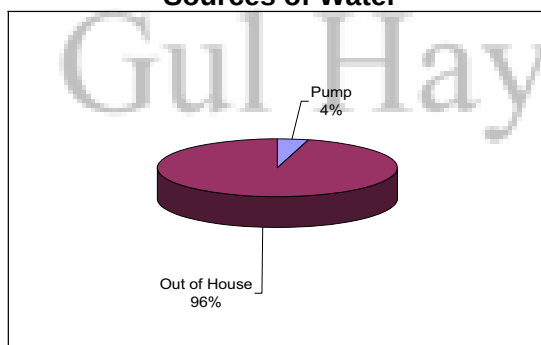
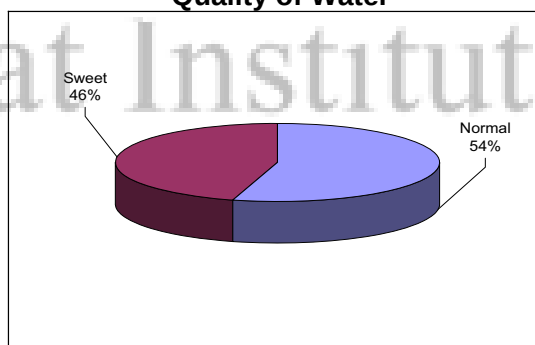


**Figure 18:
Quality of Water**

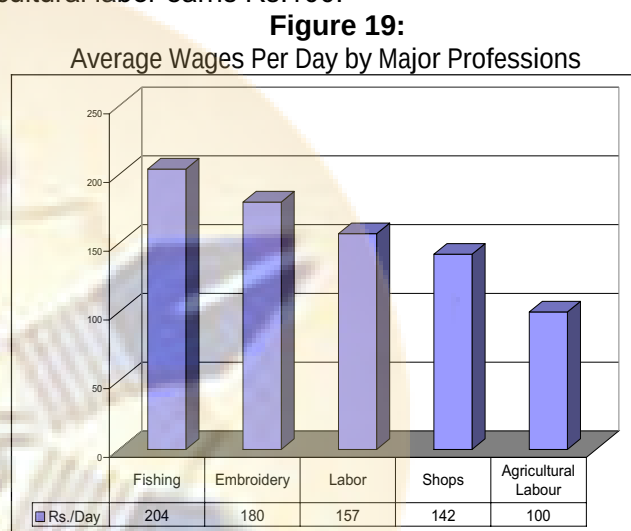


6. Economic Indicators

6.1 Average Wages Per Day by Major Professions

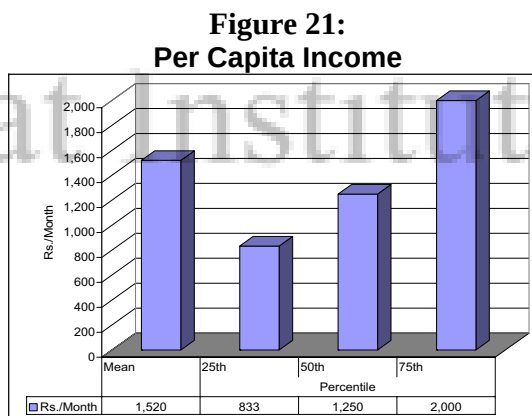
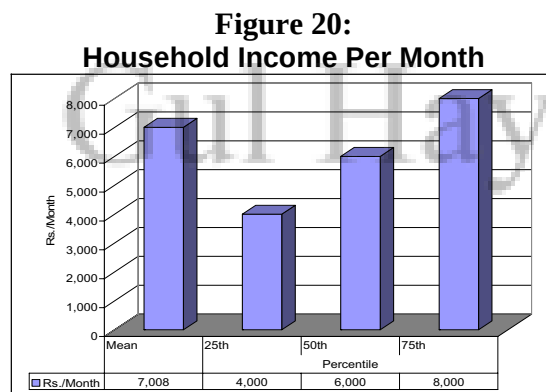
Figure 19 unveils the average income of various major professions. The highest wages of Rs. 204 per day were recorded for fishing. The average wages per day for embroidery was Rs. 180. On an average basis, shop keeper earns Rs.142 while agricultural labor earns Rs.100.

As the fishing was dominant business at Ketu Bunder, Thatta, average income was reported to be variable, particularly depending on catch and type of fish. As such, there was no wage system in fishing, but a share of total catch. On a medium boat, after deduction of expenditure on fishing including food and diesel, the net income is divided in eight shares. The share of each laborer is about one-eighth (12.5%) while 5 laborers were recorded on each boat. The collective share of labor including Nakhwa (captain) and Khalasi (supporting laborers) is 62.5% while the remaining 37.5% share of catch is divided equally for boat owner (12.5%), net owner (12.5%) and boat engine owner (12.5%).



6.2 Household Income

Figure 20 shows household income per month at Ketu Bunder, Thatta. The average income was computed to be Rs. 7,000. The figure also presents the monthly household income in percentiles. The 25th percentile (also known as first quartile) was 4,000 while 50th percentile (second quartile and median) income was 6,000 and 75th percentile (third quartile) was 8,000. Since the median income (Rs. 6,000) was less than arithmetic average (Rs. 7,000), the distribution of income was assumed to be skewed rather than normally distributed.



6.3 Earning Family Members

Table 6 depicts that, on an overall basis, each household had 1.54 (1.50 male & 0.04 female) earning members. Monthly income of male and female members was about Rs. 4,593 and 2,900, respectively. From this it was concluded that wages of male members were about 1.6 times higher than that of female members. Contribution of female members in household income was 1.7% only. These estimates are evident of poor contribution of women in household income. This highlights the need for gender mainstreaming in occupations and income generating activities.

Table 6:
Earning family members

No. of Earners/HH	Male	1.50
	Female	0.04
Monthly Income (Rs.)	Male	4,593
	Female	2,900
Contribution (%) in Household Income	Male	98.3
	Female	1.7
	Total	100.0

6.4 Household Budget

The average household expenditure was calculated to be Rs.6,612 (Figure 22). Median expenditure (50th percentile) was Rs. 4,000 which revealed that half of the population had expenditure more than Rs. 4,000 while the remaining half had less than the median value. Figure 23 displays the breakup of the household expenditure. About 44% of the budget expenditure was incurred on transportation only. This expenditure is too much because water in creek villages is also brought on boats. Expenditure on food was estimated at 31% only which is lowest in terms of percentage of total expenditure when compared with Keenjhar, Thatta; Chotiari, Sanghar; and, Pai Forest, Nawabshah where 39% was recorded on food. About 5% of the budget was reported on health including doctor fee and medicines. Expenditure on clothing and shoes was computed to be 4%. Expenditure on education was about only 3%, which is the lowest in comparison to other programme sites. Collectively 2% was recorded for electricity (1%) and phone (1%). Miscellaneous expenditure was computed to be 11% which included pocket money of dependent household members.

Figure 22:
Household Expenditure Per Month

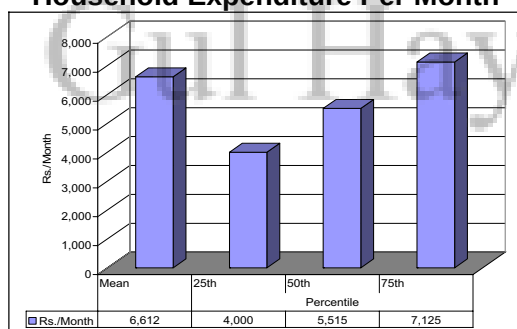
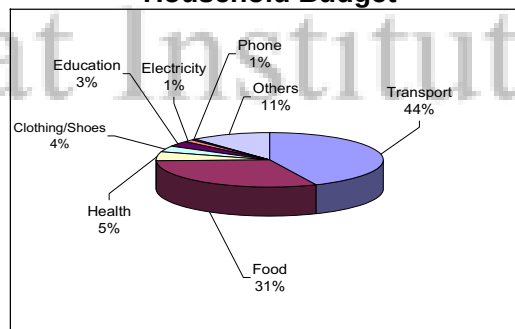


Figure 23:
Household Budget



6.5 Extent of Indebtedness

Table 7 reveals that, on an overall basis, 51% of households had availed credit/ loan of some type during 2006-07. Loan availing households reported that 62% of them were paying installments regularly while 38% denied. In response to a question whether income of the households increased due to loan opportunity, overwhelming majority of them (88%) were of the opinion that their income did not increase. The amount of loan ranged from Rs. 700 to 500,000 while the average was estimated at Rs. 71,247 only.

**Table 7:
Received Loan**

Received Loan (%)	Yes	51%
	No	49%
Installments are paid Regularly (%)	Yes	62%
	No	38%
increased household income	Yes	12%
	No	88%
Amount of loan (Rs.)	Minimum	700
	Maximum	500,000

6.6 Purpose of availing loans

Figure 24 shows the purpose of availing loan. About 75% of the loan availing households reported that loan was taken for fishing purpose including purchase/repair of boats and nets. Local lender/ fish merchants were recorded to be very active in providing loans to fisher folk families. Against loan, very cheap fish purchase was observed. In most of the cases, it was reported that loan provider were less interested in loan recovery, but to ensure supply of fish by the borrowing fisher folk. The repayment schedule was very flexible, which extended for many years.

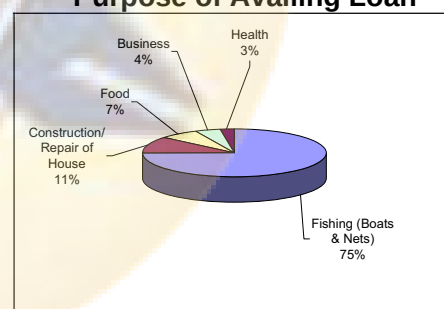
The second largest purpose (11%) of availing of loan was construction/ repair of house followed by food (7%), business (4%) and

health (3%). Irony of fact was that the money lenders exploited most of the resources of indebted fishermen by buying the fish catch

at the cheap rates

as low as 20%-30% of the market rates at big cities viz. Hyderabad and Karachi. This invites the attention of public and private sector financial institutions that credit may be provided at soft terms and conditions.

**Figure 24:
Purpose of Availing Loan**



6.7 Source of Loan

Figure 25 shows the sources of loan. The figure reveals that all the loans were obtained from local lenders. There was no role of NGOs and banks in providing loans. There is no branch of any bank at Keti Bunder. None of the respondents reported loan obtained from NGOs. The CBOs being formed by the WWF- Indus for All Programme can play an effective role at Keti Bunder to serve as micro-finance institutions.

6.8 Impact of Loan on Household Income

Figure 26 displays the reasons due to which the credit obtained could not augment household income. The main (50%) reason was identified to be high interest rate. Interest rate for local lenders was about 30%-40% per annum which was received either directly or in some form (sale of fish at cheap rate) while NGO charge 18% (at Pai Forest, Nawabshah) and Banks 14-16%. Improper utilization of loan was reported by 24% of the loan recipients. For instance, loan was obtained for purchase of boats and nets, but the same was utilized for other purposes may be on repayment of old loans, rituals of marriage, health and construction of house. Low amount was categorized by 22% while the small duration of loan was pronounced by 4%. At Ketu Bunder, Thatta amount of loan was found directly correlated with number of boats and nets as well as credibility of fisherman in repayment in the form of supply of catch/fish. Duration of loan was recorded to be 3-5 years.

Figure 25:
Source of Loan

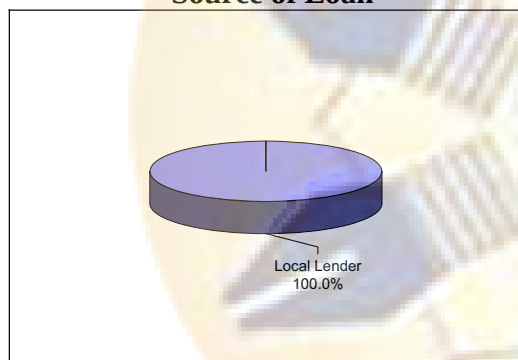
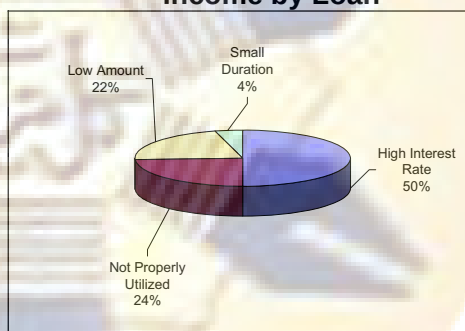


Figure 26:
Reasons of not Increasing Income by Loan



6.9 Livestock (Buffaloes and Cows)

Table 8 shows that female buffaloes were found in 11% houses while their average number was about 2.52. Milking buffaloes were found in 8% households only. Male buffaloes were recorded in 3% households only with the average number of 1.14. In comparison to buffaloes (possessed by 11% of households); significantly less proportion (0.4% only) of households possessed cows. The average number of female cows was 1 against 2 male cows. The reasons behind less number of households rearing livestock were pronounced to be lack of fodder, grazing fields, and non-availability of water.

**Table 8:
Buffaloes and Cows**

		HHs(%)	Mean
Buffaloes	Male	2.8	1.14
	Female	11.0	2.52
	Milking	7.7	2.00
Cows	Male	0.4	2
	Female	0.4	1
	Milking	0.4	1

**Table 9:
Milk production, consumption and sale**

		Liters	%
Buffalo	Production	4.35	100
	Consumption	2.35	54
	Sold	2.00	46
Cow	Production	1.00	100
	Consumption	1.00	100
	Sold	0.00	00

6.10 Milk production, consumption and sale

Table 8 reveals that the average production of milk was 4.35 liters. About 54% of the milk (2.35 liters) was consumed by the household members while 46% of the milk (2 liters) was sold. Irony of the fate was that once rich in livestock, price of a liter of milk was reported to be Rs. 60-80 in creek villages against Rs. 35 in major towns of Sindh. Powder milk was commonly used for tea making. Almost all the cow milk was consumed by members of households.

6.11 Various Type of Livestock and Poultry

Table 10 compiles data on the ownership of various animals and poultry birds at Ketu Bunder, Thatta. Goat and sheep ownership were reported by 6% and 1% households, respectively. Camels were possessed by 4% of households. Donkeys were reported by 1% households. Poultry birds were maintained by 10% of the households. The average number of goats was 3.36 and sheep was 6 per household. This clearly indicated that small proportion of household possess sheep (only 1%), but their average number

was substantially high (mean = 6) as compared to goats possessed by 6% with average number of 3.3 per household. About 2 donkeys were reported per household. Donkeys are cheap and very useful animal for fetching water and

**Table 10:
Various Type of Livestock Available**

	HHs(%)	Mean
Goat	5.7	3.36
Sheep	0.8	6.00
Camel	3.7	9.78
Donkey	0.8	2.00
Poultry	9.3	2.87

other material. The average number of poultry was 3 birds per household.

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6.12 Livestock Transactions and Mortality

Data presented in Table 11 reveals the status of animal purchase, sale, births, and deaths at Keti Bunder, Thatta during 2007. Very poor transaction of animals was recorded. No purchase of buffaloes, cows, and goats was recorded. Buffaloes were sold by 1.2% households while the average number was 1.6. Again, no sale and no new born cows were found at Keti Bunder, Thatta. New born buffaloes were reported by 5.3% households with average number of 1.38. Mortality of buffaloes was found in 0.4% households with average number of 1.38.

**Table 11:
Economics of Livestock**

		N(%)	Mean
Buffalo	Purchased	---	---
	Sold	1.2	1.67
	Died	0.4	2.00
	New Born	5.3	1.38
Cow	Purchased	---	---
	Sold	---	---
	Died	---	---
	New Born	---	---
Goat	Purchased	---	---
	Sold	---	---
	Died	---	---
	New Born	1.2	1.33

**Table 12 Ranking of Development
Priorities**

7. Community Development Priorities

Table 12 reveals data about the ranking of development priorities. The first priority was water supply followed by school, dispensary, loan and roads. A significant proportion of income of inhabitants of Keti Bunder was reportedly spent on purchase of water and its transportation through boats.

Ranking	Options
First	Water Supply
Second	School
Third	Dispensary
Fourth	Loan
Fifth	Road

Education being important factor of development, overwhelming majority (90%) of the population of age 15 years and above was illiterate and about one tenth of the household were sending their male children for primary education against an overall proportion of 30% in Sindh. Due to poor health status and lack of health facilities, the need for dispensary/BHU is also very much judicious.

8. Qualitative Inferences

The focus group and key informants stated that there are a total of about 1,000 fishing boats owned and operated by local communities- 200 large boats (30-40 feet long), 200 medium size boats (20-30 feet long) and 600 small boats (10-20 feet long). The large boats go to the open sea for all kinds of catch, the medium boats most usually operate in shallow water for fish catch, while the small boats are used mainly for shrimp and crab catch inside creek waters. They observed that, due to lack of freshwater downstream Kotri, the sea intrusion has accelerated in recent years. Consequently, the open sea which used to be at least 12 km away from Ketu Bunder town, is now at a distance of 3 km only causing serious threat to the protective bund. The quantum of fisheries catch had declined and the mangrove cover has shrunk drastically.

The Aga Khan Planning and Building Services (AKPBS) was recognized as the main developmental agency, undertaking various infrastructure works in the Ketu Bunder vicinity. In addition to the newly formed Hajamro Mahol Dost Committees at Tippun, Kharioon, Phirt and Meero Dabho, sponsored by the WWF, the United Community Development Organization (UCDO) was considered as an important local CBO having some project implementation experience. The UCDO was reported to be in the registration phase. Three CCBs were also reportedly registered in the target villages- Roshan CCB at Haji Moosa Katiar, Umar Jat CCB (at village Haji Ismail Jat), and Haji Abu CCB. These villages have received the bulk of AKPBS projects, due mainly to their proximity to Ketu Bunder town and the influence of their community leadership. Gunb village is also receiving infrastructure support from the AKPBS. Current WWF interventions include mangrove plantation (a total of 40 ha), sanitation drive in Ketu Bunder (killing of dogs and vaccination), wind turbines in two villages, fuel efficient stoves, cold storage in 10 boats, provision of boat water taker, and repair of houses and boats.

There is no bank and no formal fisheries market at Ketu Bunder. Main sources of information for the population are radio, newspapers (Kawish and Jang) and friends & relatives. Political leadership of the area is claimed by two rival groups- Sheerazi Group of Thatta and the Malkani Group of Jati. Influential inland groups include Memon, Sholani Baloch and Jat castes; while Dabho caste is the main group inside Chhan and Hajamro creeks, and Jat community in the Tarshan (Kangri) and Khobar creeks.

8.1 Issues and Options

Participants and respondents from creek communities identified the lack of drinking water, recurring disasters, depletion of mangroves and creek fodders, human disease, high cost of fuel and ration, low catch, exploitative middlemen and low rates of fisheries as the main issues to be addressed. Inland communities pinpointed shortage of drinking water as well as irrigation water, lack of fodder and grazing areas due to sea intrusion, floods and disasters, protective bunds for villages, unemployment, poor roads and transport and diseases as their main issues. The following options and suggestions were advanced:

- Poultry feed mills be established in the area to provide local market for leftover fish and *Gand* (very small fish).
- NBP branch, now closed, be reopened and institutional credit facilities be provided. Microfinance programmes may be initiated.

- Natural beaches at Hajamro and Chan creeks be developed and tourism facilities be established.
- Wherever feasible at inland villages, hand pumps be installed.
- Subsidies on POL for fishing boats be given to the extent of 40%, as admissible in India and Iran.
- New markets be explored for shrimp, Pamphret and other sea food.
- Hospital and Maternity home be established at Ketī Bunder and Juho- a large and developed settlement of Ghora Bari taluka which is in close proximity to Hajamro and Chan creeks.
- Road infrastructure be strengthened, specially the road from Ketī Bunder to Juho.
- Mangrove plantation by the WWF be managed through the communities and not through non-local contractors.
- Dai training be imparted specially in creek villages.
- Eye camps are needed.
- Well developed jetties be constructed at selected sites.
- Fiberglass water tanks be provided to the families, on soft loan basis.
- Harmful nets and large fishing trawlers be effectively banned.
- Increasing number of illegal fishermen from other provinces and countries may not be issued licenses.
- Mangrove wood cutting for sale in connivance with the SFD staff may be controlled, specially from the chan creek.
- Health awareness be provided so as to minimize smoking and drug use/ choora consumption- drug added beetle leaf and nuts.
- Influential contractors have installed harmful nets on the creek mouths, causing life threat to the poor fishermen. Pouch of Gujo net is disastrous. Import of such nets from Bangladesh should be banned.
- Eco-tourism in Chann creek to visit mangroves and algae sites.
- Fresh water be released to enhance fish production and mangroves regeneration.
- Shrimp and fish farms be established near Ketī Bunder shore.
- Poultry farms be established for employment.
- Ketī BUnder shore is suitable for mangrove plantation.
- Compensation for lands engulfed by sea intrusion may be given.
- Girls Middle School be established at Ketī Bunder.
- Shrimp cleaning center be established here for increasing income of women.
- The abolished project of Ketī Bunder Harbor/ Port may be re-initiated.

8.2 Community Input for Development

Specific needs of poor villages were compiled as under:

- Hand pumps at village Alam Sholani could provide good quality drinking water for 3 nearby villages. Other places in the vicinity have brackish water.
- Faqiriani Jat village needs a protective bund on priority basis. Nearby villages have been given the project on political basis. The villagers feel neglected by all the agencies. It is a low cost project for the consideration of the WWF.
- Village Mamoon Dablo also needed a protective bund.
- Village Meero Dablo needs a road to connect the community to Ketī Bunder.

- Mangrove plantation was emphasized by village Kharioon community.
- Ice boxes were mentioned at Village Ali Dablo.
- For priority interventions by the WWF- Indus for All Programme, the following very poor communities could be recommended: Berum, Alam Sholani, Gul Hassan Jat, Guli Sholani, and Siddique Dablo.

9. Summary and Findings

Keti Bunder is one of the major towns in Thatta district along the coastline that is facing environmental degradation and loss of livelihood opportunities for the local communities.

In Keti Bunder, villages were divided into two categories viz. Inland and Creek villages. A total of 30 villages was designated as target villages for the WWF- Indus for All Programme. Overwhelming majority (89%) of these villages was small. Eight villages were selected from creeks and 9 from inland as sample for the baseline study.

Total number of sample household surveyed from creeks was 104 and 142 from Inland villages. The average household size, enumerated from survey data, was 5.4 members. Average age at marriage for male was 21 years and for female it was about 18 years. Child marriage was also observed in some cases. Very small proportion (11%) of the household heads were recorded to be literate. Compiled data further reveals that 7.8% of the household heads have education up to primary, 1.6% middle, 0.8% matriculate, 0.4% intermediate, and 0.4% graduates. About 89% of household heads were illiterate. The minimum distance was about 1 km while the maximum was about 60km to reach the health facility while the average was 7 km. Expenditure on health varied from Rs. 40 to 3,000 only. The average expenditure was about Rs. 475 per month. Overwhelming majority (79%) births were attended by local Dai (TBA). Only about 2% births were handled by trained LHVs overwhelming majority (79%) births were attended by local Dai (TBA). Only about 2% births were handled by trained LHVs at the villages.

Fishing was reported to be major profession of more than three-fourth (77%) - 89% of the household heads reported fishing as major profession in creek villages against 67% in the inland villages. Fish was identified to be most accessible natural resource. The least accessible natural resource was drinking water with substantially high response rate of 92%. About 55% of households reported that due to degradation of drinking water, their average income had reduced to the tune of about 52 percent. Loss of income (51%) was reported by 61% of the households for reduction in production/catch of fish. One-fourth (25%) of respondents reported loss of income to the tune of 47% due to depletion of mangroves.

Jhoopra (thatched huts) were found dominant with proportion of 91%. Almost all the houses (100%) were *jhoopra* in creek villages against 84% in inland villages. It was inferred that housing condition was very poor since overwhelming majority of houses (93%) were either *katcha* or *jhoopra*. Only 4% of the houses had hand pumps installed in houses while overwhelming majority (96%) collected water from outside. Based upon average household size (5.4 members per house) and number of rooms per house (1.39); average number of household members per room was calculated to be about 4, which speaks volumes about the congested living conditions.

The highest wages of Rs.204 per day were recorded for fishing. The average wages per day for embroidery was Rs.180. On an average basis, shop keepers earned Rs.142 while agricultural labor earned Rs.100 only. Since the median income (Rs.6,000) was less than arithmetic average (Rs.7,000), the distribution of income was assumed to be skewed rather than normally distributed.

Median expenditure (50th percentile) was Rs. 4,000 which reveals that half of the population had expenditure more than Rs. 4,000 while the remaining half had less than the median value. About 44% of the budget expenditure was incurred on transportation only. This expenditure is too much because water in creek villages is also brought on boats. Expenditure on food was estimated at 31% only which is lowest in terms of percentage of total expenditure when compared with Keenjhar, Thatta; Chotiari, Sanghar; and, Pai Forest, Nawabshah where 39% was recorded on food. About 5% of the budget was reported on health including doctor fee and medicines. Expenditure on clothing and shoes was computed to be 4%. Expenditure on education was about 3%, which is the lowest as compared to that at the above mentioned programme areas.

The first priority was water supply followed by school, dispensary, loan and roads. Participants of focus groups and respondents from creek communities identified the lack of drinking water, recurring disasters, depletion of mangroves and creek fodders, human disease, high cost of fuel and ration, low catch, exploitative middlemen and low rates of fisheries as the main issues to be addressed. Inland communities pinpointed shortage of drinking water as well as irrigation water, lack of fodder and grazing areas due to sea intrusion, floods and disasters, protective bunds for villages, unemployment, poor roads and transport and diseases as their main issues.



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ANNEXURE

SUMMARY NOTES ON THE TARGET VILLAGES OF KETI BUNDER

1. Haji Moosa Katiar. Roshan CCB. Fisheries & agriculture. Water shortage for agriculture; fodder shortage for livestock, low rates for fisheries. Disease and floods. Drinking water and dispensary are priorities.
2. Haji Moosa Jat. Diseases, unemployment and floods. Water, road and school.
3. Haji Alam Sholani. Poor village. Road, school, dispensary and water supply needed. Irrigation water, fodder, diseases and floods are challenges/ issues.
4. Gunb. AKPBS support for embankment and Latrines. Fishing accessories are costly, while rates are lower. Issues are drinking water and diseases. Priorities are school, electricity, dispensary and water supply.
5. Village Faqiriani Jat. Fishing and Mat making main skills. Also engine overhaul & boat painting. Low rates of fisheries is the main issue. Water supply, school and protective bund are the priorities.
6. Village Hamzo Guggo. Fodder shortage is the main issue. School, dispensary and drinking water are main priorities.
7. Haji Mamoon Dablo. Low catch and low fish rates are the main issues. Increasing number of fishermen from outside. Also flood, drinking water and unemployment. Protective bund needed.
8. Kharioon. Hajamro Mahol Dost Committee by WWF. Skills are fishing, net making and carpenter. Low rates of fisheries. Protective bund, water and dispensary needed. Institutional credit and mangrove plantations as well.
9. Tippun. Net making and boat making are skills. Hajamro Mahol Dost Committee. Experience of mangrove plantation thru WWF. Wind mill. Flood, disease and unemployment are main issues. Trader exploitation also. Training and Loans needed.
10. Yousif Dablo. Fishing, net making and carpenter are skills. Low rates and exploitation by traders are issues. Maternity home and electricity needed. Also mangrove plantation, water supply, loans and school.
11. Ber Jat. AKPBS programme. Harmful nets, low rates and exploitative loans are main issues. Protective bund, road and school are priorities.
12. Gul Hassan Jat. Harmful nets, low rates and lack of markets in fisheries. Very poor village. Flood and diseases are main issues. Water supply, dispensary and school needed. Exploitative loans are a challenge. Institutional credit needs.
13. Ali Dablo. Ice boxes, high cost of fuel and lack of market main issues of fisheries. Flood and diseases. Water supply, school and dispensary needed.

14. Guli Sholani. Very poor. Flood and unemployment are challenges. School, water supply, loan and dispensary needed.
15. Haji Ali Jat. Transport, market and low share are problems in fisheries. Electricity, school and dispensary are basic necessities.
16. Haroon Lakhio. Low catch, low rates, lack of market, floods and unemployment. School, dispensary, loans and drinking water needed.
17. Haji Sheedi Dablo. Water supply main issue. Flood and unemployment also. School and water supply needed.
18. Hassan Jat. Harmful nets and lack of market. Flood and diseases. Water supply, dispensary, and electricity perceived needs.
19. Haji Ismail Jat. CCB Muhammad Umar Jat. Influential leadership. AKF working here. Have protective bund. Girls school and dispensary needed. Mangrove plantation, environment awareness and training needed.
20. Ketu Bunder. UCDO and Ketu Women development Organization. WWF has NRM programme while AKPBS have social development, physical environment, education and health programmes. Training in CCB formation by WWF and in Organizational Management by the AKPBS. Middlemen exploitation and low rates problems. Rural credit scheme, gas, bank, jetty, vocational training needed.
21. Meero Dablo. AKPBS has erected protective bund. WWF wind Mill. Unemployment, road and disease issues. Water supply, road and school needed.
22. Ali Bux Jat. NHA has approved the road. Flood, unemployment and diseases. Road, water supply, bank and protective bund needed. Also mangrove plantation. Education and skills training emphasized.
23. Bhoori. Exploitation by middlemen, poor fish and wood resources and unemployment issues. School, dispensary, water supply and road access needed.
24. Berum. Low rates of fisheries is the main issue. Drinking water brought from Ketu Bunder (10 km). Very poor. Water supply, food and transport are needs.
25. Ramzan Lakhio. High fuel prices, lack of market and low catch are issues. Flood, unemployment and diseases. School, water supply and market needed.
26. Khuda Bux Jat. Poor village. Middlemen, transport, low price are issues. Road, protective bund and drinking water needed. Training on NRM.
27. Phirt. Hajamro Mahol Dost Committee. WWF programme on NRM. CCB training by WWF. Ration, fuel rates and low fish rates are issues. Water supply, school, and loan are priorities. Harmful nets and illegal wood cutting be banned.
28. Siddique Dablo. Poor village. Drought and human disease. School, loan and water supply are the priorities.

29. Haji Hashim Jat. Lack of market, harmful nets, and exploitative middlemen. Flood, unemployment and human disease issues. Water supply, school, road and dispensary needed.
30. Haji Abu Jat. CCB Haji Abu Jat. Influential leadership. AKPBS road project. Fodder, drinking water and livestock dispensary needed. Low rates, transport, flood, unemployment and theft problems. Girls school, road, protective bund and drinking water needed.



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Keenjhar Site Specific Final Report

Indus For All Programme



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May, 2008

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Acronyms	
HH	House Hold
KB	Kalri Baghar
MAF	Million Acre-Feet
MDC	Management and Development Center
NCHD	National Commission for Human Development
NGO	Non-Governmental Organization
PFF	Pakistan Fisherfolk Forum
TBA	Traditional Birth Attendants
UC	Union Council
UNICEF	United Nations Children's Fund (formerly United Nations International Children's Emergency Fund)
VDO	Village Development Organization
WWF-P	World Wide Fund for Nature for Pakistan

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BASELINE INDICATORS OF KEENJHAR

SITE SPECIFIC REPORT

This report presents site specific baseline indicators for Keenjhar priority area of the WWF- Indus for All Program.

1. Background Information

Located in Thatta District, Keenjhar is a freshwater lake covering an area of about 14,000 ha. It is a wildlife sanctuary and a Ramsar site. The lake is rich in fish fauna and supports the livelihood of about 50,000 people. It is an important breeding and wintering area for a wide variety of birds. It is located between latitudes 24-15 to 25-30 N and longitudes 67-30 to 68-15 E. It came into existence as a consequence of implementation of the Kotri Barrage Canal Irrigation Project. This artificial reservoir has been formed out of natural depressions called Sonehri and Keenjhar dhands, by closing gaps in the surrounding hills with earthen embankments having an average height of about 7 meters (25 feet). The lake is 32 km (20 miles) long and has a spread of 130 sq km (50 sq miles). The gross storage capacity at its full conservation level (RL 54.00) is 0.52 MAF. Its minimum downstream level is RL 42 and usable storage is 0.37 MAF. Source of freshwater for Keenjhar lake is the Kalri Baghar (KB) feeder which takes off from the Kotri Barrage near Jamshoro.

Keenjhar is a vital wetland area of great ecological, biological, hydrological and economic significance. It has several attributes such as fish, recreation, tourism, wildlife, flood control, ground water recharge, and fresh water supply. This lake is internationally important for breeding, staging and wintering of water birds. Keenjhar, Hadero and Haleji lakes provide refuge to almost 250 different species of birds. Common, among these birds, are grey heron, purple heron, night heron, purple ganinule, water rail, brahminy kite, black shouldered kite and coucal. Keenjhar is also famous for its extensive reed beds. The lake has a remarkable cultural status in Sindhi literature because of the legendary romance of Noori and Jam Tamachi. The grave of Noori (fisherwoman turned queen), is located on an island in the middle of the lake.

The primary function of the Lake is to provide domestic and industrial water supplies to the Metropolitan City of Karachi. In addition, the Lake also caters for the irrigation water requirements of 142,600 ha (352,300 acres) perennial and 120,000 ha (252,000 acres) non-perennial area in Thatta district. The lake also serves as a reservoir for the runoff from three major hill torrents- Choher Nallah, Kalu Nallah and Muthan Nallah. Located on national highway and being the nearest water body with great scenic beauty, the lake also serves as a tourist resort especially for the urban population of Karachi. It has 12 tourist lodges and a restaurant managed by the Pakistan Tourism Development Corporation.. More lodges are being constructed currently. There is, however, no suitable arrangement to develop planned tourism and reliable livelihood opportunities for the local communities based on tourism.

2. Methodology and Household Sample

Descriptive research is used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. The methods involve structured surveys which describe the status quo about selected socio-economic indicators, the correlation studies which investigate the relationship between variables, and developmental studies which seek to determine changes over time. The descriptive research design was selected because the primary purpose of the present study was to establish the pre-project/program baseline socioeconomic profile as well as status of human and natural resources for the development of a planning and policy matrix to ensure sustainable livelihoods.

In general, the baseline studies use the standard statistical sample given in table- 1.

Table 1: Population Size and Statistical Sample for Baseline Studies

S.No.	Population Size (e.g. Total Households)	Suggested Sample
1.	10	10
2.	50	44
3.	100	80
4.	500	217
5.	1,000	278
6.	3,000	341
7.	50,000	381
8.	100,000	385

Source: Samji and Sur. 2006. Developing A high Quality Baseline. World Bank, New Delhi.

To determine a representative household sample size, the following equation was used:

$$n = \frac{N\pi(1-\pi)}{(N-1)(C/Z_{\alpha/2})^2 + \pi(1-\pi)}$$

Where n is recommended sample size, N is population size, π is proportion of a characteristic of interest (e.g. literacy rate, poor population, and mortality), C is $\pm$ error rate (confidence interval), and $Z_{\alpha/2}$ is tabulated value for confidence level (Tryfos, 1996). Plugging the proportion of 0.5 (which gives the maximum variance, $0.5*(1-0.5)= 0.25$), error rate (confidence interval) of $\pm 5\%$ and 1.96 tabulated value of $Z_{\alpha/2}$ for 95% confidence level and number of households (population) were estimated.

In Keenjhar, 38 villages were recorded around the lake. Household data were collected from 26 villages with almost the similar proportions (73% small, 19% medium and 8% large) of total number of villages. Total households surveyed in the area were enumerated to be 309. Proportions of households from small, medium and large villages were 41, 34 and 25 percent respectively.

3. Human Capital

3.1 Household Size

The average family size, enumerated from survey data, was around 7 members, table-2. The estimate coincides with the national figure for rural household size of 7 members. About 16% of the households had up to 3 members. About 56% of the households were recorded having household size between 4 to 8 members. Proportion of households with members between 9 to 13 was 20% and 14-18 members was 5% while only 3% of households were recorded with more than 18 members.

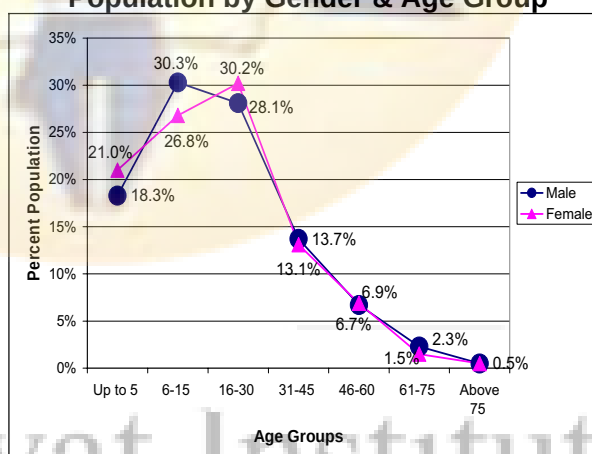
3.2 Age Groups by Gender

Figure 1 presents the distribution of population by gender. About one-fifth (21%) of the population was recorded with tender age up to 5 years. Majority of the population (60%) was recorded for two groups: i) from 6 to 15 years and ii) 16- 30 years; about 30% for each group. Proportion of population of age group 31-45 years was around 13%; 46-60 years was 7%; 61-75 years was 2% and above 75% was less than 1%. Distribution of population by gender indicates that female population is almost the same for all age groups except in children (up to 5 years) and youth groups (16-30 years), where it is higher.

Table -2
Household Size

Average Family Size		7.2
Distribution (%) of families by members	Up to 3	16.2
	4-8	56.5
	9-13	20.1
	14-18	4.5
	19 & above	2.6
	Total	100.0

Figure 1:
Population by Gender & Age Group



3.3 Average Age at Marriage

Figure 2 reveals that average age at marriage for male was 21 years and for female it was about 17 years. It was noted that tradition of child marriage has changed due to education. Significantly higher ages of educated couples were recorded in comparison to their illiterate counterparts. In some cases, child marriages were also observed. Figure 2 also presents minimum ages at

marriage by gender. Minimum age of male at marriage was about 12 years and female was 10 years while the maximum ages for both genders was 35 years.

**Figure 2:
Age at Marriage**

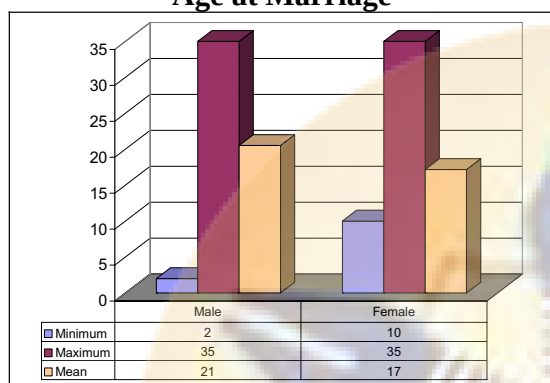
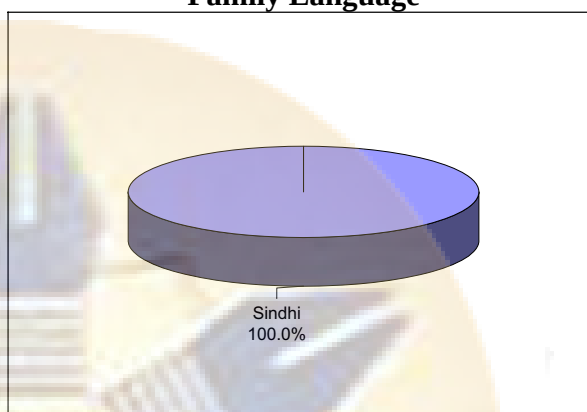


**Figure 3:
Family Language**



3.4 Family Language

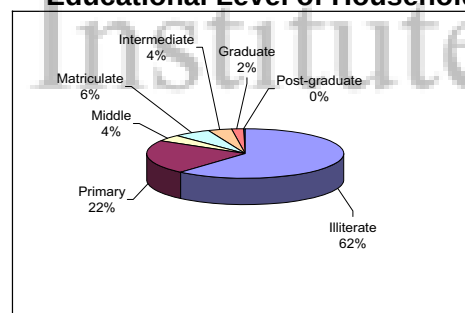
Figure 3 shows that Sindhi was the family language of all surveyed households. In comparison to other priority areas, namely Keti Bunder, Thatta; Chotiari, Sanghar; and, Pai Forest, Nawab Shah where other family languages exist to some degree, Keenjhar, Thatta is typically a monolingual area.

3.5 Education of Household Head

Figure 4 reveals educational level of household head. Majority (62%) of the household heads were reported to be illiterate. Primary education was enumerated to be 22% while middle was 4%, matriculates 6%, intermediate 4%, graduates 2% and postgraduate less than 1% only. These estimates reveals high level of illiteracy at Keenjhar in comparison to the averages for Sindh province where about 34% rural male population was recorded to be illiterate (NFDC, 2002). Educated population in Sindh was further segregated as: under matric,

intermediate, graduate and postgraduate were 29%, 23%, 11% and 3% respectively.

**Figure 4:
Educational Level of Household Head**



3.6 Education of Household Members

Data collected on household members of age above 15 years, segregated by gender, reveals significant difference in educational level (Table-3). Only 12% of the females were educated against 38% males. Out of 12% educated females, about 8% had primary education, 0.6% were middle pass, 1% matriculates and only 0.4% intermediate. Gender biases in educational status established the need for more work on female education for human development.

Table 3
Educational Level of Family Members (%)

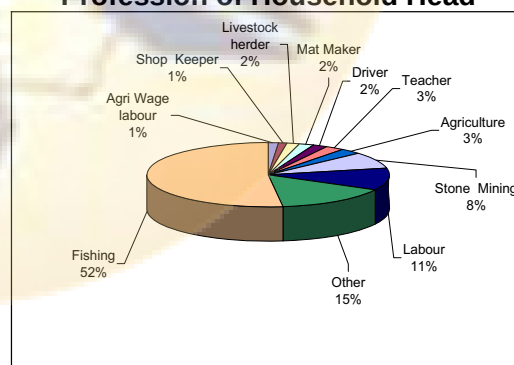
	Male	Female
Illiterate	61.6	88.2
Primary	21.3	7.6
Middle	4.0	0.6
Matriculation	7.2	1.0
Intermediate	4.0	0.4
Graduate	1.6	0.0
Postgraduate	0.2	0.0

3.7 Profession of Household Head

Figure 5 reveals profession of household head. More than half (52%) of household heads reported their business as fishing. Daily wage laborers engaged in different type of work including construction were about 11%. About 8% of all the households heads at Keenjhar were engaged in stone mining, whereas Agriculture related households were only about 3%. Teachers, drivers, mat makers, and livestock herders constituted the remaining 5% of occupations.

Various categories having proportion of less than 1% were designated as “other” which constituted 15% of the households. The “Other” category included artisans, mechanic, plumber, pesh imam, carpenter, home servant, wood cutters, contractor and poultry farm manager, etc.

Figure 5:
Profession of Household Head



3.8 Prevalence of Common Diseases

Figure 6 shows proportion of households reporting various diseases and their occurrence by number of times per year. The highest proportion (63%) of households reported Malaria as a common disease while its occurrence was about 2.3 times per year. The highest occurrence (3.84 times per year) was recorded for skin diseases, reported by 37% of the households. Diarrhea was reported by one half of the households (50%) with occurrence of 2.5 times per year. Diarrhea is a waterborne disease and mostly the children were pronounced to be more vulnerable to fatal disease. The average occurrence of cholera, typhoid, jaundice, respiratory diseases and eye diseases were 2.4, 2.5, 1.6, 3.3, and 1.5 respectively while the proportion of households reporting these diseases were 18%, 12%, 8%, 8%, and 5% respectively.

Figure 6:
Prevalence of Common Diseases

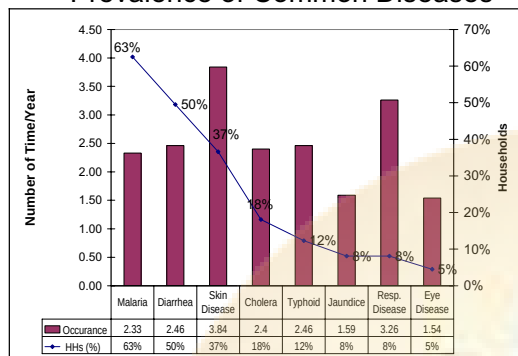
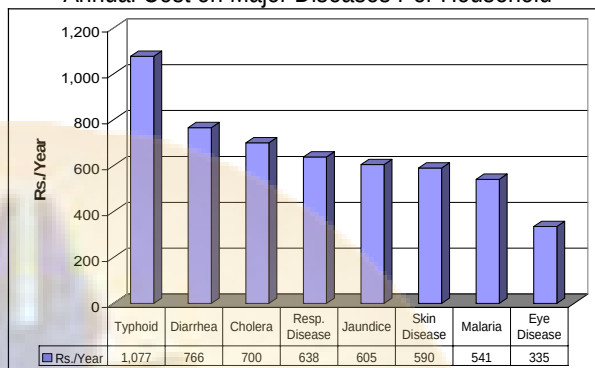


Figure 7:
Annual Cost on Major Diseases Per Household



3.9 Annual Cost on Major Diseases per Household

Figure 7 displays the annual cost on major diseases per household. The common grievances of poor households were high cost of medicines, doctor fees, and laboratory testing fees for diagnoses. Although most of the medicines are locally produced in Pakistan, sky rocketing prices are mostly attributed to inflation, which is as high as 7% to 10%. Under the circumstances, average expenditure on typhoid alone was about Rs.1000 only followed by Rs.766 only for diarrhea, Rs.700 only for Cholera, Rs.638 only on respiratory diseases, Rs.605 only on Jaundice, Rs.590 only on skin diseases, Rs.541 only on Malaria, Rs.335 only on eye diseases; per household per annum basis.

3.10 Health Facility Availed

Figure 8 reveals the health facility availed for treatment of diseases. The figure displayed that 59% of the households visited private clinic. Taluka hospital was availed by about one third (32%) of the households while dispensary and/or Basic Health Unit were availed by only 9% of the households. Despite higher costs, majority of the households preferred private clinics as a source of treatment so as to avail better health care by privately practicing doctors and for diagnosing diseases and prescribing proper medicines. Non availability of doctors and medicines were reported to be major reasons of low rate of participation in public health sector facilities and programmes.

3.11 Distance from Facility and Expenditure on Health

Table-4 reveals distance from health facility and expenditure on health. The minimum distance was about 1 km while the maximum was about 70km to reach at health facility while the average was 10 km. It was reported by some of households that they preferred district/ civil hospital at big cities e.g. Thatta and Hyderabad for treatment purpose. Expenditure on health varied from Rs.5 to 4,000. Subscription fee at public sector hospital/BHU/dispensary is Rs.5 which is reflected in the table as minimum cost (Rs.5) on health. The average monthly expenditure was about Rs.500 only.

**Figure 8:
Health Facility Availed**

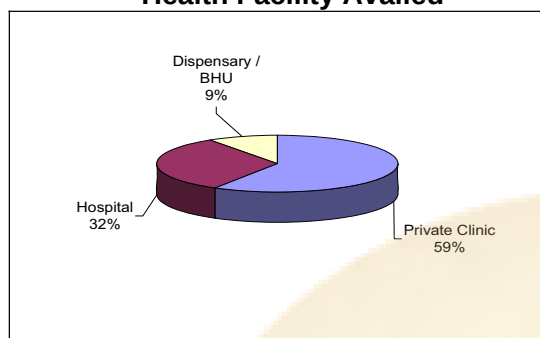


**Table -4
Distance from Health Facility and
Expenditure on Health**

	Minimum	Maximum	Mean
Distance (km) from health facility	1	70	10
Expenditure on health per month	5	3,000	501

3.12 Place of Child Delivery

Figure 9 reveals that overwhelming majority (87%) of births were attended by local Dai (TBA), while only about 0.7% births were handled by trained LHVs at the programme area villages. Public hospitals and private clinics were also visited for child births to the tune of 9.3% and 2.8%, respectively.

**Figure 9:
Place of child delivery**

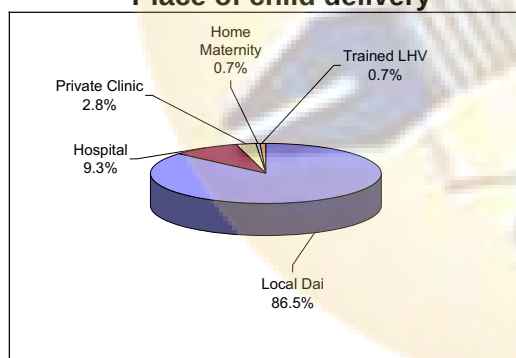


**Table -5 Expenditure and Delivery Related
Mortality**

Expenditure Per Delivery (Rs.)	Minimum	30	
	Maximum	5,000	
	Mean	823	
Delivery related mortality during last 5 years	Mothers	% of HHS	0.6
		Mean	1.0
	Baby	% of HHS	10.0
		Mean	1.45

3.13 Expenditure per Child Delivery

Expenditure per delivery, as reported by the households, are compiled in Table 5. Minimum expenditure per delivery was Rs.30 only while maximum reported expenditure per delivery was Rs. 5,000 only. On an overall basis, the average expenditure per delivery was computed to be Rs. 823 only.

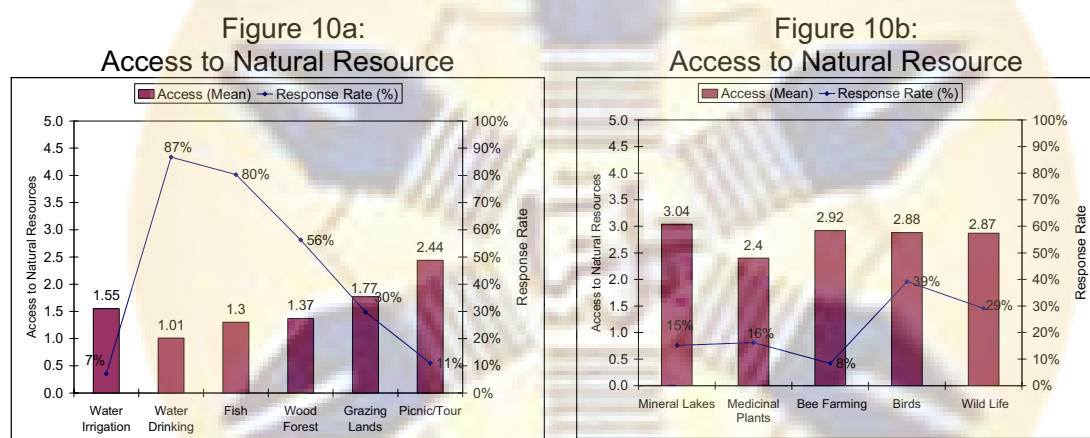
3.14 Delivery Related Mortality

Delivery related mortality is also summarized in Table 5. The table reveals that about 1% of the households reported mothers' mortality during last 5 years. About 10% of the households reported child mortality while the average number was estimated at 1.45. On an overall basis, per 100 households, about 15 children died during last 5 years. Thus, on an average, about 3 children died out of 100 households every year.

4. Natural Capital

4.1 Access to Natural Resources

Figure 10 displays response rate (%) and perceptions about frequent access to the natural resources. The Likert type scale used was: 1 means frequently; 2 means sometimes; 3 means undecided; 4 means rarely; and 5 means restricted. The more response rate (%) and the lower perceived average value indicates more access of households to the natural resources. Drinking water was identified to be the most accessible natural resource (response rate of 87% and the average value of 1), at Keenjhar, Thatta. Since households surveyed were nearby Keenjhar lake filled by Indus water, the underground water was sweet and easily accessible.



Scale used: 1 = Frequently; 2 = Sometimes; 3 = Undecided; 4 Rarely; and 5 = Restricted

The second and third most accessible natural resources were reported to be fish (80% response rate and average value of 1.30) and wood forest (56% response rate and average value of 1.37). Interestingly, less access to picnic/ tourism facilities at Keenjhar was reported with 11% response rate and average perception value of 2.44; which is close to being undecided about access. Figure 10b reveals that on an average basis, the respondents were undecided about their access to mineral resources, medicinal plants, bee farming, birds and wildlife. These estimates also reflect lack of knowledge of respondents about the above mentioned natural resources.

4.2 Degradation of Natural Resources

Analysis of respondents' perceptions presented in Figure 11a and 11b, reveals the extent of degradation of various natural resources during the last 5 years. Response rates (percentage of respondents) and their average (mean) perceptions have been reported. Likert type scale was labeled as: strongly agree 1; agree 2; undecided 3; disagree 4 and strongly disagree 5. Values close to 2 indicate that, on an overall basis, respondents agree with the research statement about degradation of resources.

Figure 11a:
Degradation of Natural Resource

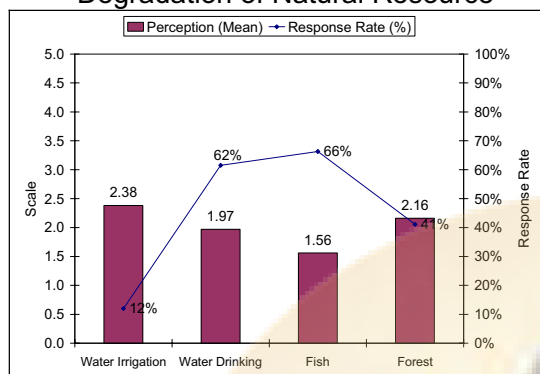
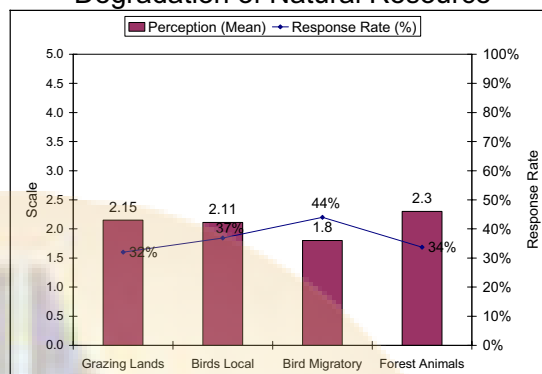


Figure 11b:
Degradation of Natural Resource



Research Statement/Hypothesis: Natural resources sharply degraded during last 5 years.

Likert Type Scale: 1=Strongly Agree; 2 =Agree; 3=Undecided; 4=Disagree and 5=Strongly Disagree

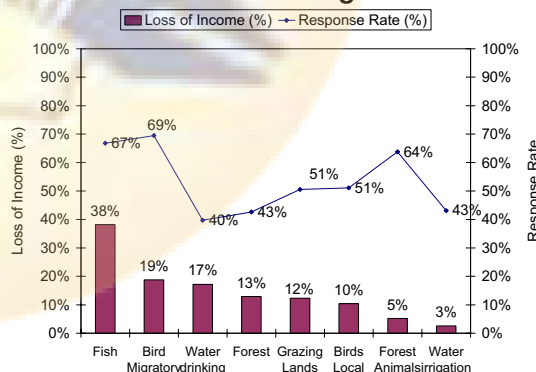
Majority (66%) of respondents from Keenjhar, Thatta agreed (mean =1.56) with the statement that fish production/catch has reduced sharply during last 5 years. Likewise, 62% of the respondents (mean =1.96) were in agreement with the research statement that supply of drinking water have reduced over the last 5 years. Figure 11b reveals that about 44% of the respondents agreed with the statement that number of migratory birds have substantially declined over the last 5 years.

4.3 Income (%) Reduced due to Depletion of Natural Resources

Figure 12 displays response rate (%) and loss of income (%) due to degradation of natural resources over the last five years. The highest response rate of 49% of households was recorded for irrigation water. The estimated loss of income was about 55% in terms of lower crop yields and incomes.

About two third (67%) of respondents were of the opinion that due to decline in fish production, their income has reduced to the tune of 38%. Likewise, 69% of the respondents expressed their concern about decline of income to the tune of 19% due to migratory birds. Forest animals were reported by 64%, grazing lands (51%), local birds (51%), forest (43%), drinking water (40%), while reduction in Income of households varied from 3% to 13% due to

Figure 12:
Income (%) Reduced due to Depletion of Natural Resource during Last 5 Years



degradation of above natural resources. It is concluded that fish and migratory birds are major sources of livelihood that have declined and caused substantial income losses at Keenjhar, Thatta during the last 5 years.

5. Physical Capital

5.1 Type of House

Figure 13 presents the baseline information about the type of housing at Keenjhar, Thatta. *Katcha* houses (mud houses) and *jhopra* were dominant with proportion of 40% each. One house out of every tenth (13%) was recorded to be *pacca* (bricks and iron or RCC structure). The proportion of Semi- *Pacca* (bricks and wood) was 7%. It was concluded that housing conditions were very poor and the overwhelming majority of houses (80%) were either *katcha* or *jhopra*.

Figure 13:
Type of House

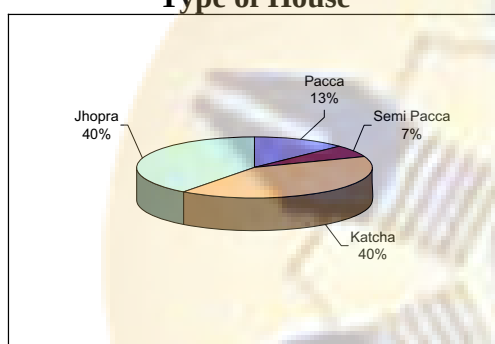
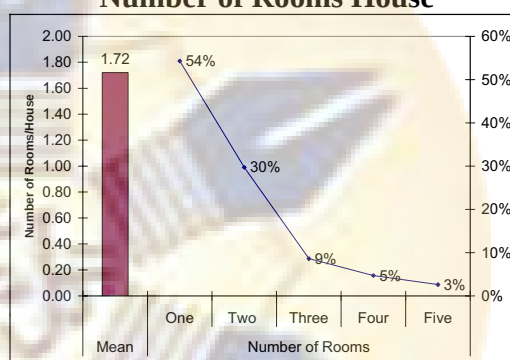


Figure 14:
Number of Rooms House



5.2 Number of Rooms per House

Figure 14 displays the average number of rooms per house and proportion of houses by number of rooms. The average number of rooms per house was 1.72. The highest proportion of houses (54%) was recorded with only 1 room while proportion of houses with 2, 3, 4, and 5 rooms were 30%, 9%, 5% and 3% respectively. The figures unveil significant difference between the proportions of 2 and 3 room-houses. Based upon average household size (7.2 members per house) and number of rooms per house (1.72); average number of household members per room was calculated to be 4. This is a clear measure of congestion, poor standard of living and lack of privacy.

5.3 Type of Toilet Facility in House

Figure 15 presents information on sanitation conditions measured by the toilet facilities inside houses. It was noted that open space was used predominantly (67%) at Keenjhar, Thatta. Proportion of non flush toilet/WC was about 12%. Only about one-fifth (21%) of the households had pit latrines inside housing units.

Figure 16 reveals that 44% (Fig -16) of the households had electricity. Even though the site is located on main national highway, more than half of villages are still deprived of electricity. Long load shedding hours is also a dilemma at Keenjhar and through out Thatta district.

**Figure 15:
Type of Toilet Facility in House**

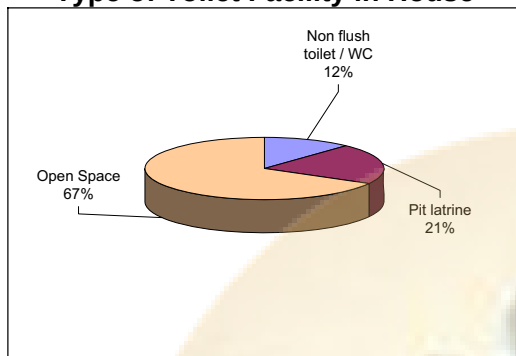
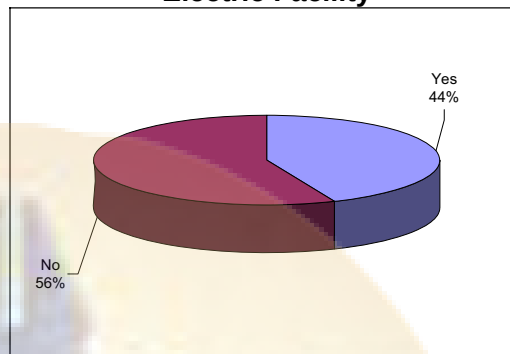


**Figure 16:
Electric Facility**



5.4 Sources and Quality of Water

Figure 17 indicates that about three fourth (76%) of the households use lake water. About 14% of the households collect water from adjoining canals and watercourses. Water supply schemes provided drinking water to only 7% of the households. Water from tanka was used about 1.4% of the households while 2.7% of the household reported various other sources such as hand pumps, etc. Regarding quality of water, 53% of the households reported that water is sweet. About 47% of households reported that the water consumed is normal. None of the households reported drinking brackish water. Good quality of water consumed by majority may be attributed to K.B. Feeder supplying water to Keenjhar Lake from the Indus river.

**Figure 17:
Sources of Water**

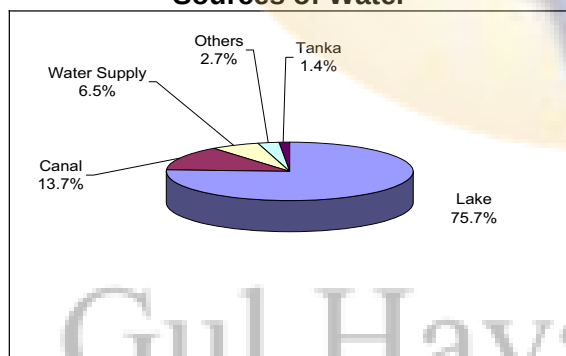
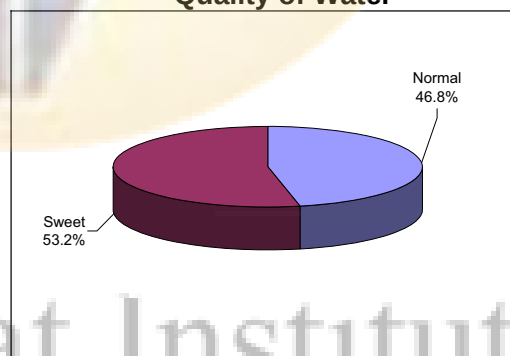


**Figure 18:
Quality of Water**

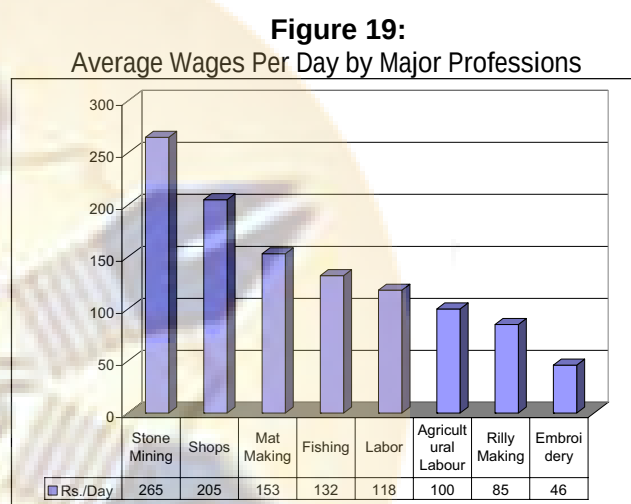


6. Economic Indicators

6.1 Wages Per Day by Major Professions

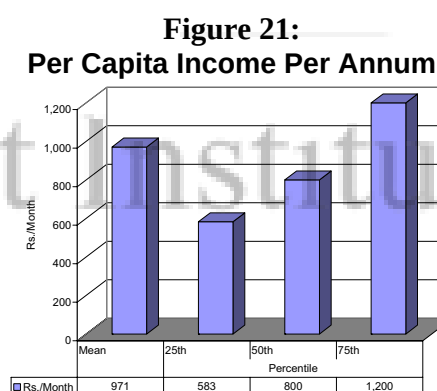
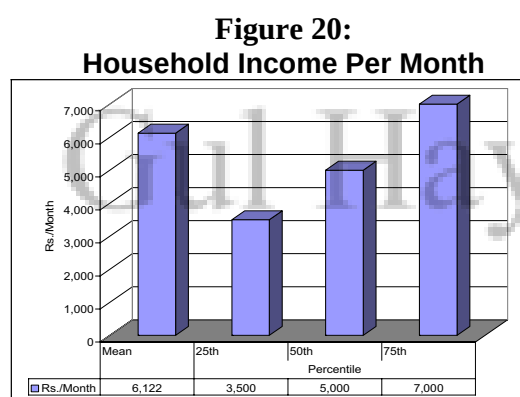
Figure 19 presents the average income of various major professions. The highest wages of Rs. 265 per day were recorded for stone mining. The average wages per day for small shops in villages was Rs.205 only and Rs.153 was enumerated for mat makers.

Daily wages for fishing was about Rs.132 only. Labor engaged in various tasks including floor mills and construction of houses earns about Rs.118 per day. Average wages for agricultural labor was Rs.100 only. The dilemma of agricultural labor was that they were offered half day employment, in the morning hours only; and, hence, they could only earn Rs.50 per day. Besides, the employment was seasonal; particularly during transplanting of rice seedlings and harvesting of rice, wheat and sugarcane crops. A low rate of Rs.85 was recorded for rilly (quilt) making in which females were found to be engaged. Meager wage of Rs.46 was recorded for embroidery on per day basis.



6.2 Household Income

The monthly average household income was computed to be Rs.6,122 only at Keenjhar, Thatta (Fig.20). The figure also presents monthly household income in percentiles. The income of 25th percentile (also known as first quartile) was 3,500 while the income of 50th percentile (second quartile and median) income was 5,000 and 75th percentile (third quartile) was 7,000. Since the median income (Rs. 5,000) was less than arithmetic average (Rs. 6,122), income distribution was assumed to be skewed rather than normally distributed.



6.3 Earning Family Members

Table 6 depicts that, on an overall basis, each household had 1.96 (1.70 male & 0.26 female) earning members. Monthly income of male and female members was about Rs. 3,257 and 1,323, respectively. From this, it was concluded that wages of male members were about 2.5 times higher than that of female family members. Contribution of female members- 13% earners, in household cash income was 6% only. These estimates are evident of poor contribution of women in household income. This also highlights the need for gender mainstreaming in occupations and income generating activities to narrow down cash wage differentials between male and female.

Table 6:
Earning family members

No. of Earners/HH	Male	1.70
	Female	0.26
Monthly Income (Rs.)	Male	3,257
	Female	1,323
Contribution (%) in Household Income	Male	94.1
	Female	5.9
	Total	100.0

6.4 Household Budget

The average household expenditure was calculated to be 5,376 (Figure 22). Since the written records of income and expenditure were not available, the actual expenditure may be assumed to be somewhat higher than reported. Median expenditure (50th percentile) was Rs.4,480 which reveals that half of the population had expenditure of more than Rs.4,480 while the remaining half had less than the median value. Figure 23 displays the breakup of the household expenditure. About 39% of the budget expenditure was incurred on food items. Expenditure on transport was computed to be 9%. About 8% of the budget was spent on health including doctor fees and medicines. Expenditure on clothing and shoes was computed to be 7%. Expenditure on education was 4% only. About 4% and 2% were spent on electricity and phone respectively. Miscellaneous expenditure was computed to be 25% which included pocket money of dependent household members.

Figure 22:
Household Expenditure Per Month

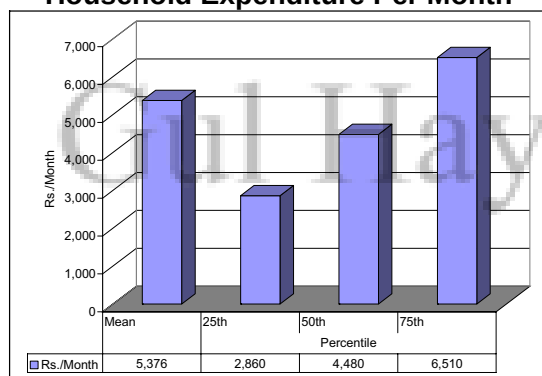
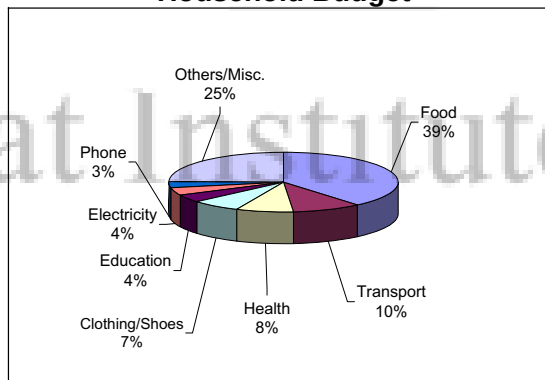


Figure 23:
Household Budget



6.5 Extent of Indebtedness

Table 7 reveals that, on an overall basis, 30% of households had availed credit/ loan of some type during 2006-07. Loan availing households reported that 66% of them were paying installments regularly. In response to a question whether income of the households increased due to loan, majority (85%) were of the opinion that their income did not increase. The amount of loan ranged from Rs. 600 to 300,000 while the average was estimated at Rs. 45,651 only.

**Table 7:
Received Loan**

Received Loan (%)	Yes	30%
	No	70%
Installments are paid Regularly (%)	Yes	66%
	No	34%
increased household income	Yes	15%
	No	85%
Amount of loan (Rs.)	Minimum	600
	Maximum	300,000
	Mean	46,651

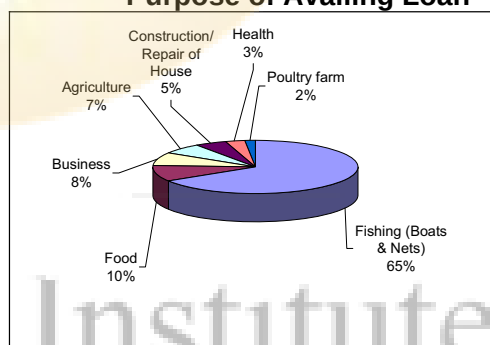
6.6 Purpose of availing loans

Figure 24 shows the purpose of availing loan. About 65% of the loan availing households reported that loan was taken for fishing purpose including purchase/repair of boats and nets. Local lender/ fish merchants were recorded to be very active in providing loans to fisher folk families. Against the loan, very cheap fish purchase was observed. In most of the cases, it was reported that loan providers were less interested in loan recovery. Instead, they wanted to ensure supply of fish by the borrowing fishermen. The repayment schedule was flexible, which was extended for many years at compound rates.

The second largest purpose (10%) of availing of loan was food items followed by business (8%), agriculture (7%), construction of households (5%), health (3%) and poultry farms (2%). The consumption loans reflected poverty of hunger. Public and

private sectors may seriously work on food sustainability and security programmes.

**Figure 24:
Purpose of Availing Loan**



6.7 Source of Loan

Figure 25 shows the sources of loan. It was revealed that overwhelming majority (90%) of the households borrowed from local lender. The proportion of loans advanced by banks and institutional sources was 10%, only. Although bank loans were cheaper than non-institutional sources, but documentation and process of loans was reported to be the main hurdle for obtaining their loans. None of the respondents reported any loan obtained from NGOs. Pakistan Poverty Alleviation Fund may intervene here to sponsor local partners for providing poverty alleviation loans. Besides, NGOs may start work on social mobilization process through which village development organizations (VDOs) and loan committees could be formed. Keenjhar Fishermen's Society is one such NGO that could serve as

a local partner. The CBOs being currently formed at Keenjhar by the WWF-P could also transform into a coordinating organizations to manage loans and other developmental interventions.

**Figure 25:
Source of Loan**

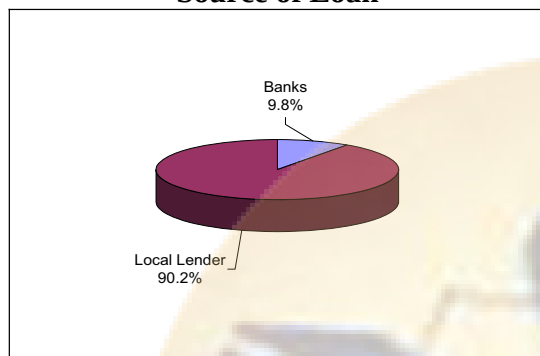
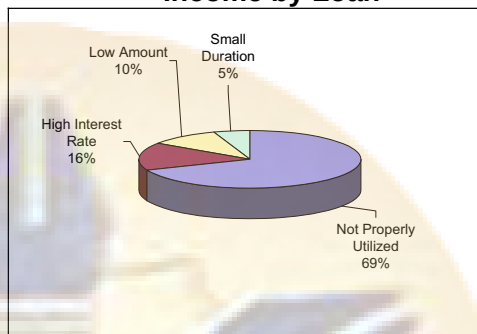


**Figure 26:
Reasons of not Increasing
Income by Loan**



6.8 Impact of Loan on Respondents Income

Figure 26 displays the reasons due to which the loans could not substantially increase respondent incomes. The main reason given by 69% of the respondents was improper utilization of loan. For instance, loan was obtained for purchase of boats and nets, but the same was utilized for other purposes such as repayment of old loans, rituals of marriage, health and construction of house. The second reason was “high interest rates”. As mentioned in Figure 25, about 90% of households received loans from local lender. The interest rate of local lenders was recorded to be as high as 36 to 60 % per annum (3% to 5% per month), as reported by the respondents. Small amount of loans, insufficient to meet seasonal productivity needs, was also identified as an issue by about 10% of the recipients.

6.9 Livestock (Buffaloes and Cows)

Table 8 shows that female buffaloes were found in every 20th household (5%) while their average number was about 3. Milking buffaloes were found in 2% households only. Male buffaloes were recorded in 1% households only with average number of 2.67. In comparison of buffaloes (possessed by 5% of households); more than double of the households (11%) possessed cows at Keenjhar, Thatta. The average number of female cows was about 4 animals per household. Cows are relatively more adaptable animals than buffaloes. *Kohistani* and *thari* cows are famous breeds that were maintained at Keenjhar, Thatta.

Table 8:
Buffaloes and Cows

		HHs(%)	Mean
Buffaloes	Male	1.0	2.67
	Female	4.5	2.93
	Milking	2.3	2.57
Cows	Male	2.6	2.38
	Female	11.0	3.88
	Milking	4.9	3.47

Table 9:
Milk production, consumption and sale

		Liters	%
Buffalo	Production	11.82	100
	Consumption	4.73	40
	Sold	7.09	60
Cow	Production	9.28	100
	Consumption	6.57	71
	Sold	2.71	29

6.10 Milk production, Consumption and Sale

Table 9 reveals that the average milk production per buffalo was estimated at 4 liters per day- a total of 12 liters per household. About 40% of the milk was consumed by the household members while 60% was sold. Cow milk was mainly consumed (71%) by household members while only 29% was sold. Reason behind selling more amount of buffalo milk could be higher prices in comparison to cow milk. The average difference between both the prices was estimated at Rs.5 – 10 per liter.

6.11 Other Types of Livestock and Poultry

Table 10 compiles data on the ownership of other animals and poultry birds at Keenjhar, Thatta. Goat and sheep ownership was reported by 11%, and 2.3% households respectively. Donkeys were reported by 3% households. Poultry birds were maintained by 13% of the households.

The table also reveals that, on an average, the households possessing small ruminants had 4 goats and 9 sheep.

About 3 donkeys were reported in two households (mean = 1.4). Donkeys were found to be very useful for fetching water and other material. The average number of

Table 9:
Various Type of Livestock Available

	HHs(%)	Mean
Goat	11.0	3.94
Sheep	2.3	8.57
Donkey	2.9	1.44
Poultry	13.3	5.51

poultry birds was 6 per household. It may be noted that on the whole the number of household possessing goats and poultry was high when compared to sheep and donkeys.

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6.12 Livestock Transactions and Mortality

Data presented in Tables 10 reveals the status of animal purchase, sale, births, and deaths at Keenjhar, Thatta during 2007. It was reported that 0.6% of the households purchased buffaloes while their average number was 1 per household. Buffaloes were sold by 1% of the households with average number of 1.67. Only 0.6% houses reported buffalo mortality with an average of 1. New Born animals were reported by 2.6% of the households with an average number of 1.3.

Purchase and sale of cows was reported by 1% and 1.3% of the households, with average number of 1.33 and 3.50, respectively. Dead and new born cows were reported by 1.3% households.

Veterinarians working on rigorous cost-benefit analysis of buffaloes and cows, favor cows for having less mortality rate and low gestation period. Purchase of goats was reported by 1% households with average number of 7.67 while, on an average, 2.75 goats were sold. Mortality was reported by 2.6% households with an average of 5.63 goats.

**Table 10:
Economics of Livestock**

		N(%)	Mean
Buffalo	Purchased	0.6	1.00
	Sold	1.0	1.67
	Died	0.6	1.00
	New Born	2.6	1.00
Cow	Purchased	1.0	1.33
	Sold	1.3	3.50
	Died	1.3	1.50
	New Born	2.3	2.71
Goat	Purchased	1.0	7.67
	Sold	1.3	2.75
	Died	2.6	5.63
	New Born	2.9	2.11

7. Community Development Priorities

Table- 11 summarizes data about ranking of development priorities. The table shows that first priority was institutional loans followed by dispensary, road, school, and water supply. The first priority for institutional credit looks very plausible since majority of the loans were obtained from local lenders at a very high interest rate. The second option reported was dispensary. It was already discussed that the substantial amounts of income (9%) was incurred on health. In case of fatal diseases, households were reported to be bankrupt and loans were repaid by selling livestock, ornaments, lands and other valuables.

The respondents realizing the importance of education, demanded schools and teachers. Roads and water supply were also stated as development priorities at Keenjhar, Thatta. Roads and dispensaries were mainly mentioned by communities located on the north western side of Keenjhar near Dolatpur and Moldi Mian.

**Table 11 Ranking of Development
Priorities**

Ranking	Options
First	Loan
Second	Dispensary
Third	Road
Fourth	School
Fifth	Water Supply

8. Qualitative Inferences

The consultants noted several issues and threats including water pollution, shortage of fish, illegal fishing and unchecked recreational activities. The lake has great potential for eco-tourism but at present the lake is losing its beauty and attraction due to mismanagement. Its banks are full of garbage and outgrowth of grasses. Facilities provided to the tourists are not sufficient, neither the trees are planted on the banks nor are there any other sources of amusement for tourists. There are 12 huts operated by Sindh Tourism Development Corporation, which are not in good condition. A dozen new huts are being constructed at the same congested place. Lack of rescue teams and overloaded old boats have caused loss of lives in recent years.

Quantity and quality of fish in Keenjhar has decreased because substantial quantum of water is diverted for agricultural and drinking uses and it drains away fish seed to the fields and private fish ponds. Many fish species like Ruhu, Mirgal, Theli, Seengharo, Sole, Barim, and freshwater shrimp are no more available for local consumption and exports. Fishing at Keenjhar is now under the License system at Rs. 561 per boat and Rs. 111 per helping hand. Issue of license to all fishermen has yet to be completed. Influential contractors, some private concerns from Karachi and the Rangers force have occupied portions of lake for private purposes due to which the access of fisher folk is denied at various points.

Raise in the embankment of Keenjhar is also an emerging issue. To fulfill the growing needs of drinking water for Karachi, the Government has decided to increase the storage of water in the lake; which may potentially submerge large areas in Jhampir and Sonda Union Councils near Jhampir mountains, dislocating poor communities. The area around the lake is already affected by water logging and salinity and embankment of the lake can trigger this problem. There is a growing concern that various threats to Keenjhar lake may affect its ecological and livelihood functions. In spite of important contribution to provincial economy, the lake seems to have been undervalued and ignored. Keenjhar lake wetland system needs to be protected to ensure the livelihoods of adjoining villages and a direct beneficiary population well above 2000 households living under abject poverty.

Potential new livelihood opportunities include stone/ lime stone mining, coal mining, industrial labor opportunities in Nooriabad, 250 or so fish farms, and emerging poultry farms around the lake. Tourism development is the key to higher income opportunities for local communities, especially on the National Highway side around Chilya, Hillaya and Sonheri clusters. Irrigated agriculture on the eastern and northern embankments, arid agriculture and livestock & poultry development on the western mountainous range could also offer ample employment opportunities for the poor communities. Water discharge at proper timings, interventions to restrict the outflow of fish seed in various channels and establishment of separate hatchery for Keenjhar, near the lake itself, are seen as necessary measures to restore the degraded fish resources.

8.1 Issues and Options

The main issues mentioned were as follows:

1. Water quality of Keenjhar is not good since it gets pollutants from Kotri and Nooriabad, which kill fish and vegetation.

2. Nets have been removed from the outlets, due to which fish seed is diverted to KB Feeder and other channels.
3. Chilya Hatchery is selling the seed to private fish farms, rather than putting it into the Keenjhar lake. Mortality rate for their small size seed is quite high.
4. Fish seed is caught illegally from Keenjhar and sold to private fish farms, as a means of livelihood.
5. Tourism facilities are inadequate.
6. Control of influential persons and rangers.
7. Issue of licenses and compensation for displacement of villages.
8. Drought, disease and unemployment on Jhimpir side.
9. Lack of fishing and tourism accessories on Sondha side.

The input of Delphi group on fisheries development and the key respondents is highlighted below:

- Polluted industrial water be treated before discharging in the lake.
- Nets be installed on the outlets.
- Illicit sale of fish seed from Chilya Hatchery to private fish farms be banned. At least 1.0 million fish seed be put into Keenjhar annually.
- Use of Boola net for catching small fish be effectively banned at Keenjhar.
- Tourism be promoted through a ring road and parks all around the lake.
- Skill training in fisheries, livestock and poultry farming.
- Limestone be utilized in cement factories by utilizing local labor.
- Arid agriculture and livestock be promoted on Jhimpir side.
- Jobs be given to local people at the nearby Nooriabad industrial site.
- Small dams be constructed in the mountainous area for rain water harvesting.
- Coal mining be promoted on the northern side of the lake.
- Quality work be done on the extension of protective bund.
- Drainage project be associated with the project of raising/extension of bund.
- District Fisheries office should be strengthened and corruption should be eliminated.
- Licenses should be issued to active fisher men and monitored.
- Speed boats should be provided for tourism purposes.
- Jetties be established at main landing centers, namely, Sonehri, Chilya, Khambo and Jhimpir.
- KB Feeder fall providing natural entry of fish may be redesigned.
- Water discharge in Keenjhar must be made available in May, June and July to promote fisheries reproduction and growth.
- Drainage be provided in Sonehri and other villages that will come under water logging due to elevation of level of reservoir.
- Separate hatchery for Keenjhar be established close to the lake; there is government land east of lake suitable for this purpose.
- Compensation be given to the villages affected by the new extension project.
- Keenjhar fishermen be trained properly. So far, only 3 training events have been organized in which real fishermen have not been invited.
- Control of Rangers from Gadhabari island of Keenjhar be released.
- Portions of lake controlled by influential people from outside be got released.
- Theft of nets be controlled to save the poor fishermen from financial loss.
- Chilling plant be established to provide cold storage for the catch.

8.2 Community Input for Keenjhar Development

In general, the fishing communities in Jhimpir cluster are also involved in mat making and stone mining. Members of herder families work as railway labor and wage workers in the Nooriabad industrial area. Communities near picnic point and the Hillaya stop are partly engaged in tourism and services. Expressed priorities of village leaders are summarized below:

- At the Jhimpir cluster villages, namely Lal Bux Manchri, Bakhar Machi, Hameed Manchri, New Ghandhri, Photo Dars, Ali Bux Manchri, Nabi Bux Palari, Sadiq Manchri, Sukhio Autho, Khudaya and Mubarak Palari, the main issues raised were unemployment and human and livestock diseases. Dispensary, veterinary hospital, jobs in Nooriabad, and loans for livestock purchase were community development priorities. Among these, the typically poor villages, deserving WWF livelihood and environmental interventions were identified as Sadiq Manchri, Bakhar Machhi, New Ghandhri, Ali Bux Manchri, Lal Bux Manchri, Yaroo Manchri and Abdul Hameed Manchri. Women development programmes can also be initiated at all Manchri caste villages, where the women are directly involved in fishing.
- The Sonehri cluster including Sonehri, Bachal Shah and Khipri villages identified drainage, disease and unemployment as main issues. Road, dispensary, electricity and loans for livestock and fishing were identified as development priorities. Sonehri village has a CCB registered and various on going initiatives of Health & Nutrients Development Society (HANDS) and National Commission for Human Development (NCHD). The Keenjhar Fishermen Welfare Society is active here and at most villages of the Hillaya and Chilya cluster. Khipri is the poorest village in this cluster, while Sonehri is significant from civil society activism point of view.
- At the Chul site, village Yar Mohammad Jakhro does not directly depend on the lake resources. Mumtaz Dhandail could be the main target village, being the center of Pakistan Fisherfolk Forum (PFF) activism and also because of its strategic location for installation of sieves/ nets on the outlets.
- Village Abdullah Gandhro at the Khambo center, being a large settlement and involved in fisheries and tourism, could form the main entry point for environmental and vocational training interventions.
- Hillaya stop village leaders identified unemployment as the major issues. Vocational center for girls, tourism infrastructure and water supply & electricity were expressed needs at villages Jaffer Hillaya, Yousif Hillaya, Adam Katiar, and Haji Soomar Solangi. Village Jaffer Hillaya is the political hub of Union Council (UC) Sondha but its suitability from the viewpoint of WWF activism needs careful consideration. From tourism point of view, village Yousif Hillaya needs emphasis.
- Dolatpur, Umar Manchri, Dodo Bhambhro and Moldi Mian villages of Chilya Cluster, are all poor communities where unemployment and disease are main issues. School, dispensary, and loans for fishing accessories and purchase of animals are needed. These communities were also found concerned about illegal hunting of water fowls and pollution of lake through car washing and garbage.

- Jhimpir could be an awareness, coordination and tourism center. Direct WWF interventions at Jhimpir may, however, be carefully examined in terms of their relevance for poor communities of Jhimpir and Moldi clusters, that have direct livelihood dependence on Keenjhar lake.

9. Summary and Findings

Keenjhar lake is a vital wetland area of great ecological, biological, hydrological and economic significance. It has several attributes such as fish, recreation, tourism, wildlife, flood control, ground water recharge, and fresh water supply. It is one of the priority areas of the WWF- Indus for All Programme. The detailed socio-economic baseline study recorded 38 target villages around the lake. Total households surveyed were 309.

The average family size, enumerated from survey data, was around 7 members. Average age at marriage for male was 21 years and for female it was about 17 years. Majority (62%) of household heads were reported to be illiterate. Out of 12% educated females, about 8% had primary education, 0.6% were middle pass, 1% matriculates and only 0.4% intermediate. Gender biases in educational status established the need for more work on female education under the programme umbrella.

More than half (52%) of household heads reported their business as fishing. Daily wage laborers engaged in different type of work including construction were about 11%. About 8% of all households heads at Keenjhar were engaged in stone mining, whereas Agriculture related households were only about 3 percent.

Diarrhea was reported by one half of the households (50%) with occurrence of 2.5 times per year. The average occurrence of cholera, typhoid, jaundice, respiratory diseases and eye diseases were 2.4, 2.5, 1.6, 3.3, and 1.5 respectively while the proportion of households reporting these diseases were 18%, 12%, 8%, 8%, and 5% respectively. About 59% households visited private clinic for treatment. The distance of health facilities was as long as 70 kilometers for some remote villages. An overwhelming majority (87%) of births were attended by local Dai (TBA), while only about 0.7% births were handled by trained LHVs at the program area villages.

Majority (66%) of respondents from Keenjhar, Thatta agreed with the statement that fish production/catch has reduced sharply during last 5 years. About 44% of the respondents agreed with the statement that number of migratory birds had substantially declined. The estimated loss of income was about 55% in terms of lower crop yields and incomes due to lack of irrigation water. About two third (67%) of respondents were of the opinion that due to decline in fish production, their income has reduced to the tune of 38%. Likewise, 69% of respondents expressed their concern about decline of income to the tune of 19% due to migratory birds.

The *Katcha* (mud houses) and *Jhoopra* (thatched huts) were dominant with proportion of 40% each. One house out of every tenth (13%) was recorded to be *pacca* (bricks and iron or RCC structure). The proportion of Semi- *Pacca* (bricks and wood) was 7%. It was noted that open space was used predominantly (67%) at Keenjhar to ease the nature. Proportion of non flush toilet/WC was about 12%. Only about one-fifth (21%) of the households had pit latrines inside housing units.

The average household income was computed to be Rs. 6,122 only at Keenjhar, Thatta. Since the median income (Rs. 5,000) was less than arithmetic average (Rs. 6,122), income distribution was assumed to be skewed rather than normally distributed. The average household expenditure was calculated to be 5,376 only. Median expenditure (50th percentile) was Rs. 4,480 only. About 39% of the budget expenditure was incurred on food items. Expenditure on transport was computed to be 9%. About 8% of the budget was spent on health including doctor fees and medicines. Expenditure on clothing and shoes was computed to be 7%. Expenditure on education was 4% only. About 4% and 2% were spent on electricity and phone respectively.

On an overall basis, 30% of households had availed credit/ loan of some type during 2006-07. Impact of loan on incomes was minimal as 69% of respondents considered that it was improperly utilized, interest rates were very high and the amount was less than the seasonal productivity needs. The interest rate charged by local lenders was recorded to be as high as 40-50% per annum. Respondents perceived institutional loans followed by dispensary, road, school, and water supply, as major development needs for their communities.

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ANNEXURE

Summary Notes on the Villages of Keenjhar Priority Area, Thatta

1. Lal Bux Manchri (Jhimpir). Fisheries, Livestock, Labor. Fish and grazing resources depleted. Drought, unemployment, harmful nets and human diseases are issues. Teacher, road and loans needed.
2. Bakhar Machhi (Jhimpir). Fisheries, railway laborers, and mat makers. Diseases, lack of market for mats/ handicrafts, and lack of livestock fodder. Poor village. Unemployment is major problem. Loan and dispensary needed.
3. Haji Khamiso Khaskheli. Sondha UC. Fisheries, agricultural labor/ tenants, and livestock. Some families seasonally migrate to Hyderabad district. Unemployment, flood and diseases are challenges. Water supply scheme, road and loans needed.
4. Abdul Hameed Manchri (Jhimpir). Government scheme of road. Lack of fishing accessories and low catch. Poor village. Unemployment and disease. Dispensary, loans, fishing accessories & modern skills needed.
5. Abdullah Gandro (Khambo center). Shaukat Gandro is the leader. It was first located at the current picnic point. Largest village in terms of HH. Fisheries, Tourism, Stone Mining, Poultry. KFWS activism here. Unemployment, loan, fishing accessories main issues. Substantial seasonal migration (200 families) to Ibrahim Hyderi and Balochistan coasts. Credit, dispensary, tourism infrastructure and school needed.
6. Mumtaz Dhandail (Chul site). PFF activism. Poor village. Unemployment, human disease and timely water discharge in the lake are issues. Loan, provision of nets, dispensary and school, net on outlets and regularization of village are expressed needs.
7. New Ghandhri (UC Jhimpir). Poor village. Health initiative by NCHD. Education programmes by UNICEF and Paiman. Training on Teaching Methodology by ESRA. Unemployment, diseases and police injustice are issues. Electricity, water, dispensary and loans needed.
8. Khipri (Soenhri, Sondha). Very poor village. Fishing is the only occupation. Road project of government. Fish and wood resources have depleted. Drought, unemployment, and diseases are issues. School, dispensary, and loans priority. Well grown seed in lake demanded. Also net on the outlets.
9. Sayed Bachal Shah (Sonehri, Sondha). Fisheries, Livestock/ Poultry and wage laborers. Training on teaching methods by UNCHD. Unemployment and diseases. Dispensary, road, electricity and loans are priorities.
10. Sonehri. Fisheries, Livestock/ Poultry, Stone Mining, Agriculture, Services and Handicrafts. Sonehri Development Organization and Keenjhar Fishermen Welfare Society. CCB is registered. NCHD medical camp and educational initiative. Training by HANDS. Membership in local government. Disease, drainage and education main

issues. Schools, road, dispensary and livestock/ poultry and tourism trainings needed. Nets demanded on outlets.

11. Photo Khan Dars (Jhimpir). Agriculture, livestock, stone mining. Kohistan Keenjhar Development Organization. Human disease and unemployment issues. Girls school, dispensary and job skills training needs.
12. Ali Bux Manchri (Jhimpir- Doulatpur). Fishing. Poor Village. Disease and unemployment issues. Loan, road and dispensary needed.
13. Dodo Bhambhro (Chilya, UC Jhimpir). Wage Labor, Livestock/ Poultry and Mat making, Fish seed sale. Livestock/ poultry disease, loan and security are issues. Poor village. Unemployment major issue. Livelihoods training, loan and road needs. Outlets should have nets.
14. Yousif Hillaya (Hillaya Stop, Sondha). NCHD training on teaching methods; Fisheries, wage labor, services and tourism. Disease and unemployment issues. Loans, dispensary, road and drainage priorities.
15. Nabi Bux Palari (Jhimpir)Paiman, NCHD and ESRA interventions. Agricultural wage labor/ tenants, mat makers, artisans and livestock. Unemployment, disease, drought issues. Out migration to Nooriabad for labor and grazing areas. Electricity, road and drinking water supply needed. Suggest ban on water fowl hunting and small fish catch.
16. Juman Jakhro (Chilya stop). Fisheries, wage labor and herders. Poor Village. Unemployment, disease (human and animal), and drought. Dispensary, roads and loan for animal purchase needed.
17. Autha Village (Moldi Mian, Jhimpir UC). Livestock, railway workers and wage labor. NCHD programmes. Unemployment and disease issues. Loan, dispensary, school, and drinking water needed. Fish farm skill training demanded.
18. Sadiq Manchri (near Jhimpir). Fisheries and Mat making. Very poor. Unemployment and disease. Loans for animal purchase and fishing accessories and dispensary needed. Nets at outlets, ample fish seed and ban on hunting.
19. Adam Katiar (Hillaya Stop, Sondha UC). Livestock, wage labor, services. Disease and unemployment. Loan for animals, dispensary and water supply.
20. Jaffer Hillaya (Hillaya stop). Land ownership, livestock, tourism and services. Unemployment and lack of tourism infrastructure are the issues. Loans for animals and Vocational skill center for girls needed. Tourism center.
21. Haji Soomar Solangi (Hillaya stop). Fisheries, wage labor, services and handicrafts. Unemployment, disease and flood. Loan, dispensary, jobs.
22. Shaukat Gandhro (Hillaya stop). Fisheries and Tourism. Unemployment and disease. Drinking water supply, school, loans and electricity needed. Privatization of tourism and regularization of villages demanded. Ban on Hunt.

23. Sukhio Autho (near Jhimpir). Wage labor and herders. Handicrafts. Poor village. Unemployment and disease. Dispensary, drinking water, school, loans.
24. Wali Mohammad Palari (near Jhimpir but Sondha UC). Wage Labor, Stone Mining and herders. Poor village. Unemployment and disease. School, dispensary, loans needed.
25. Khudaya (Jhimpir UC). Wage labor, livestock herders and stone mining. Unemployment. Middle school, dispensary, water supply and road needed.
26. Mubarak Palari (Jhimpir). Fisheries, Livestock, wage labor. Unemployment and disease. Electricity, road, dispensary and loans needed. Nets at outlet, skill training in fish farms, tree plantation, ban on fisheries. Vehicle washing ban.
27. Yar Mohammad Jakhro (Chul site, near Sondha). Land owners, Stone Mining, Livestock and labor. Unemployment major issue. Dispensary, road, school, water, loan needed. Ban on hunting.
28. Adam Bhambhro (near old Paper Mill, Chilya bus stop). Poultry farming, livestock, wage labor and services. Unemployment and poultry diseases. Dispensary, school and loans needed. Factory jobs demanded. Stop pollution.
29. Haji Ramzan Mirbahar (New Chilya stop). Fisheries is main occupation. Very poor village. Unemployment and Lack of access due influential fish contractors. Loans, fish nets and boats needed. Illegal fishing be stopped. Net on outlets.
30. Yaroo Manchri (Dhor Mian, Jhimpir). Very poor village. Fishing main occupation. Mat making. No teacher. No transport. Unemployment, disease and no fishing accessories. School, dispensary, loans and road. Nets on outlets.
31. Mohammad Rahim Machhi (near Jhimpir). Fisheries, railway and wage labor. Very poor village. Unemployment. School, loan for fishing accessories needed.
32. Mevo Manchri (near Jhimpir). Fisheries and mat making. Very poor village. Unemployment issue. School, loan and livestock support needed.
33. Rasool Bux Manchri (near Jhimpir). Fisheries, boat makers, mat makers and labor. Small poor village. No job for boat makers due to overall poverty. Unemployment. School, loan and livestock support needed.
34. Umar Manchri (on hill, Chilya stop). Fisheries and labor. Poor village. Unemployment and diseases. School, dispensary and loans. Stop small fish and bird hunting; do not put garbage in the lake.
35. Jhimpir Town. Trade, livestock, Services, labor. Law and order for Hindu population is the issue. Diseases. Dispensary, Maternity home, road and loans. Picnic point demanded.
36. Dolatpur (near Chilya stop). Fishing and artisans. Poor village. Unemployment, famine and disease. School, dispensary and loans.

Chotiari Site Specific Final Report

Indus For All Programme



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May, 2008

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Acronyms	
EIA	Environmental Impact Assessment
HH	House Hold
LBOD	Left Bank Outfall Drain
MAF	Million Acre-Feet
MDC	Management and Development Center
MMP	
NCHD	National Commission for Human Development
NGO	Non-Governmental Organization
PFF	Pakistan Fisherfolk Forum
RCC	
RWDO	Rural Women Development Organization
SDF	Sustainable Development Foundation
UC	Union Council
USAID	United States Agency for International Development
VDO	Village Development Organization
WAPDA	Water and Power Development Authority
WWF-P	World Wide Fund for Nature for Pakistan

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BASELINE INDICATORS OF CHOTIARI SITE SPECIFIC REPORT

1. Background Information

Chotiari reservoir, located in Sanghar District, occupies an area of about 18,000 ha. The reservoir exhibits a complex of terrestrial and aquatic ecosystems. The aquatic features of the reservoir area comprise diversity of small and large size (1-200 ha) freshwater and brackish water lakes. These lakes are a source of subsistence and commercial fisheries for local people and habitat for crocodiles, otters, fresh water turtles and feeding and nesting grounds for a variety of resident and migratory birds. The reservoir has a water storage capacity of 0.75 million acre feet (MAF). The main storage of the Reservoir has the Thar Desert on one side and is bounded by sand hills towards north, east and south-east and the Nara Canal towards the west and south. Bunds and dykes surround the reservoir: The Northern Bund (19 km long embankments), Western Bund (14 km), The Southern Bund (16km) and South Eastern Dykes (9km). Land in the vicinity of the embankments is largely waterlogged full with reeds and wild grasses. The area is a rich breeding and nesting ground for birds and stopping place for migratory birds.

Originally a stronghold of freedom movement launched by the Hurs during 1930s and early 1940s, the Makhi forest area and the Chotiari- Bakar wetland system comprising 80 small and large lakes was converted into an irrigation water reservoir in the 1980s under the Left Bank Outfall Drain Phase-I Project; at a total cost of Rs. 2.9 billion. The reservoir area is 45,000 acres while it is meant to irrigate about 0.3 million acres in three districts. Due to full storage in the dam area to the extent of about 0.75 MAF, the grazing area within the embankments is mostly sub-merged since 2005. This has caused relocation of periphery villages and difficulties for fishing boats which are not properly equipped. Compensation and resettlement issues have not been resolved for many communities as yet. Since 1990s, several civil society organizations have advocated the cause of Chotiari communities. Among these are the Dharti Dost Sangat, Sustainable Development Foundation (SDF), Makhi Welfare Organization, Chotiari Development Organization and Rural Women development Organization (RWDO).

The Ranto canal escape is the inlet for filling the reservoir area from Mundh Jamrao Canal. Down below the inlet, the north-western area of Awadh is still the natural habitat of crocodile, partridge and hog deer. This heavily waterlogged area is under tight control of spiritual lords of Sindh, who have protected game reserves managed by their followers. Akanwari pumping station drains the seepage water back into the reservoir there. Outlet canal is located adjacent to Bakar and Phullel villages which are the main fish landing sites. It irrigates some land in Sanghar district but it is mostly meant for irrigation in Umerkot district. Baqar also has a local fish market. This is the potential tourism site near Chotiari town. The reservoir has another escape from Nara canal near Achar Jamali village for water discharge. There is no sieve/ net on the outlet causing loss of fish seed.

On both sides of the Nara Canal here, due to severe water logging and already existing embankments of Nara and reservoir, several new fish farms are being established. Thus, in part, the fishing communities displaced by the reservoir are finding livelihood in mat making and working at fish farms. Separation of Baqar lake system from the reservoir area, has spoiled the water quality and depletion in these small lakes and depressions. Likewise, the seepage of reservoir has depleted the adjoining grazing lands in Achro Thar (north eastern area), reducing the livestock resources.

2. Household Sample

Descriptive research is used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. The methods involve structured surveys which describe the status quo about selected socio-economic indicators, the correlation studies which investigate the relationship between variables, and developmental studies which seek to determine changes over time. The descriptive research design was selected because the primary purpose of the present study was to establish the pre-project/Programme baseline socioeconomic profile as well as status of human and natural resources for the development of a planning and policy matrix to ensure sustainable livelihoods.

In general, the baseline studies use the standard statistical sample given in table- 1.

Table 1: Population Size and Statistical Sample for Baseline Studies

S.No.	Population Size (e.g. Total Households)	Suggested Sample
1.	10	10
2.	50	44
3.	100	80
4.	500	217
5.	1,000	278
6.	3,000	341
7.	50,000	381
8.	100,000	385

Source: Samji and Sur. 2006. Developing A high Quality Baseline. World Bank, New Delhi.

To determine a representative household sample size, the following equation was used:

$$n = \frac{N\pi(1-\pi)}{(N-1)(C/Z_{\alpha/2})^2 + \pi(1-\pi)}$$

Where n is recommended sample size, N is population size, π is proportion of a characteristic of interest (e.g. literacy rate, poor population, and mortality), C is $\pm$ error rate (confidence interval), and $Z_{\alpha/2}$ is tabulated value for confidence level (Tryfos, 1996). Plugging the proportion of 0.5 (which gives the maximum variance, $0.5*(1-0.5)= 0.25$), error rate (confidence interval) of $\pm 5\%$ and 1.96 tabulated value of $Z_{\alpha/2}$ for 95% confidence level and number of households (population) were estimated.

Thirty five (35) villages were recorded around the Chotiari reservoir, Sanghar with a high proportion (75%) of small villages. Out of these 35 villages, 273 households were selected from 24 villages; categorized as 16 small (67%) villages, 7 medium (29%) and 1 large (4%) . An error rate of 5.8 was recorded for a sample size of 273 households. The baseline socio-economic indicators of Chotiari priority area of the WWF- Indus for All Programme are presented below.

3. Human Capital

3.1 Household Size

The average family size, enumerated from survey data, was around 7 members (Table 1). The estimate coincides with the national figure for rural household size of 7 members. About 57% of the households were recorded having household size between 4 to 8 members. Proportion of households with members between 9 to 13 was 23% and for 14-18 members it was 3% while very small proportion (0.4%) of households was recorded having members more than 18. About 17% of the households had up to 3 members. On the whole, about 74% households had 2 to 8 family members.

3.2 Age Groups by Gender

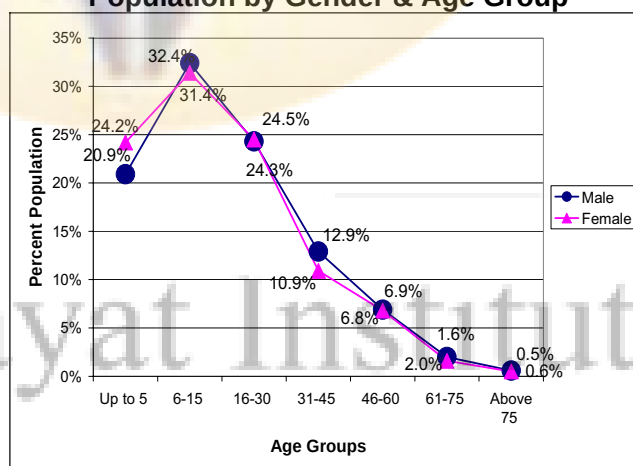
Figure 1 presents the distribution of population by gender. About one-fifth (22%) of the population was age 1 to 5 years. Majority of the population (56%) was recorded for two groups: i) from 6 to 15 years (32%) and ii) 16- 30 years (24%). Proportion of population of age group 31-45 years was around 13%; 46-60 years was 8%; 61-75 years was 2% and above 75% was 0.5%.

Distribution of population by gender indicates that female population is higher in children group of age less than 5 years while in older groups the difference reduces to 0.1% for age group above 75 years. On national level life expectancy of female is higher than male. According to Pakistan statistics, the life expectancy of male is about 64 years while female is 66 years (GoP, 2005).

Table 1:
Household Size

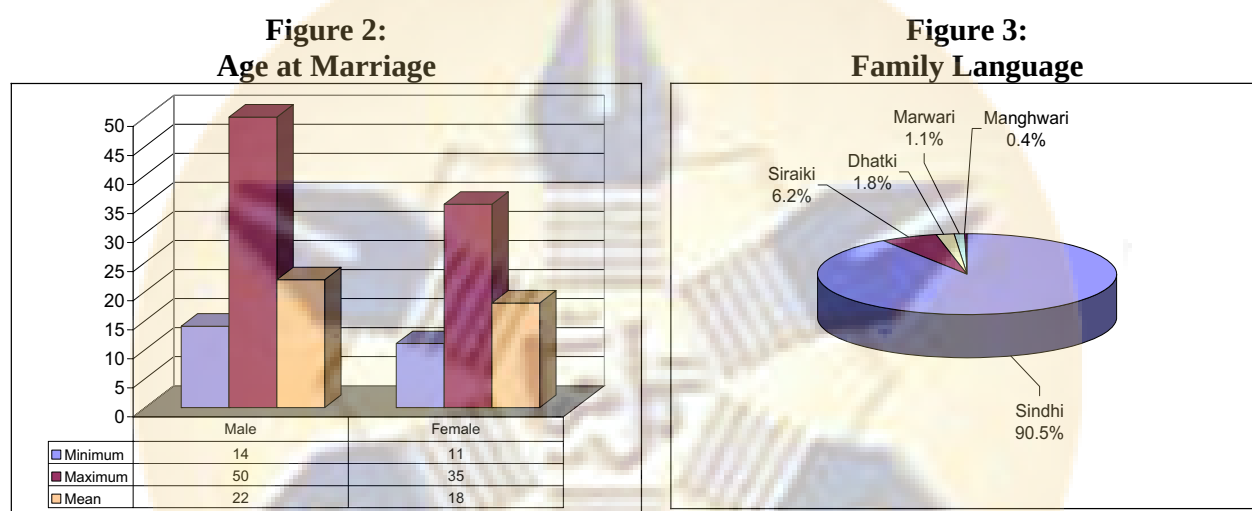
Average Family Size		6.7
Distribution (%) of families by members	Up to 3	16.8
	4-8	57.3
	9-13	22.9
	14-18	2.7
	19 & above	0.4
	Total	100.0

Figure 1:
Population by Gender & Age Group



3.3 Average Age at Marriage

Figure 2 revealed that average age at marriage for male is 22 years and for female it is about 18. Significantly higher ages of educated couples were recorded in comparison of their illiterate counterparts. In some cases, child marriages were also observed. Figure 2 displays minimum ages at marriage by gender. Minimum age of male was about 14 years while for female it was 11 years.



3.4 Family Language

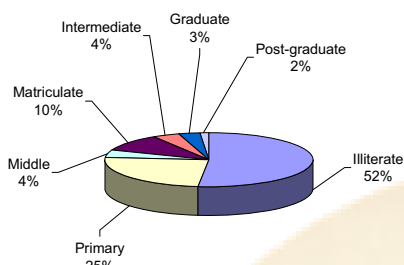
Figure 3 shows that overwhelming majority (91%) of the households were Sindhi speaking. Siraiki was observed to be the second largest (6%) language. The proportion of third languages (Dhatki) was 1.8%, fourth (Marwari) was 1% and fifth (Manghwari) was 0.4%. The above estimates reveal that Sindhi is dominant language at Chotiari, Sanghar. Siraiki, a language of southern Punjab, is very much related with Sindhi and Punjabi. Many tribes who migrated to Sindh from Southern Punjab about 200 to 300 years ago, speak Siraiki. Siraiki language was also spoken by tribes of Balochi origin but the communities were culturally cohesive.

3.5 Education of Household Head

Figure 4 reveals educational level of household head. More than half (52%) of the household heads were illiterate. Every fourth household head had Primary education. Education up to middle was 4%, matriculate 10%, intermediate 4%, graduate 3% and postgraduate 2%. These estimates revealed higher illiteracy ratio as compared with the farm level survey estimates provided by

NFDC (2002); that about 34% of the farmers were illiterate while proportions of farmers under matriculation, intermediate, graduate and postgraduate were 29%, 23%, 11% and 3% respectively.

**Figure 4:
Educational Level of Household Head**



3.6 Education of Household Members

Data collected on household members of age more than 15 years were segregated by gender reveals remarkable difference in educational level (Table 2). Surprisingly only 9% of the females were educated against 51% males. Out of 9%; about 7% of the females had education up to primary while 1.4% middle, 0.8% matriculate and only 0.2% intermediate. Gender biases in educational

estimates provided above establish the need for more work on female education for human development and success of health related programmes especially of maternal and child care.

**Table 2:
Educational Level of Family Members**

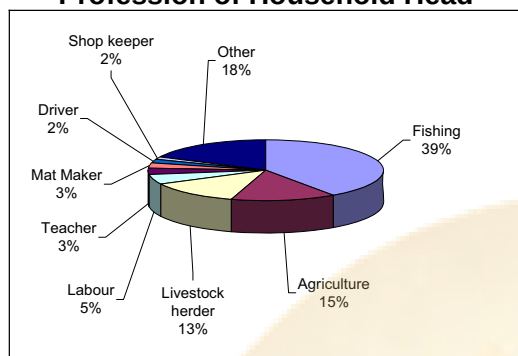
	Population (%)	
	Male	Female
Illiterate	49.40	90.90
Primary	25.80	6.70
Middle	6.10	1.40
Matriculation	9.30	0.80
Intermediate	4.80	0.20
Graduate	3.90	0.00
Postgraduate	0.70	0.00
Total	100	100

3.7 Profession of Household Head

Figure 5 revealed profession of household head. Majority of the household heads were recorded with fishing business. About 15 household heads reported their business as Tenants and agriculture wage labor. After fishing and agriculture, livestock was found to be third major profession of the households at Chotiari, Sanghar. Landless farmers, in particular, dependent upon livestock farms for their livelihood. Sindh province has fine breeds of livestock farming (IUCN, 2004).

Daily wage laborer engaged in different type of work including construction of house was about 5%. Proportions of teachers and mat-makers were estimated at 3% for each. Likewise, 2% drivers and 2% shop keepers were recorded. Various categories having proportion of less than 1% were designated as "other." Other category included artisan, mechanic, plumbers, pesh imam, carpenter, home servant, wood cutters, and poultry farm manager etc.

**Figure 5:
Profession of Household Head**



3.8 Prevalence of Common Diseases

Figure 6 shows proportions of households reported various diseases and their occurrence by number of times per year. The highest proportion (37%) of households reported Malaria as a common disease while occurrence was about 2.6 times per year. After malaria, the second highest occurrence (2.6 times per year) and proportion of households (30%) was recorded for Diarrhea. Diarrhea is a waterborne disease, mostly children were pronounced to be more vulnerable to fatal disease. The average occurrence of cholera, skin diseases, respiratory diseases, typhoid and jaundice were 2.4, 2.4, 2.6, 2.4, and 1 respectively while the proportions of households reported these diseases were 8%, 8%, 6%, 3%, and 1%, respectively.

**Figure 6:
Prevalence of Common Diseases**

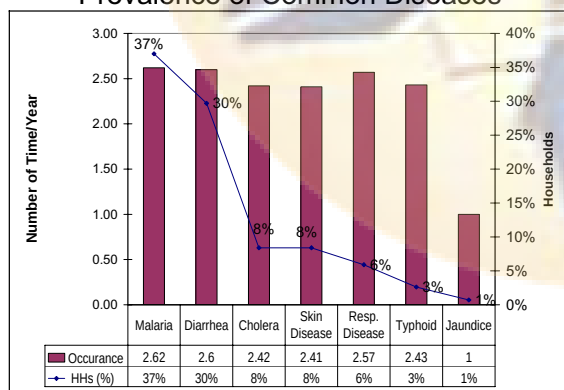
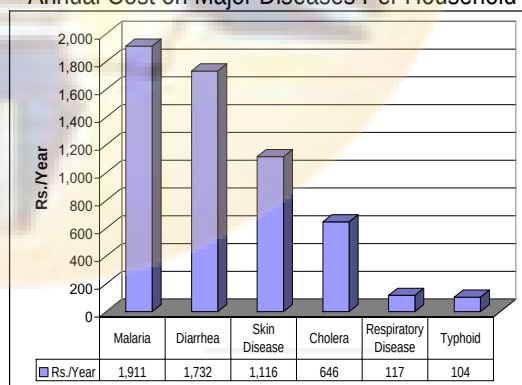


**Figure 7:
Annual Cost on Major Diseases Per Household**



3.9 Annual Cost on Major Diseases per Household

Figure 7 displays the annual cost on major diseases per household. The common grievances of poor households were high costs of medicines, doctor fees, and laboratory testing fees for diagnoses of various diseases. Although most of the medicines are locally produced in Pakistan, sky rocketing prices are mostly attributed to inflation, which is as high as 7% to 10%. Under the common circumstance, the average expenditure on malaria alone was about 1900. The average expenditure for diarrhea was Rs. 1732 per household. It was reported that the malaria occurs about two and half times (2.6) a year, expenditure per occurrence was about Rs. 730 per household. Expenditure on diarrhea was reported to be Rs.1,732, while on skin diseases, cholera,

respiratory diseases and typhoid, the reported treatment costs were Rs.1,116, Rs. 646, Rs. 117 and Rs.104 respectively.

3.10 Health Facility Availed

Figure 8 reveals the health facility availed for the treatment of diseases. The figure displays that 69% of the households reported private clinic. Taluka hospital was availed by about 13% of the households while dispensary and/or Basic Health Unit were availed by about 14% of the households. Despite higher costs, majority of the households preferred private clinics as a source of treatment because of more care by doctors in diagnosing diseases and prescribing proper medicines. Non availability of doctors and medicines were also attributed to be major reasons of low rate of participation in public sector health facilities.

3.11 Distance from Facility and Expenditure on Health

Table 3 reveals distance from health facility and expenditure on health. The minimum distance was about 1 km while the maximum was about 60km to reach at health facility while the average was 14km. It was also reported by some of the households that they preferred district headquarters for instance Sanghar and Nawabshah, for treatment purpose. Maximum distance reflected those households. Expenditure on health varied from Rs. 13 to 5,000. The average expenditure was about Rs.581.

**Figure 8:
Health Facility Availed**

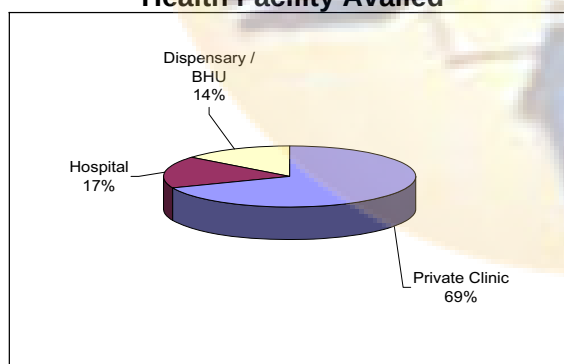


**Table 3:
Distance from Health Facility and
Expenditure on Health**

	Minimum	Maximum	Mean
Distance (km) from health facility	1	60	14
Expenditure on health per month/ per household	13	5,000	581

3.12 Place of Child Delivery

Figure 9 reveals that majority (73%) of births were attended by local Dai while only about 1% births were handled by trained LHVs. Private clinics and public hospitals were also visited for child births to the tune of 14% and 10%, respectively. These estimates establish need for the training programmes for local dais.

**Figure 9:
Place of child delivery**

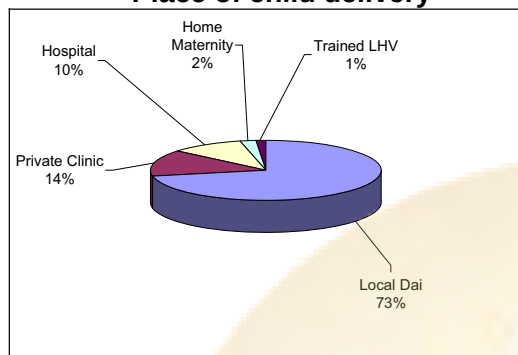


**Table 4:
Expenditure and Delivery Related Mortality**

Expenditure Per Delivery (Rs.)	Minimum		100
	Maximum		8,000
	Mean		1,475
Delivery related mortality during last 5 years	Mothers	% of HHs	----
		Mean	----
	Baby	% of HHS	2.9
		Mean	1.63

3.13 Expenditure per Child Delivery

Expenditure per delivery, as reported by the households, was compiled in Table 4. Minimum expenditure per delivery was reported to be Rs.100. Maximum expenditure per delivery was Rs.8,000. On an overall basis, the average expenditure per delivery was computed to be Rs.1,475.

3.14 Delivery Related Mortality

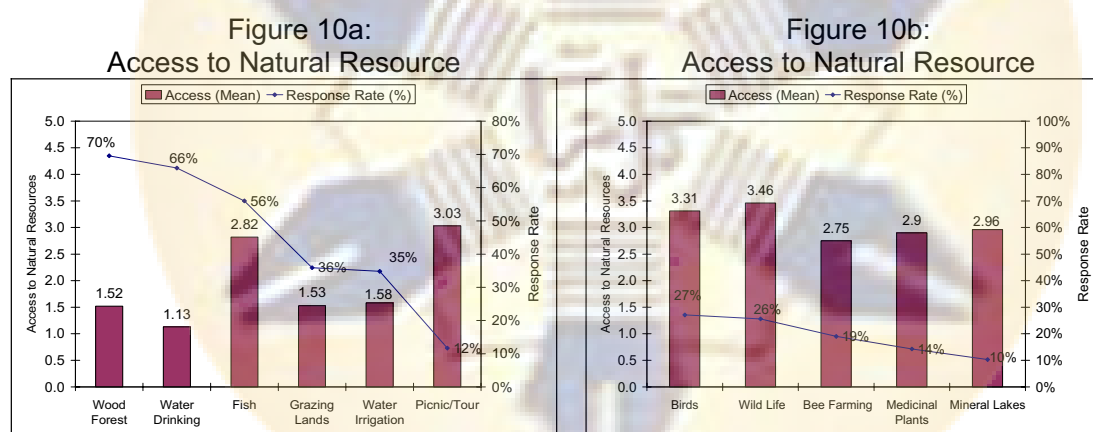
Delivery related mortality was summarized in Table 4. The table reveals that none of the mothers' mortality reported by households surveyed. About 2.9 % of the households reported child mortality while the average number was estimated at 1.63. On an overall basis, per 100 households, about 4.73 children died during last 5 years. In other words, about 1 child died out of 100 households. Proportion of child mortality can be significantly reduced by imparting training programme for local dais and meeting nutritional food requirement of the pregnant women.

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4. Natural Capital

4.1 Access to Natural Resources

Figure 10 displays response rate (%) and perception about frequent access to the natural resources. The Likert type scale used was 1 means frequently; 2 means sometimes; 3 means undecided; 4 means rarely; and 5 means restricted. The more response rate (%) and the lower perceived average value indicates the more access of households to the natural resources. Drinking water was identified to be the most accessible natural resource (response rate of 66% and the average value of 1.1; means strongly agree with the research statement) at Chotiari, Sanghar. Forest wood was reported by 70% of the respondents with the average value of 1.52.



Scale used: 1 = Frequently; 2 = Sometimes; 3 = Undecided; 4 = Rarely; and 5 = Restricted

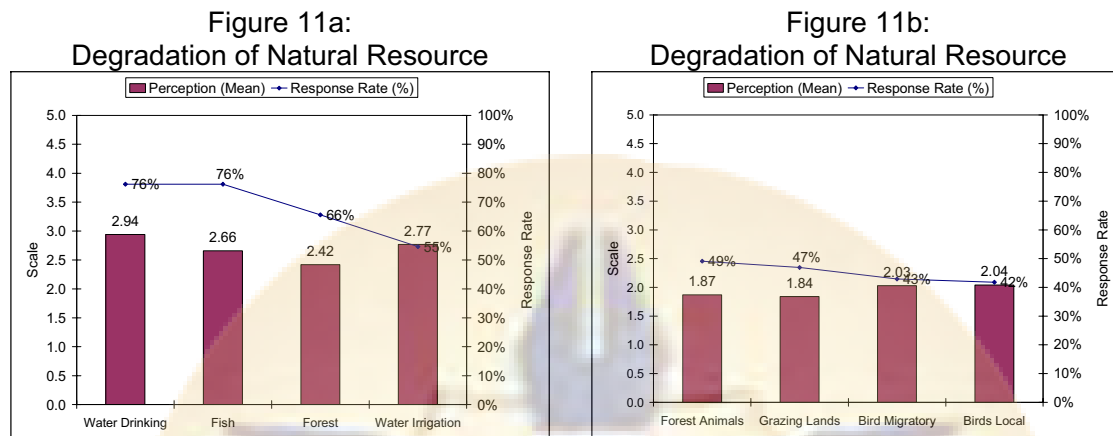
The average score for grazing land was 1.53 (half way between strongly agree and agree with research statement) and response rate was 36%. Likewise, water irrigation was reported by about 35% of the households with the average perception rate of 1.58. Interestingly, despite the major occupation of about 39% of the households (Figure 6), 56% of households reported that they were undecided, on an overall basis, that they have frequent access to fishing. This may imply the contract system on fishing and illegal occupation of so called water lords. Figure 10b reveals that on an average basis, the respondents were undecided/ unaware about their access to mineral lakes, medicinal plants, bee farming, birds and wildlife.

4.2 Degradation of Natural Resources

Analysis of respondents' perceptions presented in Figure 11a and 11b, reveals the extent of degradation of various natural resources during the last 5 years. Response rates (percentage of respondents) and their average (mean) perceptions have been reported.

The average values indicate extent the respondents agreed with the research statement that natural resources have sharply degraded during last five years. Likert type scale was labeled as:

strongly agree with 1; agree with 2; undecided with 3; disagree with 4 and strongly disagree with 5. Values close to 2 indicates that on an overall basis, responds agree with the research statement.



Research Statement/Hypothesis: Natural resources sharply degraded during last 5 years.

Likert Type Scale: 1=Strongly Agree; 2 =Agree; 3=Undecided; 4=Disagree and 5=Strongly Disagree

Majority of respondents from Chotiari, Sanghar were undecided that drinking water (mean = 2.94 and response rate of 76%), fish (mean = 2.66 and response rate of 76%), forest (mean = 2.42 and response rate of 76%) and irrigation (mean = 2.77 and response rate of 55%) have degraded over the last 5 years. Unlike these natural resources, respondents expressed their views in agreement, on an overall basis, about degradation of forest animals (mean = 1.87 and response rate of 49%), grazing lands (mean = 1.84 and response rate of 47%), birds migratory (mean = 2.03 and response rate of 43%), and birds local (mean = 2.04 and response rate of 42%).

The above estimates reveals that inhabitants around the Chotiari reservoir have much concern about the grazing land and wildlife that have been depleting due to environmental and human problems. During data collection, the respondents expressed their views that a significant proportion of forest animals have died due to overpopulation and prolong droughts in Thar over the last many years.

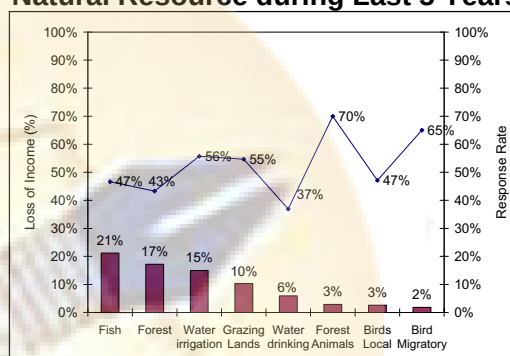
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4.3 Income Loss due to Depletion of Natural Resources

Figure 12 displays response rate (%) and loss of income (%) due to degradation of natural resources over the last five years. The highest estimated loss (21%) was recorded fish by about 47% of the households. As discussed earlier that fish is the major profession of the majority of the households, concern for reduction of fish is plausible and internally validate the survey results.

Estimated loss of income due to depletion of forest was about 17%, as reported by 43% of the respondents while 56%, 55% and 37% of the respondents recorded loss of income for reduction in water irrigation (15%), grazing lands (10%), and water drinking (6%). Although a meager proportion of income loss was reported for forest animals (3%), birds local (3%), birds migratory (2%), a substantial response rate of 70%, 47%, and 65% was enumerated, respectively. Again, this imply that despite little contribution of the sources to household income at Chotiari, Sanghar, people have more apprehension about the wildlife resources.

Figure 12:
Income (%) Reduced due to Depletion of Natural Resource during Last 5 Years



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5. Physical Capital

5.1 Type of House

Figure 13 presents the baseline information about the type of housing at Chotiari, Sanghar. *Jhoppra* were dominant (44%) at Chotiari Area. Every third house was (34%) was recorded to be *katcha* (mud) house. The proportion of *pacca* (bricks and iron or RCC structure) and Semi- *Pacca* was only 13% and 8%, respectively. The above estimates are evident of poor settlements and low life standard at Chotiari area.

Figure 13:
Type of House

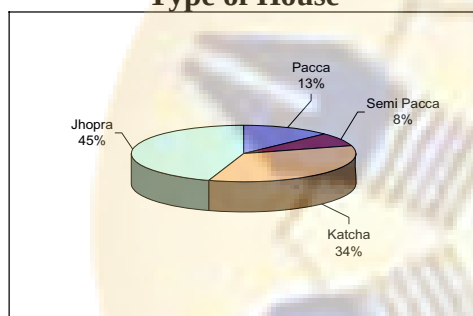
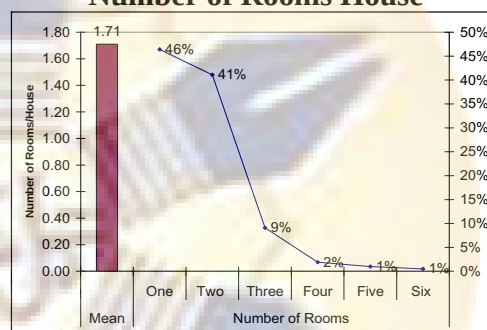


Figure 14:
Number of Rooms House



5.2 Number of Rooms per House

Figure 14 displays the average number of rooms per house and proportions of houses by number of rooms. The average number of rooms per house was 1.71. The highest proportion of houses (46%) was recorded with only 1 room while proportions of houses with 2, 3, 4, 5 and 6 rooms were 41%, 9%, 2%, 1% and 1% respectively. The figure unveils significant difference in proportions of 2 and 3 room-houses. Based upon average household size (6.7 members per house) and number of rooms per house (1.73); average number of household members per house was estimated at 4.

5.3 Type of Toilet Facility in House

Figure 15 presents information on sanitation conditions measured by the toilet facilities inside houses. It was noted that open space was predominantly used by 77% of households at Chotiari, Sanghar. Proportion of non flush toilet was only 7% while pit latrine was used by 16% of the households. This clearly indicates the unhealthy sanitation arrangements, which may be attributed to poor rehabilitation plan of villagers migrated from chotiari reservoir.

Figure 16 reveals that 40% of the households had no electricity facility. Even though the reservoir area is near Sanghar town, which is the district headquarter, it has remained neglected in terms of social and infrastructure development. The communities, in general, lack sustainable source of energy and the fuel wood resources are also depleted.

**Figure 15:
Type of Toilet Facility in House**

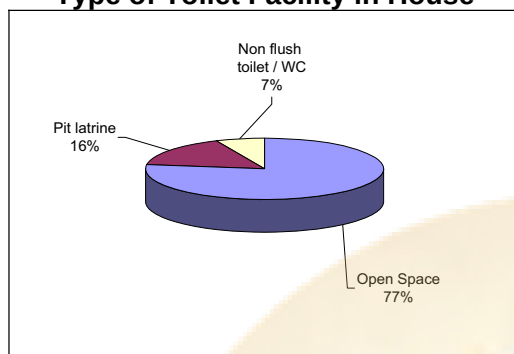
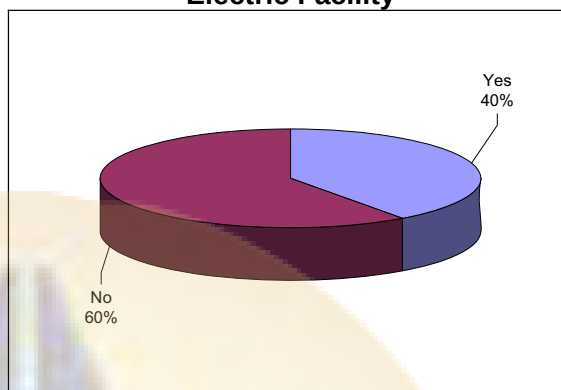


**Figure 16:
Electric Facility**



5.4 Sources and Quality of Water

Figure 17 indicates that 60% of the houses had pumps either hand or motor to use underground water. About 39% of the households reported that they collected water from outside of the house. The outside water sources are reported to be reservoir water. Regarding the quality of water consumed, 55% of the households reported that water was sweet and 42% reported that water consumed is normal. Very small proportion (3%) of the households reported that brackish water is consumed. Good quality of water consumed by overwhelming majority of water may be attributed to supply of Indus through Nara Canal.

**Figure 17:
Sources of Water**

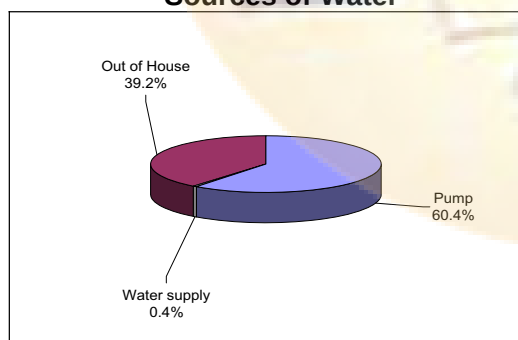
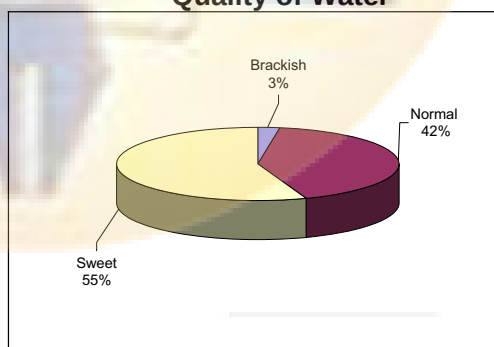


**Figure 18:
Quality of Water**



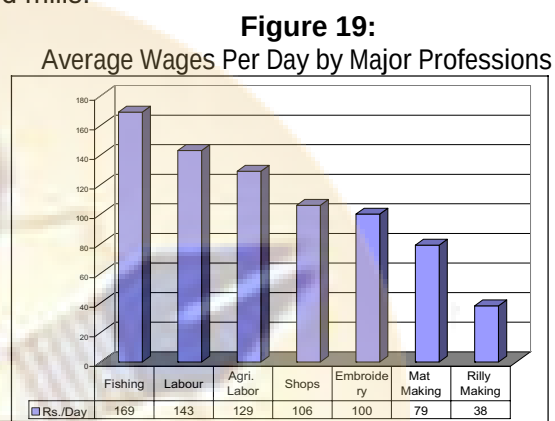
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6. Economic Indicators

6.1 Average Wages Per Day by Major Professions

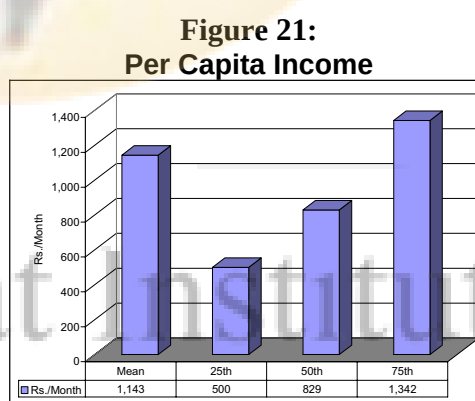
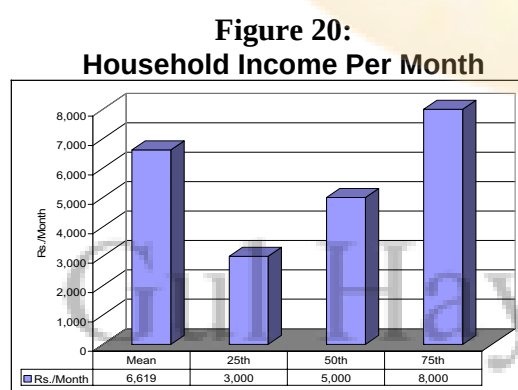
Figure 19 unveils the average income of various major professions. The highest average wages per day were recorded for fishing (Rs.167 per day). Likewise, Rs. 143 was enumerated for laborers engaged in construction of building and grind mills.

Daily wages for agricultural laborer was about Rs.129. However, agricultural wage labor is generally employed for half day and gets about Rs. 65-75 per day only. Besides, the employment is seasonal; particularly during harvesting of cotton and wheat. Shopkeeper earned Rs.106. Mat maker's average wage was Rs.79. Wages of embroidery and rilly (quilt) making, which were mostly done by females, were Rs.100 and Rs.38 respectively.



6.2 Household Income

Figure 20 shows household income per month at Chotiari, Sanghar. The average income was computed to be Rs. 6,619. The figure also presents the monthly household income in percentiles. The 25th percentile (also known as first quartile) was 3,000 while 50th percentile (second quartile and median) income was 5,000 and 75th percentile (third quartile) was 8,000. Since the median income (Rs. 5,000) was less than arithmetic average (Rs. 6,619), the distribution of income was assumed to be skewed rather than normally distributed.



6.3 Earning Family Members

Table 5 depicts that, on an overall basis, each household had 1.63 (1.45 male & 0.18 female) earning members. Monthly cash income of male and female members was about Rs. 4,587 and 1,516, respectively. From this it was concluded that wages of male members were about 3 times higher than that of female. Much of the work done by women on household chores and farming operations remains unpaid and unaccounted for. About 18% women were recorded as earning members and their contribution to the family income was a mere 4% only. This highlights the need for gender mainstreaming in occupations and income generating activities.

Table 5:
Earning family members

No. of Earners/HH	Male	1.45
	Female	0.18
Monthly Income (Rs.)	Male	4,587
	Female	1,516
Contribution (%) in Household Income	Male	96.1
	Female	3.9
	Total	100.0

6.4 Household Budget

The average household expenditure was calculated to be 5186 (Figure 22). Since the written records of income and expenditure were not available with the respondents, the actual expenditure may actually be higher than reported. Median expenditure (50th percentile) was Rs.4,150 which reveals that half of the population had expenditure more than Rs.4150 while the remaining half had less than the median value. Figure 23 displays the breakup of the household expenditure. About 39% of the budget expenditure was incurred on food items. A substantial proportion of 32 of the budget was reported on transport, while on health, 11% was recorded which included doctor fee and medicines. Proportion of budget on clothing and shoes was 7%. Expenditure on electricity and phone was 5% and 1%, respectively. Expenditure on education was 5% only.

Figure 22:
Household Expenditure Per Month

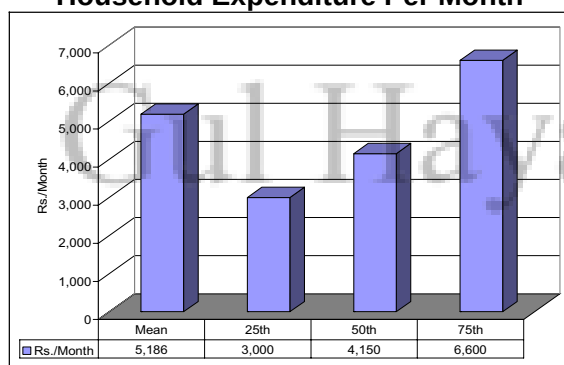
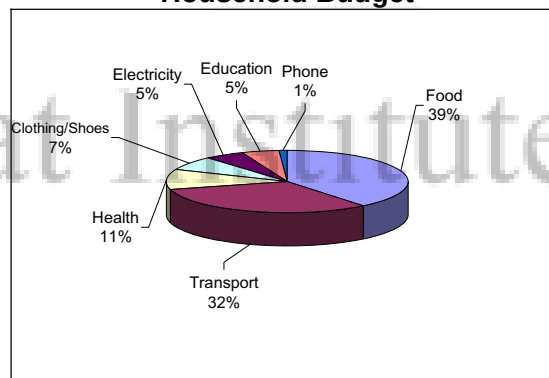


Figure 23:
Household Budget



6.5 Extent of Indebtedness

Table 6 reveals that, on an overall basis, 39% of households had availed credit/ loan of some type during 2006-07. Loan availing households reported that 85% of them were paying installments regularly while only 15% denied. In response to a question whether income of the households increased due to loan opportunity, majority of them (62%) were of the opinion that their income did not increase. The amount of loan ranged from Rs. 100 to 346,000 while the average was estimated at Rs. 38,797.

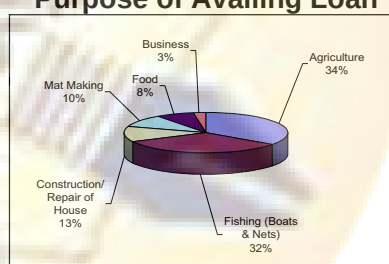
**Table 6:
Received Loan**

Received Loan (%)	Yes	39%
	No	61%
Installments are paid Regularly (%)	Yes	85%
	No	15%
increased household income	Yes	38%
	No	62%
Amount of loan (Rs.)	Minimum	100
	Maximum	346,000
	Mean	38,797

6.6 Purpose of Availing Loans

Figure 24 shows the purpose of availing loan. More than one third (34%) of the loan receivers reported that loan was obtained for agriculture purpose. These loans were received mainly for the purchase of agricultural inputs namely seed, fertilizer and pesticides. Duration of loans was mostly six months. For fishing purpose, about one third (32%) of the borrowers obtained loan. These loans were received mainly for the purchase/repair of boats and nets.

**Figure 24:
Purpose of Availing Loan**



The third largest purpose (13%) of availing of loan was construction/repair of house. Mat making, purchase of food, and business were pronounced by 10%, 8%, and 3%, respectively.

6.7 Source of Loan

Figure 25 shows the sources of loan. The figure reveals that overwhelming majority (77%) of the household borrowed from local lender. The proportion of Bank loan was estimated at 23%. Although bank loans have been categorized to be cheaper than other sources, but documentation and process of loan were important hurdles in obtaining loans. None of the respondents reported loan obtained from NGOs. There is a need that the locally operating NGOs may start work on social mobilization process through which village development organizations (VDOs) and loan committees are formed for the award of loan to villagers without tedious documentation.

**Figure 25:
Source of Loan**

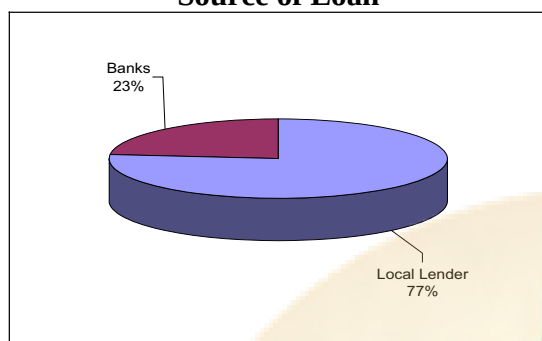
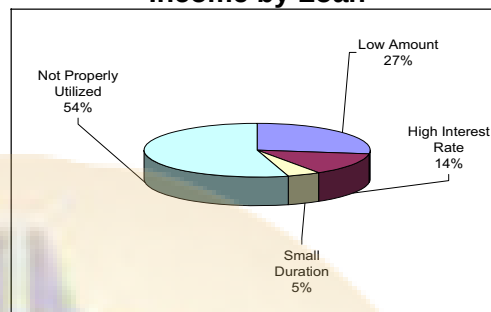


**Figure 26:
Reasons of not Increasing
Income by Loan**



6.8 Reasons of No Impact of Loan on Incomes

Figure 26 is evident of proportions of reasons of not increasing household income by loan. The highest (54%) reason was identified to be the not proper utilization of loan. For instance, loan was obtained for business purpose, but the same was utilized for other purposes may be on repayment of old loans, rituals of marriage, health and construction of house. The second highest (27%) reason was the low amount while “high interest rates” and “small duration of loan” were ranked to be 3rd and 4th reasons reported by 14% and 5% respondents. As mentioned in Figure 25, about 77% of the household received loans from local lender. The interest rate of local lenders was recorded to be as high as 40-60% per annum while bank rate charged is about 15-16%.

6.9 Livestock (Buffaloes and Cows)

Table 7 shows proportion of households possessing livestock and the average size of herd. Female buffaloes were found in every 5th household (21%) while their average number was 6.96. Milking buffaloes were reported in every 10th household (12%) while their average number was computed to be 3.38 per household. Cows were reported by 39% of household with the average number of 9.23 while milking cows were found in 25% of the households with average number of 4.77. Cows are relatively more adaptable animals than buffaloes. *Thari* cows are very famous breeds of Thar, desert of Sindh, nearby, chortiar, Sanghar.

**Table 7:
Buffaloes and Cows**

		HHS(%)	Mean
Buffaloes	Male	5.5	2.27
	Female	20.9	6.96
	Milking	11.7	3.38
Cows	Male	12.8	2.71
	Female	39.2	9.23
	Milking	25.6	4.77

**Table 8:
Milk production, consumption and sale**

		Liters	%
Buffalo Milk	Production	3.6	100
	Consumption	3.5	97
	Sold	0.1	3
Cow Milk	Production	3.4	100
	Consumption	3.3	97
	Sold	0.1	3

6.10 Milk Production, Consumption and Sale

Table 8 reveals the milk production, consumption and sale. The average production of milk was 3.6 and 3.4 liters in buffalo and cow respectively. About 97% of the milk (3.6 liters) was consumed by the household members while only 3% of the milk was sold. Like buffaloes, 97% of cow milk was domestically consumed while 3% was sold.

6.11 Other Livestock and Poultry

Table 9 compiles data on the ownership of other animals and poultry birds at Chotiari, Sanghar. Goat, sheep, and camel ownership were reported by 27%, 4%, and 3% of households, respectively. Horses were reported by 2% and Donkeys by 8.8% of the households. Poultry birds were maintained by 18% of the households. The table also reveals the average number of animals possessed by households. The average number of goats was 6.6 and sheep 9.5.

This clearly indicates that small proportion of household possess sheep (only 4.0%), but their average number was substantially high (mean = 9.5) as compared to goats possessed by 27% and the average number was about 6.64 per households. The average number of camel was computed to be 1.75 per household. Likewise, about 3.29 donkeys were reported per households. The average number of poultry birds was 6.27 per household.

Table 9:
Various Type of Livestock Available

	HHs(%)	Mean
Goat	27.1	6.64
Sheep	3.7	9.5
Camel	2.9	1.75
Horse	1.8	1.2
Donkey	8.8	3.29
Poultry	17.6	6.27

6.12 Livestock Transactions and Mortality

Data presented in Tables 10 reveals the status of animal purchase, sale, births, and deaths at Chotiari, Sanghar during 2007. It was reported that 1% of the households purchased buffaloes while their average number was 1.3 per households. Buffaloes were sold by 5% of the households with average number of 4.07. A very high proportion of about 6% reported buffalo mortality with an average of 2.75. New Born animals were reported by 11% of the households with average value of 2.19. Purchase and sale of cows were reported by 1.8% and 15% of the households respectively with purchase mean of 1.2 and sell mean of 3.78. Died and new born animals were reported by 14% and 23%, respectively.

Table 10:
Economics of Livestock

		N(%)	Mean
Buffalo	Purchased	1.1	1.3
	Sold	5.1	4.07
	Died	5.9	2.75
	New Born	11.4	2.19
Cow	Purchased	1.8	1.2
	Sold	15	3.78
	Died	13.9	2.71
	New Born	23.1	3.37
Goat	Purchased	2.2	1.5
	Sold	8.1	4.09
	Died	10.6	3.97
	New Born	15.8	3.23

Sell of goats was reported to be more than their purchase. This may be due to new born animals reported by 16% of households with average value of 3.23. Mortality of goats was reported by 11% of households with an average of about 4.

7. Community Development Priorities

Table 11 reveals summarized data about the ranking of development priorities. The table shows that the first priority was dispensary followed by link roads, school, loan, and water supply. It is already discussed that the substantial amounts of income (11%) was incurred on health. In case of fatal diseases, households were reported to be bankrupt and loans were repaid by selling livestock, ornamental, lands and other valuables. In the light of above discussion, the first prioritized demand of survey area looks plausible.

The second priority was road. A substantial proportion of 32% of the household budget was incurred on transportation (Figure 23). This may validate the second development priority by the respondents. Education plays an important role in enhancing income and living standard. Most of the respondents realizing the importance of the education, demanded schools.

Table 11 Ranking of Development Priorities

Ranking	Options
First	Dispensary
Second	Road
Third	School
Fourth	Loan
Fifth	Water Supply

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8. Community Input for Development

More than 500 fishing boats of traditional make are reported here. Only a few have the motors installed. There is no Boolo Gujo net in this area which is a blessing. In spite of government policy of issuing licenses to active fishermen, the terror of influential fishing contractors of Nizamani tribe reigns supreme. Fishing license fees fixed at Chotiari is higher when compared to Keenjhar. There is ongoing PFF activism against the contract system and there are also some court cases filed by the parties against each other. Phulhel village is the center of such activism.

8.1 Issues and Options

The following issues were highlighted by the focus group participants and key respondents the Management & Development Center (MDC) consultant's field visits:

1. Resettlement plan for Chotiari reservoir was prepared and implemented in 1993. Nevertheless, many communities neither got the compensation nor the land for involuntary resettlement. They kept on residing in their original villages within the reservoir area. Since the reservoir has started full operation since 2003-04, these communities have been displaced recently. The issue of appropriate compensation and resettlement needs immediate attention now that many families have no permanent abode and have lost valuables including livestock.
2. Sale of seedlings to fish farms by local fishermen and contractors.
3. Contract system and lack of access to the natural resources.
4. Depletion and illegal hunting of Chinkara, hog deer, crocodile, freshwater Otter, fish, partridge, huboura bustard and water fowl.
5. Water logging and spoilage of rangelands.
6. Poor quality works on reservoir and its embankment.
7. Lack of social services and animal health facilities.

Depletion of natural resources was reported by the focus group to be extensive. The status of 7 dehs (smallest revenue units) in and around the reservoir area, was assessed by the group as under:

1. Baqar is totally inside the reservoir except for the village and nearby lakes.
2. Most of the Akanwari deh is submerged. The agricultural lands are water logged with lowest productivity.
3. Part of Khadwari is under the reservoir. One third is fertile and cultivated while about one third is water logged.
4. One fourth of the Mithrao revenue unit is sub-merged and an equal area is waterlogged. Western part of deh is under fish farms.

5. Haranthari deh has suffered heavy loss of livestock and vegetation. It is under the reservoir since last three years.
6. Dubi- 2 is partly under reservoir while its biodiversity rich habitat of Awadh is waterlogged. Trees and vegetation have disappeared.
7. Makhi is partly inside the reservoir. The forest has been cut for settlement of new land owners. No land has been allotted to the displaced communities. It is also receiving heavy seepage from Nara canal and reservoir.

Participant input on various options was recorded as under:

- Improper implementation on Pati Pota Resettlement Plan has left many families without regular villages and compensation based on market prices. Re-assessment of losses and regularization of villages is the most crucial need now that the reservoir is functional. More than 500 households have reportedly not received the compensation.
- Issuance of fishing licenses to actual fishermen is urgently urged. A note of caution is that the contractors here are very influential and they may get the licenses issued for their henchmen and fictitious fishermen.
- Control of influential fishing contractors may be got vacated.
- Social development and road infrastructure is needed for awareness and livelihood opportunities.
- Drainage system may be constructed through a supplementary project, specially in the areas submerged near Nara canal, outfall drain near Baqar and escapes in the north western zone.
- Small escape from the reservoir is needed for improving the water quality and fisheries in Baqar lake system.
- Crocodile, hog deer and partridge can be multiplied through technical support in the Awadh zone. Crocodile and hog deer farms were also suggested by the key respondents.
- Partridge is being sold in open market at Rs. 150 per bird. It is also being over-hunted without any check by the staff of Game Department. Awareness and effective ban on illegal hunting is needed.
- Due to poor workmanship, the reservoir bund is in a deplorable condition. New work on its expansion and level raising is of poor quality. Strict supervision and quality assurance is needed to save the area from an eminent disaster.
- Tree plantation is needed around the reservoir embankment to stabilize the soil and to compensate for excessive wood cutting that has occurred since 2004-05.
- Erosion of mounds inside the reservoir area is causing an irreparable loss of biodiversity. Interventions are needed to save the smaller species and shift them to the nearby Achhro Thar area. A museum could also be established near Juneja Marrion (old architecture houses) in the desert for tourist attraction.

- Due to continuous operation of Awadh pumping station, which drains the saline effluent in the reservoir, the water quality is increasingly becoming unsuitable for fish and agricultural productivity. It is not even suitable for drinking purposes any more. Innovative engineering options are needed to rescue the area from total disaster.
- Sanghar drain networking can provide relief from water logging to the Makhi, Khadwari, Mithrao and Akanwari dehs.
- Government scheme for installation of 100 tube wells around the reservoir area may be started urgently.
- Tourism infrastructure and motor boats be provided at the Baqar/ Phullel point. Desert safaris can also be arranged in Acchro Thar.
- Vocational, fish farm/ aquaculture, agricultural and other skills be managed through training programmes.
- Institutional credit for boats & fishing accessories and microfinance for livestock and other purposes be provided.
- Rangeland improvement programme be initiated.
- The whole site should be declared as a Protected Area. Specific areas be reserved for the conservation of crocodile, Otter, and hog deer.
- Experienced wildlife/ game warden be given employment for protection and multiplication purposes.
- Hatchery project of Fisheries Department may be expedited and fish seed should be exclusively put into the reservoir and lakes for attaining the target of 4000 tons of fish per annum, as originally planned.

8.2 Development Proposals

In general, the village leaders demanded reduction in the reservoir level to manage seepage and water logging issues. Most villages expressed the need for dispensary, veterinary hospital, drainage system, road, employment and tree plantation. Tourism infrastructure was needed at Baqar and Phullel villages. Village Laloo Mangrio has no road exit to the mainland. Village Phullel can be connected to the mainland through a low cost project which may also provide for a protective bund surrounding the settlement. It is the nerve center of fisher folk activism and could also be the main tourist attraction if protected in its natural environment.

The poorest villages are Mallah communities, namely Abdul Rahman Mallah, Siddique Mallah, Haji Khan Mallah and Sommar ji Mian.

9. Summary and Findings

Thirty five (35) villages were recorded around the Chotiari reservoir, Sanghar with a high proportion (75%) of small villages. Out of these 35 villages, 273 households were selected from 24 villages; categorized as 16 small (67%) villages, 7 medium (29%) and 1 large (4%) . An error rate of 5.8 was recorded for a sample size of 273 households. The main baseline socio-economic indicators of Chotiari priority area of the WWF- Indus for All Programme are presented below.

The average family size, enumerated from survey data, was around 7 members. Average age at marriage for male was 22 years and for female it was about 18. Significantly higher ages of educated couples were recorded in comparison of their illiterate counterparts. Overwhelmingly majority (91%) of the households were Sindhi speaking. Siraiki was observed to be the second largest (6%) language. More than half (52%) of the household heads were illiterate. Every fourth household head had Primary education. Education up to middle was 4%, matriculate 10%, intermediate 4%, graduate 3% and postgraduate only 2%. The highest proportion (37%) of households reported Malaria as a common disease while its occurrence was about 2.6 times per year. The second highest occurrence (2.6 times per year) and proportion of households (30%) was recorded for Diarrhea. The minimum distance was about 1 km and the maximum was about 60km to reach health facility while the average distance was 14km.

Fishing was major occupation (39% households) followed by 15% agriculturists, and 13% livestock herders. Drinking water was identified to be the most accessible natural resource (response rate of 66% and the average value of 1.1; means strongly agree with the research statement) at Chotiari, Sanghar. Forest wood was reported by 70% of the respondents with the average value of 1.52. Respondents expressed their views in agreement, on an overall basis, about degradation of forest animals (mean = 1.87 and response rate of 49%), grazing lands (mean = 1.84 and response rate of 47%), birds migratory (mean = 2.03 and response rate of 43%), and birds local (mean = 2.04 and response rate of 42%).

The average income was computed to be Rs.6,619. Monthly income of male and female members was about Rs. 4,587 and 1,516, respectively. From this it was concluded that wages of male members were about 3 times higher than that of female. About 39% of the budget expenditure was incurred on food items. A substantial proportion of 32 of the budget was reported on transport, while on health, 11% was recorded which included doctor fee and medicines. Proportion of budget on clothing and shoes was 7%. Expenditure on electricity and phone was 5% and 1%, respectively. Expenditure on education was 5%.

The first priority was dispensary followed by link roads, school, loan, and water supply. In general, the village leaders demanded reduction in the reservoir level to manage seepage and water logging issues. Most villages expressed the need for dispensary, veterinary hospital, drainage system, road, employment and tree plantation. Tourism infrastructure was needed at Baqar and Phullel villages.

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ANNEXURE

Summary Notes on the Villages Surrounding Chotiari Reservoir

1. Sohno Fakir Umrani (UC Mian). Agricultural labor/ tenants and land owners. Sukar VDO in education, infrastructure and health. Road in progress. Unemployment, disease, and water-logging. Water supply and dispensary needed. Rice mill demanded.
2. Haji Khan Laghari, UC Mian. Land owners, tenants and herders. Unemployment, water - logging and diseases. Dispensary and electricity needed.
3. Dur Mohammad Laghari (UC Mian). Land owners, wage labor and drivers. Unemployment, water - logging and disease are issues. Water supply, electricity and dispensary needed.
4. Jani Khan Junejo (UC Chotiari). Livestock, land owners and wage labor. Animal and human diseases, unemployment and police excesses. Dispensary, drainage system, and school needed.
5. Soomar ji Mian. Fisheries and mat making. PFF active in social development. Contract system is major issue. Poor village. Social injustice, unemployment and disease are issues. Fisheries Licenses, loans, dispensary, girls school needed.
6. Tharo Mangrio (Dogrioon), UC Chotiari. Land owners, tenants and services. Sustainable Development Foundation active here. Unemployment, water logging and seepage, animal and human diseases. Brackish underground water. Water supply, girls school, dispensary needed. Drain demanded.
7. Wasayo Junejo (Deh Baqar, UC Shah Sikandarabad). Land rent and Livestock. Fodder issue for buffaloes. Unemployment is issue. Seepage and water logging. Drain, dispensary, school and road needed.
8. Wali Mohammad Ibupoto (Akanwari, Shah Sikandarabad UC). Livestock, fisheries and wage labor. NCHD education Programme. Water logging, unemployment and animal diseases. Drainage, skill training in carpet weaving and black smithy needed.
9. Sobharo Mallah (haranthari, Shah Sikandarabad UC). PFF activism. Fisheries and mat making. Poor village. Unemployment, contract system and drought. Loans, school and fishing license needed. Reduction in reservoir level demanded.
10. Siddique Mallah (Makhi, UC Mian). Small very poor village. Mat making and fishing. Unemployment, water logging, disease, police injustice. Housing, road, school and dispensary needed.
11. Rano Junejo (Baqar, UC Shah Sikandarabad). Livestock herders. Small village. Unemployment, water logging and drought. Road, dispensary and school needed. Livestock training, rangeland development, tree plantation around reservoir and reducing its level proposed.

12. Pir Bux behan (Haranthari, UC S.Sikandarabad). First located inside reservoir area. Livestock herders. Poor now. Drought, unemployment, water logging and diseases. Land for settlement, dispensary and school needed. Reduction of level.
13. Phullel (Baqar, S. Sikandarabad). Fisheries is the only occupation. Mat making and handicrafts Largest fishing village. PFF active here. Report writing and community organization training conducted. CCB Phullel registered but no project as yet. Poverty, unemployment, health and future of settlement are issues. School, dispensary and road are needed. Tourism facilities demanded.
14. Padario (Bakar). Herders. SDF Sanghar active. Drought, waterlogging and unemployment issues. School, road, dispensary needed. Livestock management training. Reduction in water level at Chotiari.
15. Usman Ibupoto (Akanwari, S. Sikandarabad). Herders, landowners, wage labor/ tenants. Unemployment, water logging, disease issues. Road, dispensary, vet hospital needed. Drains and reduction of dam level demanded.
16. Uris Junejo (Baqar, S. Sikandarabad). Small village of herders, 4 HH. Water logging, unemployment, diseases. School, road and dispensary needed.
17. Mohammad Hussain. Makhi, UC Mian. Herders and Beldars. Waterlogging, unemployment and disease. School, road and dispensary. Drains and Babool plantation suggested.
18. Meer Mohammad. Bakhero, UC Mian. Mat Making, herders, fisheries and agri. Labor. Waterlogging, unemployment and disease. School, road, dispensary and LHV needed. Seed for fish farms, drain, reduction of level, jobs demanded.
19. Malhar Wassan. Janib Dhoru, S. Sikandarabad UC. Land owners, herders, wage labor/ tenants. Water logging, grazing land and unemployment issues. Girls primary school, dispensary, Vet hospital and water supply needed. Drainage.
20. Laloo Mangrio. Baqar, UC S. S.Abad. No road access. They travel by boat to Awadh road. Herders small village. Water logging, disease issues. School, dispensary and road access needed. Reduction of dam level demanded.
21. Lal Khan Junejo. Baqar. Herders small village. Unemployment, water logging and diseases. School, dispensary, vet hospital needed. Rangeland development demanded and digging of wells in Achro Thar (White desert).
22. Lal Bux Unnar (Akanwari, S. S. Abad). Land owners, herders, and wage labor. Water logging, unemployment and disease. School, road and dispensary needed. Training in livestock management. Hog deer farming and reduction in level.
23. Imamdin Sandh (Dub-2, S. S. Abad). Herders and wage labor/ tenants. Water logging and unemployment. Dispensary, road and school needed. Teacher, drains, and saline tube wells needed.
24. Haji Khan Mallah (Akanwari, S. S. Abad). Fishing. Poor. Unemployment and disease. School, dispensary and loans needed. Fishing accessories needed. They can do the farming of crocodile and Ludhro and hog deer.

25. Haji Islam Larik (Baqar,). PFF active here. Fishing, mat making and herders. Very poor village. Unemployment and disease. School, road and dispensary needed. Tourism development and easy marketing of mats demanded.
26. Chotiaroon. Wage labor/ tenants, artisans, services and fisheries. Large settlement. Chotiarion development Organization and Citizens Action Committee. Unemployment, water supply, female education issues. Girls school, dispensary and water supply needed.
27. Ghulam Hussain Laghari, UC Jhuingi. Small village. Herders and land. Water logging, unemployment and disease. School, dispensary and vet hospital needed. Training in fish farming. Ludhro sited here.
28. Bilawal (Akanwari, S. S. Abad). Land, Herders and wage labor/ tenants. Poor village. Water logging, unemployment and disease. Dispensary, vet hospital and loans needed. Drains and rangelands demanded.
29. Baqar (UC Shah Sikandarabad). Fisheries and artisans. Chotiarion Development Organization and the PFF. Licenses for fishing, unemployment issues. Contractor menace. School, dispensary and fishing licenses needed. Voc Training center, reduction in level demanded.
30. Allahdino Behan (Akanwari, UC S. Sikandarabad). Small village. Land and herders. Water logging and unemployment. Drains, dispensary and vet hospital.
31. Allah Bux Junejo (Akanwari). Herders, land and wage labor. Very poor village. Water logging and unemployment. Dispensary, vet hospital and loans needed. Drainage schemes and grazing lands.
32. Achar Jamali (Makhi, UC Mian). Livestock herders. Water logging, unemployment and diseases. Resettlement, grazing area and training in LM.
33. Abdul Rahman Mallah (Haranthari, S. S. Abad). PFF active. Small fishing poor village. License and unemployment issues. Loan, dispensary and school needs.
34. Abdul Qadir (Baqar). Fishing and herders. Water quality in Baqar lake is the main issue. School, dispensary and road needed. Freshwater in the lake and seed.
35. Abdul Karim Mallah. Haranthari. PFF active here. Poor village. Unemployment, water logging and disease. School, dispensary and loan needed. Fishing licenses demanded. Fish feed needed in the dam.

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Pai Forest Site Specific Final Report

Indus For All Programme



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May, 2008

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Acronyms	
CCB	Citizen Community Board
DFO	Divisional Forest Officer
HESCO	Hydro Electric Supply Company
HH	House Hold
MDC	Management and Development Center
NAB	National Accountability Bureau
NCHD	National Commission for Human Development
NGO	Non-Governmental Organization
RWDO	Rural Women Development Organization
SAWFCO	Sindh Agricultural & Forestry Workers' Cooperative Organization
SEF	Sindh Education Foundation
SFD	Sindh Forest Department
SPO	Strengthen Participatory Organization
TBA	Traditional birth Attendants
TVO	Trust for Voluntary Organization
UC	Union Council
USAID	United States Agency for International Development
WAPDA	Water and Power Development Authority
WWF-P	World Wide Fund for Nature for Pakistan

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BASELINE INDICATORS OF PAI FOREST

SITE SPECIFIC REPORT

1. Background Information

Pai Forest in Nawabshah district covers an area of 1933 hectares. Due to its ecological importance, the entire area of Pai forest has been declared as a Game Reserve by Sindh Wildlife Department. The forest provides a natural habitat for different wildlife species that include hog deer, partridge, asiatic jackal, jungle cat, porcupine, wild boar, snakes and others. Originally, the Pai forest formed the part of riverine ecosystem which depended on annual inundation of the River Indus; but, due to construction of protective embankments all along both sides of the Indus in early twentieth century, Pai forest was cut off from the riverine tract and it became dependent on sanctioned irrigation water supply which is inadequate and unreliable to sustain the entire forest area. This situation is leading to a continuous degradation of forest and wildlife habitat.

Sindh Forest Department (SFD) (2000), in the forest management plan for Nawabshah district, documented that the total area of riverine forests is 48,189.5 ac (19,502.0 ha), and of irrigated plantation is 6,926.6 ac (2,803.2 ha). The latter includes 870.1 ha of plantations established in two riverine forests of Ketijurio and Mari. Thus, the combined area of all state forests is 55,115.5 ac (22,305.8 ha), which is distributed among 3 forest ranges of Nawabshah Forest Division. Pai irrigated plantation is situated at a distance of about 5 km from Sarkand town with its area falling in 5 dehs.

Prior to the construction of Sukkur barrage, this forest depended for its water supply on the scanty rainfall and the unregulated water supply from the river through inundation channels. As water supply was not assured, the growing stock was poor both in quality and quantity. The Barrage was constructed during 1931-35, but no provision was made in it initially for supply of water to the Pai inland forest. Raising of tree plantations under agroforestry system was however, started in 1937-38 with the help of irrigation water. As water supply was small, only small areas of 20 to 40 ha were taken up each year for raising tree crops. This arrangement continued till 1946-47, when the Government of Sindh realized the grave situation created by the shortage of fuel-wood and charcoal in the province. As a result, the Public Works Department agreed to provide the required discharges from Rohri canal.

The agreed irrigation water supply is at the rate of 0.86 cusec of perennial water per 100 ac (40.4 ha). Thus sanctioned water of 30 cusecs is sufficient for irrigating 1,212 ha of plantation. But out of sanctioned 30 cusec of water, only about 10 cusec of water is generally received because the plantation is located at the tail end of the irrigation channel which receives only one third of the sanctioned water. In order to overcome the problem, 13 tubewells have been installed in it at different times to irrigate the tree plantations. The prevalent practices of irrigation are very defective. It is known that the plantation does not receive the sanctioned water supplies.

Pai forest, was taken up for systematic conversion into irrigated plantation during 1960-61 under a development scheme titled "Industrial Wood Plantation Phase-I". 506 ha were planted under this scheme. In addition, an area of 174 ha was planted under Industrial Wood Plantation Phase-II in 1988-91 and 455 ha have been planted under SFDP since 1996-97. Most of the areas planted with Shisham during 1960-61 to 1969-70 under first development scheme were invaded by Kandi due to fires and shortage of canal water. Therefore, 13 tubewells were installed in Pai plantation to irrigate the plantation in time of shortage. Presently 1299.2 ha are under Babul, 107.4 ha under

Eucalyptus, 1044.9 ha under Kandi and 11.7 ha under Shisham crop. Thus total stocked area is 2463.0 ha, which is 85% of its total area. Theft of sanctioned water and unchecked wood cutting have caused serious threat to the Pai forest in recent years.

2. Household Sample

Descriptive research is used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. The methods involve structured surveys which describe the status quo about selected socio-economic indicators, the correlation studies which investigate the relationship between variables, and developmental studies which seek to determine changes over time. The descriptive research design was selected because the primary purpose of the present study was to establish the pre-project/programme baseline socioeconomic profile as well as status of human and natural resources for the development of a planning and policy matrix to ensure sustainable livelihoods.

In general, the baseline studies use the standard statistical sample given in table- 1.

Table 1: Population Size and Statistical Sample for Baseline Studies

S.No.	Population Size (e.g. Total Households)	Suggested Sample
1.	10	10
2.	50	44
3.	100	80
4.	500	217
5.	1,000	278
6.	3,000	341
7.	50,000	381
8.	100,000	385

Source: Samji and Sur. 2006. Developing A high Quality Baseline. World Bank, New Delhi.

To determine a representative household sample size, the following equation was used:

$$n = \frac{N\pi(1-\pi)}{(N-1)(C/Z_{\alpha/2})^2 + \pi(1-\pi)}$$

Where n is recommended sample size, N is population size, π is proportion of a characteristic of interest (e.g. literacy rate, poor population, and mortality), C is $\pm$ error rate (confidence interval), and $Z_{\alpha/2}$ is tabulated value for confidence level (Tryfos, 1996). Plugging the proportion of 0.5 (which gives the maximum variance, $0.5*(1-0.5)= 0.25$), error rate (confidence interval) of $\pm 5\%$ and 1.96 tabulated value of $Z_{\alpha/2}$ for 95% confidence level and number of households (population) were estimated.

Pai Forest Nawabshah had comparatively larger villages. larger settlements with a majority of medium villages (42%), followed by small villages (39%) and large village (19%). Socio-economic data were collected from 236 households in 10 villages - 5 small, 3 medium and 2 large.

3. Human Capital

3.1 Household Size

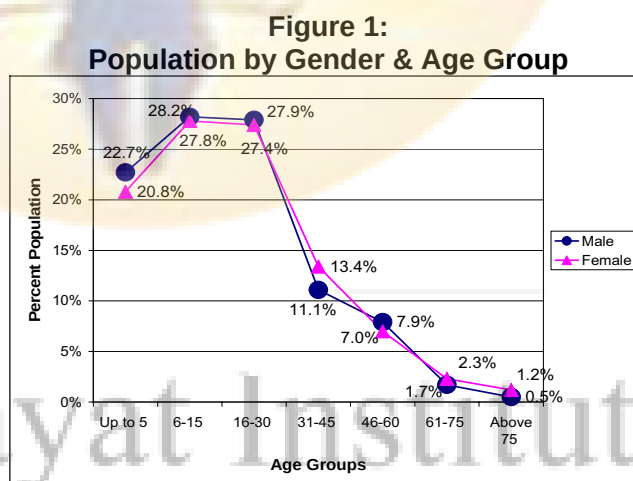
The average family size, enumerated from survey data, was around 7 members (Table 2). The estimate coincides with the national figure for rural household size of 7 members. About 59% of the households were recorded having household size between 4 to 8 members. Proportion of households with members between 9 to 13 was 24% while very small proportion (1%) of households was recorded having members more than 18. About one-tenth (13%) of the households had up to 3 members.

3.2 Age Groups by Gender

Figure 1 presents the distribution of population by gender. About one-fifth (21%) of the population was recorded of age up to 5 years. Majority of the population (56%) was recorded for two groups: i) from 6 to 15 years and ii) 16- 30 years; about 28% for each group. Proportion of population of age group 31-45 years was around 13%; 46-60 years was 8%; 61-75 years was 2% and above 75% was 1%.

Distribution of population by gender indicates that female population is higher in older age group while male population was higher in children and young groups this indicated that life expectancy of female is higher than male. According to Pakistan statistics, the life expectancy of male is about 64 years while female is 66 years (GoP, 2005).

Table 2: Household Size		
Average Family Size		6.9
Distribution (%) of families by members	Up to 3	13.0
	4-8	59.1
	9-13	23.9
	14-18	3.0
	19 & above	0.9
	Total	100.0



3.3 Average at Marriage

Figure 2 revealed that average age at marriage for male was 21 years and for female was about 18. It has been observed that tradition of child marriage has changed due to education. Significantly higher ages of educated couples were recorded in comparison of their illiterate

counterparts. In some cases, child marriages were also observed. Figure 2 also reported minimum ages at marriage by gender. Minimum age of male was about 2 years while that of female was 10 years.

**Figure 2:
Age at Marriage**

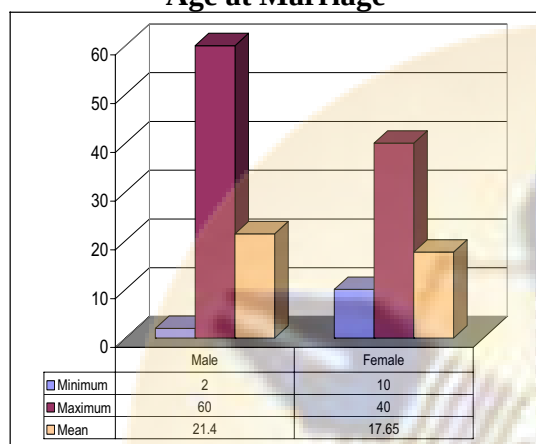
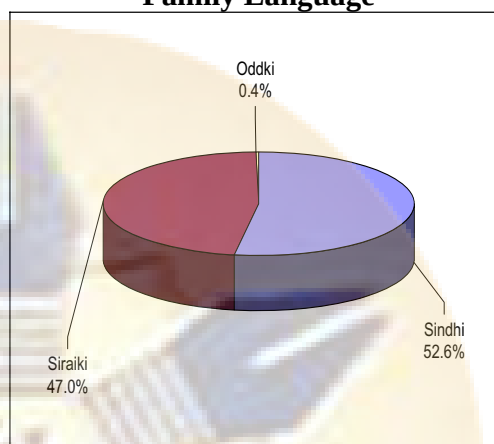


**Figure 3:
Family Language**



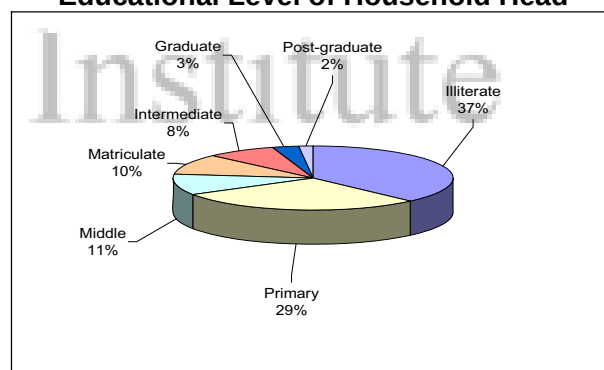
3.4 Family Language

Figure 3 shows that majority (53%) of the households were Sindhi speaking. Seraiki was observed to be the second largest (47%) speaking language. The proportion of third languages (Oddki) was very small even less than 1%. The above estimates revealed that Sindhi and Seraiki are dominant languages in Pai Forest area. Siraiki, a language of southern Punjab, is very much related with Sindhi and Punjabi. Many tribes migrated to Sindh from Southern Punjab about 200 to 300 years ago. Seraiki language was also spoken by tribes of Balochi origin mainly at the Pai site but the communities were culturally cohesive.

3.5 Education of Household Head

Figure 4 reveals educational level of household head. There were 37% of the respondents reported to be illiterate. Primary education was enumerated to be 29% while middle was 11%, matriculate 10%, intermediate 8%, graduate 3% and postgraduate only 2%. These estimates are in agreement with the farm level survey estimates provided by NFDC (2002); that about 34% of the farmers were illiterate while proportions of farmers under matric, intermediate, graduate and postgraduate were 29%, 23%, 11% and 3% respectively.

**Figure 4:
Educational Level of Household Head**



3.6 Education of Household Members

Data collected on household members of age more than 15 years were segregated by gender revealed remarkable difference in educational level (Table 3). Only 20% of the females were educated against 63% males. Out of the 20% educated females, 11% had education up primary level, 2% were middle pass, 5% matriculates and only 1% intermediate. Gender biases in educational estimates provided above established the need for more work on female education for the human development and success of health related programmes especially of maternal and child care.

Table 3
Educational Level of Family Members

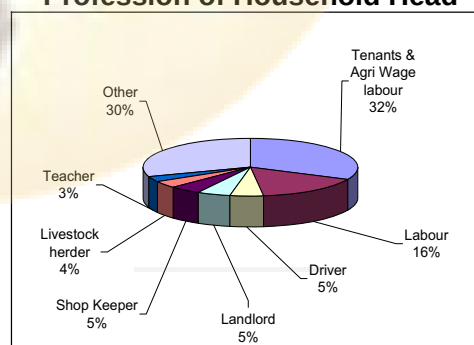
	Population (%)	
	Male	Female
Illiterate	36.8	80.0
Primary	26.1	11.0
Middle	10.5	2.1
Matriculation	13.1	5.4
Intermediate	9.0	1.0
Graduate	3.0	0.0
Postgraduate	1.5	0.5

3.7 Profession of Household Head

Figure 5 reveals profession of household head. About one-third (32%) household heads reported their business as Tenants and agriculture wage labor. Daily wage laborer engaged in different type of work including construction of house was reported to be about 16%. Interestingly, the proportion of drivers, landlords, and shopkeepers were recorded to be 5% for each category.

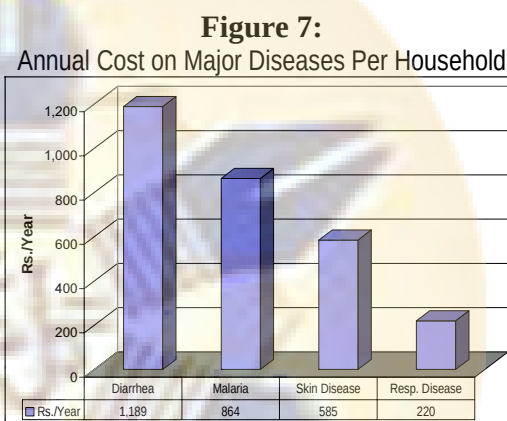
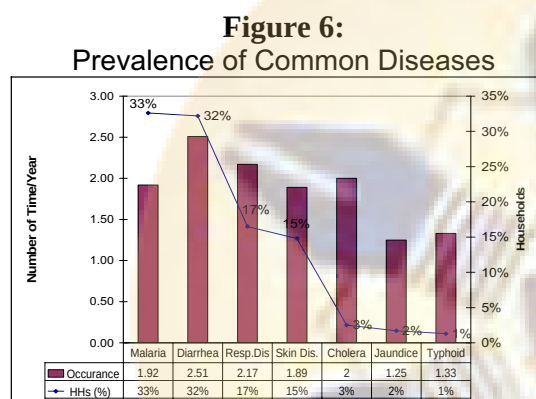
The drivers (5%), who were intermittently unemployed, could easily be employed in urban areas if they are given proper training in driving rules and they get the driving licenses issued. Livestock herders were reported to be 4% and 3% teachers. Various categories having proportion of less than 1% were designated as "other." Other category included artisan, mechanic, plumbers, Pesh Imam, carpenter, home servant, wood cutters, and poultry farm manager etc.

Figure 5:
Profession of Household Head



3.8 Prevalence of Common Diseases

Figure 6 shows proportions of households reported various diseases and their average occurrence by number of times per year. The highest proportion (33%) of households reported Malaria as a common disease while their occurrence was about 2 times per year. The highest occurrence (2.5 times per year) was recorded for Diarrhea, a reported by 32% of the households. Diarrhea is a waterborne disease, mostly children were pronounced to be more vulnerable to fatal disease. The average occurrence of respiratory diseases, skin diseases, cholera, jaundice, and typhoid were 2.2, 1.9, 2, 1.3, and 1.3 respectively while the proportions of households reported these diseases were 17%, 15%, 3%, 2%, and 1%, respectively.



3.9 Annual Cost on Major Diseases per Household

Figure 7 displays the annual cost on major diseases per household. The common grievances of poor households were high costs of medicines, doctor fees, and laboratory testing fees for diagnoses of various diseases. Although most of the medicines are locally produced in Pakistan, sky rocketing prices are mostly attributed to inflation, which is as high as 7% to 10%. Under the common circumstance, the average expenditure on diarrhea alone was about Rs.1200 only. The average expenditure for malaria was Rs. 864 per household. It was reported that malaria occurs two times (two seasons) a year and the expenditure per seasons was about Rs.432 per household. Reported expenditure on skin diseases was Rs. 585 only and on respiratory diseases Rs.220 per month only.

3.10 Health Facility Availed

Figure 8 reveals the health facility availed for the treatment of diseases. The figure displayed that more than three-fourth (76%) of the households reported private clinic. Taluka hospital was availed by about 13% of the households while dispensary and/or Basic Health Unit were availed by about 11% of the households. Despite higher costs, majority of the households preferred private clinics as a source of treatment because of more care by doctors in diagnosing diseases and prescribing proper medicines. Non availability of doctors and medicines were also attributed to be major reasons of low rate of participation in public health sector.

3.11 Distance from Health Facility and Expenditure on Health

Table 4 reveals distance from health facility and expenditure on health. The minimum distance was about 1 km while the maximum was about 40km to reach at health facility while the average was 8km. It was also reported by some of the households (<1%) that they preferred district headquarter, Nawabshah, for treatment purpose. Maximum distance reflected those households. Expenditure on health varied from Rs.50 to 4000 per month per household. The average expenditure was about Rs.600.

Figure 8:
Health Facility Availed

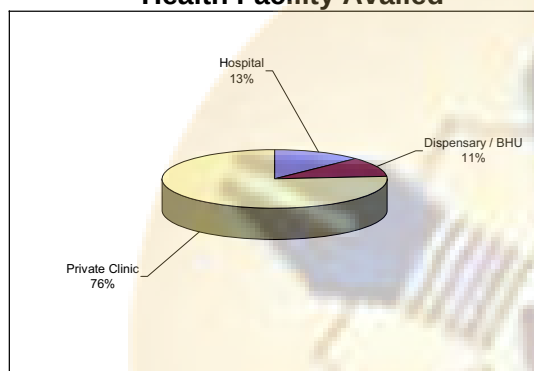


Table 4:
Distance from Health Facility and
Expenditure on Health

	Minimum	Maximum	Mean
Distance (km) from health facility	1	40	8
Expenditure on health per month	50	4,000	600

3.12 Place of Child Delivery

Figure 9 reveals that more than 66% births were attended by local Dai while only about 0.5% births were handled by trained LHVs. Private clinics and public hospitals were also visited for child births to the tune of 28% and 5% only, respectively.

Figure 9:
Place of child delivery

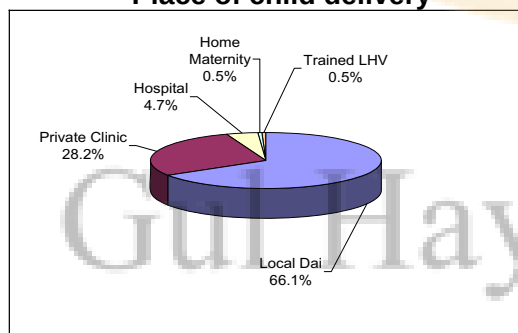


Table 5:
Expenditure and Delivery Related Mortality

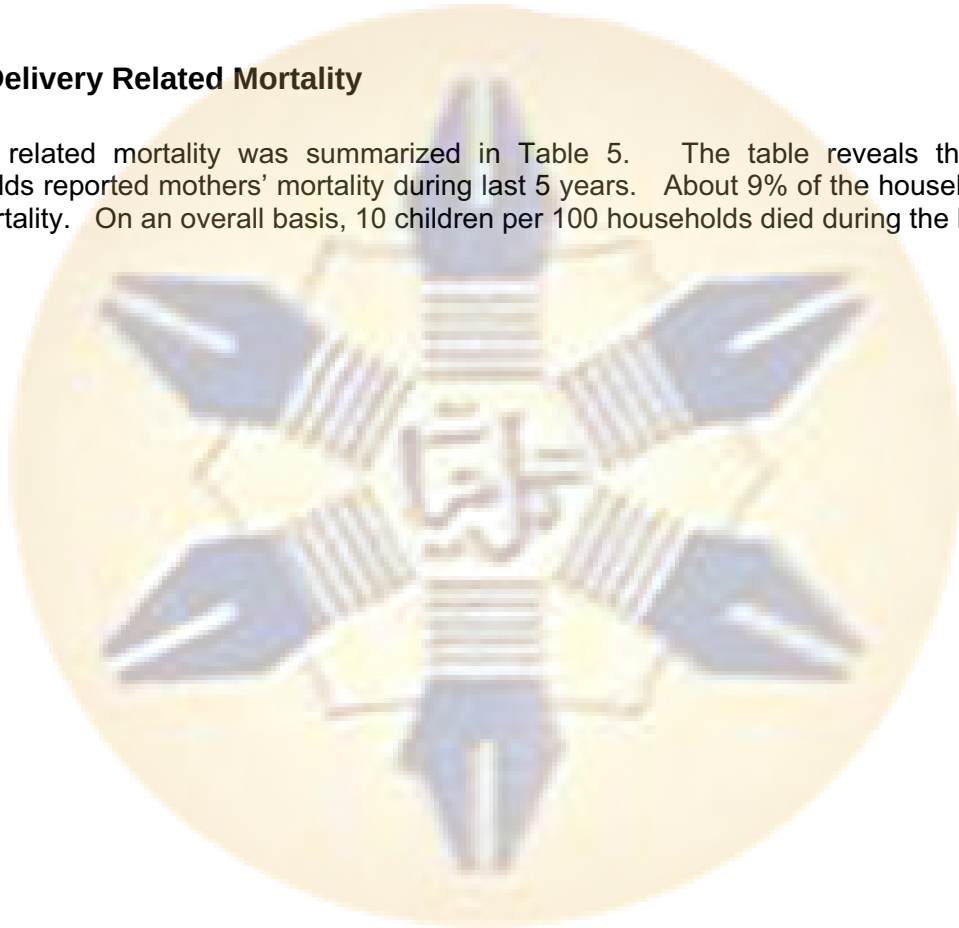
Expenditure Per Delivery (Rs.)	Minimum		200
	Maximum		4,000
	Mean		1,105
Delivery related mortality during last 5 years	Mothers	% of HHs	1.3
		Mean	1.0
	Baby	% of HHs	8.5
		Mean	1.2

3.13 Expenditure per Child Delivery

Expenditure per delivery, as reported by the households, was compiled in Table 5. Minimum expenditure per delivery was reported to be Rs. 200 only. Maximum expenditure per delivery was Rs.4,000 only. On an overall basis, the average expenditure per delivery was computed to be Rs.1,105 only.

3.14 Delivery Related Mortality

Delivery related mortality was summarized in Table 5. The table reveals that 1% of the households reported mothers' mortality during last 5 years. About 9% of the households reported child mortality. On an overall basis, 10 children per 100 households died during the last 5 years.

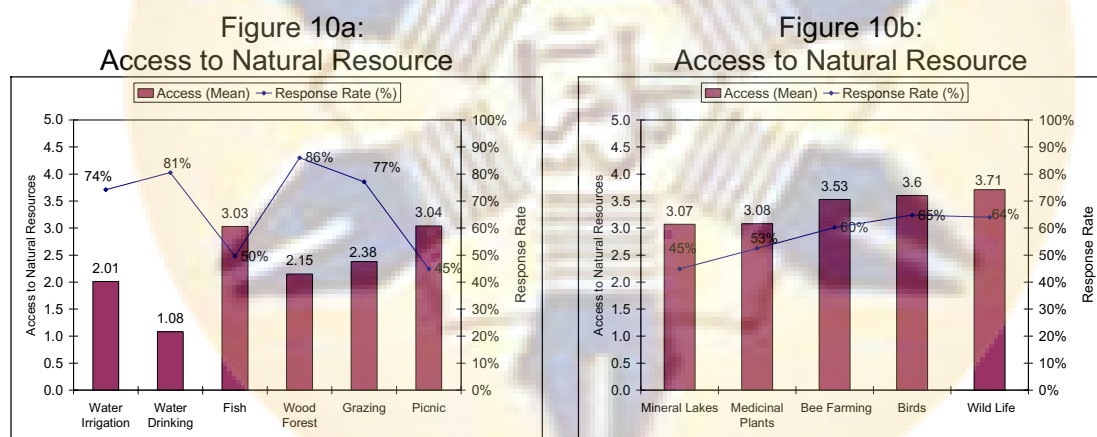


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4. Natural Capital

4.1 Access to Natural Resources

Figure 10 displays the response rate (%) and average value of perception about the frequent access to the natural resources. The Likert type scale used was 1 means frequently; 2 means sometimes; 3 means undecided; 4 means rarely; and 5 means restricted. The more response rate (%) and the lower perceived average value indicated the more access of households to the natural resources. Drinking water was identified to be most accessible natural resource (response rate of 86% and the average value of 1; means strongly agree with the research statement) at Pai Forest, Nawabshah. Since Indus river flows nearby the Pai Forest, therefore, the underground water was sweet and easily accessible. The source of water was identified to be the hand pumps. The second and third natural resources were reported to be wood forest (86% response rate and average was 2.15) and water irrigation (81% response rate and average was 2.01). Figure 10b reveals that on an average basis, the respondents were undecided about their access to mineral deposits, medicinal plants, bee farming, birds and wildlife.



Scale used: 1 = Frequently; 2= Sometimes; 3 = Undecided; 4 Rarely; and 5 = Restricted

4.2 Degradation of Natural Resources

Analysis of respondents' perceptions presented in Figure 11a and 11b, reveals the extent of degradation of various natural resources during the last 5 years. Response rates (percentage of respondents) and their average (mean) perceptions have been reported.

The average values indicate extent the responds agreed with the research statement that natural resources sharply degraded during last five years. Liket type scale was labeled as: strongly agree with 1; agree with 2; undecided with 3; disagree with 4 and strongly disagree with 5. Values close to 2 indicated that on an overall basis, respondents agreed with the research statement.

Figure 11a:
Degradation of Natural Resource

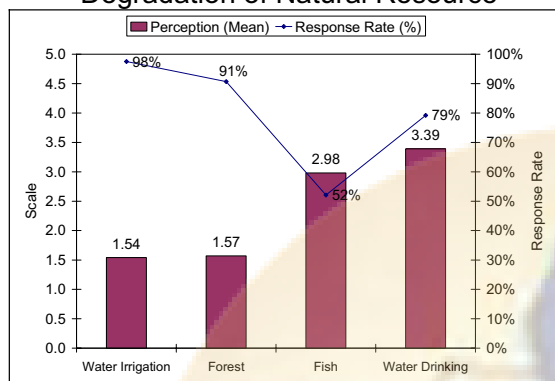
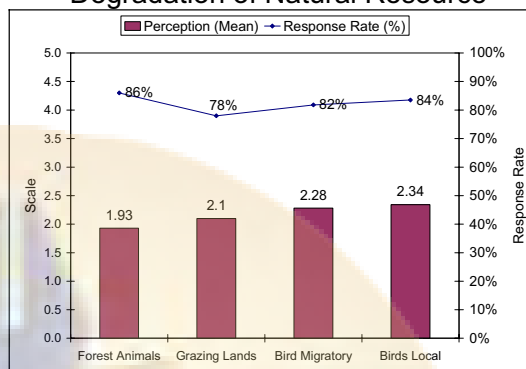


Figure 11b:
Degradation of Natural Resource



Research Statement/Hypothesis: Natural resources sharply degraded during last 5 years.

Likert Type Scale: 1=Strongly Agree; 2 =Agree; 3=Undecided; 4=Disagree and 5=Strongly Disagree

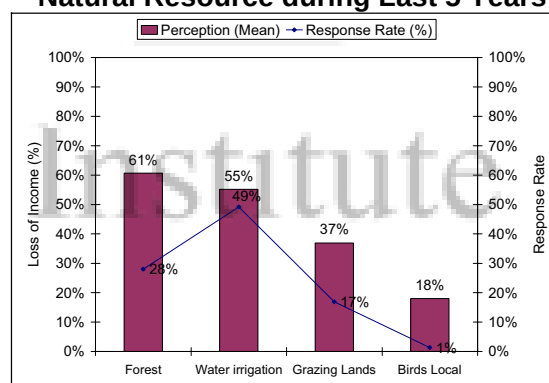
Overwhelming majority (97.5%) of respondents from Pai Forest, Nawabshah agreed (mean =1.54) with the statement, that supply of irrigation water has reduced sharply during last 5 years. Likewise, 91% of the respondents recorded their responses (mean =1.57) in agreement with the research statement that Pai Forest sharply degraded over the last 5 years. Figure 11b reveals that about 86% and 78% of the respondents, on an overall basis, agreed with the statement that forest animals died and grazing lands substantially reduced over the last 5 years.

4.3 Income Loss due to Depletion of Natural Resources

Figure 12 displays response rate (%) and loss of income (%) due to degradation of natural resources over the last five years. The highest response rate of 49% of the households was recorded for irrigation water. The estimated loss of income was about 55%.

households reported loss of income (18%) due to decline in local birds.

Figure 12:
Income (%) Reduced due to Depletion of
Natural Resource during Last 5 Years



The respondents were of the opinion that due to shortage of irrigation water, not only crop production and cropping intensity have declined, but income from livestock has also declined considerably due to shortage of fodder crops. Twenty eight percent (28%) of the respondents reported loss of income (61%) due to deforestation of income. 37% loss of income due to grazing land was reported by 17% households. Only 1% of the

5. Physical Capital

5.1 Type of House

Figure 13 presents the baseline information about the type of housing at Pai Forest Site. *Katcha* houses (mud houses) were dominant (49%) at Pai Forest Area. One house out of very five (19%) was recorded to be *pacca* (bricks and iron or RCC structure). The proportion of Semi- *Pacca* (bricks and wood) was 27%. *Jhopra* was recorded to be only 5%.

Figure 13:
Type of House

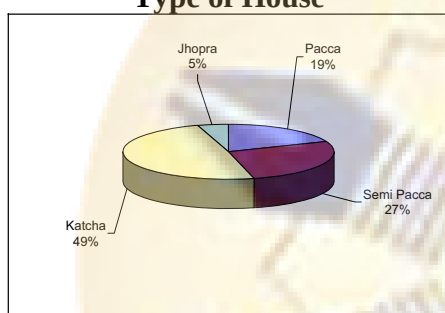
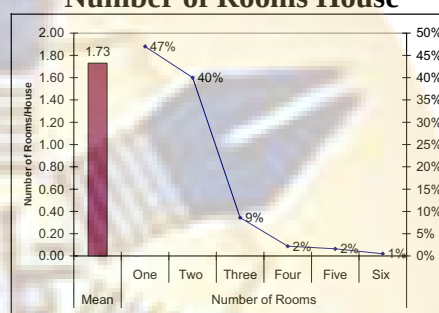


Figure 14:
Number of Rooms House



5.2 Number of Rooms per House

Figure 14 displayed the average number of rooms per house and proportions of houses by number of rooms. The average number of rooms per house was 1.73. The highest proportion of houses (47%) was recorded with only 1 room while proportions of houses with 2, 3, 4, 5 and 6 rooms were 40%, 9%, 2%, 2% and 1% respectively. The figure unveils significant difference in proportions of 2 and 3 room-houses. Based upon average household size (6.9 members per house) and number of rooms per house (1.73); average number of household members per room was calculated to be 4, which is indicative of a very high level of congestion.

5.3 Type of Toilet Facility in House

Figure 15 presents information on sanitation conditions measured by the toilet facilities inside houses. It was noted that open space was used predominantly (47%) at Pai Forest, Sakrand. Proportion of non flush toilet was about 18%. About one-third (35%) of the households surveyed had pit latrine. This clearly indicates the poor sanitation arrangements.

Figure 16 reveals that 85% of the households had electricity facility. Installation of electricity has remained one of the top priorities of politician and local leaders of Pakistan. Due to electrification of new villages, increasing load shedding hours is dilemma of the country since the energy resources of electricity has remained stagnant over many years.

**Figure 15:
Type of Toilet Facility in House**

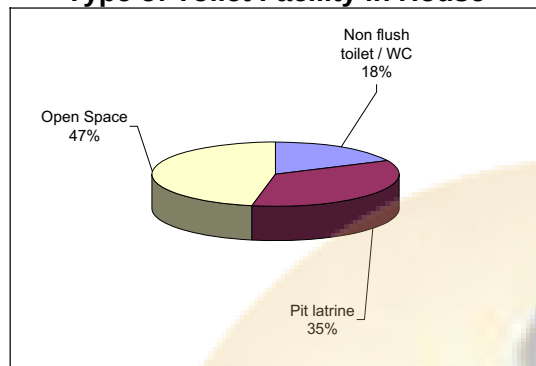
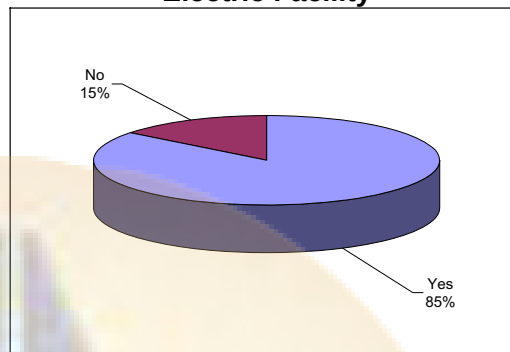


**Figure 16:
Electric Facility**



5.4 Sources and Quality of Drinking Water

Figure 17 indicates that 85% of the houses have pumps either hand or motor to use underground water. About 15% of the households reported that they collect water from outside of the house. The outside water sources were reported to be wells, tanka (Big cemented tanks), and canals. Regarding the quality of water consumed, 81% of the households reported that water was sweet. One out of 5 households (19%) reported that water consumed was normal. Very small proportion (0.4%) of the households reported that brackish water was consumed. Good quality of water consumed by overwhelming majority of water may be attributed to Indus River flowing nearby the Pai Forest area.

**Figure 17:
Sources of Water**

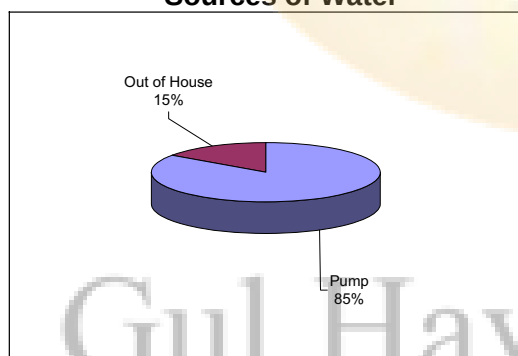
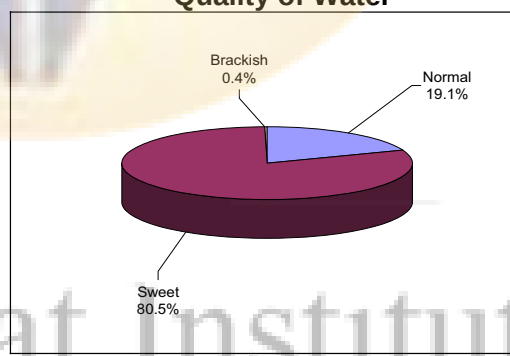


**Figure 18:
Quality of Water**

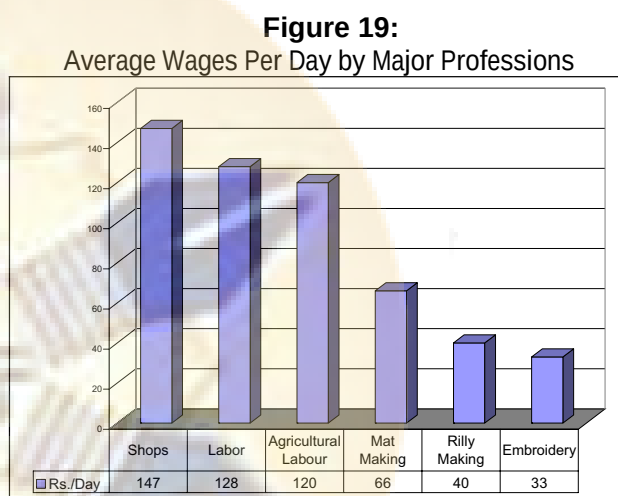


6. Economic Indicators

6.1 Wages Per Day by Major Professions

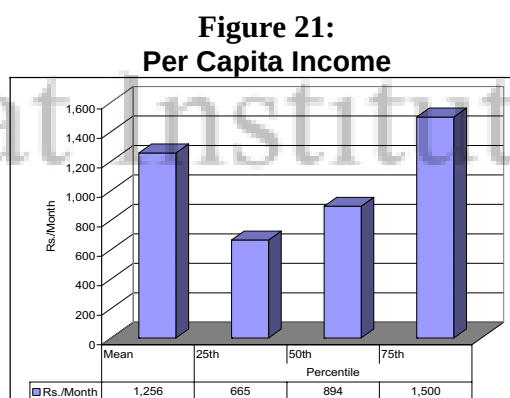
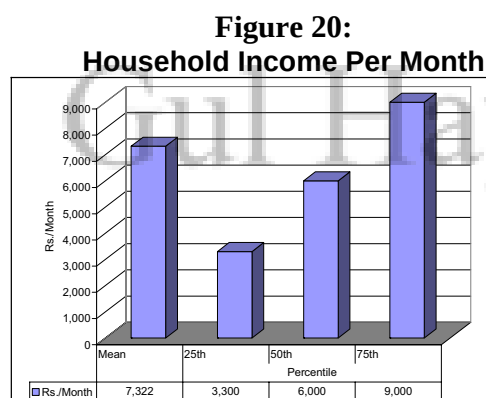
Figure 19 unveils the average income of various major professions. The average wages per day for small shops in villages was Rs.147 per day. Likewise, Rs. 128 was enumerated for laborers engaged in construction of building and grind mills.

Daily wages for agricultural laborer was about Rs. 120. However, the dilemma of agricultural labor was that they were offered half day employment, in the morning hours only. Therefore, a wage laborer could earn Rs. 60 per day. Besides, the employment was seasonal; particularly during harvesting of cotton and wheat. Lowest rate of Rs. 66 was recorded for mat making, in which male and females were found to be engaged. Meager wages of Rs. 40 and 33 were recorded for female professions namely rilly making and embroidery, respectively.



6.2 Monthly Household Income

Figure 20 shows household income per month at Pai Forest, Nawabshah. The average income was computed to be Rs. 7,322. The figure also presents the monthly household income in percentiles. The 25th percentile (also known as first quartile) was 3,300 while 50th percentile (second quartile and median) income was 6,000 and 75th percentile (third quartile) was 9,000. Since the median income (Rs. 6000) was less than arithmetic average (Rs. 7322), the distribution of income was assumed to be skewed rather than normally distributed.



6.3 Earning Family Members

Table 6 depicts that, on an overall average basis, each household had 1.68 (1.38 male & 0.30 female) earning members. Monthly income of male and female members was about Rs. 4,784 and 1,255, respectively. From this it was concluded that wages of male members were about 4 times higher than that of female. Contribution of female members in household income was 5% only. These estimates are evident of poor contribution of women in household income. About 18% women were recorded as earning members and their contribution to the family income was a mere 5%. This highlights the need for gender mainstreaming in occupations and income generating activities, as well as bringing equality in wages

Table 6:
Earning family members

No. of Earners/HH (Average)	Male	1.38
	Female	0.30
Monthly Income (Rs.)	Male	4,784
	Female	1,255
Contribution (%) in Household Income	Male	94.7
	Female	5.3
	Total	100.0

6.4 Household Budget

The average household expenditure was calculated to be 6,917 (Figure 22). Since the written records of income and expenditure were not available with the respondents, the actual expenditure may be assumed to be higher than reported. Median expenditure (50th percentile) was Rs.5,780 which reveals that half of the population had expenditure more than 5780 while the remaining half had less than the median value. Figure 23 displays the breakup of the household expenditure. About 39% of the budget expenditure was incurred on food items. About one-tenth (10%) of the budget was reported on health including doctor fee and medicines. Expenditure on transport and education was computed to be 9% each. Proportion of budget on clothing and shoes was 8%. About 6% and 2% were recorded for electricity and phone, respectively. Miscellaneous expenditure was computed to be 17% which included pocket money of dependent household members.

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**Figure 22:
Household Expenditure Per Month**

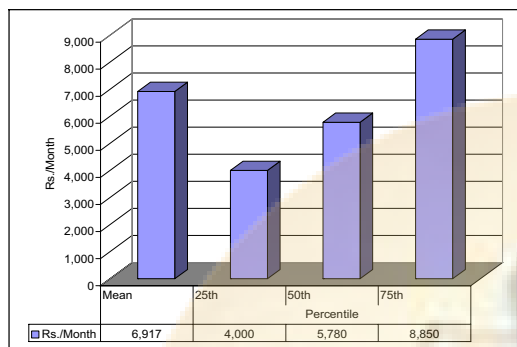
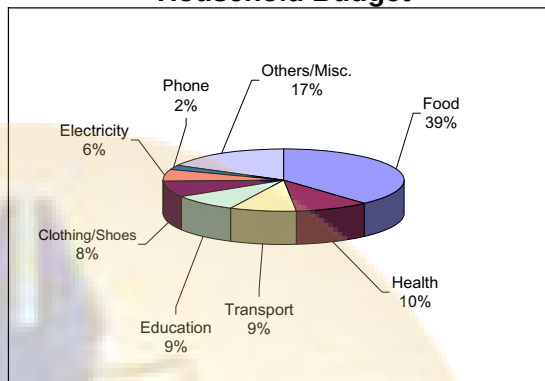


**Figure 23:
Household Budget**



6.5 Extent of Indebtedness

Table 7 reveals that, on an overall basis, 46% of households had availed production credit/loan of some type during 2006-07. Loan availing households reported that 78% of them were paying installments regularly while 22% denied. In response to a question whether income of the households increased due to loan opportunity, majority of them (65%) were of the opinion that their income did not increase. The amount of loan ranged from Rs. 1,300 to 300,000 while the average was estimated at Rs. 40,298.

**Table 7:
Received Loan**

Received Loan (%)	Yes	46%
	No	54%
Installments are paid Regularly (%)	Yes	78%
	No	22%
increased household income	Yes	35%
	No	65%
Amount of loan (Rs.)	Minimum	1,300
	Maximum	300,000
	Mean	40,298

6.6 Purpose of availing loans

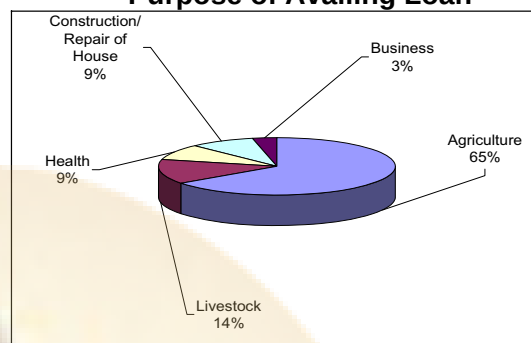
Figure 24 shows the purpose of availing loan. About 65% of the loan was availed for agricultural purposes. These loans were received mainly for the purchase of farm inputs namely seed, fertilizer and pesticides. Duration of loans was usually six months.

The second largest purpose (14%) of availing of loan was livestock followed by health (9%), construction/repair of house (9%) and 3% business. It was observed that after the induction of Engro Foods as milk collection agency in Pai Forest, prices of milk have increased from about Rs. 12 to 25 per kg. This had become a reliable source of livelihood for livestock owners.

Resultantly, investment in livestock, particularly buffaloes and cows, was found to have increased disproportionately.

Surprisingly, 9% of all loan receivers reported that the amount borrowed was used on health, which indicated higher prevalence of diseases and lack of health facilities by the public sector. The households have to incur high cost for treatment at private clinics.

**Figure 24:
Purpose of Availing Loan**



6.7 Source of Loan

Figure 25 reveals that overwhelming majority (72%) of the household borrowed loan from local lender. The proportions of Banks and NGOs were estimated at 15% and 12%, respectively. Although banks loan have been categorized to be cheaper than other sources, but documentation and process of loan was one of the important hurdles for obtaining loans for villagers. NGOs have recently introduced the loan schemes. Loan committees are formed at village level to identify the potential/real borrowers to enhance their household income and to avoid bad loans. Sindh Agricultural & Forestry Workers Coordinating Organization (SAFWCO) was found to be active loan provider among NGOs. Very small proportion of the bad loans, provided through loan committees by NGOs, are evident that social mobilization model adopted by NGOs institutions are generally effective.

**Figure 25:
Source of Loan**

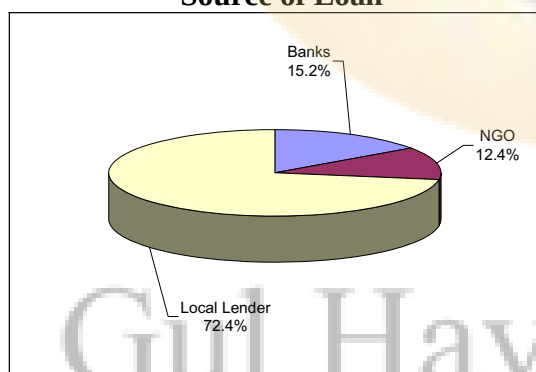
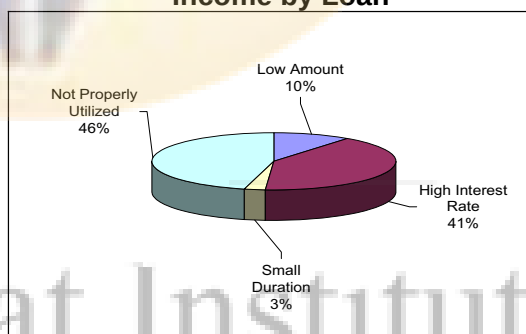


**Figure 26:
Reasons of not Increasing
Income by Loan**



6.8 Reasons of No Increase in Income

Figure 26 provides proportions of reasons of not increasing household income by loan. The highest (46%) reason was identified to be the not proper utilization of loan. For instance, loan was obtained for business purpose, but the same was utilized for other purposes may be on repayment of old loans, rituals of marriage, health and construction of house. The second highest reason was the "high interest rates". As mentioned in Figure 18, about 72% of the household received loans from local lender. The interest rate of local lenders was recorded to be as high as 40-50% per annum. Interest rates of local NGOs was about 18% while Banks charged about 15-16%. Low amount was identified by about 10% of the loan recipients while low duration was categorized by only 3% borrowers.

6.9 Possession of Livestock (Buffaloes and Cows)

Table 8 shows that since Pai Forest Nawashah is an agriculture based area, female buffaloes were found in every 2nd household (52%) while their average number was 2. Milking buffaloes were reported in every 3rd household (35%) while their average number was computed to be 1.43 per household. Cows were reported by every 5th household with the average number of 2.4 while milking cows were found in 14% of the households with average number of 1.6.

Table 8:
Buffaloes and Cows

		HHS(%)	Mean (# of Animals)
Buffaloes	Male	10.6	1.6
	Female	51.7	2.0
	Milking	35.2	1.4
Cows	Male	13.6	1.9
	Female	22.0	2.4
	Milking	14.4	1.6

Table 9:
Milk production, consumption and sale

		Liters/day	%
Buffalo Milk	Production	6.2	100
	Consumption	4.8	77
	Sold	1.4	23
Cow Milk	Production	4.2	100
	Consumption	4.0	95
	Sold	0.2	5

6.10 Milk Production, Consumption and Sale

Table 9 shows the milk production, consumption and sale. The average production of milk was 6.2 liters. As earlier discussed that the average number of milking buffaloes were 1.4, the average milk production per buffaloes was estimated at 4.4 liters per day. About 77% of the milk (4.8 liters) was consumed by the household members while only 23% of the milk (1.4 liters) was sold. Comparatively lower production of cow (2.6 liters per cow) was estimated. Substantial portion (95%) of cow milk was consumed by household members while only 5% was sold.

6.11 Various Type of Livestock and Poultry

Table 10 compiles data on the ownership of other animals and poultry birds at Pai Forest, Nawabshah. Goat, sheep, and camel ownership were reported by 49%, 0.4%, and 0.8% households, respectively. Donkeys were reported by 15% households only. Poultry birds were maintained by 25% of the households.

Table 10.

Various Type of Livestock Available

	% of HHs possessing animals	Mean # of animals per HHs
Goat	48.7	5.3
Sheep	0.4	20.0
Camel	0.8	1.0
Donkey	15.3	1.4
Poultry	25.0	4.9

The table also reveals the average number of animals possessed by households. The average number of goats was 5.3 and sheep was 20. This clearly indicates that small proportion of household possess sheep (only 0.4%), but their average number was substantially high (mean = 20) as compared to goats possessed by 50% and the average number was about 5 per households. The average number of camel was computed to be 1 per household. Likewise, about 3 donkeys were reported in two households (mean = 1.4). The average number of poultry birds was 5 per households.

6.12 Livestock Transactions and Mortality

Data presented in Tables 11 reveals the status of animal purchase, sale, births, and deaths at Pai Forest, Nawabshah during 2007. It was reported that 6.4% of the households purchased buffaloes while their average number was 1.5 per households. Buffaloes were sold by 11% of the households with average number of 1.4. A very high proportion of about 6% reported buffalo mortality with an average of 1.1. New Born animals were reported by 20% of the households with an average of 1.3. Purchase and sale of cows were reported by 4.2% and 5.5% of the households respectively with almost the same average of 1.5. Died and new born animals were reported by 1.3% and 7.6%, respectively.

Table 11.

Economics of Livestock

		N(%)	Mean
Buffalo	Purchased	6.4	1.5
	Sold	11	1.4
	Died	5.5	1.1
	New Born	19.9	1.3
Cow	Purchased	4.2	1.5
	Sold	5.5	1.4
	Died	1.3	1.0
	New Born	7.6	1.3
Goat	Purchased	7.6	2.5
	Sold	15.7	3.5
	Died	9.7	3
	New Born	13.6	4.3

Veterinarians working on rigorous cost-benefit analysis of buffaloes and cows, favor cows for having less mortality rate and low gestation period. Sell of goats was reported more than double of their purchase. This may be due to new born animals reported by

13.6% households with an average of 4.3. Mortality of goats was reported by 9.7% households with an average of 3 per household.

7. Community Development Priorities

Table 11 reveals summarized data about the ranking of development priorities. The table shows that the first priority was dispensary followed by school, water supply, loan and link roads. It already discussed that the substantial amounts of income (10%) was incurred on health. Furthermore, 9% of the loan recipients reported that the loan was received for health purpose (Figure 17). In case of fatal diseases, households were reported to be bankrupt and loans were repaid by selling livestock, ornaments, lands and other valuables. In the light above of above discussion, the first prioritized demand of survey area looks plausible. Education plays an important role in enhancing income

and living standard. Most of the respondents realizing the importance of the education, demanded schools along with facilities and teachers. Water supply was categorized to be third priority of communities at Pai forest.

Table 12 Ranking of Development Priorities

Ranking	Options
First	Dispensary
Second	School
Third	Water Supply
Fourth	Loan
Fifth	Road

8. Stakeholder Input for Development

Out of a total of 5,982 acres notified in 1883 under Pai Riverine forest, only 4,726 acres are officially designated now as irrigated plantation on allocated irrigation water and tube wells. The remaining area, with the exception of 300 acres of Agriculture Department's Seed Farm, is mostly under the control of Pakistan Army; which has leased it out to a private party for cultivation. Some 300 acres are also reported under encroachment. The net area under the administration of DFO Nawabshah is only about 3,446 acres.

In general, the access to forest resources is restricted but it is open for influential people and those who undertake illicit wood cutting in connivance with the SFD personnel. Illegal and over-hunting of partridge is rampant. High level government and army functionaries as well as local politicians, often break the sanctioned hunting limit and cause serious threat to the wildlife in Pai. The present game warden lives in Nawabshah city and does not command local influence in Sakrand area. Forest lands under encroachment have not been vacated in spite of three official campaigns and cases lodged with the National Accountability Bureau (NAB) during the last five years.

Nawabshah district has 300 registered CBOs/ NGOs, out of which some 80 organizations are active. Several local organizations are active in the target villages as well. SAFWCO is the main microfinance agency which has also installed arsenic removal plants. Strengthening Participatory Organization (SPO), Sindh Education Foundation (SEF) and Trust for Voluntary Organization (TVO) have different interventions. An impressive number of 325 Community Citizen Boards (CCBs) have been formed in Nawabshah district, out of which 5 CCBs are also active in the priority area villages. Shah Latif Welfare Association is registered in village Ghulam Hyder Bhutto. There is practically no need to form project specific CBOs at Pai forest.

8.1 Issues and Options

Five major issues were highlighted:

1. Shortage and theft of irrigation water sanctioned for the forest plantation.
2. Illicit wood cutting for commercial use in brick kilns and sale in towns.
3. Extensive reliance of communities on fire wood and overgrazing.
4. Encroachment by adjoining land owners.
5. Excessive billing by the HESCO on tube- wells meant for forest irrigation.

Participants of focus group and key respondents advanced the following options and suggestions to check depletion and re-establish the bio-diversity:

- Provision of gas in Marri Jalbani and other larger settlements can reduce the wood cutting by communities.
- Strict vigilance on wood cutting meant for brick kilns and other commercial purposes by high officials, since it is done in connivance with the district forest officials.
- New influential game warden may be designated.
- Skill training for youth and women to ensure gainful employment.
- New water course be sanctioned for Pai forest from the Shahbaz minor, which provides water to the Army lands.
- Special supervision of Chowkris 80, 81, 82, 62, 35 to 39 and 42 to 44 may be undertaken involving local communities of Tilli and Rahmoon Keerio to protect valuable wildlife.
- Sufficient number of wildlife staff and licensed arms may be provided.
- NO hunting licenses be issued in reproductive season. Partridge hunting should only be allowed during November to January. Heavy fines must be imposed on those who are found in illegal hunting of hog deer and birds.
- Sanctioned bag limits must be strictly enforced for those hunting on seasonal permits. Only 2 -3 permits be given each year.

8.2 Proposals for Development

Most village leaders identified lack of irrigation water, illicit wood cutting, unemployment and diseases as major issues. They expressed the need for dispensary, gas, school, water supply, electricity, veterinary hospital and production credit as well as microfinance. Some also suggested skill training, jobs for youth and tree plantation. Two villages were distinctly noted for local CBO activity and organizational experience- Ghulam Hyder Bhutto and Rasool Bux Keerio. Two very poor villages were identified as Gulsher Machhi and Rahmoon Keerio. Villages Rahmoon Keerio and Talli were suggested for involvement in wildlife conservation.

9. Summary and Findings

BASELINE INDICATORS OF PAI FOREST

Pai forest, was taken up for systematic conversion into irrigated plantation during 1960-61 under a development scheme titled "Industrial Wood Plantation Phase-I". Presently 1299.2 ha are under Babul, 107.4 ha under *Eucalyptus*, 1044.9 ha under Kandi and 11.7 ha under Shisham crop. Theft of sanctioned water and unchecked wood cutting have caused serious threat to the Pai forest in recent years. Socio-economic data were collected from 236 households in 10 villages - 5 small, 3 medium and 2 large.

The average family size, enumerated from survey data, was around 7 members. Average age at marriage for male was 21 years and for female was about 18. The highest proportion (33%) of households reported Malaria as a common disease. Three-fourth (76%) of the households reported private clinic for treatment. Taluka hospital was availed by about 13% of the households while dispensary and/or Basic Health Unit were availed by about 11% of the households. Maximum expenditure per delivery was Rs. 4,000 only. On an overall basis, the average expenditure per delivery was computed to be Rs. 1,105 only. Most deliveries were attended by local Dai (TBAs).

Drinking water was identified to be most accessible natural resource (response rate of 86%). The second and third natural resources were reported to be wood forest (86% response rate and average was 2.15) and water irrigation (81% response rate and average was 2.01). Overwhelming majority (97.5%) of respondents from the Pai Forest, Nawabshah agreed (mean =1.54) with the statement, that supply of irrigation water has reduced sharply during last 5 years. Likewise, 91% of the respondents recorded their responses (mean =1.57) in agreement with the research statement that Pai Forest sharply degraded over the last 5 years. Twenty eight percent (28%) of the respondents reported loss of income (61%) due to deforestation.

Katcha (mud houses) were dominant (49%) at Pai Forest Area. The proportion of Semi- *Pacca* (bricks and wood) was 27%. The average number of rooms per house was 1.73. The highest proportion of houses (47%) was recorded with only 1 room while proportions of houses with 2, 3, 4, 5 and 6 rooms were 40%, 9%, 2%, 2% and 1% respectively. Based upon average household size (6.9 members per house) and number of rooms per house (1.73); average number of household members per house was calculated to be 4.

The average wages per day for small shops in villages was Rs.147 per day. Daily wages for agricultural laborer was about Rs.120. Lowest rate of Rs. 66 was recorded for mat making, in which male and females were found to be engaged. The average income was computed to be Rs. 7,322 only. The average household expenditure was calculated to be 6,917 only. On an overall basis, 46% of households had availed production credit/ loan of some type during 2006-07. Loan availing households reported that 78% of them were paying installments regularly. In response to a question whether income of the households increased due to loan opportunity, majority of them (65%) were of the opinion that their income did not increase. The amount of loan ranged from Rs. 1,300 to 300,000 while the average was estimated at Rs.40,298 only.

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ANNEXURE

Summary Notes on the Villages Surrounding Pai Forest

1. Haji Keerio. Land owners and wage labor/ tenants. SAFWCO loans. Unemployment and disease. Dispensary, loans and vet hospital needed. Implement legislation about Pai forest.
2. Marri Jalbani. Land owners, tenants, herders, services. NCHD programmes. In general poor people. Lack of irrigation water, unemployment and diseases. Gas, water supply, dispensary and drainage system needed for the settlement. New minor demanded from the river for this area.
3. Marri Sabqi. Land owners, wage labor/ tenants and services. Water supply and diseases issues. Dispensary, school and vet hospital needed.
4. Marri Alam. Land owners, wage labor/ tenants. Water supply, disease and police excesses are issues. School, dispensary and vet hospital needed. Employment is suggested and skill training, tree plantation.
5. Jaffer Jamali. Wage labor/ tenants. Drains, school, water supply needed. This village is against the forest reserve altogether.
6. Haji Ali Bux Chohan. Livestock and land lease, tenants. Community Development Foundation working on education. Lack of irrigation water, unemployment, and diseases. Dispensary and Gas needed. Gas demanded.
7. Gulsher Machhi. Land and wage labor. Small poor village. Sindhri Welfare Association here. SAFWCO loans for livestock. Unemployment issue. School and gas needed. Vocational training and tree plantation suggested.
8. Gohram Faqir. Land owners and peasant proprietors. Irrigation water shortage. Dispensary, school and road demanded. Illicit wood cutting be stopped.
9. Ghulam Haider Bhutto. Herders and handicrafts. Shah Latif Welfare Association Registered. Unemployment, drought/ lack of irrigation water and diseases. Dispensary, Girls School teacher, water supply and gas needed. Voc Training , micro credit, irrigation methods, tree plantation/ social forestry suggested.
10. Daud Gudaro. Herders and land. Unemployment issue. School teachers needed. Irrigation for forest and ban on illicit cutting.
11. Talli. Wage labor, herders, artisans, services. Wood brought from forest. Unemployment, gas and water supply issues. Gas, water supply, dispensary, Boys middle school and vet hospital needed.
12. Sahib Khan Lund. Land owners and wage labor/ tenants. Handicrafts. Labor on Brick kilns. SAFWCO, SPO, Asia Foundation, First Microfinance Bank interventions. Lack of

irrigation water, disease and unemployment. Handicraft marketing, girls school and dispensary.

13. Rasool Bux Keerio. Herder and wage labor and services. Sindhri Welfare Association, SAFWCO loans, Asia Foundation and WWF medical camp. Unemployment and police injustices. School and gas needed.
14. Rahmoon Keerio. Herders, Wage labor/ tenants and services. Marvi CCB, Village Development Association/ ADB projects. Poor village near forest. Unemployment, diseases and drought issues. Girls school and loans for livestock. Hog deer and partridge farming suggested. Tree plantation.
15. Ghulam Qadir Jatoi. Land and wage labor/ tenants. Unemployment. School, dispensary, road and irrigation needs. Cotton factory suggested for jobs. Illegal and over- Hunting be stopped. Tree plantation.
16. Punhoon Gudaro. Land and wage labor/ tenants, transport. Sindh Gudaro Welfare Association. Disease and tribal clashes issues. Gas, dispensary, school staff and road needed. Vocational training, livestock loan, tree plantation and ban on illegal hunting suggested.
17. Palyo Bhutto. Land and wage labor. Unemployment and diseases. Water supply, electricity and dispensary needed. Sugar and cotton mills suggested for jobs.
18. Nazar Mohammad Bhatti. Herders, wage labor. Lack of irrigation water, unemployment and disease. School, dispensary and loans needed. Illicit cutting be stopped and ban on hunting.
19. Nangar Khan Chandio. Herders, land and wage labor. SCHWA active. Water shortage, Unemployment and diseases. Gas, School teacher and road needed. They cut wood from forest for sale.
20. Mahmood Keerio. Land owners, wage labor/ tenants and transport. SAFWCO active here. Unemployment, disease, police injustices. Girls school, dispensary staff and employment needed. Factories for jobs. Nursery for social forestry and irrigation water theft be stopped for conservation.
21. Morio Lakho. Land, wage labor/ tenants, herder, services. Animal disease is issue. Gas, dispensary, vet hospital and school staff needed.

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Socio- Economic Baseline Study of The Indus For All Programme Priority Areas in Sindh Province

STATISTICAL ANNEXURE

(FINAL REPORT)



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May, 2008

ANNEXURE –A – Villages and Settlements

Table 1: List of villages and settlements in Keti Bunder

S.no:	Name of Village	H/Holds	Type	N	E
01	Berim	16	Creek	24*15.872	067*20.803
02	M Yousif Dablo	13	Creek	24*12.498	067*22.454
03	Kharyoon	35	Creek	24*08.473	067*26.221
04	Phirt	40	Creek	24*08.060	067*23.539
05	Siddique Dablo	30	Creek	24*07.850	067*26.019
06	Tippun	100	Creek	24*07.234	067*24.067
07	Haji Sheedi Dablo	10	Creek	24*05.325	067*24.291
08	Haji Mamoo Dablo	25	Creek	24*05.035	067*24.225
09	Missri Rajero	12	Creek	24*04.580	067*31.610
10	Bhoori	400	Creek	24*03.457	067*23.571
11	Meerano Jat	30	Creek	24*02.617	067*28.575
12	Cheerh Dablo	30	Creek	24*03.170	067*26.077
13	Guli Sholani	05	Creek	24*02.862	067*26.160
14	Haji Ali Khan Jat	30	Creek	24*01.555	067*27.814
15	Ramzan Lakhio	10	Creek	24*020.446	067*24.817
16	Haroon Lakhio	06	Creek	24*00.880	067*25.904
17	Gul Hassan Jat	10	Creek	24*01.736	067*29.219
18	Ali Dablo	12	Creek		
19	Jarhho Dablo	10	Creek		
20	Hassan Jat	35	Inland	24*10.290	067*31086
21	Siddique Faqeerani Jat	200	Inland	24*10.806	067*30.406
22	Haji Ismail Jat Dabai	60	Inland	24*11.022	067*30.234
23	Haji Abu Jat	144	Inland	24*07.700	067*28.008
24	Beer Jat	25	Inland	24*07676	067*27.805
25	Haji Moosa Jat	40	Inland	24*07.663	067*27.622
26	Khuda Bux Jat	25	Inland	24*07.550	067*27.533
27	Haji Hashim Jat	15	Inland	24*07.545	067*27.346
28	Ali Bux Jat	20	Inland	24*07.416	067*27.079
29	Gurb	90	Inland	24*07.724	067*27.314
30	Meeroo Dablo	56	Inland	24*08.089	067*26.672
31	Keti Bunder	310	Inland	24*08.653	067*27.000

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Table 2: List of the villages in Keenjhar Site

S #	Name of the Village /Location	Coordinates
1.	Chiliya Bus Stop Villages: Ramzan Mirbhar	24°50'19.46"N E68° 0'5.09"E
2.	Umer Manchri (Chilya Ireland)	N 24°51'7.83" E 68° 0'21.99"
3.	Village Essa Manchri	N-24 52.303' E-068 01.766'
4.	Khambho Abdul Gandhro Center Villages:	N-24 53.236' E- 068 02.983'
5.	Adam Katiyar	N 24°53'46.39" E 68° 3'39.38"
6.	Soomar Solangi	N 24°53'41.53" E 68° 3'55.03"
7.	Jafar Hilayo	N 24°54'6.15" E 68° 3'49.58"
8.	Dubani Mirbhar (South of Khambho)	N 24°53'50.89" E 68° 3'36.78"
9.	Village Yousif Hilaya	N 24°55'7.85" E 68° 4'31.89"
10.	Village Ahmed Khan Solangi	N-24 54.903' E-068 05.306'
11.	Haji Kameso Kaskeli	N-24 56.386' E-068 06.511'
12.	Village Sonehri	N 25° 0'11.38" E 68° 6'55.29"
13.	Village Khipri Near Sonhari	N-25 01.072 E-68 07.797
14.	Mumtaz Dandhail	N-25° 2' 12.29" E-68° 8' 12.69"
15.	Village Adam Bambhro	N 24°50'40.47" E67°59'24.15"
16.	Dodo Babhro	N- 24 52.870' E-068 01.656'
17.	Village Dolatpur	N- 24 55.388' E-068 01.555'
18.	Jumo Jakhra Near Dolat Pur (Dhore Area)	N-24 54.566" E-68 00.678"
19.	Yaroo Manchri (Dhor Miyan)	N 24°55'36.13" E67°58'50.13"
20.	Lal Bux Manchri	N 24°57'13.33" E 67°59'12.34"
21.	Village Sukhio Autho	N- 24 58' 40.9" E-068 00' 29.6"
22.	Saddique Manchri	N 24°58'58.11" E 68° 0'50.59"
23.	Kareemdad Manchri	N 24°59'8.19" E68° 0'57.27"
24.	Village Autha	N-24 58'15.93" E- 068 1' 3.61"
25.	Bakhir Machi	N 24°58'8.10" E 68° 1'7.33"
26.	Mevo Manchhri	N 24°59'41.82" E68° 0'44.25"
27.	Rasool Bux Manchhri	N 24°59'53.63" E 68° 0'48.93"
28.	Village Mohammad Raheem Machhi	N- 25 00' 27.8" E-068 00' 53.7"
29.	Village Juman Dars	N- 25 01' 01.6" E-068 00' 55.4"
30.	Hashim Solangi	N 25° 1'9.11" E68° 0'54.08"
31.	Jhampir Twon	N-25 01' 19.6" E-068 00' 49.9"
32.	Nai Gandhri	N 25° 1'29.03" E68° 1'18.07"
33.	Village Photo Dars	N-25 01.941' E-68 02.164'
34.	Village Nabi Bux Palari	N 25° 0'43.02" E 68° 2'26.37"
35.	Village Haji Dino Manchri/Hameed Manchri	N 24°59'43.47" E 68° 2'20.78"
36.	Village Khudaiyo	N- 25 00' 46 E-68 03' 30
37.	Dandhail Near Khudayo Village	N-25 00' 22 E-68 03' 52
38.	Village Haji Ali Bux Manchri	N-24 59' 59 E-68 03' 44
39.	Village Syed Bachhal Shah	N 24°59'50.86" E 68° 4'47.35"

Table 3: Villages Around The Paiforest, Nawabshah

S.#	Name of Village/Town	GIS Coordinates	GIS Points
01	Haji Kerio	Elv: 651ft N- 26°08.225' EO68°14.649'	100
02	Ghullam Hyder Bhutto	Elv: 645ft N- 26°08.422' EO68°13.250	101
03	Rasool Abad	Elv: 641ft N- 26°07.817 EO68°13.728	102
04	Rahmo Kerio	Elv: 637ft N- 26°06.956 EO68°13.900	103
05	Gull Sheer Machi	Elv: 641ft N- 26°07.918 EO68°13.515	104
06	Majeed Kerio	Elv: 575ft N- 26°07.728 EO68°12.920	105
07	Murad Kerio	Elv: 463ft N- 26°06.471 EO68°12.918	106
08	Nazar Mohammad Bhatti	Elv: 623ft N- 26°06.346 EO68°13.240	107
09	Mari Sabki/Mari Alam	Elv: 702ft N- 26°05.113 EO68°11.082	112
10	Mari Alam	Elv: 702ft N- 26°05.113 EO68°11.082	112
11	Mari Jalbani	Elv: 622ft N- 26°05.081 EO68°11.959	113
12	Talli	Elv: 521ft N- 26°07.176 EO68°16.832	114
13	Khan Mohammad Chowhan	Elv: 608ft N- 26°07.644 EO68°14.295	116
14	Jaffar Jamali	Elv: 620ft N- 26°07.555 EO68°16.720	117
15	Mehmood Kerio	Elv: 616ft N- 26°05.759 EO68°16.912	118
16	Doud Gudaro	Elv: 662ft N- 26°05.207 EO68°15.902	119
17	Ghullam Qader Jatoi	Elv: 669ft N- 26°05.102 EO68°16.023	120
18	Punhoon Gudaro	Elv: 677ft N- 26°04.777 EO68°15.881	121
19	Morio Lakho	Elv: 486ft N- 26°04.526 EO68°15.021	122
20	Nangar Chandio	Elv: 682ft N- 26°04.641 EO68°14.320	123
21	Palyo Bhutto	Elv: 690ft N- 26°04.690 EO68°13.995	126
22	Guhram Fageer Zardari	Elv: 668ft N- 26°05.695 EO68°12.457	127

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Table 4: Villages around the Chotiari Reservoir

Sno	Name of deh	Name of village	No of h.h	Population
1	Bakar	Bakar Village	60	500
2	Bakar	Abdul Qadir Mallah	30	360
3	Bakar	Phulal	180	1500
4	Bakar	Wasio Junijo	8	50
5	Bakar	Uris Junijo	10	70
6	Bakar	Rano Junijo	7	40
7	Bakar	Padhario A Majeed Mangrio	5	30
8	Bakar	Lal Khan Junijo	9	45
9	Bakar	Lalo Mangrio	10	60
10	Haranthari	Abdul Karim Mallah	50	400
11	Haranthari	Sobharo Mallah	25	200
12	Haranthari	Peer Bux Behan	40	350
13	Haranthari	Abdul Rahman	6	30
14	Makhi	Muhammad Hassan Hingoro	25	100
15	Makhi	Meer Muhammad	20	80
16	Makhi	Achar Jamali	30	360
17	Makhi	Soomar Mallah	100	850
18	Mithrao	Ghulam Hussan Laghari	15	100
19	Mithrao	Muhammad Siddique Mallah	30	180
20	Akanwari	Lal Bux Unar	10	70
21	Akanwari	Wali Muhammad Ibupoto	40	300
22	Akanwari	Muhammad Usman	35	200
23	Dubi 2	Imamdin	15	80
24	Dubi 2	Haji Khan Mallah	15	100
25	Avadh	Blawal	20	130
26	Avadh	Allah Dino	10	70
27	Avadh	Allah Bux Junijo	10	60
28	Saharpeer	Dogaryoon	100	800
29	Chotiaryoon	Chotiari Town	1000	6500
30	Janib dohoro	Haji Malahar Wassan	50	300

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Table 5: Statistical Profiles of Thatta

S. No	Name of District	Thatta
1	Area (sq: K.M)	17355
2	Population	1113194
3	Male	589341
4	Female	523853
5	Literacy rate(male/female)	22.1
6	No. of universities.	NIL
7	No. of schools(primary/secondary)	2498
8	No. of newborn(0-12 months)	43.8
9	Population (01-14)	53.2
10	Population (15-49)	53.2
11	population(60 and above)	4.8
12	Population Growth Rate	2.26
13	Density per sq k.m	64.1
14	Users percentage	-
15	Contraceptive Choice Percentage	-
16	No. of FWCs	25
17	No. of MSUs	2
18	No. of RHS-A	2
19	No. of RHS-B	1
20	No. of Hakims/Homeopaths/RMPs	H.H 140, RMPs 273
21	Contraceptive prevalence rate	20.3
22	No.of Male Mobilizers	32
23	Total Fertility Rate	5.2
24	No. of Taluka Hospitals	05
25	No. of RHCs	9
26	No. of BHUs	49
27	No. of Prominent NGOs	10
28	No.of Donor Agencies Working for Population Planning	01
29	No. of Male Elected Councillors	847
30	No. of Female Elected Councillors	364
31	Family Size	5.2
32	House Hold Size	5.1

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Table 6: Statistical Profiles of Nawabshah

S.No	Name of District	Nawabshah
1	Area (sq: K.M)	4239
2	Population	1135131
3	Male	599275
4	Female	535856
5	Literacy rate(male/female)	34.13%
6	No. of universities.	One
7	No. of schools(primary/secondary)	102
8	Population below 15 Years.	45%
9	Population between 15-65 Years.	52.2%
10	Population above 65 Years	2.8%
11	Population Growth Rate	3.09%
12	Density per sq k.m	240
13	Users percentage	34%
14	Contraceptive Choice Percentage	34%
15	No. of FWCs	19
16	No. of MSUs	02
17	No. of RHS-A	01
18	No. of RHS-B	01
19	No. of Hakims/Homeopaths/RMPs	117
20	Contraceptive prevalence rate	28%
21	No.of Male Mobilizers	10
22	Total Fertility Rate	1.96%
23	No. of Taluka Hospitals	1
24	No. of RHCs	5
25	No. of BHUs	31
26	No. of Prominent NGOs	21
27	No.of Donor Agencies Working for Population Planning	Nil
28	No. of Male Elected Councillors	765
29	No. of Female Elected Councillors	306
30	Family Size	5.8
31	House Hold Size	6.0

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Table 7: Statistical Profiles of Sanghar

S. No	Name of District	Sanghar
1	Area (sq: K.M)	10728
2	Population	1452956
3	Male	762212
4	Female	690744
5	Literacy rate(male/female)	30.87
6	No. of universities.	NIL
7	No. of schools(primary/secondary)	3252
8	No. of newborn(0-12 months)	2.5
9	Population (01-14)	97.04 (1998)
10	Population (15-49)	44.97 (1998)
11	Population(60 and above)	54.61 (1998)
12	Population Growth Rate	2.74
13	Density per sq k.m	135.04
14	Users percentage	32% about
15	Contraceptive Choice Percentage	35% about
16	No. of FWCs	24
17	No. of MSUs	2 Nos.
18	No. of RHS-A	3
19	No. of RHS-B	4
20	No. of Hakims/Homeopaths/RMPs	RMPs 241, H.H. 69,
21	Contraceptive prevalence rate	24
22	No.of Male Mobilizers	4.76
23	Total Fertility Rate	5
24	No. of Taluka Hospitals	07
25	No. of RHCs	52
26	No. of BHUs	35
27	No. of Prominent NGOs	10
28	No.of Donor Agencies Working for Population Planning	25
29	No. of Male Elected Councillors	882
30	No. of Female Elected Councillors	389
31	Family Size	07
32	House Hold Size	N.A

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Table 8: Statistical Profiles of Sukkur

S. No	Name of District	Sukkur
1	Area (sq: K.M)	5165
2	Population	908373
3	Male	483251
4	Female	425122
5	Literacy rate(male/female)	59.83 (M)
6	No. of universities.	Nil
7	No. of schools(primary/secondary)	1039 Primary, 156 Secondary
8	No. of newborn(0-12 months)	14.4%
9	Population (01-14)	44%
10	Population (15-49)	53.4%
11	Population(60 and above)	4.4%
12	Population Growth Rate	2.88
13	Density per sq k.m	175.9
14	Users percentage	24%
15	Contraceptive Choice Percentage	Condom 40%, OP 30.2%, inj-20.3%, Cu-t, Copper-T 9.5%
16	No. of FWCs	20
17	No. of MSUs	02
18	No. of RHS-A	01
19	No. of RHS-B	03
20	No. of Hakims/Homeopaths/RMPs	27 Hakims, 23 Homeopaths, 74 RMPs
21	Contraceptive prevalence rate	24.5%
22	No.of Male Mobilizers	31
23	Total Fertility Rate	4.4
24	No. of Taluka Hospitals	03
25	No. of RHCs	03
26	No. of BHUs	24
27	No. of Prominent NGOs	05
28	No.of Donor Agencies Working for Population Planning	03
29	No. of Male Elected Councillors	45
30	No. of Female Elected Councillors	18
31	Family Size	5
32	House Hold Size	2

Source: Population as per census of 1998

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Table 9: Population /Education/ Health and Other Facilities

S. No	Name of District	Sanghar
1	Area (sq: K.M)	10728
2	Population	1452956
3	Male	762212
4	Female	690744
5	Literacy rate (male/female)	30.87
6	No. of universities.	NIL
7	No. of schools (primary/secondary)	3252
8	No. of newborn(0-12 months)	2.5
9	Population (01-14)	97.04 (1998)
10	Population (15-49)	44.97 (1998)
11	Population(60 and above)	54.61 (1998)
12	Population Growth Rate	2.74
13	Density per sq k.m	135.04
14	Users percentage of Family Planning	32% about
15	Contraceptive Choice Percentage	35% about
16	No. of FWCs	24
17	No. of MSUs	2 Nos.
18	No. of RHS-A	3
19	No. of RHS-B	4
20	No. of Hakims/Homeopaths/RMPs	RMPs 241, H.H. 69,
21	Contraceptive prevalence rate	24
22	No. of Male Mobilizers of Family Planning	4.76
23	Total Fertility Rate	5
24	No. of District Head Quarter Hospitals	01
25	No. of Taulka Hospitals	04
26	No. of RHCs	06
27	No. of BHUs	55
28	No. of Dispensaries (Govt/ District Council)	80
29	No. of Major NGOs Working	10
30	No. of Health Institutions	83
31	Family Size (Average)	07
32	House Hold Size	N.A

Table Source: Population Welfare Department

Gul Hayat Institute

Table 10: Area, Population by Sex, Density, Urban Proportion, Average Household Size & Average Annual Growth Rate, 1998 by Talukas Included in the WWF- Indus for All Program

Admin Unit	Area (sq km)	Population 1998						1981-98 Average Annual Growth Rate (%)
		Total Population	Male	Female	Population Density (per sq. km)	Urban Proportion	Average HHs Size	
Nawabshah Distt:	4,502	1,071,533	555,677	515,856	238.0	26	6.0	1.63
Sakrand				131,941	193.6	10	5.6	0.90
Sanghar Distt	10,728	1,453,028	762,284	690,744	135.4	22.8	5.8	2.74
Sanghar						23	5.9	3.16
Thatta District	17,355	1,113,194	589,341		64.1	11.2	5.1	2.26
Keti Bunder	771	25,700	13,553	12,147	33.3	9.8	4.9	1.14
Thatta	3,823	253,748	134,200	119,548	66.4	14.8	5.6	2.36

Source: District Census Reports Nawabshah, Sanghar, Thatta. 1998; Shirkat Gah (2007).

Table 11: Selected NGOs of Sanghar District Relevant for the IFAP at Chotiari

S. No	Organization	Sector	Contact Person
1.	Women Welfare Organization, Rehmat Shah Chowk, Sanghar	Education, Health, Women Welfare	Ms. Masooda Hameed Shah & Farah Naz
2.	Rural Women Welfare Organization, Wasan Manzil, Liaqat Bazar, Sanghar	Health, Education, Population Welfare	Mrs. Imam Zadi Wasan
3.	Makhi Welfare Assciation, Sanghar	Education & Health	Khan Mohammad Mari
4.	Anjuman Mutasareen Chotiariion	Education & Agric.	Ali Khan Jamali
5.	Chotiari Development Organization	Education & Agric.	Yakoob Kumbhar
6.	Dharti Dost Sangat, Sanghar	Environment	Allah Warayo Behan
7.	Christain Youth Organization, Padri	Education & Health	John Loosar
8.	Explorer Tanzeem, Sanghar	Culture & Environment	Nawaz Kumbhar
9.	Sanghar Development Association	Health & Development	Bakhshan Mehranvi
10.	Usman Welfare Association, Sanghar	Health & Education	Khair Mohd Landhar
11.	National Rural Support Program	Rural Development	-----
12.	Sindh Agric & ForestryDevelopment, Workers Coordinating Organization Shahdadpur/ Hyderabad	Micro-Credit	Mr. Suleman Abro

Table 21: Selected NGOs and CBOs of Thatta District Relevant for the IFAP at Ketu Bunder and Keenjhar Sites

S.No.	NGO Name & Address	Nature of Work	Contact Person
1.	Makli Cultural & Educational Society	Education, Culture	Mr. Ali Nawaz Khaskhely
2.	Sahil Young Welfare Association Ketu Bunder		-----
3.	Sujag Welfare Association, Sonda		Khaliq Komoro
4.	Village Development Welfare Organization		Faiz Brohi
5.	Citizen Community Board, Sonehri		Mohd Ali Gandro
6.	Citizen Community Board, Yousif Hillaya		Nasir Ali Shah
7.	Roshan Sij, CBO, Village Moosa Katir, Ketu Bunder		Haji Moosa Katiar
8.	Jidojehd, CBO Village Moosa Katiar, Ketu Bunder		Gul Mohammad
9.	Sarang CBO, Village Mohd Raheem Mallah		Ramzan Mallah
10.	INSAF CBO, Village Abdullah Mallah		Akbar Mallah
11.	Sartiyoan CBO, Ketu Bunder		Mehrun Nissa
12.	AILAN CBO, Ketu Bunder		Mr. Yakoob Shah
13.	Nai Roshni CBO, Ketu Bunder		Sikandar Ali Shah
14.	Haji Mossa Jat CBO, Ketu Bunder		Allah Dino Jat
15.	Pir Dino Shah CBO, Ketu Bunder		Qadir Dino Shah

Table 22: Selected Registered Coastal NGOS of Thatta

S. No	Name of NGOs	Address	Contact person
1	Bhambore Ambulance Division	C/o Al-Shifa Clinic Gharo District Thatta.	
2	Fisher Man Welfare Association	Deh Patmoro, Taluka Mirpur Sakro, District Thatta.	Faqir Muhammad
3	Karampur Welfare & Development Organization.	Taluka Mirpur Sakro District, Thatta.	
4	Ketu Bunder Youth Welfare Association	P.o & Taluka Ketu Bunder Dist: Thatta	
5	Pakistan association for blind	Gharo, Near Rehmani Masjid, Gharo, Distt. Thatta	
6	Nojawan Social Welfare Association	Taluka Kharo Chan District, Thatta	Yaqoob Urghar Baloch
7	Goth Abad Social Welfare Samaji Tanzeem	Taluka Ketu Bunder, District Thatta.	
8	United Memon Welfare Association, Kharo Chan	Sajan Vari (U/C) Sajan Vari, P.O Gharo District, Thatta	Abdullah Memon
9	Young Welfare Association, Juha,	Taluka Ghora Bari, Sub-Division, Mirpur Sakro	

Source: Community Development Department, Thatta District, 2006

ANNEXURE – B PRIMARY AND SECONDARY SUPPORTING DATA

Table 1: Quality of Water Fetched from Outside by the Households

Area/Site	Category of villages	Proportion (%)			
		Brackish	Normal	Sweet	Total
Keti Bunder, Thatta	Creek	1.9	64.4	33.7	100.0
	Inland	0.0	41.5	58.5	100.0
	Site Average	0.8	51.2	48.0	100.0
Keenjhar, Thatta	Small	0.0	14.4	85.6	100.0
	Medium	0.0	1.9	98.1	100.0
	Large	0.0	59.7	40.3	100.0
	Site Average	0.0	21.4	78.6	100.0
Chotiari, Sanghar	Small	0.0	68.6	31.4	100.0
	Medium	0.0	65.7	34.3	100.0
	Large	0.0	88.7	11.3	100.0
	Site Average	0.0	71.1	28.9	100.0
Pai, Forest, Nawab Shah	Small	0.0	93.8	6.2	100.0
	Medium	0.0	90.2	9.8	100.0
	Large	0.0	86.5	13.5	100.0
	Site Average	0.0	89.8	10.2	100.0
Overall		0.2	56.2	43.6	100.0

Table 2: Proportion of Marriages within Same Caste in Program Areas

		Proportion (%)		
		Same Caste	Other Caste	Site Average
Keti Bander Thatta	Creek	96.5	3.5	100.0
	Inland	92.5	7.5	100.0
	Site Average	93.9	6.1	100.0
Kenjhar Thatta	Small	98.5	1.5	100.0
	Medium	97.6	2.4	100.0
	Large	98.2	1.8	100.0
	Site Average	98.2	1.8	100.0
Chotiari Sanghar	Small	99.3	0.7	100.0
	Medium	98.6	1.4	100.0
	Site Average	100.0	0.0	100.0
	Site Average	99.0	1.0	100.0
Pai Forest Nawabshah	Small	100.0	0.0	100.0
	Medium	100.0	0.0	100.0
	Large	99.0	1.0	100.0
	Site Average	99.6	0.4	100.0
Overall		97.7	2.3	100.0

Table 3: Family Composition in Program Priority Areas

Area/Site	Category of villages	Proportion (%)								
		Household Head	Husband/ Wife	Son /Daughter	Son/ Daughter	Grand Son/Daughter	Father/Mother	Sister/ Brother	Other Relatives	Site Average
Keti Bunder, Thatta	Creek	1.0	0.9	3.1	0.0	0.1	0.1	0.5	0.0	5.7
	Inland	1.0	1.0	2.5	0.1	0.2	0.1	0.3	0.1	5.2
	Site Average	1.0	1.0	2.7	0.0	0.1	0.1	0.4	0.0	5.4
Keenjhar, Thatta	Small	1.0	1.1	3.2	0.4	0.5	0.1	0.8	0.3	7.4
	Medium	1.0	0.9	3.7	0.3	0.1	0.1	0.7	0.1	6.9
	Large	1.0	1.2	4.1	0.2	0.4	0.3	0.0	0.2	7.4
	Site Average	1.0	1.0	3.6	0.3	0.3	0.2	0.5	0.2	7.2
Chotiari, Sanghar	Small	1.0	0.9	3.4	0.1	0.1	0.1	0.7	0.0	6.3
	Medium	1.0	1.0	4.0	0.2	0.2	0.2	0.3	0.1	7.1
	Large	1.0	0.9	3.2	0.1	0.2	0.2	0.6	0.1	6.3
	Site Average	1.0	1.0	3.7	0.2	0.2	0.2	0.4	0.1	6.7
Pai, Forest, Nawab Shah	Small	1.0	1.0	3.4	0.2	0.4	0.2	0.3	0.0	6.6
	Medium	1.0	1.0	3.6	0.1	0.0	0.2	0.6	0.3	6.9
	Large	1.0	0.9	3.8	0.2	0.5	0.2	0.4	0.1	7.1
	Site Average	1.0	1.0	3.6	0.2	0.3	0.2	0.5	0.1	6.9
Overall		1.0	1.0	3.4	0.2	0.2	0.1	0.5	0.1	6.6

Table 4: Education of Respondents Interviewed for Household Survey

Area/Site	Category of villages	Proportion (%)							
		Illiterate	Primary	Middle	Matriculate	Intermediate	Graduate	Postgraduate	Total
Keti Bunder, Thatta	Creek	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Inland	84.5	7.7	3.5	2.1	1.4	0.7	0.0	100.0
	Site Average	91.0	4.5	2.0	1.2	0.8	0.4	0.0	100.0
Keenjhar, Thatta	Small	60.0	21.6	4.8	2.4	5.6	5.6	0.0	100.0
	Medium	68.9	17.9	2.8	6.6	1.9	0.9	0.9	100.0
	Large	49.4	27.3	3.9	18.2	1.3	0.0	0.0	100.0
	Site Average	60.4	21.8	3.9	7.8	3.2	2.6	0.3	100.0
Chotiari, Sanghar	Small	67.4	18.6	1.2	9.3	3.5	0.0	0.0	100.0
	Medium	41.8	32.8	6.0	9.0	3.7	5.2	1.5	100.0
	Large	39.6	15.1	1.9	22.6	9.4	3.8	7.5	100.0
	Site Average	49.5	24.9	3.7	11.7	4.8	3.3	2.2	100.0
Pai, Forest, Nawab Shah	Small	46.2	21.5	10.8	7.7	6.2	4.6	3.1	100.0
	Medium	31.7	30.5	11.0	15.9	7.3	1.2	2.4	100.0
	Large	36.0	29.2	9.0	11.2	11.2	3.4	0.0	100.0
	Site Average	37.3	27.5	10.2	11.9	8.5	3.0	1.7	100.0
Overall		59.6	19.9	4.8	8.2	4.2	2.4	1.0	100.0

Table 5: Households Sending Their Children to Schools

		Primary School				Middle School				High School			
		Male		Female		Male		Female		Male		Female	
		Household (%)	Children (Mean)	Household (%)	Children (Mean)	Household (%)	Children (Mean)	Household (%)	Children (Mean)	Household (%)	Children (Mean)	Household (%)	Children (Mean)
Keti Bunder, Thatta	Creek	1.0	1.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
	Inland	17.6	1.36	12.0	1.65	4.2	1.00	0.7	1.00	2.8	1.25	0.7	2.00
	Site Average	10.6	1.35	6.9	1.65	2.4	1.00	0.4	1.00	1.6	1.25	0.4	2.00
Keenjhar, Thatta	Small	35.7	1.42	19.8	1.44	16.7	1.62	11.9	1.80	15.9	1.70	12.7	1.81
	medium	37.7	1.48	32.1	1.44	8.5	1.89	5.7	2.00	8.5	1.89	4.7	2.00
	large	40.3	1.68	16.9	1.46	2.6	1.00	0.0	0.00	1.3	1.00	0.0	0.00
	Site Average	37.5	1.51	23.3	1.44	10.4	1.66	6.8	1.86	9.7	1.73	6.8	1.86
Chotiari, Sanghar	Small	27.9	1.58	15.1	1.62	2.3	1.00	1.2	1.00	3.5	1.33	0.0	0.00
	medium	37.3	1.68	15.7	1.86	2.2	1.00	0.0	0.00	3.0	1.50	1.5	1.00
	large	34.0	1.78	18.9	1.30	9.4	1.20	0.0	0.00	7.5	1.00	0.0	0.00
	Site Average	33.7	1.67	16.1	1.66	3.7	1.10	0.4	1.00	4.0	1.27	0.7	1.00
Pai Foerst, Nawabshah	Small	44.6	1.52	29.2	1.42	10.8	1.00	1.5	1.00	10.8	1.29	0.0	0.00
	medium	37.8	1.58	17.1	1.50	7.3	1.17	0.0	0.00	4.9	1.50	1.2	1.00
	large	27.0	1.50	30.3	1.33	10.1	1.44	3.4	1.00	9.0	1.25	2.2	1.50
	Site Average	35.6	1.54	25.4	1.40	9.3	1.23	1.7	1.00	8.1	1.32	1.3	1.33
Overall		29.9	1.5	18.1	1.5	6.6	1.3	2.5	1.2	6.0	1.4	2.5	1.6

Table 6: Proportion (%) of Respondents Satisfied with Wages by Profession

		Agricultural Labour	Embroidery	Fishing	Labour	Mat Making	Rilly Making	Shops	Stone Mining
Keti Bander Thatta	Creek	NA	0.0	17.9	0.0	NA	NA	100.0	NA
	Inland	0.0	NA	13.7	25.0	NA	NA	25.0	NA
	Site average	0.0	0.0	15.7	23.1	NA	NA	33.3	NA
Kenjhar Thatta	Small	14.3	20.0	24.4	30.8	66.7	0.0	0.0	10.5
	Medium	25.0	33.3	39.4	50.0	100.0	50.0	100.0	100.0
	Large	33.3	20.0	36.4	24.0	0.0	20.0	20.0	50.0
	Site average	21.4	23.1	32.6	33.3	75.0	13.3	45.5	20.5
Chotiari Sanghar	Small	15.4	100.0	17.4	NA	28.6	0.0	100.0	NA
	Medium	59.3	75.0	38.7	57.1	44.4	0.0	100.0	NA
	Large	30.8	100.0	0.0	25.0	0.0	100.0	0.0	NA
	Site average	41.5	85.7	30.0	50.0	31.6	10.0	60.0	NA
Pai Forest Nawabshah	Small	41.2	27.3	NA	33.3	NA	NA	0.0	NA
	Medium	50.0	40.0	NA	68.2	0.0	100.0	33.3	NA
	Large	32.0	75.0	NA	28.0	NA	50.0	0.0	NA
	Site Average	38.5	40.0	NA	45.3	0.0	66.7	14.3	NA
Overall		37.8	41.3	25.4	39.1	47.1	17.9	37.5	20.5

Table 7: Current Level of Interest Rates Charged in Program Areas

Area/Site	Category Of villages	Minimum	Maximum	Mean
Keti Bunder, Thatta	Creek	10	60	27
	Inland	10	50	27
	Site Average	10	60	27
Keenjhar, Thatta	Small	10	50	20
	Medium	10	15	11
	Large	10	25	19
	Site Average	10	50	19
Chotiari, Sanghar	Small	10	35	18
	Medium	9	30	16
	Large	10	20	14
	Site Average	9	35	16
Pai, Forest, Nawab Shah	Small	9	20	16
	Medium	10	25	18
	Large	10	25	16
	Site Average	9	25	17
Overall		9	60	21

Table 8: Proportion (%) of Places of Deaths during Delivery

Area/Site	Category of villages	Proportion (%)					
		Government Hospital	Private Clinic	Trained LHV	Local Dai	Others	Total
Keti Bunder, Thatta	Creek	9.1	0.0	9.1	81.8	0.0	100.0
	Inland	22.2	0.0	11.1	66.7	0.0	100.0
	Site Average	15.0	0.0	10.0	75.0	0.0	100.0
Keenjhar, Thatta	Small	10.0	10.0	0.0	70.0	10.0	100.0
	Medium	0.0	0.0	0.0	100.0	0.0	100.0
	Large	66.7	33.3	0.0	0.0	0.0	100.0
	Site Average	16.7	11.1	0.0	66.7	5.6	100.0
Chotiari, Sanghar	Small	66.7	0.0	0.0	33.3	0.0	100.0
	Medium	0.0	50.0	0.0	50.0	0.0	100.0
	Large	0.0	0.0	0.0	0.0	0.0	0.0
	Site Average	28.6	28.6	0.0	42.9	0.0	100.0
Pai, Forest, Nawab Shah	Small	0.0	50.0	0.0	50.0	0.0	100.0
	Medium	16.7	33.3	0.0	50.0	0.0	100.0
	Large	23.1	46.2	0.0	30.8	0.0	100.0
	Site Average	17.4	43.5	0.0	39.1	0.0	100.0
Overall		19.5	20.2	2.3	56.4	1.6	100.0

Table 9: Proportion of Family Members by Place of Waste Disposed

		Nearby house door					Identified place in locality				
		Male	Female	Children	Servant	Site Average	Male	Female	Children	Servant	Site Average
Keti Bander Thatta	Creek	8.7	91.3	0.0	0.0	100.0	1.3	98.7	0.0	0.0	100.0
	Inland	5.9	93.4	0.7	0.0	100.0	2.9	97.1	0.0	0.0	100.0
	Site Average	7.0	92.5	0.4	0.0	100.0	2.2	97.8	0.0	0.0	100.0
Kenjhar Thatta	Small	3.7	93.9	2.4	0.0	100.0	1.0	99.0	0.0	0.0	100.0
	medium	3.3	96.7	0.0	0.0	100.0	5.1	94.9	0.0	0.0	100.0
	large	12.8	87.2	0.0	0.0	100.0	0.8	99.2	0.0	0.0	100.0
	Site Average	5.5	93.4	1.1	0.0	100.0	2.1	97.9	0.0	0.0	100.0
Chotiyari Sanghar	Small	13.5	68.3	18.3	0.0	100.0	0.8	97.5	1.7	0.0	100.0
	medium	5.3	78.9	15.8	0.0	100.0	6.2	93.1	0.8	0.0	100.0
	large	2.7	75.7	21.6	0.0	100.0	2.0	97.0	1.0	0.0	100.0
	Site Average	8.7	73.6	17.7	0.0	100.0	4.0	95.0	1.0	0.0	100.0
Pai Forest Nawabshah	Small	11.2	84.7	4.1	0.0	100.0	8.9	83.1	8.1	0.0	100.0
	medium	5.4	84.8	9.8	0.0	100.0	5.7	89.5	2.9	1.9	100.0
	large	6.1	88.6	3.0	2.3	100.0	7.0	92.3	0.7	0.0	100.0
	Site Average	7.5	86.3	5.3	0.9	100.0	7.3	88.4	3.8	0.5	100.0
Overall		7.1	86.5	6.1	0.2	100.0	3.76	95.0	1.10	0.1	100.0

Source of Tables 1-9: MDC, Primary Data from Household Survey, 2007

Table 10 : Taluka-wise Land Losses in Indus Riverine and Deltaic Region

Taluka	District	Land Loss (ha.)
Keti Bunder	Thatta	46,137
Ghorabari	Thatta	12,749
Kharo Chan	Thatta	47,701
Mirpur Sakro	Thatta	24,363
Shah Bunder	Thatta	2,38,866
Jati	Thatta	91,766
Badin	Badin	19,910
Golarchi	Badin	12,398

Source: Board of Revenue, GoS, Hyderabad, 2004.

Table 11: Administrative Profile of Program Area Districts

District	Cities	No: Of UC's	No: Of villages	No: Of Households	Population HH × 7=POP
Nawabshah					
	Nawabshah	13	49	38.340	268.38
	Daur	14	109	32.910	230.37
	Sakrand	12	59	34.707	242.949
	Daulatpur	12	65	35.257	246.799
Sub Total	4	51	282	141.214	988.498
Thatta					
	Thatta	13	70	36.249	253.743
	Sujawal	6	71	18.186	127.302

	Mirpur Sakro	10	92	28.406	198.842
	Mirpur Bathoro	8	65	21.701	151.907
	Ghorabari	5	62	15.068	105.476
	Keti Bunder	1	42	3.671	25.697
	Kharochhan	1	41	3.667	25.669
	Shah Bunder	5	90	14.368	100.576
	Jati	6	133	17.708	123.956
Sub Total	9	55	666	159.024	1113.168
Sukkur					
	Sukkur	20	78		
	Rohri	11	550		
	Salehpat	03	297		
	Pano Akil	12	516		
Sub Total	4	46	1441		

Source: Development Statistics of Sindh, 2006.

Table 12: Potential Sites in Coastal Sindh for Electrification through Solar and Wind Energy Hybrid Systems

S.No	Name of Village	Location	Population	Electricity Demand/Day	Project Proposal (Wind +Solar)	Estimated Cost (Rs. in Lacs)
01.	Lakhadino Rajo	Badin	500	28 kWh	3 kW & 8 kW	15
02.	M.I.Thatheem Chak-52	Badin	600	34 kWh	4 kW & 12 kW	20
03.	Ibrahim Mahandro	Badin	400	25 kWh	2.5 kW & 7 kW	14
04.	Golo Mahandro	Badin	1200	60 kWh	6 kW & 16 kW	30
05.	Raees Ahmed Ali Jat	Thatta	2000	110 kWh	10 kW & 30 kW	42
06.	Haji Varayo Jat	Thatta	2000	110 kWh	10 kW & 30 kW	42
07.	Haji Doongar Jat	Thatta	400	25 kWh	2.5 kW & 7 kW	14
08.	Soomar Jat	Thatta	2500	125 kWh	13 kW & 38 kW	60
09.	Ratoo Khan Rind	Thatta	4500	240 kWh	24 kW & 70 kW	100
10.	Haji Ismail Katiyar	Thatta	10,000	500 kWh	50 kW & 150 kW	150
11.	Mubark Village	Karachi	6000	325 kWh	30 kW & 80 kW	110
12.	Chashma Goath	Karachi	1200	60 kWh	6 kW & 16 kW	30
Total						627

SDSC- SFD. 2004. Statistical Data Collection for Integrated Coastal Zone Management in Sindh Province. Sindh Forest & Wildlife Department, Karachi

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Table 13: Environmental Degradation by Cause and Effect Relationship in the Coastal Belt of Sindh Province

Environmental Degradation / Loss				
Coastal Wetlands	District	Natural causes	Anthropogenic causes	Impact
Nurreri Lagoon	Badin	Less freshwater in the supply drain Karo-Ghangro outfall drain.	The major reason for drying of this wet land is due to reduction in drain water supply through Phuleli/Gunni Karo-Gangro Outfall Drain	Shrinkage of habitat / almost dry / Water is highly saline
Jaboh Lagoon	Badin	Less freshwater in the supply drain Karo-Ghangro outfall drain.	1) Channel was dug deep to increase its depth so it stops the outflow of water into the Jhabo area. 2) Lack of water in the drain, 3) outlets of the channel was choked due to sedimentation deposition after the cyclone 1999.	Salinity is highly increased as much as 28 ‰. Loss of coastal fishing, habitat shrinkage. Sedimentation deposition after the Cyclone of 1999
Haleji lake	Thatta	Less rainfall	Stoppage of water from the Jam branch to the lake from 1996. Water supply to the Karachi is diverted from the Haleji lake.	Lake water mostly in standing condition. The water level down and causes the extensive cover of vegetation-(Eutrophication) – Migratory waterbirds population declining.
Keenjhar lake	Thatta		Excessive local tourism, No management.	The bank of the lake is polluted by the tourists and the vehicle washing is common. Disturbed wildlife.
Hadero lake	Thatta	Less rainfall	Illegal hunting	Disturbed wildlife
Mahboob Shah lake (Marshy wetland)	Thatta	Less rainfall	Wetland area grabbed for the agriculture purposes	Loss of coastal fisheries. Shrinkage of marsh habitat.
Shahbunder Salt Waste and Jafri Lake	Thatta	Less freshwater + Less Rainfall		Sea intrusion, Coastal habitat changed turns to sea water and almost no freshwater mixing in the coastal wetlands of the area.
Keti Bundar (Delta)	Thatta	Less freshwater down stream Kotri for the delta	Diversion of irrigation water for the agriculture.	Sea Intrusion, loss of Coastal fishing, Creeks habitat totally changed turns to sea water only
Korangi Gahro creek	Karachi	Less rain fall	Developmental activities like RBOD	Shrinkage of breeding grounds of palla and other important fishes.

Source: SDSC-SFD. 2004. Statistical Data Collection for ICZM in Sindh.

Table 14: Ongoing Development Schemes in Indus Delta Mangroves in

Keti Bunder Area

Name of Project	Planting of <i>Rhizophora mucronata</i> over 10,000 ha of Indus Delta Mangroves Phase-II
Duration of Project	2003-04 to 2007-08
Cost of Project	Rs. 35.20 million This cost is over all cost of above project. It includes cost of works being carried out in Keti Bunder, Shah Bunder & Karachi areas under this project.
Activities	Targets (Keti Bunder)
a) Planting in blank area under this activity, afforestation over potential blank mudflats is carried out to increase area under tree cover in Indus Delta Mangroves.	2000 hectares
b) Assisted Natural Regeneration under this activity, sparse natural regeneration assisted by artificial planting to bridge the gaps. By doing this, density of crop is improved & sparse mangroves are converted into dense/ quality stands.	500 hectares
c) Raising of <i>Rhizophora</i> container plants nursery Nursery is raised to consume plants in restocking operation and also to carry out plantation in off season.	250,000 plants
Sites being Tackled	Prar Creek
Species planted	_ <i>Avicennia marina</i> _ <i>Rhizophora mucronata</i>

Name of Project	Rehabilitation & Propagation of Drought Affected Coastal Mangroves of Thatta District.
Duration of Project	2003-04 to 2007-08
Cost of Project	Rs. 39.69 million This cost is over all cost of above project. It includes cost of works being carried out in Keti Bunder & Shah Bunder areas.
Activities	Targets (Keti Bunder)
a) Planting in drought affected blank area	1950 hectares
b) Assisted Natural Regeneration under this activity, sparse natural regeneration is assisted by artificial planting to bridge gaps	1850 hectares
c) Raising of mangrove container plants nursery. Nursery is raised to consume plants in restocking operation for off-season planting	550,000 plants
Sites being Tackled	Chan Creek

Species planted	_ <i>Avicennia marina</i> _ <i>Rhizophora mucronata</i> _ <i>Ceriops tagal</i>
Name of Project	Conservation & Rehabilitation of Indus Delta Mangroves for Sustainable Management.
Duration of Project	2005-06 to 2007-08
Cost of Project	Rs. 39.500 million This cost is over all cost of above project. It includes cost of works being carried out in Karachi, Ketu Bundar & Shah Bundar areas under this project.
Activities	Targets (Ketu Bundar)
a) Afforestation in blank mudflats under this activity, afforestation over potential blank mudflats is carried out to increase area under tree cover in Indus Delta Mangroves.	500 hectares
b) Afforestation in partially blank mudflats under this activity, sparse natural regeneration is assisted by artificial planting to bridge the gaps. By doing this, density of crop is improved & sparse mangroves are converted into dense/ quality stands.	750 hectares
c) Raising of mangrove container plants nursery Nursery is raised to consume plants in restocking operation and to carry out plantation in off season.	250,000 plants
Sites being Tackled	Buri & Turshian Creeks
Species planted	_ <i>Avicennia marina</i> _ <i>Rhizophora mucronata</i>

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ANNEXURE – C PROGRAM DISTRICT INDICATORS

I. Thatta District

Table 1: Population Growth Rates

Indicators	Estimates
Total Population "000": 1998	1,113.19
1951	286.25
Average Annual Growth Rate (1981-1998)	2.26
Area	17,355 Sq.Km
Density (1998)	64.1 Persons Per Sq K.m
Rural Population (1998)	88.8
Urban Population (1998)	11.2
15-49 (Female)	47.3

Table 2: Age Structure by Urban & Rural Divisions

Sexes	All Areas	Rural Area	Urban Area
Both Sex	43.8	44.1	41.6
Male	44.3	44.5	42.2
Female	43.45	43.7	41.1
Sex Ratio 1998	1.13	1.13	1.09

Table 3: Dependency Rates by Male & Female Groups

	All Areas	Rural Area	Urban Area
Overall	87.94	89.06	79.42
Old Age	5.53	5.64	4.71
Child Age	82.41	83.42	74.71

Table 4: Mean Age at Marriage

	All Areas	Rural Area	Urban Area
Median Age. (years)			
Male 1998	18.12	18.01	18.97
Female 1998	18.37	18.01	18.97
Simulate Mean Age At Marriage 1998 (years)			
Male	24.21	23.82	26.14
Female	20.19	19.85	22.40

Table 5: Labour Force

Economically Active	All Area	Rural Area	Urban Area
Both Sexes	25.07	25.32	23.03
Male	46.59	47.04	42.91
Female	0.86	0.79	1.38

Table 6: Unemployment Ratio

	All Area	Rural Area	Urban Area
Both Sexes	17.82	17.99	7.37
Male	17.95	18.08	8.88
Female	16.73	17.21	0.61

Table 7: Room, Water and Energy Sources

		All Area	Rural Area	Urban Area
Person per housing Unit		5.1	5.00	6.00
One Room		78	80	60
Two Room		16	14.0	27
Drinking Water available	Inside Home	33.05	28.83	73.49
	Outside Home	66.95	71.17	26.51
Source of lighting	Electricity	25.93	21.41	69.34
	Kerosene Oil	72.88	77.39	29.62
	Other	1.19	1.20	1.04

Table 8: House Related Information

		All Area	Rural Area	Urban Area
Backed Bricks/Blocks/Stones.		17.32	13.59	53.07
Unbacked Bricks, Earth Bounded		10.68	11.15	6.15
Wood/Bamboo etc.		65.80	68.57	39.23
Material used in Roofs	RCC/RCB	7.64	5.59	27.37
	Cement/Iron-sheet	8.26	7.15	18.89
	Wood Bamboo	73.56	76.01	50.02
	Others etc	10.54	11.25	3.72
Kitchen Facilities	Separate	37.98	37.1	46.48
	Shared	36.81	36.64	38.43
	None	25.21	26.26	15.09
Bathroom Facilities	Separate	35.25	34.01	47.15
	Shared	27.34	26.1	39.29
	None	37.41	39.89	13.56
Latrine Facilities	Separate	33.44	31.66	50.50
	Shared	18.58	16.61	37.51
	None	47.98	51.73	11.99
Ownership of housing Unit	Own	93.57	94.84	81.44
	Rented	1.78	1.1	8.26
	Rent Free	4.65	4.06	10.3

Table 9: Health State in the District

Facility	Number	Beds
Hospital	5	296
Dispensary 2000	4	-
Rural Health Centre	7	88
Basic Health Unit	47	94
Mother/ ChildHealth Centre	9	-

Table 10: Percentage of Disabled Population

	All Area	Rural Area	Urban Area
Male	1.71	2.00	1.06
Female	1.71	1.86	0.54

Table 11: Percentage Literate Population

	All Area	Rural Area	Urban Area
Male	31.58	28.31	56.98
Female	11.40	8.34	33.90

Table 12: Educational Facilities

		Number	Student	Teacher
Primary Schools	Male	2262	63856	4288
	Female	298	26831	789
Middle Schools	Male	50	968	156
	Female	32	522	83
High Schools	Male	40	8193	549
	Female	11	2025	229
Intermediate Colleges	Male	1	516	8
	Female	1	186	4
Degree College	Male	2	928	27
	Female	1	379	9

Table 13: Number of farms and average farm size

Year	Number of Farms	Area (in acres)	Average Farm Size
1990	48,566	542,176	11.2

Table 14: Tubewells

Type	Number
Diesel (1999-2000)	18 number
Electric (1999-2000)	34 number
Total Reported area (Acres)	1,726,000
Cultivated area acres	377,000
Uncultivated area acres	1,349,000

Table15: Livestock (Thousand)

	1990	1996
Cattle	244	339
Buffaloes	155	314
Sheep	84	170
Goats	125	240
Camels	8	11
Horses	2	0.424
Asses	7	23

Table 16: Major Industry (2001)

	Number
All industrial group	22

Table 17: Roads (2000)

Type	Km
High Type Roads	1669
Low Type Roads	258

Table 18: Crime (2001-02)

Type	Km
Murder	43
Attempt to Murder	43
Kidnapping/Abductions	16
Dacoity	9
Robbery	28
Cattle Thefts	27
Hurt	50

Rape	0
Assault on Public servant	15
M.V. Accidents	31
Theft u/s 382 PPC	2
All other Crimes	602

Table 19: Marine Life

Species	Year				
	1999	2000	2001	2002	2003
SMALL PELAGICS	41631	35231	33895	32160	31080
Shads	78	69	66	62	54
Sardinellas	18,765	15621	14912	14650	13100
Misc. Clupoids	14532	13216	12781	11876	11600
Thryssas	7432	5100	4100	3132	3200
Scads	43	32	54	19	24
Indian mackerel	781	1193	1983	2421	3102
DEMERSALS	34703	31127	26358	22679	20444
Sharks	1653	1254	1214	1421	1100
Guitarfish	4	1	1	2	4
Rays	4532	4321	3912	2198	2109
Wolf herrings	9	11	6	1	2
Bombay duck	54	49	44	41	32
Catfish	3212	2981	2761	2423	2105
Eels	231	199	187	132	143
Threadfin breams	14	11	9	11	32
Barracudas	19	12	15	31	32
Mullets	9875	8971	7239	6873	6700
Groupers	21	32	116	44	21
Croakers	5579	5498	4121	3549	3186
Silver whittings	431	367	219167	115	
Queenfish	43	22	21	1	3
Travellies	8	9	11	9	11
Snappers	1145	981	871	761	511
Grunts	341	321	210	176	132
Emperors	11	9	9	1	3
Threadfins	67	54	41	39	34
Misc. Sea beams	121	66	54	42	23
King soldier bream	7	4	5	2	3
Ribbonfish	3653	3124	2811	2543	2100
White pomferts	211	178	145	165	126
Soles	541	431	328	249	231
Black pomferts	45	32	21	12	33
Others	2876	2189	1987	1786	1653
LARGE PELAGICS	44	43	32	42	39
Spanish meckereis	44	43	32	42	39
SHELLFISH	4409	3436	2213	2135	1917
White shrimps	876	798	712	689	630
Pink/ brown shrimps	560	432	214	321	232
Kiddy shrimps	521	453	143	147	123
Lobsters	8	9	3	9	12
Crabs	1890	1365	899	799	768
Ivory shells	500	345	210	121	109

Cephalopods	54	34	32	49	43
Total	80787	69837	62498	57016	53480
Species	1999	2000	2001	2002	2003
SMALL PELAGICS	41631	35231	33895	32160	31080
DEMERSALS	34703	31127	26358	22679	20444
LARGE PELAGICS	44	43	32	42	39
SHELLFISH	4409	3436	2213	2135	1917
Total	80787	69837	62498	57016	53480

(Source Marine Fisheries Department)

ADDITIONAL INDICATORS OF THATTA DISTRICT

Table 1: Population Growth Rates

Indicators		Estimates
Total Population "000":	1998	1,453,028
	1951	319,070
Average Annual Growth Rate (1981-1998)		3.22
Area		6,726 sq. km
Density	(1998)	169 persons per sq. km
Rural Population	(1998)	83.6
Urban Population	(1998)	
15-49 (Female)		16.4

Table 2: Labor Force Details (1998)

	All Area	Rural Area	Urban Area
Both Sex	17.96	17.22	21.70
Male	32.55	31.54	37.67
Female	1.76	1.40	3.62

Table 3: Unemployment Rate (1998)

	All Area	Rural Area	Urban Area
Both Sex	13.61	13.64	13.47
Male	14.16	14.07	14.57
Female	2.22	3.04	0.57

Table 4: Land Degradation Due to Sea Water Intrusion up to 2003-04

S#	Taluka	No. Deh	Area of Taluka (Acres)	Area Affected				
				Dehs fully eroded by sea	Area (Acres)	Dehs partially affected	Area in Acres	Total affected area
1	2	3	4	5(a)	5(b)	5(c)	5(d)	5(e)
District Thatta								
1	Shah Bundar	92	729382	12	504553-24	31	85884-18	590443-2
2	Ghorabari	59	231980	2	7316-25	8	24174-0	31490-25
3	Karochan	41	252110	21	95910-0	9	21913-0	117823-0
4	M.Sakro	90	736541	3	11033-24	17	49140-13	60178-37
5	Jaati	132	875376	1	194556-0	10	274569-0	226663-0
6	Keti Bunder	42	150594	28	112959-0	1	1000-0	113959-0
	Total	456	2975893	67	414464-33	76	456680-31	1140556
District Badin								

1	S.F.Raho	102	440504	1	6762-0	5	23853-0	30625-0
2	Badin	140	352681	4	28986-7	6	20193	49179-7
	Total	242	793185	5	35758-7	11	44046	79804-7
	G.Total	693	3769078	72	450223-03	87	500726-31	1220360

Source: Board of Revenue, Government of Sindh, Hyderabad

Table 5: Communities Affected by the Recent Coastal Disasters in Thatta District

S.No	Affected Villages of Kharo Chhan	Population
1.	Syed Ghulam Hyder Shah	72
2.	Syed Juman Shah	150
3.	Hashim Patni	48
4.	Natho Ghambheer	60
5.	Qasim Utradi	72
6.	Haji Mohammed Husain Madir	210
7.	Zangi Baloch	120
8.	Mamoon Khaskheli	120
9.	Ghulam Husain Otho	60
10.	Misri Mirbahar	120
11.	Tayyab baloch	30
12.	Umar Patni	60
13.	Ali Patni	60
14.	Abdullah Katiar	60
15.	Ali Asghar Shah	48
16.	Kando Pinyani Baloch	120
17.	Yaqoob Shaikh	114
18.	Phul Mandeer	108
19.	Ismail Katiar	360
20.	Usman Patni	102
21.	Mamoon Meerbahar	30
22.	Usman Katiar	120
23.	Suleman Khaskheli	36
24.	Pirdad Mundir	126
25.	Syed Hasan Shah	90
26.	Haji Shah Bukhari	108
27.	Ali Mohammed Khaskheli	42
28.	Mohammed Rahim Khaskheli	72
29.	Mohammed Misri	60
30.	Mohammed Jat	600
31.	Mohammed Hasan Kehar	60
32.	Abdul Rehman Jarejo	90
33.	Hashim Jarejo	120
34.	Soomar Mallah	72
35.	Essa Mallah	48
36.	Salih Mallah	90
37.	Pir Allah Dino Shah	54
38.	Ramzan Mallah	72
39.	Abdul Rehman Gagoo	150
40.	Pir Hanif Shah	72
41.	Husain Khaskheli	90
42.	Ramzan Khaskheli	108
43.	Urs Mallah	120

44.	Adam Jarejo	132
45.	Ismail Khaskheli	126
46.	Urs Sheedi	90
47.	Mohammed Mallah	108
48.	Abdullah Mallah	72
49.	Ramzan Kehar	90
50.	Ahmed Jarejo	
Affected Villages of Ketī Bandar		Population
51.	Haji Idrees Gabol	300
52.	Haji Ibrahim Gabol	360
53.	Sharif Gabol	150
54.	Haji Khan Sobedar	60
55.	Soomar Jokhio	125
56.	Mir Khan Jokhio	120
57.	Mohammed Talib	96
58.	Baboo Dablo	50
59.	Yaqoob Ahmed	72
60.	Husain Ibrahim	120
61.	Hamzo	90
62.	Abdullah Dablo	72
63.	Ishaq Dablo	90
64.	Mohammed Dablo	120
65.	Siddiq Karo	120
66.	Qabool Dablo	210
67.	Motoo Dablo	24
68.	Yousuf	240
69.	Ismail	60
70.	Haji Mamoon	90
71.	Bilal Dablo	90
72.	Guli Dablo	150
73.	Raza Mohammed Barj	72
74.	Ghani Barj	90
75.	Allah Bachayo Rano	120
76.	Ahmed Samoon	108
77.	Haji Abu Bakar Samoon	126
78.	Kurmi Samoon	90
79.	Mitho Gulri	120
80.	Younus Gambhir	150
81.	Syed Maqbool Shah	180
82.	Mehar Shaikh	120
83.	Anwer Barj	90
84.	Abdullah Deeno	72
85.	Ismail Lalani	90
86.	Biloo Gulri	108
87.	Mohammed Mallah	72
88.	Abdullah Mallah	120
89.	Abdul Razzaq Jat	130
90.	Anwer Jat	90
91.	Haji Mamoon Jat	96
92.	Pir Abdullah Shah	72
93.	Pir Haji Qasim Shah	108
94.	Mohammed Ali Barj	120

95.	Usman Gagoo	90
96.	Dilawar Khan Sholani	96
97.	Suleman Gagoo	90
98.	Haji Alim Sholani	120
99.	Haji Mamoon Poonbhar	90
100.	Haji Moosa Katiar	90
101.	Syed Ali Mohammed Shah	150
102.	Ayub Khan Sholani	72

Table 6: Land Degradation Details Due to Seawater Intrusion in Thatta & Badin Districts

Sr. No	Talukas	No. of Dehs	Areas of Talukas In Acres	Affected Area				
				Dehs Totally Eroded by Sea	Area in Acres	Dehs Partially Affected	Area in Acres	Total Affected
1	2	3	4	5[a]	5[b]	5[c]	5[d]	5[e]
District Thatta								
1	Shah Bandar	92	729382-0	12	504553-24	31	85884-18	590443-2
2	Ghorabari	59	231980-0	2	7316-25	8	24174-0	31490-25
3	Kharochhan	41	252110-0	21	95910-0	9	2193-0	117823-0
4	M. Sakro	90	736541-0	3	11033-25	17	49140-13	60178-0
5	Jati	132	8753760	1	194556-0	10	274569-0	226663-0
6	Keti Bandar	42	150594-0	28	112959-0	1	1000-0	113959-0
	Total	456	2975893	67	414464-33	76	456680-31	1140556

Source: Board of Revenue, Government of Sindh

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II. SELECTED INDICATORS OF SANGHAR

S. No	Name of District	SANGHAR
1	Area (sq: K.M)	10728
2	Population	1452956
3	Male	762212
4	Female	690744
5	Literacy rate (male/female)	30.87
6	No. of universities.	NIL
7	No. of schools (primary/secondary)	3252
8	No. of newborn(0-12 months)	2.5
9	Population (01-14)	97.04 (1998)
10	Population (15-49)	44.97 (1998)
11	Population(60 and above)	54.61 (1998)
12	Population Growth Rate	2.74
13	Density per sq k.m	135.04
14	Users percentage of Family Planning	32% about
15	Contraceptive Choice Percentage	35% about
16	No. of FWCs	24
17	No. of MSUs	2 Nos.
18	No. of RHS-A	3
19	No. of RHS-B	4
20	No. of Hakims/Homeopaths/RMPs	RMPs 241, H.H. 69,
21	Contraceptive prevalence rate	24
22	No. of Male Mobilizers of Family Planning	4.76
23	Total Fertility Rate	5
24	No. of District Head Quarter Hospitals	01
25	No. of Taulka Hospitals	04
26	No. of RHCs	06
27	No. of BHUs	55
28	No. of Dispensaries (Govt/ District Council)	80
29	No. of Major NGOs Working	10
30	No. of Health Institutions	83
31	Family Size (Average)	07
32	House Hold Size	N.A

SOURCE TABLE: Population Welfare Department

III. Demographic Indicators of Nawabshah District

Table-1. Population Data for Nawabshah District

Description	1951	1961	1972	1981	1998
Population (Thousands)	220.50	320.33	663.43	813.53	1071.53
Inter-census increase (Percent)		54.27	107.11	22.63	31.73
Cumulative increase (Percent)		54.27	200.87	268.94	385.95
Average Annual Growth rate (Percent)		3.84	6.44	2.44	1.63

Population Union Council Based

Sr. No	Name of Taluka/U.C.	Census Population 1998	Population-2005
1	Thatta-I	20,002	23,388
2	Thatta-II	19,973	23,354
3	Makli	18,742	21,915
6	Chatto Chand	21,246	24,843
5	Doomani	19,657	22,985
7	Sonda	17,897	20,927
4	Kalla Koat	18,567	21,710
8	Jhirck	17,755	20,761
9	Ongar	18,880	22,076
10	Tando Hafiz Shah	17,903	20,934
11	Jhimpeer	20,614	24,104
12	Jungshahi	22,348	26,132
13	Kalri	20,146	23,557
Total	13	253,730	296,686
14	Mirpur Sakro	23,489	27,466
15	Gujjo	18,715	21,883
16	Gharo	21,731	25,410
17	Dhabejee	22,946	26,831
18	Chow Bandi	17,510	20,474
19	Haji Ghirano	18,265	21,357
20	Karampur	18,459	21,584
21	Sukhpur	18,671	21,832
22	Ghulamullah	18,441	21,563
23	Boohara	20,628	24,120
Total	10	198,855	232,521
24	Khann	22,088	25,827
25	Kotri Allah Rakhio Shah	19,309	22,578
26	Mehar	21,490	25,128
27	Udasi	21,136	24,714
28	Garho	21,539	25,186
Total	5	105,562	123,434
29	Kharo Chann	25,666	30,011
Total	1	25,666	30,011
30	Keti Bundar	25,700	30,051
Total	1	25,700	30,051

Sr. No	Name of Taluka/U.C.	Censes Population 1998	Population-2005
31	Sujawal	23,286	27,228
32	Jaar	20,256	23,685
33	Keenjhar	22,514	26,326
34	Bello	22,272	26,043
35	Bejora	20,504	23,975
36	Ali Behar	18,467	21,593
Total	6	127,299	148,851
37	Chuhar Jamali	20,672	24,172
38	Ladiyoon	20,067	23,464
39	Jungo Jalbani	20,207	23,628
40	Doulatpur	19,267	22,529
41	Goongani	20,362	23,809
Total	5	100,575	117,602
42	Mughal Been	19,969	23,350
43	Kothi	19,935	23,310
44	Gul Muhammad Baran	20,767	24,283
45	Karr Malik	19,721	23,060
46	Begna Mori	21,464	25,098
47	Mureed Khoso	22,101	25,843
Total	6	123,957	144,943
48	Mirpur Bathoro	19,028	22,249
49	Darro	22,318	26,096
50	Mehar Shah	18,265	21,357
51	Jhoke Sharif	17,880	20,907
52	Laiqpur	18,592	21,740
53	Bachal Gugo	17,996	21,043
54	Banoo	19,032	22,254
55	Darya Khan Sooho	18,804	21,988
Total	8	151,915	177,634
G.T.	55	1,113,259	1,301,734

Ref: (National commission for Human Development Thatta& NADRA Thatta)

LITERACY RATIO

According to the Census report of Thatta year 1998

Area	Both sexes	Male	Female	Both sexes	Male	Female
All Areas	17.78	26.47	7.72	22.14	31.58	11.40
Rural	15.84	23.90	6.47	18.99	28.31	8.34
Urban	35.39	49.92	18.83	45.92	56.98	33.90

Veterinary Facilities in Thatta

S#	Name of Taluka	Hospital/ Dispensary	Vet. Centre
1,	Thatta	Vet. Hospital Thatta Vet. Hospital Jherrack Vet. Hospital Jhimpir	Vet.Center Jhunghshahi Vet.Center Haji Siddique Shoro Vet. Center Colombia farm Jhimpir
2,	Sujawal	Vet. Hospital Sujawal	Vet. Center Nodo Baran Vet. Center Beilo
3,	Jati	Vet. Hospital Jati	Vet. Center Tarr Khuwaja Vet. Center Begna Mori
4,	M.P.Bhathoro	Vet. Hospital M.P.Bhathoro Vet Hospital Darro	Vet. Center Shah Nawaz Laghari Vet. Center Banoon
5,	Shah Bander	Vet. Hospital Choar Jamali	-----
6,	M.P.Sakro	Vet. Hospital M.P.Sakro Vet Hospital Gharo	Vet. Center Vur Mobile Unit Gharo
7,	Ghorabari		Ghorabari
8,	Ketibander		Gharro

Live Stock population of District Thatta

S#	Category	Census 1996	Projected 2004
1	Buffalo	3,14,253	3,92,560
2	Cow's	3,39,105	4,05,575
3	Sheep	1,70,031	2,09,440
4	Goat	2,40,902	2,58,830
5	Others	35,436	1,26,380

Private Live stock Farmers in District Thatta

S#	Name of Farm	Type of Farming	Live stock population
1	Sheerazi Farm Thatta	Dairy Farming	300
2	Sheerazi Farm Syed pur	Dairy Farming	200
3	Colombia Farm Jhimpir	Dairy Farming	700
4	Qurashi Farm M.P.Sakro	Dairy Farming	250
5	Shafquat Cattle Farm Gharo	Dairy Farming	50
6	Sardar Farm Gharo	Dairy Farming	98

Ref: Livestock Department Thatta

Agricultural Production

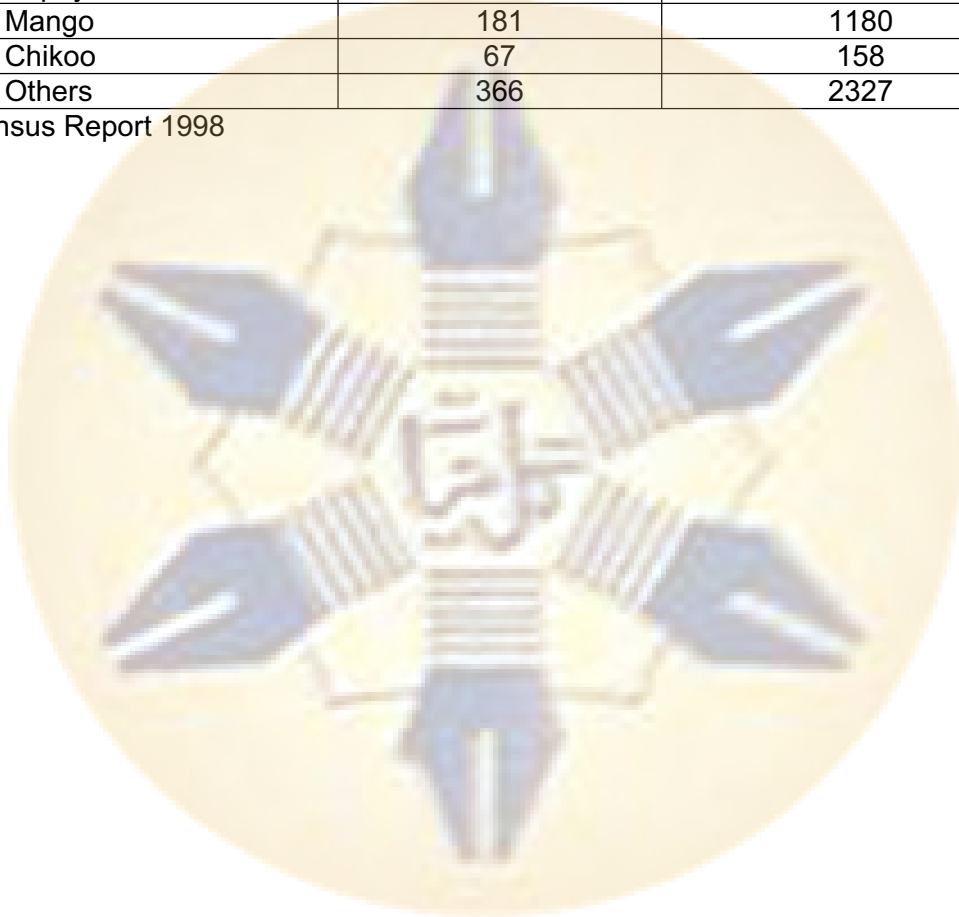
S#	Crop	Area in Hectares	Production in Metric tone
1	Rice	65.321	130.629
2	Wheat	11.024	16.236
3	Cotton	41	95
4	Sugarcane	25.851	1556.127
5	Jower	178	72
6	Bajra	14	5
7	Maize	211	75
8	Sesame	43	16
9	Barley	8.795	4.340
10	Gram	408	294
11	Rapeseed & Mustard	1.594	757
12	Masoor	1.594	757
13	Other pulses	588	251

Ref: Census Report 1998

Fruits and Vegetables Production

S#	Fruit/Vegetable	Area in Hectares	Production in metric tone
1	Peas	812	401
2	Potato	05	52
3	Onion	455	4296
4	Banana	2387	5066
5	Coconut	195	335
6	Papaya	235	1003
7	Mango	181	1180
8	Chikoo	67	158
9	Others	366	2327

Ref: Census Report 1998



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ANNEXURE – D1 ADDITIONAL PRIMARY DATA TABLES

Table- 1. Proportion of Villages in Small, Medium and Large categories

Area		Size of villages			Site Total
		Small	Medium	Large	
Keti Bunder, Thatta	N	21	6	1	28
	%	75.0	21.4	3.6	100.0
Keenjhar, Thatta	N	23	12	3	38
	%	60.5	31.6	7.9	100.0
Chotiari, Sanghar	N	24	6	1	31
	%	77.4	19.4	3.2	100.0
Pai Forest, Nawab Shah	N	13	13	2	28
	%	46.4	46.4	7.1	100.0
Overall	N	81	37	7	125
	%	64.8	29.6	5.6	100.0

Village Categories: Small = > 50 HHs; Medium= 51-200 HHs; Large = > 200 HHs.

Table 2: Type of Housing

Area	Village By Size	Proportion (%)				Average Village Size (HHs)
		Katcha	Pacca	Wooden	Total	
Keti Bunder, Thatta	Small	58.3	0.6	41.1	100.0	22.38
	Medium	13.2	0.1	86.7	100.0	135.33
	Large	40.0	30.0	30.0	100.0	1000.00
	Total	34.2	13.3	52.5	100.0	81.50
Keenjhar, Thatta	Small	28.4	33.2	38.4	100.0	26.35
	Medium	35.1	22.0	43.0	100.0	95.25
	Large	31.0	65.3	3.7	100.0	586.67
	Total	31.9	45.7	22.5	100.0	92.34
Chotiari, Sanghar	Small	37.7	8.3	54.0	100.0	24.00
	Medium	30.9	16.5	52.6	100.0	96.00
	Large	15.8	69.7	14.5	100.0	947.00
	Total	26.0	38.3	35.8	100.0	67.71
Pai Forest, Nawab Shah	Small	34.7	47.9	12.3	100.0	15.08
	Medium	47.4	36.3	12.2	100.0	104.46
	Large	26.1	18.1	55.7	100.0	1090.00
	Total	34.3	26.3	37.6	100.0	133.36
Overall		32.1	31.8	35.6	100.0	92.99

Table 3: Road, Bus Stop and Village History

Area	Distance in (km)		History (Old in years)
	Road	Bus	
Keti Bunder, Thatta	3.87	5.09	48.25
Keenjhar, Thatta	5.04	4.49	49.15
Chotiari, Sanghar	10.20	6.41	108.78
Pai Forest, Nawab Shah	1.56	2.66	180.37
Overall	5.58	4.63	95.61

Table 4: Proportion of Population Engaged in Different Occupations

Professions	Keti Bunder, Thatta	Keenjhar, Thatta	Chotiari, Sanghar	Pai Forest, Nawabshah	Total
Fisheries	113.61	42.66	60.26	0.07	53.38
Agri. Wage labour	1.75	7.74	20.39	77.89	25.25
Livestock herder	2.21	18.63	14.71	17.71	13.78
Mat Maker	7.14	11.13	8.81	0.00	7.17
Stone Mining	0.00	18.37	0.00	0.00	5.58
Labour	0.00	9.16	0.00	8.68	4.73
Artisan	0.21	3.08	7.26	6.29	4.19
Landlord (< 12.5 acre)	0.04	1.82	5.81	8.89	3.99
Landlord (12.5-25)	0.36	1.08	4.16	2.32	1.96
Landlord (26-50)	0.18	0.00	2.52	1.68	1.04
Landlord(51-100)	0.00	0.00	0.55	0.46	0.24
Landlord (>100)	0.00	0.00	0.32	0.18	0.12
Herder	0.21	1.89	4.39	3.21	2.43
Transporter	2.86	1.32	0.52	4.71	2.22
Teacher	0.43	2.71	0.87	3.79	1.98
Kiryana	0.54	1.74	0.84	3.54	1.65
Wood Cutter	0.11	1.74	0.97	3.61	1.60
Tenants	0.00	0.03	3.23	2.89	1.46
Hotel	0.39	1.42	0.65	2.93	1.34
Cabin	0.43	2.84	0.48	1.04	1.31
Dai	0.61	1.74	1.48	1.04	1.26
Leasee	0.00	0.16	2.10	2.61	1.15
Tailor	0.43	1.00	0.23	2.21	0.95
Govt. servant	0.04	1.08	0.94	1.32	0.86
Carpenter	1.68	1.00	0.06	0.50	0.81
Policemen	0.00	0.71	0.39	1.82	0.72
LHV	0.11	0.32	0.06	1.75	0.53
Flour/ Grain Mill	0.00	0.11	0.55	1.21	0.44
Field Assistant	0.00	0.47	0.29	0.68	0.37
Barber	0.11	0.55	0.16	0.57	0.36
Dispenser	0.21	0.24	0.00	0.54	0.24
Peasant	0.00	0.03	0.00	0.71	0.17
Doctor MBBS	0.18	0.32	0.03	0.07	0.16
Medical store	0.04	0.18	0.29	0.11	0.16
Doctor (Attai)	0.04	0.05	0.29	0.14	0.13
Camel Cart	0.00	0.00	0.00	0.39	0.09
Well digger	0.00	0.21	0.10	0.00	0.09
Embroidery	0.00	0.21	0.00	0.00	0.06
Black smith	0.00	0.08	0.13	0.04	0.06
Doctor (Vet.)	0.00	0.00	0.00	0.07	0.02

Table 5: Primary Boys Schools

Area	Primary Boys School			If yes, details			If no, distance (km)
	Yes	No	Total	Rooms	Teachers	Students	
Keti Bunder, Thatta	21.4	78.6	100	2.16	1.67	33.50	3.22
Keenjhar, Thatta	63.2	36.8	100	2.50	3.29	82.56	3.92
Chotiari, Sanghar	48.4	51.6	100	2.00	2.36	59.71	5.40
Pai Forest, Nawab Shah	78.6	21.4	100	3.00	3.13	111.89	1.00
Overall	53.6	46.4	100	2.51	2.87	81.64	3.95

Table 6: Primary Girls Schools

Area	Primary Boys School			If yes, details			If no, distance (km)
	Yes	No	Total	Rooms	Teachers	Students	
Keti Bunder, Thatta	7.1	92.9	100.0	3.00	2.00	50.00	1.33
Keenjhar, Thatta	36.8	63.2	100.0	2.60	2.50	72.25	3.37
Chotiari, Sanghar	3.2	96.8	100.0	5.00	1.00	15.00	10.90
Pai Forest, Nawab Shah	75.0	25.0	100.0	3.00	2.00	72.43	1.67
Overall	28.9	71.1	100.0	2.92	2.17	69.50	5.44

Table 7: Middle Boys Schools

Area	Middle Boys School			If yes, details			If no, distance (km)
	Yes	No	Total	Rooms	Teachers	Students	
Keti Bunder, Thatta	0.0	100.0	100	---	---	---	5.96
Keenjhar, Thatta	2.6	97.4	100	6.00	4.00	50.00	14.88
Chotiari, Sanghar	3.2	96.8	100	30.00	NA	NA	7.25
Pai Forest, Nawab Shah	14.3	85.7	100	4.50	7.00	164.00	7.95
Overall	4.8	95.2	100	4.50	5.50	126.00	5.96

Table 8: Middle Girls Schools

Area	Middle Boys School			If yes, details			If no, distance (km)
	Yes	No	Total	Rooms	Teachers	Students	
Keti Bunder, Thatta	0.0	100	100	---	---	---	---
Keenjhar, Thatta	2.6	97.4	100	6.00	---	---	7.11
Chotiari, Sanghar	3.2	96.8	100	3.00	1.00	---	12.71
Pai Forest, Nawab Shah	21.4	78.6	100	6.00	7.00	99.33	14.00
Overall	6.4	93.6	100	5.50	4.00	99.33	9.28

Table 9: High Boys Schools

Area	Middle Boys School			If yes, details			If no, distance (km)
	Yes	No	Total	Rooms	Teachers	Students	
Keti Bunder, Thatta	3.6	96.4	100	5.00	4.00	30.00	5.13
Keenjhar, Thatta	2.6	97.4	100	14.00	19.00	---	10.50
Chotiari, Sanghar	6.5	93.5	100	7.00	8.00	117.50	13.35
Pai Forest, Nawab Shah	3.6	96.4	100	15.00	10.00	400.00	7.80
Overall	4.0	96.0	100	9.60	9.80	166.25	10.08

Table 10: High Girls Schools

Area	Middle Boys School			If yes, details			If no, distance (km)
	Yes	No	Total	Rooms	Teachers	Students	
Keti Bunder, Thatta	0	100	100	---	---	---	---
Keenjhar, Thatta	2.6	97.4	100	9.00	3.00	---	3.50
Chotiari, Sanghar	0	100	100	---	---	---	11.13
Pai Forest, Nawab Shah	3.6	96.4	100	10.00	4.00	---	19.00
Overall	1.6	98.4	100	9.50	3.50	100.00	8.50

Table 11: Local organizations

Area	Yes	No	Total
Keti Bunder, Thatta	32.1	67.9	100.0
Keenjhar, Thatta	21.1	78.9	100.0
Chotiari, Sanghar	35.5	64.5	100.0
Pai Forest, Nawab Shah	57.1	42.9	100.0
Overall	35.2	64.8	100.0

Table 12: Public Sector Health Facilities

Area	Dispensary		Basic Health Unit		Rural Health Centre		Govt. Hospital	
	N (%) [*]	If no, Distance	N (%)	If no, Distance	N (%)	If no, Distance	N (%)	If no, Distance
Keti Bunder, Thatta	7.1	15.00	10.7	NA	3.6	6.75	0.0	4.33
Keenjhar, Thatta	5.3	5.42	5.3	8.50	0.0	19.77	0.0	27.73
Chotiari, Sanghar	3.2	9.91	3.2	12.08	0.0	35.43	0.0	31.32
Pai Forest, Nawab Shah	14.3	7.58	3.6	4.55	0.0	9.40	0.0	7.58
Overall	7.2	7.16	5.6	8.56	0.8	19.98	0.0	22.34

* facility available in villages

NA = Data not available

Table 13: Private Sector Health Facilities

Area	Private Clinic		Hakeem		Maternity Home		LHV/DAI	
	N (%) [*]	If no, Distance	N (%)	If no, Distance	N (%)	If no, Distance	N (%)	If no, Distance
Keti Bunder, Thatta	0.0	3.00	3.6	NA	0.0	NA	10.7	NA
Keenjhar, Thatta	0.0	6.48	2.6	12.56	0.0	22.36	26.3	9.67
Chotiari, Sanghar	3.2	12.67	3.2	26.33	0.0	32.33	16.1	12.67
Pai Forest, Nawab Shah	7.1	6.33	3.6	9.50	2.4	7.69	32.1	6.20
Overall	2.4	7.78	3.2	16.96	10.7	21.37	21.6	9.71

* facility available in villages

NA = Data not available

Table 14: Veterinary Facilities Available

Area	Veterinary Hospital		Local Health Worker	
	N (%) [*]	If no, Distance	N (%)	If no, Distance
Keti Bunder, Thatta	0.0	55.00	0.0	67.50
Keenjhar, Thatta	2.6	15.28	7.9	12.15
Chotiari, Sanghar	3.2	22.53	3.2	23.63
Pai Forest, Nawab Shah	10.7	7.64	17.9	14.43
Overall	4.0	18.04	7.2	18.05

^{*} Proportion of villages having facility available NA = Data not available

House Hold Data of Keti Shah, Sukkur

Table 1: Villages by Size

	Village of Size		
	Small	Medium	Total
N	7	2	9
%	77.8	22.2	100

Village Size categories: Small = > 50 HHs; Medium: 51-200 HHs; Large=> 200 HHs

Table 2: Type of House

Villages By Size	Proportion (%)				Average Village Size (HHs)
	Katcha	Pacca	Wodden	Total	
Small	40.1	1.2	58.7	100.0	24.57
Medium	16.6	27.0	56.4	100.0	120.50
Overall	26.4	16.2	57.4	100.0	45.89

Table 3: Road and Bus Stop and History

Facility	Mean
Road (km)	10.56
Bus Stop (km)	10.43
History (old in years)	69.50

Table 4: Population in Different Occupational Groups

Area	Total
Livestock herder	105.33
Agri. Wage labour	102.56
Herder	33.33
Landlord (< 12.5 acre)	24.67
Landlord (12.5-25)	9.33
Landlord (26-50)	0.78
Landlord(51-100)	0.33
Labour	22.22
Wood Cutter	6.11
Artisan	6.00
Fisheries	4.44
Tenants	1.67
Barber	1.33
Transporter	1.33
Dai	1.00
Mat Maker	1.00
Flour/ Grain Mill	0.78
Kiryana	0.67
Policemen	0.67
Carpenter	0.44

Teacher	0.11
Dispenser	0.11

Table 5: Educational Facilities

		Primary Boys School			If yes, details			If no, distance (km)
		Yes	No	Total	Rooms	Teachers	Students	
Primary	Male	44.4	55.6	100	2.00	1.00	45.00	18.2
	Female	88.9	11.1	100	2.00	1.00	25.00	12.0
Middle	Male	00	100	100	---	---	---	14.2
	Female	00	100	100	---	---	---	14.2
High	Male	00	100	100	---	---	---	14.2
	Female	00	100	100	---	---	---	14.2

Table 6: Health Facility in Villages

Facility	Facility in Village			If not available in village, distance (km)
	Yes	No	Total	
Dispensary	0.0	100	100	14.57
Basic Health Unit	0.0	100	100	14.00
Rural Health Centre	0.0	100	100	14.33
Govt. Hospital	0.0	100	100	15.75
Private Clinic	0.0	100	100	14.75
Hakeem	0.0	100	100	15.75
Maternity Home	0.0	100	100	15.14
LHV/DAI	11.1	88.9	100	15.14

Table 7: Veterinary Facility in Villages

Facility	Facility in Village			If not available in village, distance (km)
	Yes	No	Total	
Dispensary	0.0	100	100	15.2
Basic Health Unit	0.0	100	100	15.2

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ANNEXURE- D-2: PRIMARY TABLES OF VILLAGE PROFILE DATA IN KETI BUNDER, KINJHAR, CHOTIARI AND PAI FOREST SITES OF THE WWF- INDUS FOR ALL PROGRAM

Table 1: Address and Location of Villages

S #	Name of village	Deh	UC	Taluka	District	Distances (km)			Nearest Town	Histroy (old years)	Leader of village
						Distances (km)		Road			
Ketī Bunder, Thatta											
1	Ali Bux Jat	Keti Pir Ali Bux	Keti Bunder	Keti Bunder	Thatta	2			Keti Bunder		Muhammad Umar Jat
2	Berum			Keti Bunder	Thatta	10	10		Keti Bunder	60	Ismail
3	Bhori	Kher Sir South	Keti Bunder	Keti Bunder	Thatta	7	-		Keti Bunder+	42	Taib Jat
4	Faqeerani Jat	Bhambhatio	Keti Bunder	Keti Bunder	Thatta	1	3		Jooho	40	Haji Noor Mohd
5	Guli Sholani	Hashim Takyo	Keti Bunder	Keti Bunder	Thatta				Keti Bunder		Guli Sholani
6	Gunb	Takkar Kharioon	Keti Bunder	Keti Bunder	Thatta	0	0		Keti Bunder	100	Allah Dino Paatni
7	Haji Abu Jat	Negawari	Keti Bunder	Keti Bunder	Thatta	2	2				Muhammad Umar Jat
8	Haji Aleem Sholani	Moranjhar	Keti Bunder	Keti Bunder	Thatta	2	2		Keti Bunder	40	Haji Ladho
9	Haji Ali Khan Jat	Hashim Takyo	Keti Bunder	Keti Bunder	Thatta				Keti Bunder+		
10	Haji Hashim Jat	Negawari	Keti Bunder	Keti Bunder	Thatta				Kharochan		Essa & Niaz Jat
11	Haji Ismail Jat	Bhambhatio	Keti Bunder	Keti Bunder	Thatta	14	0				Muhammad Khan
12	Haji Mamoo Dabloo	Miaani	Keti Bunder	Keti Bunder	Thatta				Keti Bunder		Muhammad Umar Jat
13	Haji Mosa Jat	Negwasi	Keti Bunder	Keti Bunder	Thatta	0	0		Keti Bunder	20	Haji Mamoo Dabloo
14	Haji Mosa Katiar	Wathion	Keti Bunder	Keti Bunder	Thatta	0	2		Keti Bunder	40	Haji Mosa Jat
15	Haji Sheedi Dablo	Kangri	Keti Bunder	Keti Bunder	Thatta				Keti Bunder		Haji Mosa Katiar
16	Hamzo Guggo	Wathion	Keti Bunder	Keti Bunder	Thatta	0	0		Keti Bunder	22	Haji Sheedi Dublo
17	Haroon Lakhio	Kara Mona	Keti Bunder	Keti Bunder	Thatta				Keti Bunder		Hamzo Guggo
18	Hussan Jat	Bambhtio	Keti Bunder	Keti Bunder	Thatta				Keti Bunder	30	Haroon Lakhio
19	Kangri	Miaani	Keti Bunder	Keti Bunder	Thatta	15	15		Keti Bunder	60	Ahmed Jat
20	Keti Bunder	Takkar Kharioon	Keti Bunder	Keti Bunder	Thatta	0	32		Keti Bunder	50	Haji Mehmood
21	Kharioon	Takkar Kharioon	Keti Bunder	Keti Bunder	Thatta	1	1		Keti Bunder	100	
22	Khuda Bux Jat	Negawari	Keti Bunder	Keti Bunder	Thatta	1.5	1.5				Ghulam
S #	Name of village	Deh	UC	Taluka	District	Distances (km)			Nearest Town	Histroy	Leader of village

S #	Name of village	Deh	UC	Taluka	District	Distances (km)		Nearest Town	Histry (old years)	Leader of village
						Road	Bus Stop			
45	Jhampir	Kohistan 7/1	Jhampir	Thatta	Thatta					Rasool Bux Dars
46	Juman Dars	7/1	Jhampir	Thatta	Thatta	0	0.5	Jhampir	150	Muhammad Ismail
47	Jumoon Jakhro	Kohistan 7/1	Jhampir	Thatta	Thatta	7	7	Chilya	60	Piro Jakhro
48	Khipri	Sonehri	Sonda	Thatta	Thatta	10	20	Sonda	100	Allah Bachayo
49	Khudaiyo	Kohistan 7/1	Jhampir	Thatta	Thatta	3	3	Jhampir	50	Khan Muhammad Khaskheli
50	Lal Bux Mancchri	Kohistan 7/1	Jhampir	Thatta	Thatta	3.5		Jhampir		Lal Bux
51	Mevo Khan Mancchri	Kohistan 7/1	Jhampir	Thatta	Thatta		1	Jhampir	30	Muhammad Wadero
52	Mubarak Palari	Kohistan 7/1	Jhampir	Thatta	Thatta	4	4	Jhampir	50	Haji Khan Palari
53	Muhammad Rahim Machi	Kohistan 7/1	Jhampir	Thatta	Thatta	0.5	2	Jhampir	18	Rahim Machi
54	Muhammad Siddique Manchri	Kohistan 7/1	Jhampir	Thatta	Thatta	1	0.5	Jhampir	30	Siddique Mancchri
55	Mumtaz Dandhial	Chul Site	Onger	Thatta	Thatta	10	0.5	Sonda	15	Mumtaz Dhandail
56	Nabi Bux Palari	Kohistan 7/1	Jhampir	Thatta	Thatta	5	8	Jhampir	80	Haji Raza Muhammad
57	New Ghandri	Kohistan 7/1	Jhampir	Thatta	Thatta	4				Muhammad Arab
58	Rasool Bux Mancchri	Kohistan 7/1	Jhampir	Thatta	Thatta	2	2		15	Haji Rasool Bux Manchhari
59	Shoukat Gandharo	Hilaya	Sonda	Thatta	Thatta	2		Thatta	40	Shoukat Gandharo
60	Sonehri	Sonehri	Sonda	Thatta	Thatta	4	4	Sonda	50	Muhammad Ibrahim Gaudharo
61	Sukhio Autho	Kohistan 7/1	Jhampir	Thatta	Thatta	0.5		Jhampir	50	Sukhio Autho
62	Syed Bachal Shah	Sonehri	Sonda	Thatta	Thatta	7	12	Jhampir	50	Syed Bakir Shah
63	Umar Mancchri	Kohistan 7/2	Jhampir	Thatta	Thatta	3		Chitoo Chand, Thatta		Umar Mancchri
64	Wali Muhammad Palari	Kohistan 7/2	Jhampir	Thatta	Thatta	4	4	Jhampir, Sonda		Ali Akbar Palari
65	Yaaro Mancchri	Miyan	Jhampir	Thatta	Thatta	5		Jhampir, Thatta	50	Yaaro
66	Yousaf Hilaya	Hilaya	Sonda	Thatta	Thatta					Ghulam Hyder Hillaya

S #	Name of village	Deh	UC	Taluka	District	Distances (km)		Nearest Town	Histroy (old years)	Leader of village
						Road	Bus Stop			
Chotiari, Sanghar										
67	Abdul Karim Mallah	Haran Thari	Shah Sikandarabad	Sanghar	Sanghar	20	0	Sanghar	50	Abdul Karim
68	Abdul Qadir	Bakar	Shah Sikandarabad	Sanghar	Sanghar	8	0	Sanghar	70	
69	Abdul Rehaman Mallah	Hassan Thari	Shah Sikandarabad	Sanghar	Sanghar	14	15	Gujri	6	Abdul Rehman Mallah
70	Achar Jamali	Makhi	Miaan	Sanghar	Sanghar	8	0	Sanghar	70	Bhalo Khan
71	Allah Bux Junejo	Akan Wari	Shah Sikandarabad	Sanghar	Sanghar	0	--	Sanghar	100	Allah Bux
72	Allah Dino	Akan Wari	Shah Sikandarabad	Sanghar	Sanghar	0	0	Sanghar	100	Allah Dino
73	Bakar	Bakar	Shah Sikandarabad	Sanghar	Sanghar	3	7	Chotiaryoon	300	Sayed Ali Bux Shah
74	Bilawal	Akan Wari	Shah Sikandarabad	Sanghar	Sanghar	0	0	Sanghar	60	Allah Dino
75	Chotiaryoon	Chotiaryoon	Chotiaryoon	Sanghar	Sanghar	0	0	Sanghar	400	M. Usman Keerio
76	Ghulam Hussain Laghari	Malhario	Janjani	Sanghar	Sanghar	1	--	Sanghar	50	Manthar
77	Haji Islam Larik	Bakar	Shah Sikandarabad	Sanghar	Sanghar	6	6	Chotiaryoon	--	Haji Islam Larik
78	Haji Khan Mahar	Akan Wari	Shah Sikandarabad	Sanghar	Sanghar	8	--	Sanghar	30	Huquman Mulla
79	Imam Din Saandh	Deh 2	Shah Sikandarabad	Sanghar	Sanghar	3	0	Sanghar	70	Mehmood
80	Kharo Mangrio (Dogriyon)	Saher Pir	Chotiaryoon	Sanghar	Sanghar	--	--	Chotiaryoon	200	Tharo Mangrio
81	Lal Bux Unnar	Akan Wari	Shah Sikandarabad	Sanghar	Sanghar	7	--	Sanghar	--	Lal Bux
82	Lal Khan Junejo	Bakar	Shah	Sanghar	Sanghar	40	0	Sanghar	100	Manthar Dodo

S #	Name of village	Deh	UC	Taluka	District	Distances (km)		Nearest Town	History (old years)	Khan
						Road	Bus Stop			
83	Lalo Mangrio	Bakar	Shah Sikandarabad	Sanghar	Sanghar	6	--	Sanghar	100	Lalo
84	Malhar Wassan	Junib Dhoru	Shah Sikandarabad	Sanghar	Sanghar	0	3	Sanghar	--	Muhammad Hasan Wassan
85	Mir Muhammad	Bakhero	Miaan	Sanghar	Sanghar	6	0	Sanghar	--	Mir Muhammad
86	Muhammad Hussain	Makhi	Miaan	Sanghar	Sanghar	4	--	Sanghar	100	Soomar
87	Muhammad Urs Junejo	Bakar	Shah Sikandarabad	Sanghar	Sanghar	8	8	Chotiaryoon	300	Sono Junejo
88	Muhammad Usman Ibupoto	Akan Wari	Shah Sikandarabad	Sanghar	Sanghar	6	0	Sanghar	65	Muhammad Usman
89	Pacchario	Bakar	Shah Sikandarabad	Sanghar	Sanghar	30	--	Chotiaryoon	80	M. Ibrahim Mangrio
90	Phullel	Bakar	Shah Sikandarabad	Sanghar	Sanghar	12	12	Chotiaryoon	37	Yousif and Parial Mallah
91	Pir Bux Behan	Hassan Thari	Shah Sikandarabad	Sanghar	Sanghar	17	25	Sanghar	350	Pir Bux Behan
92	Rano	Bakar	Shah Sikandarabad	Sanghar	Sanghar	52	--	Chotiaryoon	30	Bagh Khan
93	Siddique Mallah	Makhi	Miaan	Sanghar	Sanghar	2	2	Gujri	20	Soomar Mallah
94	Sobharo Khan Mallah	Hassan Thari	Shah Sikandarabad	Sanghar	Sanghar	8	16	Sanghar	50	Sobharo Khan
95	Soomar Ji Miaan	Khad-wari	Chak # 3	Sanghar	Sanghar	7	7	Sanghar	87	Soomar Mallah
96	Wali Muhammad Ibo poto	Akan Wari	Shah Sikandarabad	Sanghar	Sanghar	5	15	Sanghar	12	Wali Muhammad Ibupoto
97	Wasayo Junejo	Bakar	Shah Sikandarabad	Sanghar	Sanghar	25	25	Lutko	100	Wasayo Junejo

Pai Forest, Nawab Shah										
98	Bakhsho Magsi		Marvi 41	Sakrand	Nawab Shah					
99	Bhudho Wadhan		Marvi	Sakrand	Nawab Shah					
100	Daud Gudaro	Morio Lakho	Hamal Faqeer	Sakrand	Nawab Shah	0	1	Sakrand	200	Haji Daud Gudaro
101	Ghulam Hyder Bhutto	20 Bhutta	Pir Zakiri - 01	Sakrand	Nawab Shah	0	1.5	Sakrand	400	
102	Gohram Faqeer	6 Marvi	Marvi	Sakrand	Nawab Shah	0	2	Sakrand	300	Shoukat Faqeer
103	Gulsher Macchi	17 Fareed keerio	Daleel Dero	Sakrand	Nawab Shah	0	0.5	Sakrand	30	Gulsher
104	Haji Ali Bux Chouhan	18 Sakrand	Pir Zakiri - 01	Sakrand	Nawab Shah	0.3	3	Sakrand	150	Haji Ali Sher Chouhan
105	Haji Keerio	18 Sakrand	Pir Zakiri - 33	Sakrand	Nawab Shah	0	3	Sakrand	400	M Ali Keerio
106	Jaffar Jamali	18 Sakrand	Pir Zakiri - 01	Sakrand	Nawab Shah	0	1	Sakrand	45	Ameer Bux Jamali
107	Jeando Lund		6 Marvi	Sakrand	Nawab Shah					
108	Khan Muhammad Chandio		Pir Zakiri	Sakrand	Nawab Shah					
109	Majeed Keerio	17 Fareed keerio	Daleel Dero	Sakrand	Nawab Shah	0	0	Sakrand	180	
110	Mari Alam	13 Marvi	Marvi	Sakrand	Nawab Shah	0	0	Sakrand	--	Sher Muhammad Jalbani
111	Mari Sabqi	13 Marvi	Marvi	Sakrand	Nawab Shah	0	0	Sakrand	--	Sher Muhammad Jalbani
112	Marri Jalbani	13 Marvi	41 Marvi	Sakrand	Nawab Shah	0	0	Sakrand	200	
113	Morio Lakho	Morio Lakho	Hamal Faqeer	Sakrand	Nawab Shah	0	0	Sakrand	200	Noor Ahmed Lakho
114	Murad Keerio		Marvi	Sakrand	Nawab Shah					
115	Mureed Keerio	Talli	Hamal Faqeer	Sakrand	Nawab Shah	0	5	Sakrand	200	Mureed Khan
116	Nangar Khan Chandio	Morio Lakho	Hamal Faqeer	Sakrand	Nawab Shah	0	12	Sakrand	300	Haji Khuda Bux
117	Nazar Muhammad Bhatti	6 Marvi	Marvi	Sakrand	Nawab Shah	0	4	Sakrand	40	M Yaseen
118	Pallyo Bhutto	Morio Lakho	Hamal Faqeer	Sakrand	Nawab Shah	10	20	Sakrand	200	Dilawar Bhutto

119	Punho Gudaro	Morio Lakho	Hamal Faqeer	Sakrand	Nawab Shah	0.5	0	Sakrand	200	Rais Noor Ahmed Lakho
120	Rahimo Keerio	6 Marvi	Marvi	Sakrand	Nawab Shah	0	2	Sakrand	72	Abdul Sattar Dheto
121	Rais Ghulam Qadir Jatoi	Morio Lakho	Hamal Faqeer	Sakrand	Nawab Shah	0.5	0.5	Sakrand	100	Rais G Qadir
122	Rasool Bux Keerio	6 Marvi	6 Marvi	Sakrand	Nawab Shah	0	2	Sakrand	40	Ameer Bux
123	Rasoolabad		Marvi	Sakrand	Nawab Shah					
124	Sahib Khan Lund	7- Darri	6 Marvi	Sakrand	Nawab Shah	0	0	Sakrand	170	M Urs Lund
125	Talli	25 Matho	UC 2	Sakrand	Nawab Shah	23	1	Sakrand	--	Sharif keerio

Table 2: Household Population, Major Castes, Local Leaders and Type of Housing

S #	Name of village	Total Households	Major Castes	Local Leaders	Type of Housing			
					Katcha	Pacca	Wooden	Total
Ketki Bunder, Thatta								
1	Ali Bux Jat	20	Jat	Muhammad Umar Jat	15	0	5	20
2	Berum	12	Dablo	Ismail	0	0	12	12
3	Bhori	40	Jat, Shaikh, Badala	Taib Jat	0	0	200	200
4	Fageerani Jat	200	Jat	Haji Noor Mohd	3	0	197	200
5	Guli Sholani	10	Sholani	Guli Sholani	10	0	0	10
6	Gunb	60	Utradi, Roonjha, Palijo	Hassan Utradi, Siddique Ronjha, Ahmed Palijo	0	0	60	60
7	Haji Abu Jat	150	Jat	Umar Jat	10	0	140	150
8	Haji Aleem Sholani	44	Sholani	Haji Ladhoo	0	0	44	44
9	Haji Ali Khan Jat	30	Jat	Essa Jat	26	0	4	30
10	Haji Hashim Jat	15	Jat	Muhammad Khan	12	0	3	15
11	Haji Ismail Jut	100	Jut	Abdul Majeed Jut	94	1	5	100
12	Haji Mamoo Dabloo	25	Dablo	Haji Mamoo Dablo	24	0	1	25
13	Haji Mosa Jat	18	Jat	Haji Mosa Jat	0		18	18
14	Haji Mosa Katiar	18	Katiar	Haji Mosa Kaatiar	0	3	15	18
15	Haji Sheedi Dablo	11	Dablo	Haji Sheedi Dablo	11	0	0	11
16	Hamzo Guggo	15	Guggo	Hamzo Guggo	0	0	15	15
17	Haroon Lakhio	6	Lakhio	Haroon Lakhio	6	0	0	6
18	Hassan Jut	40	Jut	Ahmed Jut	40	0	0	40
19	Kangri	17	Dablo	Haji Mehmood	0	0	17	17

20	Keti Bander	1000	Memon, Khaskheli, Kazi, Peer, Sheedi, Shaikh, Mallah, Bhogani	Babo Memon, Khaskheli	400	300	300	1000
21	Kharioon	35	Dablo	Ghulam	0	0	0	35
22	Khuda Bux Jat	25	Jat	Pir Dino Jat	19	0	0	25
23	Meero Dablo	36	Dablo	Saleem Abdullah	34	0	0	36
24	Phirt	35	Dablo	Yaqoob	30	0	0	35
25	Ramzan Lakhio	15	Lakhio	Ramzan Lakhio	15	0	0	15
26	Siddique Dablo	30	Dablo, Lakhio	Hussain Haroon	32	0	0	32
27	Tippun	102	Dablo	Talib Dablo, Ameen Dablo	0	0	0	102
28	Yousaf Dablo	11	Dablo	M Umar	0	0	0	11
Keenjhar, Thatta								
29	Abdul Hameed Mancchri	80	Mallah	Abdul Hameed	0	0	0	80
30	Abdullah Gandhro	1000			300	700	0	1000
31	Adam Bhambhro	90	Kachi	Adam, Lakhano, Khuda Bux	40	25	25	90
32	Adam Katiyar	75	Autho, Khaskheli, Katiyar	Mosa, Ayob, Mola Bux	20	45	10	75
33	Ali Bux Mancchri	90	Janbani, Balwani, Nindwani		30	10	50	90
34	Ali Muhammad Soomro	15	Soomra	Ali Muhammad	13	2	0	15
35	Autha	43		Mohsin	5	7	31	43
36	Bakhr Macchi	150	Pandhiani	Ahmed Khan	4	0	146	150
37	Chul Site(Yaar Muhammad Jakhro)	115	Jakhro, Machi, Shaikh Bhamro, Dhafrani, Mancchri	Wahid Bux, Abdullah, Ismail	55	21	39	115
38	Dodo Bhombhro	22	Mancchri	Dodo Bhambhro	17	5	0	22
39	Dolt Pur	56	Mallah, Mancchri, Ghathani	Ramzan, Ghaffar, Ibrahim	1	5	50	56
40	Foto Khan	42	Dars, Khaskheli	Muhammad Jamil	2	40	0	42
41	Haji Ramzan Mirbhar	95	Sakyain, Chandani, Saindodail	Dost Muhammad Pathan	0	14	81	95
42	Haji Rasool Bux Manchhari	6	Mallah	Haji Rasool Bux	0	0	6	6
43	Haji Soomar Mirbhar	100	Mirbhar	Abdul Fateh	70	20	10	100

44	Jaffar Hillayo		50	Hillaya		Haji Hassan Hillaya	10	40	0	50
45	Jhampir		500			Rasool Bux Dars	50	400	50	500
46	Juman Dars		22	Dars, Jumani, Janwani, Sulowani, Nohandani		Muhammad Aslam Dars	2	20	0	22
47	Jumoon Jakhro		31	Jakhro, Mallah		Piro, Yaqoob Mallah	0	20	11	31
48	Khipri		28	Mallah		Laiq	0	0	28	28
49	Khudaiyo		112	Khaskheli, Khudai, Koreja		Khan Muhammad, Gaffor, Arif	27	85	0	112
50	Lal Bux Mancchri		90	Kudhani		Lal Bux, Ali Murad	70	20	0	90
51	Mevo Khan Mancchri		48	Eidhani, Umedhani, Makrani		Qaim, Ali Sher	4	0	44	48
52	Mubarak Palari		15	Palari, Khaskheli		Haji Khan, Hamid, Usman	0	7	8	15
53	Muhammad Rahim Machi		20	Machi		Rahim Machi	15	0	5	20
54	Muhammad Siddique Manchri		20	Mancchri		Siddique Mancchri	3	3	14	20
55	Mumtaz Dhandhail		43	Dhandhail		Mumtaz	0	0	43	43
56	Nabi Bux Palari		44	Palari		Haji Raza Muhammad	20	20	4	44
57	New Ghandri		28	Karani, Bachlani, Aryani		Muhammad Arab	15	13	0	28
58	Rasool Bux Mancchri		16	Pareri, Chakarani		Haji Rasool Bux	0	0	16	16
59	Shoukat Gandharo		20	Gandhro		Shoukat Gandharo	5	15	0	20
60	Sonehri		260	Gandhro		Rais Ibrahim Gandhro	195	50	15	260
61	Sukhio Autho		35	Autho		Sukhio Autho	32	3	0	35
62	Syed Bachal Shah		11	Syed		Mohsin Shah	9	2	0	11
63	Umar Mancchri		20	Mancchri		Umar Manchri	0	0	20	20
64	Wali Muhammad Palari		7	Palari, Solangi		Ali Akhter Palari	0	4	3	7
65	Yaaro Mancchri		20	Mancchri		Yaaro	20	0	0	20
66	Yousaf Hillaya		90	Hillaya		Ramzan Siddique	84	6	0	90
Chotiari, Sanghar										
67	Abdul Karim Mallah		50	Mallah		Abdul Karim	0	0	50	50
68	Abdul Qadir		25	Mallah		Haji Hassan	22	3		25
69	Abdul Rehaman Mallah		5	Mallah		Abdul Rehaman Mallah	0	0	5	5
70	Achar Jamali		25	Jamali		Bhaloo Khan	25	0	0	25
71	Allah Bux Junejo		50	Junejo		Allah Bux	50	0	0	50
72	Allah Dino Behan		13	Behan		Allah Dino Behan	13	0	0	13

73	Blawal		38	Ibu Pota, Behan		Allah Dino	38	0	0	38
74	Bakar		57	Mallah, Sayed		Ali Bux Mallah	16	12	29	57
75	Chotiaryoon		947	Keerio, Kumbhar		M. Usman Keerio, Wali M. Kumbhar	150	660	137	947
76	Ghulam Hussain Laghari		15	Leghari		Manthar Laghari	15	0	0	15
77	Haji Islam Larik		37	Mallah		Haji Islam Larik	4	0	33	37
78	Haji Khan Mallah		15	Mallah		M Luqman Mallah	0	0	15	15
79	Imam Din Saandh		50	Kand, Gaho, Chandio, Behan		Mehmood	0	0	50	50
80	Lal Bux Unnar		20	Unar, Bhali, Magsi		Lal Bux	0	0	20	20
81	Lal Khan Junejo		10	Junejo		Manthar Dodo Khan	0	0	10	10
82	Lalo Mangrio		8	Junejo, Mangrio		Lalo	0	0	8	8
83	Malhar Wassan		28	Wassan, Bheel		Hassan Wassan	8	20	0	28
84	Mir Muhammad		42	Hingoro, Mallah		Mr Muhammad	0	10	32	42
85	Muhammad Hussain		16	Hingoro		Soomar	2	9	0	11
86	Muhammad Urs Junejo		4	Junejo		Sono Khan	0	0	4	4
87	Muhammad Usman Ibupoto		40	Behan, Ibupoto		Muhammad Usman	40	0	0	40
88	Pacchario		33	Junejo, Mangrio		Abdul Majeed Mangrio	0	0	33	33
89	Phullel		172	Mallah		Yousif, Paryal, Pir Bux	12	0	160	172
90	Pir Bux Behan		22	Behan		Pir Bux Behan	0	0	22	22
91	Rano		6	Junejo		Bag Khan Junejo	0	0	6	6
92	Siddique Mallah		15	Mallah		Soomar Mallah	0	0	15	15
93	Sobharo Khan Mallah		64	Mallah, Hashimani, Jearani		Sobharo Khan Mallah	0	0	64	64
94	Soomar Ji Miaan		103	Mallah		Soomar, Hubb Ali, Noor Md, Yameen	50	13	40	103
95	Tharo Mangrio (Dogriyon)		110	Mangrio, Abu Pota, Sayed, Leghari, Kundhani		Tharo Mangrio	50	50	10	110
96	Wali Muhammad Ibupoto		70	Sadhoja, Lohar, Baboja, Kalani, Ibupota		Wali Muhammad Ibupoto	50	20	0	70
97	Wasayo Junejo		14	Junejo		Wasaya Junejo	0	6	8	14
Pai Forest, Nawab Shah										
98	Bakhsho Magsi		300	Magsi, Siyal, Channa		Riaz Ahmed Mangsi				0
99	Bhudho Wadhan		25	Bhutta		Rasool Bux Bhutto				0

100	Daud Gudaro		21	Gudaro		Haji Daud Gudaro	0	18	3	21
101	Ghulam Hyder Bhutto		165	Noonari, Bhutta, Syed, Leghari		Usman Bhutto, Muhib leghari	84	81	0	165
102	Gohram Fageer		20	Zardari		Shoukat Fageer	18	1	1	20
103	Gulsher Macchi		41	Macchi, Brohi, Sami Fageer		Gulsher	33	3	5	41
104	Haji Ali Bux Chouhan		125	Gujjar, Lathique, Panhwar		Ali Sher, Hashim	20	105	0	125
105	Haji Keerio		84	Keerio, Kumbhar, Arain, Lakha, Bhagri		Muharam Ali Keerio	48	32	4	84
106	Jaffar Jamali		60	Jamali		Ameer Bux Jamali	20	25	15	60
107	Jeando Lund		60	Lund		Shamsudin Lund				0
108	Khan Muhammad Chandio		70	Chouhan		Shoukat Ali Chouhan				0
109	Majeed Keerio		360	Keerio, Khokhar, Khaskheli			70	275	15	360
110	Mari Alam		120	Jalbani, Soomro, Pechoho		Sher M Jalbani	100	20	0	120
111	Mari Sabqi		200	Sabqi, Jalbani, Soomro, Chandia		Sher M Jalbani	180	20	0	200
112	Marri Jalbani		1820	Jalbani			500	120	1200	1820
113	Morio Lakho		68	Lakha, Solangi, khaskheli, Gudaro		Noor Ahmed Lakho	30	18	20	68
114	Murad Keerio		55	Mangharhar, Solangi		Ali Sher Mangharhar				55
115	Mureed Keerio		76	Keerio, Khaskheli		Mureed Khan	0	20	56	76
116	Nangar Khan Chandio		61	Chandio		Haji khuda Bux	10	10	41	61
117	Nazar Muhammad Bhatti		35	Bhatti		M Yaseen Bhatti	0	35	0	35
118	Pallyo Bhutto		10	Bhutto		Dilawar Bhutto	3	7	0	10
119	Punho Gudaro		53	Gudaro, Khoso		Rais Noor Ahmed	6	27	15	48
120	Rahimo Keerio			Detha, Brohi, Jamali, Solangi		Abdul Sattar Dhetho				0
121	Rais Ghulam Qadir Jatoi		175	Jatoi, Macchi, Kumbhar, Oad		Rais Ghulam Qadir	135	10	30	175
122	Rasool Bux Keerio		11	Keerio		Ameer Bux	8	3	0	11
123	Rasoolabad		10	Keerio, Solangi, Brohi		Ghulam Ali Keerio				10
124	Sahib Khan Lund		67	Lund		M Urs Lund	0	67	0	67
125	Talli		102	Keerio, Mallah, Jamali,		Sharif Keerio	17	85	0	102

125	Talli	80		7	1		20	8	2	3		15	2	2

Table 4: Local Organizations

Name of village		Community Organization	If yes, name of organization	Total Members	Activities	Name of Training	Organizing Agency	No. of Participants	Nature of Training
Keti Bander, Thatta									
1	Ali Bux Jat	No							
2	Berum	No							
3	Bhori	No							
4	Faqeerani Jat	No							
5	Guli Sholani	No							
6	Gunb	Yes	Village Development Organization	7	CPI		AKF		Development
7	Haji Abu Jat	Yes	Community Development Organization	96	AKPBS	CPI	AKPBS	1	Capacity Building
8	Haji Aleem Sholani	No							
9	Haji Ali Khan Jat	No							
10	Haji Hashim Jat	No							
11	Haji Ismail Jat	Yes	Muhammad Umer Jat	65	SD		AKF	2	CBO
12	Haji Mamoo Dabloo	No							
13	Haji Mosa Jat	No							
14	Haji Mosa Katiar	Yes	Roshan	15					
15	Haji Sheedi Dablo	No							
16	Hamzo Guggo	No							
17	Haroon Lakhio	No							
18	Hassan Jat	No							
19	Kangri	No							
20	Keti Bander	Yes	United Development Organization	100	SD, CPI, ED, HP	CCB Formation, Organizational	WWF, AKPBS	10,15	CCB Formation,

									Management			Organizational Management
21	Kharioon	Yes	Hajamro Mahol Dost Committee	15	SD, HP				CBO Formation, Organizational Management	WWF	4,3	Environment, Awareness, Community Development
	Name of village	Community Organization	If yes, name of organization	Total Members	Activities	Name of Training	Organizing Agency	No. of Participants	Nature of Training			
Keti Bander, Thatta												
22	Khuda Bux Jat	No										
23	Meero Dablo	Yes	Traqiyati	40	Protection Bund							
24	Phirt	Yes	Hajamro Mahol Dost Committee	6	WWF	Natural Resource Management	WWF	3	Record Keeping and Management			
25	Ramzan Lakhio	No										
26	Siddique Dablo	No										
27	Tippun	Yes	Hajamro Mahol Dost Committee	80	Environment	Mangrove Plantation, Organizational Management	WWF	40, 25	Plantation			
28	Yousaf Dablo	No										
Keenjhar, Thatta												
29	Abdul Hameed Mancchri	No										
30	Abdullah Gandhro	No										
31	Adam Bhambhro	No										

51	Mevo Khan Mancchri	No															
52	Mubarak Palari	No															
53	Muhammad Rahim Machi	No															
54	Muhammad Siddique Manchri	No															
55	Mumtaz Dhandhail	Yes	Fisher Folks Forum	1	SD												
56	Nabi Bux Palari	Yes	PEMAN, NCHD, ESSRA	1	ED, HP												
	Name of village	Community Organization	If yes, name of organization	Total Members	Activities	Name of Training	Organizing Agency	No. of Participants	Nature of Training								
57	New Ghandri	No			ED, HP	Multi Grade Training and New Methodologies	ESRA, UNICEF, PAIMAN										
58	Rasool Bux Mancchri	No															
59	Shoukat Gandharo	No															
60	Sonehri	Yes	Sonehri Development Organization	50	SD, HP, ED	Capacity Building, Health Awareness, Teachers Training	PFF, KFWS, NCHD, HANDS	3,9	Capacity Building, Health Awareness, Teachers Training								
61	Sukhio Autho	No															
62	Syed Bachal Shah	No															
63	Umar Mancchri	No															
64	Wali Muhammad Palari	No															
65	Yaaro Mancchri	No															
66	Yousaf Hillaya	Yes	NCHD		ED	Teacher	NCHD	2	Training								

106	Jaffar Jamali		No					Management, IPM				
107	Jeando Lund*		Yes	Marri Village Welfare Association								
108	Khan Muhammad Chandio*		No									
109	Majeed Keerio		Yes	Sindhi Reform Society,	120	EDS, HP		Microfinance, Community, Development	SAFWCO, Asia Foundation, SPO	83	Discussion, Lecture	
110	Mari Alam		Yes	SM Shah Welfare Organization	50	EDS						
111	Mari Sabqi		Yes	SM Shah Welfare Organization	50	EDS		Agriculture, Capacity Building, OLS	SAFWCO	8	Capacity Building	
112	Marri Jalbani		Yes	Village Development Organization	17	HP		ORS	NCHD	5	Health	
	Name of village	Community Organization	If yes, name of organization	Total Members	Activities	Name of Training	Organizing Agency	No. of Participants	Nature of Training			
113	Morio Lakho	No										
114	Murad Keerio*	Yes	Goth Sundar Sangat	25	SD, Agriculture	Capacity Building, Livestock, Agriculture	SAFWCO	106	Capacity Building			
115	Mureed Keerio	Yes	SCHWA	4	SD, CPI							
116	Nangar Khan Chandio	No										
117	Nazar Muhammad Bhatti	No										
118	Pallyo Bhutto	No										
119	Punho Gudaro	Yes	Village Development	82	SD, HP							

			Organization										
120	Rahimo Keerio	No											
121	Rais Ghulam Qadir Jatoi	No											
122	Rasool Bux Keerio	Yes	Sindhri Welfare Association	45	EDS, HP		ODP, TB awareness		SAFWCO, Asia Foundation		2		CBOs, Volunteers awareness
123	Rasoolabad	Yes	Sindhri Welfare Association										
124	Sahib Khan Lund	Yes	Watan Dost village development organization	40	EDS, CPI, HP, Agriculture		Livestock management, Leadership Skills		SAFWCO, Asia Foundation, SPO		3		Livestock
125	Talli	Yes	SAFWCO	2500									

Table 5: Educational Facility Available in Village

S #	Name of village	Primary										Middle										High School																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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		Available (Yes/No)	Rooms	Teachers	If Yes	Distance (km)	Available (Yes/No)	Rooms	Teachers	If Yes	Distance (km)	Available (Yes/No)	Rooms	Teachers	If Yes	Distance (km)	Available (Yes/No)	Rooms	Teachers	If Yes	Distance (km)	Available (Yes/No)	Rooms	Teachers	If Yes	Distance (km)	Available (Yes/No)	Rooms	Teachers	If Yes	Distance (km)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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1	Ali Bux Jat	Y	2	1	25						N											N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</

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46	Juman Dars	No	1	No	39	No		39	No	1	No		39	Yes	
47	Jumoon Jakhro	No	8	No	8	No		15	No	15	No		15	Yes	3
48	Khipri	No	20	No	20	No		50	No	20	No		20	Yes	
49	Khudaiyo	No	6	No	6	No			No		No			Yes	
50	Lal Bux Manochri	No		No	6	No		52	No		No			No	
51	Mevo Khan Mancchri	No	2	No	2	No			No	2	No			No	
52	Mubarak Palari	No	7	No	7	No			No		No			No	
53	Muhammad Rahim Machi	No	2	No		No			No		No			No	
54	Muhammad Siddique Manchri	No	6	No		No			No		No			No	
55	Mumtaz Dhandhail	No	3	No	3	No	8	8	No	8	No		3	No	3
56	Nabi Bux Palari	No	8	No	8	No	30	50	No	8	No		50	No	8
57	New Ghandri	No	1	No		No		43	No	1	No		1	No	1
58	Rasool Bux Mancchri	No	2	No	2	No			No	2	No			No	
59	Shoukat Gandharo	No	2	No	2	No			No		No			No	
60	Sonehri	Yes	1	No	10	No		20	No	4.5	No			Yes	4
61	Sukhio Autho	No	6	No		No			No		No			No	
62	Syed Bachal Shah	No	12	No		No		52	No	12	Yes	1		No	
63	Umar Mancchri	No		No		No		15	No	8	No			No	
64	Wali Muhammad Palari	No		No	20	No			No		No			No	8
65	Yaaro Mancchri	No		No	12	No		15	No	10	No			No	
66	Yousaf Hillaya	No	2	No	2	No	2	30	No	2	No			Yes	
Chotiari, Sanghar															
67	Abdul Karim Mallah*	No		No		No			No		No			No	
68	Abdul Qadir	No		No	12	No			No		No			No	
69	Abdul Rehman Mallah	No	15	No	15	No	40	40	No	15	No		40	No	15
70	Achar Jamali	No		No		No			No	8	No			No	
71	Allah Bux Junejo	No		No		No			No		No			No	
72	Allah Dino Behan	No		No		No			No	10	No			No	
73	Bakar	No	7	No	7	No	40	40	No	7	No		40	No	7
74	Blawal	No	8	No		No		32	No		No			No	
75	Chotiaryoon	Yes	6	Yes	--	No	26	26	Yes	20	Yes	1	26	Yes	3
76	Ghulam Hussain Laghari	No	20	No		No		20	No		No			No	
77	Haji Islam Larik	No		No	9	No		36	No	9	No			No	

78	Haji Khan Mallah	No		No		No		No		8	No		No		No		No		No	
79	Imam Din Saandh	No		No	10	No		No			No		No		No		No		No	
80	Lal Bux Unnar	No		No		No		No			No		No		No		No		No	
81	Lal Khan Junejo	No		No		No		No			No		No		No		No		No	
82	Lalo Mangrio	No		No		No		No			No		No		No		No		No	
83	Malhar Wassan	No		No	3	No		No		25	No		No		No		No		Yes	
84	Mir Muhammad	No		No		No		No		17	No		No		No	17	No		No	
85	Muhammad Hussain	No		No		No		No			No		No		No		No		No	
86	Muhammad Urs Junejo	No		No	8	No		No	40	40	No		No	8	No	40	No		No	8
87	Muhammad Usman Ibupoto	No		No		No		No		40	No		No		No		No		No	
88	Pacchario	No		No		No		No			No		No		No		No		No	
89	Phullel	No		No		No	15	No		40	No		No		No		No		Yes	3
90	Pir Bux Behan	No	15	No		No	15	No	30	30	No		No	15	No	30	No		No	30
91	Rano	No		No		No		No			No		No		No		No		No	
92	Siddique Mallah	No		No		No	3	No		6	No		No	1	No	1	No		No	
93	Sobharo Khan Mallah	No	9	No		No	20	No	45	45	No		No	9	No	45	No		No	9
94	Soomar Ji Miaan	No	9	No		No	6	No		13	No		No	13	No		No		Yes	4
95	Tharo Mangrio (Dogriyon)	No	7	No		No	7	No	27	27	No		No	7	No	7	No		No	7
96	Wali Muhammad Ibupoto	No	8	No		No		No		50	No		No	50	No	50	No		Yes	3
97	Wasayo Junejo	No		No		No	30	No		60	No		No		No		No		No	
Pai Forest, Nawab Shah																				
98	Bakhsho Magsi*	No		No		No		No			No		No		No		Yes		Yes	3
99	Bhudho Wadhan*	No		No		No		No			No		No		No		No		No	
100	Daud Gudaro	No	1	No		No	10	No	10	10	No		No	10	No	10	No		No	10
101	Ghulam Hyder Bhutto	Yes	2	No		No	1	No		6	No		No	6	No		Yes		Yes	
102	Gohram Fageer	No		No	3	No	10	No	10	10	No		No	10	No	10	No		No	3
103	Gulsher Macchi	No		No	3	No		No			No		No		No		No		No	
104	Haji Ali Bux Chouhan	No		No		No		No		3	No		No	3	No		No		No	
105	Haji Keerio	No	3	No		No	3	No	3	3	No		No	3	No	3	No		Yes	3
106	Jaffar Jamali	No		No		No		No		3	No		No		No		No		No	
107	Jeando Lund*	No		No		No		No			No		No		No		No		Yes	1
108	Khan Muhammad Chandio*	No		No		No		No			No		No		No		No		No	
109	Majeed Keerio	No		Yes	5	No		No			No		No		No		Yes	3	No	

S #	Name of village	Dispensary			BHU			Rural Health Centre			Govt. Hospital			Private Clinic			Hakeem			Maternity Home			LHV/DAI		
		Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance
110	Mari Alam	No		2	No		No	No			No			No			No			No			No		
111	Mari Sabqi	No		2	No		2	No			No			No			No			No			No		
112	Marri Jalbani	Yes	4		No		No	No		15	Yes	1		No			No			No			No		
113	Morio Lakho	No		35	No		No	No			No			No			No			No			Yes	1	
114	Murad Keerio*	No			No			No			No			No			No			No			Yes	1	
115	Mureed Keerio	No		5	No			No			No			No			No			No			No		
116	Nangar Khan Chandio	No		12	No		12	No		12	No	1		No			No			No			No		
117	Nazar Muhammad Bhatti	No		2	No		4	No		10	No			No			No			No			No		
118	Pallyo Bhutto	No		1	No		2	No			No			No			No			No			No		
119	Punho Gudaro	Yes	2		No			No			No			No			No			No			No		
120	Rahimo Keerio	Yes	2		No		2	No		12	No			No			No			No			No		
121	Rais Ghulam Qadir Jatoi	No		29	No			No			No			No			No			No			No		
122	Rasool Bux Keerio	No			No		1	No		5	No			No			No			No			Yes	1	
123	Rasoolabad	No			No			No			No			No			No			No			No		
124	Sahib Khan Lund	No			No		3	No		8	No			No			Yes	1		No			Yes	2	
125	Talli	No		0.5	No			No		1.5	No			No			No			No			Yes	1	

Table 7. Veterinary Hospital and Marketing Facilities for Agriculture

S #		Name of village	Veterinary Health Facilities					
			Veterinary Hospital			Local Health Worker		
			Available	Staff	If no, distance	Available	Staff	If no, distance
Keti Bander								
1		Berum	No		75	No		75
2		Guli Sholani	No			No		
3		Haji Ali Khan Jat	No			No		
4		Haji Mamoo Dabloo	No			No		
5		Haroon Lakhio	No			No		
6		Haji Sheedi Dablo	No			No		
7		Hassan Jat	No			No		
8		Haji Ismail Jat	No			No		
9		Keti Bander	No			No		
10		Meero Dablo	No			No		
11		Ali Bux Jat	No			No		
12		Phirt	No			No		
13		Siddique Dablo	No			No		
14		Haji Hashim Jat	No			No		
15		Haji Abu Jat	No			No		
16		Khuda Bux Jat	No			No		
17		Ramzan Lakhio	No			No		
18		Bhori	No			No		
19		Faqeerani Jat	No			No		
20		Gunb	No			No		
21		Haji Aleem Sholani	No		50	No		
22		Haji Mosa Jat	No			No		
23		Haji Mosa Katiar	No		25	No		
24		Hamzo Guggo	No			No		
25		Kangri	No			No		
26		Kharioon	No			No		

55	Mumtaz Dhandhail		No				No			
56	Nabi Bux Palari		No			8	Yes	1		
57	New Ghandri		No			1	No		1	
58	Rasool Bux Mancchri		No			2	No			
59	Shoukat Gandharo		No			30	No		30	
60	Sonehri		No			52	No		52	
61	Sukhio Autho		No			35	No		6	
62	Syed Bachal Shah		No				No			
63	Umar Mancchri		No			15	No			
64	Wali Muhammad Palari		No			15	No		15	
65	Yaaro Mancchri		No			15	No			
66	Yousaf Hillaya		No			27	No			
Chotiari, Sanghar										
67	Abdul Karim Mallah*		No				No			
68	Abdul Qadir		No				No			
69	Abdul Rehman Mallah		No			40	No		40	
70	Achar Jamali		No			8	No			
71	Allah Bux Junejo		No				No			
72	Allah Dino Behan		No				No			
73	Bakar		No			7	No		7	
74	Blawal		No			32	No			
75	Chotiaryoon		Yes	3			Yes	4		
76	Ghulam Hussain Laghari		No			22	No			
77	Haji Islam Larik		No			6	No			
78	Haji Khan Mallah		No			8	No			
79	Imam Din Saandh		No				No			
80	Lal Bux Unnar		No				No			
81	Lal Khan Junejo		No			40	No			
82	Lalo Mangrio		No				No			
83	Malhar Wassan		No				No			
84	Mir Muhammad		No			17	No			
85	Muhammad Hussain		No				No			
86	Muhammad Urs Junejo		No			40	No		40	
87	Muhammad Usman Ibupoto		No			40	No			

88	Pacchario	No			No				
S #	Name of village	Veterinary Health Facilities							
		Veterinary Hospital				Veterinary Hospital			
		Available	Available	Available	Available	Available	Available	Available	Available
89	Phullel	No			15	No			
90	Pir Bux Behan	No			30	No			30
91	Rano	No				No			
92	Siddique Mallah	No			3	No			
93	Sobharo Khan Mallah	No			20	No			9
94	Soomar Ji Miaan	No			13	No			6
95	Tharo Mangrio (Dogriyon)	No			7	No			7
96	Wali Muhammad Ibupoto	No			50	No			50
97	Wasayo Junejo	No			30	No			
Pai Forest, Nawab Shah									
98	Bakhsho Magasi*	No				No			
99	Bhudho Wadhan*	No				No			
100	Daud Gudaro	No			10	No			10
101	Ghulam Hyder Bhutto	No			1	Yes			
102	Gohram Faqeer	No			3	No			
103	Gulsher Macchi	No			3	No			
104	Haji Ali Bux Chouhan	No			3	No			
105	Haji Keerio	No			3	Yes		2	
106	Jaffar Jamali	No			3	No			
107	Jeando Lund*	No				No			
108	Khan Muhammad Chandio*	No				No			
109	Majeed Keerio	Yes		5		No			
110	Mari Alam	No			18	No			
111	Mari Sabqi	No			18	No			
112	Marri Jalbani	Yes		1		No			
113	Morio Lakho	No				No			35
114	Murad Keerio*	No				No			
115	Mureed Keerio	No			5	No			

116	Nangar Khan Chandio	No			12	No			12
117	Nazar Muhammad Bhatti	No			4	No			4
118	Pallyo Bhutto	No			20	Yes		3	
S #	Name of village	Veterinary Health Facilities							
		Veterinary Hospital				Veterinary Hospital			
		Available	Available	Available	Available	Available	Available	Available	Available
119	Punho Gudaro	No			0.5	No			10
120	Rahimo Keerio	Yes	1			Yes			
121	Rais Ghulam Qadir Jatoi	No			29	No			29
122	Rasool Bux Keerio	No			1	Yes		1	
123	Rasoolabad*	No				No			
124	Sahib Khan Lund	No			3	No			
125	Talli	No			1	No			1

Table 8. Sources and Quality of Drinking Water in PA Villages

S #	Name of village	Water Supply			Hand/Motor pump			Well/ Canal			Lake/Pond			Tanker/Tank			
		Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Sweet	Cost
Keti Bunder, Thatta																	
1	Ali Bux Jat															1	10
2	Berum															1	8000
3	Bhori																6400
4	Faqeerani Jat															2	1000
5	Guli Sholani											1					
6	Gunb															1	4000
7	Haji Abu Jat															1	150000
8	Haji Aleem Sholani															1	150000
9	Haji Ali Khan Jat															1	22500
10	Haji Hashim Jat																
11	Haji Ismail Jut											1					
12	Haji Mamoo Dabloo						10	10									
13	Haji Mosa Jat				1		3	4									
14	Haji Mosa Katiar															1	800
15	Haji Sheedi Dablo															1	1000
16	Hamzo Guggo								1	1							
17	Haroon Lakhio															1	1200
18	Hassan Jut															1	3000
19	Kangri															1	24800
20	Keti Bander										1		1				
21	Kharioon															35	83000
22	Khuda Bux Jat								1	1							
23	Meero Dablo															1	30000
24	Phirt															1	6400
25	Ramzan Lakhio															32	6600

S #	Name of village	Water Supply			Hand/Motor pump			Well/ Canal			Lake/Pond			Tanker/Tank		
		Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Cost
26	Siddique Dablo														1	10
27	Tippun															
28	Yousaf Dablo														1	6000
Keenjhar, Thatta																
29	Abdul Hameed Mancchri											1	1			
30	Abdullah Gandhro										1		1			
31	Adam Bhambhro														1	
32	Adam Katiyar											1	1			
33	Ali Bux Mancchri	1	1									1	1			
34	Ali Muhammad Soomro											1	1			
35	Autha											1	1			
36	Bakhr Macchi											1	1			
37	Chul Site(Yaar Mohd Jakhro)											1	1			
38	Dodo Bhombhro											1	1			
39	Dolt Pur											1	1			
40	Foto Khan			1	1							1	1			5000
41	Haji Ramzan Mirbhar											1	1			
42	Haji Rasool Bux Manchhari	2	2						1							
43	Haji Soomar Mirbhar	1	1									1	1			3000
44	Jaffar Hillayo	1	1													50HH
45	Jhampir											1	1			
46	Juman Dars											1	1			
47	Jumoon Jakhro											1	1			
48	Khipri											1	1			
49	Khudaiyo											1	1			
50	Lal Bux Mancchri											1	1			
51	Mevo Khan Mancchri											1	1			
52	Mubarak Palari											1	1			

S #	Name of village	Water Supply			Hand/Motor pump			Well/ Canal			Lake/Pond			Tanker/Tank		
		Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Sweet	Brackish	Drinkable	Sweet	Brackish	Drinkable	Sweet	Brackish	Drinkable
116	Nangar Khan Chandio				70											
117	Nazar Muhammad Bhatti				35											
118	Pallyo Bhutto				12											2000
119	Punho Gudaro				53											100
120	Rahimo Keerio				300											
121	Rais Ghulam Qadir Jatoi				55											900
122	Rasool Bux Keerio				4											
123	Rasoolabad*				1											
124	Sahib Khan Lund				67											
125	Talli				90											2000

Table 9. Source and Monthly Expenditure on Energy

S #	Name of village	Electricity		Fuel		Wood		Gas	
		Yes /No	Cost/Month	Yes /No	Cost/Month	Yes /No	Cost/Month	Yes /No	Cost/Month
Ketji Bander, Thatta									
1	Ali Bux Jat	No		Yes		No		No	
2	Berum	No		Yes	5000	Yes	6000	Yes	500
3	Bhori	No		No		Yes	4000	No	
4	Faqeerani Jat	No		Yes	1500	Yes	15000	Yes	5000
5	Guli Sholani	Yes		No		No		No	
6	Gunb	No		Yes	150	Yes	15000	No	
7	Haji Abu Jat	No		Yes	1000	Yes	1200	No	
8	Haji Aleem Sholani	No		No		Yes	15000	No	
9	Haji Ali Khan Jat	No		No		Yes	600	No	
10	Haji Hashim Jat	No		No		Yes		No	
11	Haji Ismail Jat	No		Yes	90	Yes	2400	No	
12	Haji Mamoo Dabloo	No		No		Yes		No	

13	Haji Mosa Jat	Yes		Yes		Yes		Yes		100	No	
14	Haji Mosa Katiar	No		No		No		No			No	
15	Haji Sheedi Dablo	No		Yes	40	Yes		Yes		150	No	
16	Hamzo Guggo	No		No		No		Yes			No	
17	Haroon Lakhio	No		Yes	7500	Yes		Yes		50	Yes	3750
18	Hassan Jut	No		No		No		Yes		2000	No	
19	Kangri	No		Yes	10000	Yes		Yes		32400	No	
20	Keti Bander	Yes		No		No		Yes			No	
21	Kharioon	No		Yes	1200	Yes		Yes		900	No	
22	Khuda Bux Jat	No		No		No		Yes			No	
23	Meero Dablo	No		No		No		Yes		15000	No	
24	Phirt	No		Yes		Yes		Yes		100	No	
25	Ramzan Lakhio	No		Yes	1200	Yes		Yes		1300	No	
26	Siddique Dablo	No		Yes		Yes		Yes			No	
27	Tippun	No		Yes	180	Yes		Yes			No	
28	Yousaf Dablo	No		Yes	1500	Yes		Yes			No	
Keenjhar, Thatta												
29	Abdul Hameed Mancchri	No		No		No		Yes		1000	No	
30	Abdullah Gandhro	Yes	200	No		No		No			No	
31	Adam Bhambhro	No		No		No		Yes		1500	No	

S #	Name of village	Electricity		Fuel		Wood		Gas	
		Yes /No	Cost/Month	Yes /No	Cost/Month	Yes /No	Cost/Month	Yes /No	Cost/Month
32	Adam Katiyar	Yes	300	No		Yes		No	
33	Ali Bux Mancchri	Yes		No		No		No	
34	Ali Muhammad Soomro	No		No		Yes		No	
35	Autha	No		No		No		No	
36	Bakhr Macchi	No		No		Yes	300	No	
37	Chul Site(Yaar Mohd Jakhro)	No		No		Yes		No	
38	Dodo Bhombhro	No		No		Yes		No	
39	Dolt Pur	No		No		Yes		No	
40	Foto Khan	Yes	300	No		Yes		No	
41	Haji Ramzan Mirbhar	Yes	250	No		Yes		No	
42	Haji Rasool Bux Manchhari	Yes	100	No		Yes	1000	No	
43	Haji Soomar Mirbhar	Yes	150	No		Yes	300	No	
44	Jaffar Hillayo	Yes	300	No		No		Yes	100
45	Jhampir	No		No		Yes		No	
46	Juman Dars	No		No		Yes		No	
47	Jumoon Jakhro	Yes	400	No		No		No	
48	Khipri	No		No		Yes		No	
49	Khudaiyo	No		No		Yes		No	
50	Lal Bux Mancchri	No		No		No		No	
51	Mevo Khan Mancchri	Yes	300	Yes		Yes		No	
52	Mubarak Palari	No		No		Yes		No	
53	Muhammad Rahim Machi	No		No		Yes		No	
54	Muhammad Siddique Manchri	No		No		Yes		No	
55	Mumtaz Dhandhail	No		No		Yes		No	
56	Nabi Bux Palari	No		No		Yes		No	
57	New Ghandri	No		No		Yes	300	No	
58	Rasool Bux Mancchri	Yes	200	No		Yes	50	No	
59	Shoukat Gandharo	No		No		No		No	
60	Sonehri	No		No		Yes		No	
61	Sukhio Autho	No		No		Yes		No	
62	Syed Bachal Shah	No		No		Yes		No	

Table 10: On Going Development Projects in PA Villages

S #	Name of village	Education		Health		Road		Water Supply		Drainage		Others	
		NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost
Keti Bander, Thatta													
1	Ali Bux Jat	No		No		No		No		No		No	
2	Berum	No		No		No		No		No		No	
3	Bhori	No		No		No		No		No		No	
4	Faqeerani Jat	No		No		No		No		No		No	
5	Guli Sholani	No		No		No		No		No		No	
6	Gunb	No		No		No		No		No		No	
7	Haji Abu Jat	No		No		No		No		No		No	
8	Haji Aleem Sholani	No		No		No		No		No		No	
9	Haji Ali Khan Jat	No		No		No		No		No		No	
10	Haji Hashim Jat	No		No		No		No		No		No	
11	Haji Ismail Jat	No		No		No		No		No		No	
12	Haji Mamoo Dabloo	No		No		No		No		No		No	
13	Haji Mosa Jat	No		No		No		No		No		No	
14	Haji Mosa Katiar	AFK		AFK		AFK		No		AFK		WWF	
15	Haji Sheedi Dablo	No		No		No		No		No		No	
16	Hamzo Guggo	No		No		No		No		No		No	
17	Haroon Lakhio	No		No		No		No		No		No	
18	Hassan Jat	No		No		No		No		No		No	
19	Kangri	No		No		No		No		No		No	
20	Keti Bander	No		No		No		No		No		No	
21	Kharioon	No		No		No		No		No		No	
22	Khuda Bux Jat	No		No		No		No		No		No	
23	Meero Dablo	No		No		No		No		No		No	
24	Phirt	No		No		No		No		No		No	
25	Ramzan Lakhio	No		No		No		No		No		No	
26	Siddique Dablo	No		No		No		No		No		No	
27	Tippun	No		No		No		No		No		No	
28	Yousaf Dablo	No		No		No		No		No		No	

S #	Name of village	Education		Health		Road		Water Supply		Drainage		Others	
		NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost		
Keenjhar, Thatta													
29	Abdul Hameed Manochhri	No		No		No		No		No			
30	Abdullah Gandhro	No		No		No		No		No		No	
31	Adam Bhambhro	No		No		No		No		No		No	
32	Adam Katiyar	No		No		No		No		No			
33	Ali Bux Manochhri	No		No		No		No		No			
34	Ali Muhammad Soomro	No		No		No		No		No		No	
35	Autha	No		No		No		No		No			
36	Bakhr Macchi	Yes		No		No		No		No		No	
37	Chul Site (Yaar Muohd Jakhro)	Yes		Yes		No		No		No		No	
38	Dodo Bhombhro	No		No		No		No		No			
39	Dolt Pur	No		No		No		No		No		No	
40	Foto Khan	No		No		No		No		No		No	
41	Haji Ramzan Mirbhar	Yes		Yes		Yes		Yes		Yes			
42	Haji Rasool Bux Manchhari	No		No		No		No		No			
43	Haji Soomar Mirbhar	No		No		No		No		No			
44	Jaffar Hillayo	No		No		No		No		No			
45	Jhampir	No		No		No		No		No		No	
46	Juman Dars	No		No		Yes		No		No		No	
47	Jumoon Jakhro	No		No		No		No		No			
48	Khipri	No		No		No		No		No		No	
49	Khudaiyo	No		No		No		No		No			
50	Lal Bux Manochhri	No		No		No		No		No			
51	Mevo Khan Manochhri	No		No		No		No		No			
52	Mubarak Palari	No		No		No		No		No			
53	Muhammad Rahim Machi	No		No		No		No		No		No	
54	Muhammad Siddique Manochhri	No		No		No		No		No		No	

S #	Name of village	Education		Health		Road		Water Supply		Drainage		Others	
		NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost
88	Pacchario	NO		NO		NO		NO		NO			
89	Phullel	NO		NO		NO		NO		NO			
90	Pir Bux Behan	NO		NO		NO		NO		NO			
91	Rano	NO		NO		NO		NO		NO			
92	Siddique Mallah	NO		NO		NO		NO		NO			
93	Sobharo Khan Mallah	NO		NO		NO		NO		NO			
94	Soomar Ji Miaan	NO		NO		NO		NO		NO			
95	Tharo Mangrio (Dogriyon)	NO		NO		ADB, CCB	16 Million, 20000	NO		NO			
96	Wali Muhammad Ibupoto	NCHD	Unknown	NO		NO		NO		NO			
97	Wasayo Junejo	No		NO		NO		NO		NO			
Pai Forest, Nawab Shah													
98	Bakhsho Magsi*	No		NO		NO		NO		NO			
99	Bhudho Wadhan*	No		NO		NO		NO		NO			
100	Daud Gudaro	No		NO		NO		NO		NO			
101	Ghulam Hyder Bhutto	No		NO		NO		NO		NO			
102	Gohram Fageer	No		NO		NO		NO		NO			
103	Gulsher Macchi	No		NO		NO		NO		NO			
104	Haji Ali Bux Chouhan	No		NO		NO		NO		NO			
105	Haji Keerio	Yes	544000	NO		NO		NO		Yes	375900		
106	Jaffar Jamali	No		NO		NO		NO		NO			
107	Jeando Lund*	No		NO		NO		NO		NO			
108	Khan Muhammad Chandio*	No		NO		NO		NO				Agri culture	2500 000
109	Majeed Keerio	No		NO		NO		NO		NO			

Table 11: Marketing Margins and Nearest Market for Primary Products of PA Villages

Table 22: marketing margins and near cost market for primary products of FA villages																
S#	Name of Village	Crops			Livestock			Handicraft			Fishing			Mat		
		Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village	
Keti Bander, Thatta																
1	Ali Bux Jat	--			--			--				3	Karachi	130	--	
2	Berum	--			--			--				100	Karachi	200	--	
3	Bhori	--			--			--				75	Keti Bander	15	--	
4	Faqeerani Jat	--			--			--				66	Keti Bander	2	--	
5	Guli Sholani	--			--			--				80	Keti Bander	15	--	
6	Gunb	--			--			--				--			--	
7	Haji Abu Jat	--			--			--				70	Keti Bander	2	--	
8	Haji Aleem Sholani	--			--			--				50			--	
9	Haji Ali Khan Jat	--			--			--				10	Karachi	200	--	
10	Haji Hashim Jat	--			--			--				10	Karachi	130	--	
11	Haji Ismail Jat	--			--			--				20	Karachi	115	--	
12	Haji Mamoo Dabloo	--			--			--				50	Keti Bander	6	--	
13	Haji Mosa Jat	--			--			--				--			--	
14	Haji Mosa Katiar	--			--			--				--			--	
15	Haji Sheedi Dablo	--			--			--				20	Keti Bander		--	
16	Hamzo Guggo	--			--			--				--			--	
17	Haroon Lakhio	--			30	Garho	100	--				80	Keti Bander	70	--	
18	Hassan Jat	--			--			--				10	Karachi	170	--	
19	Kangri	--			--			--				--			--	
20	Keti Bander	50	Karachi	200	50	Karachi	200	--				50	Karachi	200	--	
21	Kharioon	--			--			--				40	Keti Bander	1	--	
22	Khuda Bux Jat	--			--			--				50	Keti Bander	3	--	
23	Meero Dablo	--			--			--				30	Keti Bander	1	--	
24	Phirt	--			--			--				60	Keti Bander	5	--	
25	Ramzan Lakhio	--			--			--				100	Keti Bander	150	--	

S#	Name of Village	Crops		Livestock		Handicraft		Fishing		Mat	
		Middlemen Margins (%)	Distance (km)	Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village
26	Siddique Dablo	--		--			--	Keti Bander	30	--	
27	Tippun	--		--			--	Keti Bander		--	
28	Yousaf Dablo	--		--			--	Keti Bander	7	--	
Keenjhar, Thatta											
29	Abdul Hameed Mancchri	--		--			--	Thatta	8	--	
30	Abdullah Gandhro	--		--			--	Thatta	21	--	
31	Adam Bhambhro	--		--			--				
32	Adam Katiyar	--		10			--				
33	Ali Bux Mancchri	--		--			--	Jhampir	12	30	Karachi
34	Ali Muhammad Soomro	--		--			--			--	
35	Autha	--		--			--			--	
36	Bakhr Macchi	--		20	Thatta		15	Jhampir		--	
37	Chul Site(Yaar Muhammad Jakhro)	--		--			--	Thatta			
38	Dodo Bhombhro	30	Chatochad	10			--	Chatochad	15	--	
39	Dolt Pur	--		--			--	Thatta	20	--	
40	Foto Khan	25	Thatta	2.5	Karachi	30	30	Karachi		--	
41	Haji Ramzan Mirbhar	--		--			--	Thatta	12		
42	Haji Rasool Bux Manchhari	--		--			--	Thatta	40	--	
43	Haji Soomar Mirbhar	--		--			--	Thatta	25		
44	Jaffar Hillayo	--		10			--				
45	Jhampir	--		--			--				
46	Juman Dars	--		35	Thatta	39	--	Thatta	39	--	
47	Jumoon Jakhro	30	Thatta	15	Thatta	15	--	Thatta	15	30	Thatta
48	Khipri	--		--			--	Thatta	50	--	
49	Khudaiyo	--		--			--				
50	Lal Bux Mancchri	--		10	Thatta		--	Jhampir		--	
51	Mevo Khan Mancchri	--		--			--				
52	Mubarak Palari	--		--			--				

S#	Name of Village	Crops		Livestock		Handicraft		Fishing		Mat	
		Middlemen (%)	Village	Distance (km)	Middlemen (%)	Village	Distance (km)	Middlemen (%)	Village	Distance (km)	Middlemen (%)
53	Muhammad Rahim Machi	--			--			10			
54	Muhammad Siddique Manchri	--			--						
55	Mumtaz Dhandhail	--			--			10	Chul	0.5	--
56	Nabi Bux Palari	25	Jhampir	8	30	Jhampir	8	--			40
57	New Ghandri	--			--			40	Jhampir	1	--
58	Rasool Bux Mancchri	--			--			10			50
59	Shoukat Gandharo	--			--			10			--
60	Sonehri	--			--			15	Thatta	36	--
61	Sukhio Autho	--			10	Jhampir		--			--
62	Syed Bachal Shah	5	Jhampir		5	Jhampir		--			--
63	Umar Mancchri	--			--			--			--
64	Wali Muhammad Palari	--			--			--			--
65	Yaaro Mancchri	--			--			15			--
66	Yousaf Hillaya	--			--			10	Thatta	27	--
Chotiari, Sanghar											
67	Abdul Karim Mallah	--			--			60	Sari Patan	3	--
68	Abdul Qadir	--			--			--			--
69	Abdul Rehman Mallah	--			--			75	Chotiari toon		--
70	Achar Jamali	--			--			20	Sanghar	20	--
71	Allah Bux Junejo	--			--			--			--
72	Allah Dino Behan	--			--			--			--
73	Bakar	20	Sanghar	40	25	Sanghar	40	75	Sanghar	40	40
74	Blawal	25	Sanghar	32	20	Sanghar	32				--
75	Chotiaryoon	15	Sanghar	26	15	Sanghar	26	15	Sanghar	26	15
76	Ghulam Hussain Laghari	20	Sanghar	22	30	Sanghar	22	--			40
77	Haji Islam Larik	--			--			60	Sanghar	36	--
78	Haji Khan Mallah	--			--			60	Sanghar	40	--
79	Imam Din Saandh	--			--			--			--
80	Lal Bux Unnar	--			--			--			--

ANNEXURE – C: PRIMARY DATA OF KETI SHAH VILLAGE PROFILES

Table 1: Address and Location of Villages

S #	Name of village	Deh	UC	Taluka	District	Distances (km)		Nearest Town	Histroy (old years)	Leader of village
						Road	Bus Stop			
1	Eidan Bhatta	Kacho Qadir Dino	Noraja	Pano Aqil Bheli	Sukkur	15	15	Chak		Haji Qadir Bux
2	Ghalo Indher	Panhwari Raiti	Noraja	Pano Aqil Bheli	Sukkur	18	0	Pano Aqil		Haji Muhammad Ilyas
3	Hussain	Hussain Bheli	Noraja	Pano Aqil Bheli	Sukkur	8	--	Pano Aqil		Wadero Bahram Khan
4	Iqbal Bharo	Ali Wahan	Ali Wahan	Rohri	Sukkur	8	10	Rohri		Iqbal Bharo
5	Khadhari	Khadhari	Noraja	Pano Aqil Bheli	Sukkur	4	10	Rohri		Abdul Karim Solangi
6	Pir Musafir	Keti Shah	Noraja	Pano Aqil Bheli	Sukkur	12	20	Pano Aqil	19	Abdul Rahim Mahar
7	Sonaro	Bhindi	Noraja	Pano Aqil Bheli	Sukkur	6	6	Sangi		Achar Khan Indher
8	Suleman Dedo	Dedo	Chak	Lakhi	Shikarpur	12		Chak	1200	Amanullah
9	Wali Khan Damia	Daida	Chak	Lakhi	Shikarpur	12	12	Chak		Wali Khan

Table 2: Household Population, Major Castes, Local Leaders and Type of Housing

S #	Name of village	Total Households	Major Castes	Local Leaders	Type of Housing		
					Katcha	Pacca	Wooden
1	Eidan Bhatta	106	Bhatar, Mangi, Sheikh	Qadir Bux, Laig, Allah Warayo	0	30	76
2	Ghalo Indher	30	Indher	M Ilyas	10	0	20
3	Hussain	135	Mahar, Idher, Sheikh, Malik	Behram, Ali Bux, Sachal, Nawaz	40	35	60
4	Iqbal Bharo	32	Bhara	Iqbal Bharo	0	0	32
5	Khadhari	30	Solangi, Sheikh	Abdul Karim Solangi	10	2	18
6	Pir Musafir	20	Mahar	Abdul Raheem Mahar	0	0	20
7	Sonaro	21	Indher	Achar Indhar	10	0	11
8	Suleman Dedo	30	Deda	Amanullah	30	0	0
9	Wali Khan Damia	9	Damia, Bijarani	Wali Muhammad	9	0	0
							9

Table 3: Occupations and Tenures

S#	Name of village	Agri. Wage labour	Artisan	Barber	Carpenter	Dai	Dispenser	Fisheries	Flour/ Grain Mill	Herder	Kirana	Labour	Landlord (< 12.5 acre)	Landlord (12.5-25)	Landlord (26-50)	Landlord(51-100)	Livestock herder	Mat Maker	Police men	Teacher	Tenants	Transporter	Wood Cutter
1	Eidan Bhatta	40		12		3			3	100	1		70	25	3		100	6	1	1			
2	Ghalo Indher													3			100					2	
3	Hussain	500	4		3				2		2		100	10	4	3	1200					5	25
4	Iqbal Bharo											200		1			200						
5	Khadhari	180				2		40	2	90	2		25	30			210		5			1	
6	Pir Musafir	200	20							50							70					2	6
7	Sonaro		30		1					30			5				100						4
8	Suleman Dedo					3	1			30	1		15	15			30	3			15	2	20
9	Wali Khan Damia	3				1							7				9						

Table 4: Local Organizations

	Name of village	Community Organization	If yes, name of organization	Total Members	Activities	Name of Training	Organizing Agency	No. of Participants	Nature of Training
1	Eidan Bhatta	No							
2	Ghalo Indher	No							
3	Hussain	No							
4	Iqbal Bharo	No							
5	Khadhari	No							
6	Pir Musafir	No							
7	Sonaro	No							
8	Suleman Dedo	No							
9	Wali Khan Damia	No							

Table 5: Educational Facility available in village

S #	Name of village	Primary						Middle						High School								
		Male			Female			Male			Female			Male			Female					
		Available (Yes/No)	If Yes	If No	Distance (km)	Students	Teachers	Rooms	Available (Yes/No)	If Yes	If No	Distance (km)	Students	Teachers	Rooms	Available (Yes/No)	If Yes	If No	Distance (km)	Students	Teachers	Rooms
1	Eidan Bhatta	No		20				No			20				No			No				
2	Ghalo Indher	Yes	2	30				No			1				No			No	18			
3	Hussain	Yes	3	10				No							No			No				
4	Iqbal Bharo	No		18				No			18				No			No	18			
5	Khadhari	Yes	2	25			2	Yes		25					No			No	14			
6	Pir Musafir	No		20				No							No			No				
7	Sonaro	Yes	1	25	1			No			6				No			No	6			
8	Suleman Dedo	No		15				No			15				No			No	15			
9	Wali Khan Damia	No						No							No			No				

Table 6: Health Facilities available in Village

S #	Name of village	Dispensary			BHU			Rural Health Centre			Govt. Hospital			Private Clinic			Hakeem			Maternity Home			LHV/DAI		
		Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance	Available	Staff	If no, distance
1	Eidan Bhatta	No			No		18	No			No		20	No			No		20	No		Yes	3		
2	Ghalo Indher	No		18	No		18	No		18	No		18	No		18	No		18	No		No		18	
3	Hussain	No		8	No		12	No		12	No		12	No		12	No		12	No		No		12	
4	Iqbal Bharo	No		18	No		18	No		18	No		18	No		18	No		18	No		No		18	
5	Khadhari	No		14	No		14	No		14	No		14	No		14	No		14	No		No		14	
6	Pir Musafir	No		20	No			No			No		20	No		20	No		20	No		No		20	
7	Sonaro	No		6	No		6	No		6	No		6	No		6	No		6	No		No		6	
8	Suleman Dedo	No		18	No		18	No		18	No		18	No		18	No		18	No		No		18	
9	Wali Khan Damia	No			No		12	No			No			No		12	No			No		No			

Table 7: Veterinary and Marketing Facilities for Agriculture and Livestock

S #	Name of village	Veterinary Health Facilities					
		Veterinary Hospital			Local Health Worker		
		Available	Staff	If no, distance	Available	Staff	If no, distance
1	Eidan Bhatta	No		20	No		20
2	Ghalo Indher	No		18	No		18
3	Hussain	No		12	No		12
4	Iqbal Bhara	No		18	No		18
5	Khadhari	No		14	No		14
6	Pir Musafir	No		20	No		20
7	Sonaro	No		8	No		8
8	Suleman Dedo	No		15	No		15
9	Wali Khan Damia	No		12	No		12

Table 8: Water Facilities

S #	Name of village	Water Supply			Hand/Motor pump			Well/ Canal			Lake/Pond			Tanker/Tank		
		Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Sweet	Total	Brackish	Drinkable	Sweet
1	Eidan Bhatta							150	150							
2	Ghalo Indher						15	15	30							100
3	Hussain						60	60	120		1	1	2			50
4	Iqbal Bhara						12	13	25							50
5	Khadhari						10	10	20							100
6	Pir Musafir						10	10	20							50
7	Sonaro						10	10	20							100
8	Suleman Dedo							30	30							100
9	Wali Khan Damia							10	10							

Table 9: Source of Energy

S #	Name of village	Electricity			Fuel			Wood			Gas		
		Yes /No	Cost/Month	Yes /No	Cost/Month	Yes /No	Cost/Month	Yes /No	Cost/Month	Yes /No	Cost/Month	Yes /No	Cost/Month
1	Eidan Bhatta	No		No		Yes		Yes		No			
2	Ghalo Indher	No		No		Yes	500	Yes		No			
3	Hussain	No		No		Yes	200	Yes		No			
4	Iqbal Bhara	No		No		Yes		Yes		No			
5	Khadhari	No		No		Yes	50	Yes		No			
6	Pir Musafir	No		No		Yes		Yes		No			
7	Sonaro	No		No		Yes		Yes		No			
8	Suleman Dedo	No		Yes	100	Yes	200	Yes		No			
9	Wali Khan Damia	No		No		Yes		Yes		No			

Table 10: On Going Projects

S #	Name of village	Education		Health		Road		Water Supply		Drainage		Others	
		NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost	NGO Involved	Total Cost
1	Eidan Bhatta	No											
2	Ghalo Indher	No											
3	Hussain	No											
4	Iqbal Bharo	No											
5	Khadhari	No											
6	Pir Musafir	No											
7	Sonaro	No											
8	Suleman Dedo	No											
9	Wali Khan Damia	No											

Table 11: Marketing Margins and nearest Market

S#	Name of Village	Crops			Livestock			Handicraft			Fishing			Mat		
		Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village	Distance (km)	Middlemen Margins (%)	Village	Distance (km)
1	Eidan Bhatta	--			--			--			--			--		
2	Ghalo Indher	--			--			--			--			--		
3	Hussain	--			--			--			--			--		
4	Iqbal Bharo	--			--			--			--			--		
5	Khadhari	--			--			--			--			--		
6	Pir Musafir	--			--			--			--			--		
7	Sonaro	--			--			--			--			--		
8	Suleman Dedo	--	Chack	12	30	Chack	15	--			--			--		
9	Wali Khan Damia	10	Chack		--			--			--			--		

ANNEXURE – E: SURVEY SCHEDULES

VILLAGE PROFILE SCHEDULE

Questionnaire No. _____

WWF – MDC Baseline Survey

Form B: Baseline Household Survey

Enumerator's Name: _____

Edited by: Signature _____ and Name _____

Checked by: Signature _____ and Name _____

No. of visits

1	2	3

Form B: VILLAGE PROFILE

Name of enumerator _____ Date _____

1. Location

Village _____ Deh _____ UC _____

Taluka _____ District _____ Leader of village _____

2. Village History:

3. Distance

Road _____ Bus Stop _____ Train Station _____

Nearest Town _____

4. Population

Para				
Castes				
Households				
Local leaders / Contact Person				

5. Type of Housing

Type	Structure	Number
Pacca	A: Tin Roof/Plastered/ Un-plastered Wall	
	B: Mud/ Thatched roof/plastered /un-plastered	
Katcha	Mud / Thatched Roof and walls	
Wooden (Jhoopra)		
Total		

6. Occupations

Profession	Number	Monthly Income	Profession	Number	Monthly Income
Agri. Wage labour			Lady Health Visitors		
Artisan			Leasee		

Barber			Livestock herder		
Black smith			Mat Maker		
Cabin			Medical store		
Carpenter			Peasant Proprietors		
Dai			Policemen		
Dispenser			Tailor		
Doctor MBBS			Well digger		
Doctor (Attai)			Teacher		
Field Assistant			Tenants		
Fisheries			Transporter		
Flour/ Grain Mill			Wood Cutter		
Herder			Other specify:		
Hotel			Other specify:		
Kiryana			Other specify:		
Landlords	< 12.5 acres		Other specify:		
	12.5– 25acres				
	25-50 acres				
	50-100 acres				
	> 100 acres				

7. Local Organizations

- Is there any community organization in the village? Yes / No
- If yes, what is the name of the organization? _____
- Total members in village _____
- NGO actively working in village?

Name of NGO	Activity
	1. Social Development (Building Community Organizations)
	2. Economic Development Sector (Micro finance)
	3. Community Physical Infrastructure (building schools, dispensary etc.)
	4. Education Development (enhancing enrollment and monitoring)
	5. Health Programs (training and awareness)
	6. Any other: Please Specify

8. Training Programs during last 2 years

Name of Training	Organizing Agency	Number of Participants	Nature of Training

9. Educational Institutions

School	Gender	Yes /No	Rooms	If Yes, Teachers	Students	If no, distance(km) from nearest
Primary	Male					
	Female					
Middle	Male					
	Female					
Matriculation	Male					
	Female					
Madarsa School	Male					
	Female					
Any Other, specify	Male					
	Female					

10. Health Facilities

Facility	Yes / No	If available in village,		If not, distance (km) from nearest
		Staff	Facilities	
Dispensary				
Basic Health Unit				
Rural Health Centre				
Govt. Hospital				
Private Clinic				
Hakeem				
Maternity Home				
LHV/Dai				
Other, specify:				

11. Veterinary Facilities

Facility	Yes / No	If available in village,		If not, distance (km) from nearest
		Staff	Facilities	
Any Veterinary Hospital/clinic				
Local Health Worker				
Other, specify:				

12. Drinking Water Availability

Source	Total	Water Quality			Cost/ Month
		Brackish	Drinkable	Sweet	
Water Supply					
Hand Pump					
Well					
Lake/Pond					
Other, Specify:					

13. Source of Energy

Type of Energy	Cost / Month
Electricity	
Fuel	
Wood	
Gas	
Other, Specify	

14. On Going Government Projects

Project	Name of NGO if Involved	Cost of Project
Education		
Health		
Road		
Water Supply		
Drainage		
Other, Specify		

15. Tenure and Markets

Profession		Please Specify Shareholders and share (%)	Nearest Market	
			Village	Km
Agriculture				
Livestock	Buffaloes			
	Cows			
	Goat			
	Sheep			
	Camel			
	Other Specify			
Wood				

Fishing			
Other Specify			

16. Major Issues of Common Professions (Please specify by rank)

Profession	Issues / Problems by Rank		
Agriculture	1.	2.	3.
Livestock	1.	2.	3.
Business	1.	2.	3.
Farm/daily labour	1.	2.	3.
Government Service	1.	2.	3.
Handicrafts	1.	2.	3.
Wood Cutting	1.	2.	3.
Fisheries	1.	2.	3.
Other, Specify	1.	2.	3.

17. Middleman Margins (%)

Profession	Margins (%)	Nearest Market	
		Name	Distance Km
Crops			
Livestock			
Handicrafts			
Fisheries			
Mat			
Other, Specify			

18. Biodiversity and Habitats

Wild Animals	Birds		Fish	Aquatic Animals	Medicinal Plants
	Local	Migratory			

19. Sources of Information.

Please rank three most common sources of information. (Rank 1 for first most common; 2 for second most common; and 3 for third most common information source).

Source	News Paper	Radio	TV	Friend Relatives	Mobile/Phone	Agri. Extension Agents
Rank						

20. Members of Local Government

	Male	Female	Total
Union Council			
Taluka Council			
District Council			

21. Poverty Status of Village in General

(Tick the most appropriate for the most of villagers)

Very poor	Poor	Average	Wealthy	very wealthy

22. Social Status

Status	Too Much	Much	average	Poor	Very Poor
Peeri / Muridi					
Social Affiliation					

23. Loans

Lending Agency	Household Person Availed Loan	Total Amount of Loan in Village	Interest Rate (%)	Duration (Months)	Purpose of loan taken

24. Status of Natural Resources

Resources	Too Much	Much	average	Poor	Very Poor
Fish					
Wood					
Grazing					
Fertile land					
Recreational /Tour					
Mineral Lakes					
Medicinal Plants					
Bee farming					
Birds					
Other specify					

25. Migration

Migration Status	Purpose of Migration	Number of families	Place of migration
Seasons			
Permanent			

26. Common Challenge: (Rank three most common challenges)

Challenge	Drought	Flood	Unemployment	Disease Prevalence		Tribe Clashes	Police Injustice	Other Specify
				Human	Animal			
Rank								

**27. Community Development Priorities
(Rank 3 most development priorities)**

Development	School	Road	Dispensary	Loan	Animal Disp.	Water supply	Other Specify
Rank							

28. Suggestion about improving livelihoods _____

29. Suggestion about improving natural resources _____

Gul Hayat Institute

Household Survey Questionnaire

Questionnaire No. _____

Form A: Baseline Household Survey

Enumerator's Name: _____

Edited by: Signature _____ and Name _____

Checked by: Signature _____ and Name _____

No. of visits

1	2	3

I. Address

Name of village: _____ UC: _____

Deh _____ Taluka: _____ District: _____

II. Respondent

1. Name: _____ Caste: _____

3.

Age: _____ 4. Gender: Male / Female

5. Qualification: _____ 6. Profession: _____

7. Relation with Household Head: _____

1= self; 2= husband/wife; 3=son/daughter; 4=son/daughter in law; 5=grand son/daughter; 6=Father/Mother; 7=Brother/Sister; 8=Other Relatives; 9= Other non-relatives	

8. Family Language: _____

9. Total Family Members _____

10. Skills: _____

1= Electrician; 2= Plumber, 3= Mechanic/ Technician; 4 = Mason; 5 = Mat making; 6 = Carpenter; 7= Black smith; 8 = Barber; 9=Other Specify	

III. Household Head

1. Name: _____ 2. Age: _____

2. Gender: Male / Female 4. Qualification: _____

IV. Family Profile, House Condition, and Facilities

1. Family Members Living in Same Household (Include those who are temporarily away and exclude guests)

S #	Name.....	Gender 1=Male 2=Female	Age*	Relations with Household Head	Married 1 = Yes 2 = No	If married		Education 0= illiterate 1=Primary; 2=Middle; 3= Matric; 4=Inter; 5=Graduate; 6= Postgraduate, 7=Madrssa Education	Income Monthly (Rs)
				1= self; 2= husband/wife; 3=son/daughter; 4=son/daughter in law; 5=grand son/daughter; 6=Father/Mother; 7=Brother/Sister; 8=Other Relatives; 9= Other non- relatives		Age when got married.	Whether from the same caste 1=Same caste 2=Other Caste		
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
15.									
16.									
17.									

* Age in days if less than one month; In months if between 1 – 11 months; In years if one year or more

2. Wages by Profession

Profession/Skills	No. of Family members Engaged	Wages/ Day	Work (Days/Month)	Distance (km) from Work Place	Satisfied with Wages
Agriculture Labor					
Artisan					
Black Smith					
Carpenter					
Electrician					
Embroidery					
Fishing					
Hat Making					
Home Servant					
Labour					
Mat Making					
Mechanic					
Poultry					
Rilly Making					
Shops					
Stone mining					
Wood cutter					
Other (Specify.....)					
Other (Specify.....)					

3. Income from Various Sources

Source	Income in Cash/ Kind
1=Agriculture; 2= Fishing; 3=Livestock; 4=Wood Cutting; 5= Seed and by-products of trees	
6=Sale of Birds; 7= Mat-making	

Note: Enumerator may calculate roughly the % of income from various sources.

4. Change of Profession by Season

Family Members	Winter	Spring	Summer	Autumn
1.				
2.				
3.				
4.				

5. Source of Energy

Electricity	1 = Yes and 2 = No	
Gas	1 = Yes and 2 = No	

6. House Type, Rooms and Toilet Facility

House Type	Please Tick (✓) House Type			
	Pacca	Semi Pacca	Katcha	Jhopra
Number of Rooms				
Toilet Facility (Please Tick ✓)				
1. Non flush toilet/WC	2. Pit latrine	3. Open Space		

7. Sanitation/Disposal of Waste

Type of Waste	Occurrence of Thrown 1=Twice a Day; 2=Daily; 3= Alternate day 4= Weekly 5= Fortnightly	Family members engaged 1 = Male 2 =Female 3 =Children 4=Servants	Place of disposal 1=Dispose to nearby house door 2=Dispose at an identified place in locality 3=House to house collection	Satisfied with Sanitation 1=Satisfied 2= undecided 3=Dissatisfied
Kitchen				
House				
Animal Waste				
Glass and Plastic bottles/Cans				

8. Water Facility in House

Source	Please Tick (√) the Source of Water			
	Pump	Well	Water Supply	Other Specify
Quality 1. Brackish 2. Drinkable 3. Sweet				

9. If Water Facility not Available in House, Common Source of Water Outside

Water Source	Please Tick (√) the Source of Water From Outside of Home						
	Pump	Well	Water Supply	Tanka	Lake	Canal	Other Specify
Time consumed	----hrs ---min	----hrs ---min	----hrs ---min	----hrs ---min	----hrs ---min	----hrs ---min	----hrs ---min
Quality of water: 1. Brackish 2. Drinkable 3. Sweet							

V. Family Monthly Expenditure

Head of expenditure		Amount (Rs.)	Head of expenditure		Amount (Rs.)
Kitchen expenditure (e.g. vegetables, meat, fish, spices)			Pocket money	Children	
				House wife	
Cereals	Wheat		Maintenance	Old age	
	Rice			Motor Cycle	
	Others			Car	
Grain mills (Grinding cereals)				Tractor	
Clothing			Utility bills	Electricity	
Shoes				Gas	
Education				Phone	
Transport			Maintenance of house		
Usable items (towel, soap, etc)			Servant(s)		
Health	Doctor's Fees		Recreation & Religions activities		
	Medicine				

Others		Others	
Total			

VI. Household and Productive Assets

Assets	Number	Assets	Number
Cycle		Motorcycle	
Sewing machine		Car	
Radio		Tractor	
TV		Bus	
Phone / Mobile		Truck	
Computer		Boat (Simple)	
Tractor		Boat (Motor)	
Trolley		Net	
Thresher		Saw	
Donkey Cart		Other	

VII. Loans

1. Have you received loan? Yes / No

2. If yes, give details

Name of lending institution	Amount	Interest rate	Purpose of loan	Year	Whether installments are regularly paid	If no, reasons

Note: Money borrowed from relatives may also be mentioned.

3. Do you think that amount borrowed increased household income? Yes / No

4. If no, tick (✓) the most appropriate reason

Low amount	High interest rate	Small duration	Not properly utilized

VIII) Health and Educational Facilities

1. Health Facility Availed

	Please Tick (✓) The Most Common Health Facility Availed			
	Government		Private Clinic	Any other, Specify
	Hospital	Dispensary /BHU		
Distance (km)				
Expenditure/month				

2. Place of Delivery (Giving birth)

	Please Tick (✓) Place of Birth				
	Government		Private Clinic	At Home by	
	Hospital	Home Maternity		Trained LHV	Local Dai
Distance (km)					
Expenditure/ Delivery					

3. Place of Delivery (Giving birth)

	Please Tick (✓) Place of Birth					
	Government		Private Clinic	At Home by		Other, Specify
	Hospital	Home Maternity		Trained LHV	Local Dai	
Distance (km)						
Expenditure/ Delivery						

4. Mortality during Pregnancy/Delivery since last 5 year in Family

Mortality	No.	Reason of Death	Place			
			Hospital /Clinic		At Home by	
			Govt.	Private	LHV	Dai
Mother						
Baby						

5. Water Borne Disease

Most common Diseases in family 1=Diarrhea; 2=Cholera; 3=Typhoid 4=Jaundice; 5=Malaria 6= Skin disease; 7= Eye disease 8=Respiratory disease; 9=Other Specify	Yearly Occurrence (Number of times) of disease	No. of family member fell ill	Cost per treatment /per person fell ill

6. Education

	Primary		Middle		High School		College		University	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Number of family members										
Facility in Village 1= Yes 2= No										
If no, Distance (km)										

IX). Access, Right to Use and any Charge/Fee for use

Resources		Please Tick (✓) the Most Appropriate					Any Cost (Rs.) per Year
		Frequently	Sometimes	Undecided	Rarely	Restricted	
water	Irrigation						
	Drinking						
Fish							
Wood/ Forest							
Grazing							

Picnic Place /Tour						
Mineral Lakes						
Medicinal Plants						
Bee farming						
Birds						
Wildlife						
Other specify						

X). Perceptions

1. Perceptions about Degradation of Natural Resources and Associated Income

Perceptions			Please Tick (√) the Most Appropriate					Percent (%) income decreased due to degradation of Natural resources
			Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
Natural Resources Have Sharply Degraded During Last 5 Years								
Natural Resources	Water	Irrigation						
		Drinking						
	Fish							
	Forest							
	Grazing Lands							
	Bird	Local						
		Migratory						
	Forest animals							
	Any Other Specify							
Any Other Specify								
Resources are misused/ mismanaged								
Community is playing vital role in conserving natural resources								

2. Problems Emerged Due to Degradation of Natural Resources

Natural Resources		Problems emerged
Water	Irrigation	
	Drinking	
Fish		
Forest		
Grazing Lands		
Bird	Local	
	Migratory	
Forest animals		
Any Other Specify		
Any Other Specify		

3. Perception about Environmental Services

Willing to pay for environmental services 1=Yes 2=No	If yes, mention amount (Rs. / Year)	Mention Natural Resources of interest 1= Water irrigation 2=Water drinking 3=Fish 4=Forest 5=Grazing land 6= Local Birds

		7= Migratory Birds 8=Other (Mention)

XI). Agriculture, Livestock and Marketing

1. Tenancy status in agriculture (Please ✓ Tick)

Landlord	Tenant (<i>Hari</i>)	Landlord-cum-tenant (Cultivating own land)	Leasee

2. Total area : _____ (acres);

3. Area Cultivated (Acres) by Crops

	Rabi Crops (Winter Crops)			Kharif Crops (Summer Crops)		
Name of Crop						
Acres (Acres)						

4. Livestock available

BUFFALOES:	TOTAL MALE:	
	Total Female:	Milking:
Cattle:	Total Male:	
	Total Cows:	Milking:
Goats:		
Sheep:		
Camel:		
House:		
Poultry:		
Donkey:		
Total cost on animal feed (Rs.)/ month:		

5. Production, Domestic Consumption and Sale of Milk

	Milk production (liters/kg)	Local Consumption (liters/kg)	Milk sold (liters/kg)	Price /liter (kg)	Satisfied with Price
Buffaloes:					Yes / No
Cows:					Yes / No
Butter					Yes / No

6. Purchased, Sold, Died and New Born Animals during Last 1 Year

Animal Type	Number of Animals		Market		Number of Animals	
	Sold	Purchased	Name	Distance (km)	Died	New Born
Buffaloes						
Cow						
Goat						
Sheep						
Camel						
Horse						
Other						

XII. Leadership Skills, Challenges and Community Development Priorities

1. Are you member of the community organization? Yes / No
2. Have you been on any position of the organization? Yes / No

3. If yes, please tick (✓) the position

President	Vice President	Secretary	Joint Secretary
Finance Secretary	Information Secretary	Member on any committee	Any Other, Specify

4. Common Challenge in family: (Rank three most common challenges)

Challenge	Drought	Flood	Unemployment	Disease Prevalence		Tribal/family Clashes	Police Injustice	Other Specify
				Human	Animal			
Rank								

5. Disasters during Last 5 Years

Disaster 1=Drought 2= Flood 3=Human Diseases 4= Storm/Cyclones 5=Any Other	Deaths		Estimated loss of household and farm assets (Rs.)
	Human	Animals	

6. Development Priorities (Rank 3 Most Important Development Options)

Development	School	Road	Dispensary	Loan	Animal Disp.	Water supply	Other Specify
Rank							

7. Any new opportunities/ potential sources of income in the short run? Please specify:

.....

.....

.....

Gul Hayat Institute

GENDER – BASED INDICATORS

Female Questionnaire

Questionnaire No. _____

WWF – MDC Baseline Survey

Form C: Female Questionnaire

Enumerator's Name: _____

Edited by: Signature _____ and Name _____

Checked by: Signature _____ and Name _____

No. of visits

1	2	3

1. Respondent Address

- 1.1 Code No. _____ Date _____
1.2 Name of Respondent _____
1.3 Age _____
1.4 Village _____
1.5 Village size _____
1.6 Deh _____ U.C. _____
1.7 Taluka _____
1.8 District _____

2. Family Perspective

- 2.1 Family Type (Tick one) a) Join _____ b) Nucleus _____
2.2 Total Family Size _____ Member

(Please write the number of family members in each category)

Male Adult: _____	Female Adult: _____
Male children: _____	Female children: _____

3. Education and Skills

3.1 Education

0=illiterate; 1=Primary; 2=Middle; 3= Matric; 4=Inter; 5=Graduate; 6= Postgraduate,
7=Madrsa Education

3.2 Type of School Attended, Distance, Transportation and Expenditure

School	Type 1= Male 2=Female	Distance from Home (km)	Type of Transportation	Total Monthly Expenses**	Who Finance Relation 1=Father; 2=Mother; 3= Uncle; 4=Brother; 5=Husband; 6=Sister 7= Cousin; 8=Other Specify
Primary					
Middle					
High School					
College					

** Monthly Expenses include books, fees, transportation and pocket money.

3.3 Skills Possess

1=Sewing; 2= Rilly Making; 3= Embroidery; 4= Hat Making; 5=Other Specify	

4. Profession/ Earning Resource

4.1 Occupation and Income of Respondent

Profession	Embroidery	Hat Making	Home Servant	Rilly Making	Sewing
Income (Rs./Month)					
Profession	Livestock	Shops	Wood Cutter	Any Other Specify	Any Other Specify
Income (Rs./Month)					

4.2 Occupation and Income of Respondent's Husband

Profession	Agri. Labour	Tenant	Peasant	Landlord	Mat Maker	Herder	Fisherman
Income (Rs./Month)							
Profession	Business/Trade	Service	Wood Cutter	Artisan	Mechanic	Electrician	Any Other
Income (Rs./Month)							

4.3 No. of male earning members _____

4.4 No. of female earning members _____

4.5 Total Family Income (All family members including husband) Rs. _____

4.6 Wage rate in vicinity

(i) Male : Rs. _____/Day

(ii) Female: Rs. _____/Day

4.7 Are women preferred for employment over men in rural areas: a) Yes b) No

If yes, in which occupation or jobs _____
5. Water, Energy and Sanitation

5.1. Water Facility in House

Source	Please Tick (✓) the Source of Water			
	Pump	Well	Water Supply	Other Specify
Quality Brackish Drinkable Sweet				

5.2. If Water Facility not Available in House, Common Source of Water Outside

Water Source	Please Tick (✓) the Source of Water From Outside of Home						
	Pump	Well	Water Supply	Tanka	Lake	Canal	Other Specify
Time consumed	----hrs ---min	----hrs ---min	----hrs ---min	----hrs ---min	----hrs ---min	----hrs ---min	----hrs ---min
Quality of water: 1. Brackish 2. Drinkable 3. Sweet							

5.3 Source of Energy

Electricity	1 = Yes and 2 = No	
Gas	1 = Yes and 2 = No	

5.4 Details of Fire Wood Collection

Who Fetches fire wood 1. Male 2. Female 3. Children	Time Consumed in Minutes	How often (Frequency) 1. Daily; 2. Weekly; 3. Fortnightly 4. Monthly; 5. Other Specify	Quantity ----maunds* --- -kgs	Cost Paid (Rs. /Maund)

* 1 Manud = 40 kg

5.5 Sanitation/Disposal of Waste

Type of Waste	Occurrence of Thrown 1=Twice a Day; 2=Daily; 3= Alternate day 4= Weekly 5= Fortnightly	Family members engaged 1 = Male 2 =Female 3 =Children 4=Servants	Place of disposal 1=Dispose to nearby house door 2=Dispose at an identified place in locality 3=House to house collection	Satisfied with Sanitation 1=Satisfied 2= undecided 3=Dissatisfied
Kitchen				
House				
Animal Waste				
Glass and Plastic bottles/Cans				

6. Housing

6.1	House Type	a) Kacha	b) Pacca
6.2	No. of Rooms		
6.3	No. of Toilets		
6.4	Water supply availability	a) Yes	b) No
6.5	Sewerage system	a) Yes	b) No
6.6	Electricity	a) Yes	b) No
6.7	Radio	a) Yes	b) No
6.8	TV	a) Yes	b) No
6.9	Washing Machine	a) Yes	b) No
6.10	Are there separate rooms for		
	(i) Male children	a) Yes	b) No
	(ii) Female children	a) Yes	b) No
	(iii) Young unmarried Boys	a) Yes	b) No
	(iv) Young unmarried Girls	a) Yes	b) No
	(v) Married couples	a) Yes	b) No
6.11	Separate Toilet for Women	a) Yes	b) No
6.12	Gas/ Gas Cylinder	a) Yes	b) No

7. Activity Profile

Time	Activity
6-9 AM	
9-12 Noon	
12-3 PM	
3-6 PM	
6-9 PM	

8. Needs Assessment of the Respondents

Need	Rank
1. Drinking Water	
2. Credit/Micro credit	
3. Electricity	
4. Mattled Road	
5. Transportation	
6. Health Facility	
7. Education	
8. Employment	
9. Veterinary Facilities	
10. Sanitation/Wash rooms	
11. Easy access to energy	
12. Technical Training	
13. Access to Water	
14. Other Specify	

9. Migration and Mobility

9.1	Do you seasonally migrate?	a) Yes	b) No
9.2	If yes, reason of the migration		

- 9.3 If yes, where do you migrate _____
 9.4 Distance from village _____
 9.5 Why you prefer to migrate to the mentioned place? Reason _____

9.6 Jobs/ Tasks Performed During/at Migration Sites _____

10. Dietary Pattern

- 10.1 Break fast _____ Time _____
 10.2 Lunch _____ Time _____
 10.3 Dinner _____ Time _____
 10.4 Snacks, if any _____ Time _____
 10.5 Common drinks a) Tea b) Lassi c) Other (specify)
 10.5.1 Difference between male and female diet _____

11. Health

11.1 Common Diseases

Female	Children
1.	1.
2.	2.
3.	3.
4.	4.

11.2 Mode of Treatment for Female (Tick the most common)

Private Doctor	Public Doctor	Hakeem	Homeopathic
Midwife	Dispenser	Household Treatment	Spiritual Treatment

11.3 Mode of Treatment for children (Tick the most common)

Private Doctor	Public Doctor	Hakeem	Homeopathic
Midwife	Dispenser	Household Treatment	Spiritual Treatment

11.4 Distance from clinic/ doctor

- (i) Private Clinic _____ km
 (ii) Public (Govt.) Dispensary/BHU/Hospital _____ km

11.5 Is there any midwife / LHV / LHW in your village / adjacent village?

a) Yes b) No

11.6 If midwife is serving, is she trained? a) Yes b) No

11.7 If LHV is serving, does she frequently visit your village? a) Yes b) No

12. Role in Decision Making

Matters	Male	Female	Both
House Hold Management			

Family Matters			
Land and Crop			
Health			
Matrimonial			
Property/Ownership			
Livestock Management			
Marketing of fish			
Sale of agriculture production			

13. Traditions and customs

Piri Muridi	Child marriage	Exchange marriage	Spiritual leaders	Grand child rearing
Karo kari	dowry	hospitality	Murder	Other (specify)

14. Discrimination in comparison of male members of the family

(If yes tick it, if no leave blank)

Attitude	education	dietary	work	Dress
Mobility	Property	Land management	Family decisions	Any other

15. Sources of information (please tick the most frequent source of information)

Radio	TV	Letter	Newspaper
Neighbor	Family head	Educated children	Social/NGO worker

16. Community participation (please tic if yes, leave blank if no)

NGO membership	Local bodies
Collective community activities	Entertainment/cultural activities

17. Awareness (please tick if yes, leave blank if no)

Election	Dist. Govt	NGOs	Human Rights
Women's rights	Beauty cosmetics	New Dress	Law And Order
Family courts	Family planning	Tribal Chiefs	Towns / Large Villages
Loss of fish	Quantity of water	Quality of water	Loss of forest

18. Marital Perspectives (Skip this section for single)

18.1 Marital Status (Please Tick one)

a) Single b) Married c) Widow d) Divorced

If married, divorced or widow, ask the following question, otherwise go to the section 19

18.2 Age of Husband at Marriage Time _____ Years

18.3 Age of Respondent at Marriage Time _____ Years

18.4 Divorce in the village, in any _____ Yes / No

18.5 Consent during marriage: 1) Yes _____ b) No _____

18.6 Cases of Karo/Kari in the village, if any Yes / No

18.7 Exchange Marriages in the village, if any Yes / No

18.8 Marriages of the divorced / widow women in the village Yes / No

19. Children/Off Spring Perspectives

Ages of Children

Please write present ages of your children in years start with the eldest one.

S#	1	2	3	4	5	6	7	8	9
Male									
Female									

No. of miscarriages if any: _____
 No. of Deaths during infancy: _____
 Reason(s) of Death: _____
 No. of Death in Adolescent: _____
 Reason(s) of Death: _____

20. Property/Ownership and Business Perspective

20.1 Do you have land? Yes _____ No _____
 If yes, from what origin: 1. Inheritance _____ 2. Gifted _____ 3. Purchase _____

20.2 Who manage the land?

1 =Self; 2=Brother; 3=Husband; 4=Father; 5=Manager

20.3 Are you satisfied with the laws and practices of inheritance?

Yes _____ No. _____

20.4 Are you also engaged in fish catching? a) Yes b) No

20.5 Are you satisfied with the wages?
 Yes _____ No _____

20.6 Do you have facilities of raw material/marketing for handicrafts?

Yes _____ No. _____

What the difficulties in livestock management / A.H?

21. Family Planning (Skip this section for single)

21.1 Is there any family planning clinic/facility in your village? a) Yes b) No

21.2 Are you visited by LHV's or any other functionaries of Family Planning Department?
 a) Yes b) No

Note: Please ask the next question only with married woman, not widow

21.3 Do you use contraceptives? a) Yes b) No

21.4 If yes, what type and why? _____

22. Anxiety Perspective

22.1 Are you suffering from the most disturbing problem in your family since the last six months?

Yes _____ No. _____

22.2 If yes, what is the nature of the problem? _____

23. Perceptions about Natural Resources

Perceptions about Degradation of Natural Resources and Associated Income

Perceptions			Please Tick (✓) the Most Appropriate					Percent (%) income decreased due to degradation of Natural resources
			Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
Natural Resources Have Sharply Degraded During Last 5 Years								
Natural Resources	Water	Irrigation						
		Drinking						
	Fish							
	Forest							
	Grazing Lands							

	Bird	Local						
		Migratory						
	Forest animals							
	Any Other Specify							
	Any Other Specify							
Community is playing vital role in conserving natural resources								

24. General Comments

ANNEXURE- F: The MDC Study Team

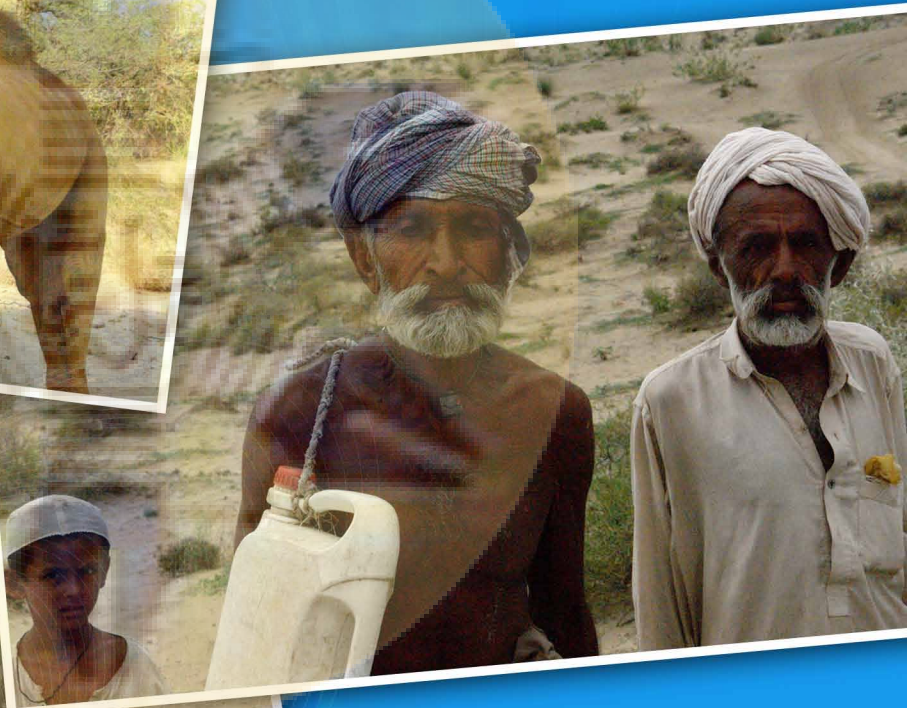
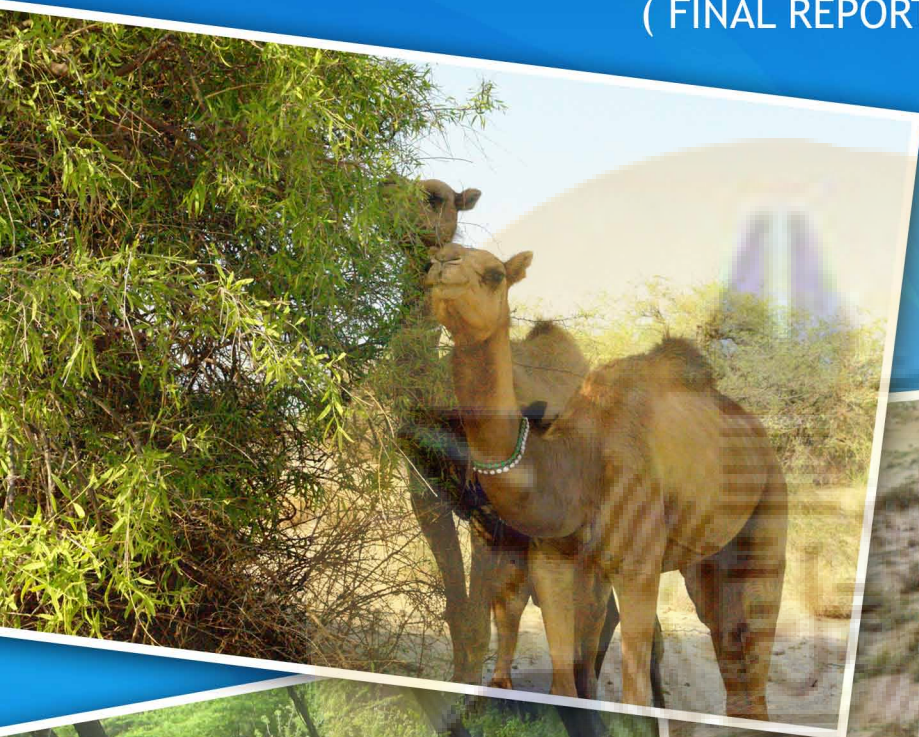
Position	Person	Qualification and Experience	Responsibility
Team Leader	Dr. Rajab A. Memon	• Ph.D. USA • Post- Doc (USA) • 40 years of experience in Social Research	• Overall design, supervision and Report Writing. • Interaction with stakeholders.
Economist/ Poverty and HDI Expert	Dr. M. Yameen Memon	• M.S. (Economics), USA. • Ph.D. USA. • 30 years experience in qualitative and quantitative research	• HID and poverty reports
Data Analyst/ Statistician	Dr. Aijaz Khoonharo	• M.Sc. (Applied Statistics) • M.S. (USA) • Ph.D. (SAU, Pakistan) • 15 years research analysis	• Data supervision • Data analysis • Field Assessments • District Indicators
Gender Specialist	Ms. Fiza Qureshi	• M.A (Sociology) and MBA (Sindh) • 10 years experience in gender and development	• Facilitate field activities, • Gender development analysis
• Enumerators	• Mr. Imtiaz Laghari • Mr. Rizwan Soomro	• M.A/ MSc. Social Sciences with research experience	• Household Data collection • Collection of Data from Districts and Major NGOs

Note: The village profile data were collected by the WWF field teams.

Poverty & Income Distribution

Indus For All Programme

(FINAL REPORT)



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May, 2008

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Acronyms	
ALI	Adult Literacy Index
BHU	Basic Health Unit
CCB	Citizen Community Board
EI	Educational Index
GEI	Gross Enrollment Index
GER	Gross Enrollment Ratio
GoP	Government of Pakistan
HDI	Human Development Index
MDC	Management and Development Center
NGO	Non-Governmental Organization
NWFP	North West Frontier Province
UNDP	United Nations Development Program
USA	United States of America
WWF-P	World Wide Fund for Nature for Pakistan

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POVERTY AND INCOME DISTRIBUTION

BASELINE RESEARCH PAPER

WWF- INDUS FOR ALL PROGRAMME

1. Background Information

This research was conducted to develop poverty profile of households in the priority areas selected for implementation of identified interventions under the Indus for All Programme of the WWF, namely Ketī Bunder, Thatta; Keenjhar Lake, Thatta; Chotiari Sanghar; and, Pai Forest, Nawabshah. Using survey data of 1,064 households, head count ratio, poverty gap, and Sen index were calculated for poverty estimation while ratio of first (poorest) and fifth (richest) quintiles of income and Gini Coefficient were calculated to explore the distribution of income for inequalities. Besides, Lorenz curves were constructed to visualize the distribution of income and calculations of Gini Coefficients.

2. Approaches to Poverty Measurement

Poverty has remained one of the most serious problems of Pakistan- over one third of the population is living under the poverty line. About forty-four percent of population is below the poverty line on the human poverty index (UNDP, 2002). Although governmental bodies, local and international NGOs, and international organizations operating in Pakistan have made eradication of poverty a top priority and have operated many social development programmes, poverty has been on a rise when compared to the level of 26 percent in 1988 (GoP, 2003). A significant proportion of Pakistan's population does not have adequate levels of food, access to basic services and opportunities and hence are particularly vulnerable to economic, environmental and political shocks. Sixty five percent of Pakistan's population lives in rural areas and majority of them live below poverty line (World Bank, 2002).

Different measures of poverty have been proposed by the economists and sociologists; and based upon these measurements; different definitions have been worked out. Poverty is multifaceted and is caused by a variety of economic, physical and social deprivations. The past decades have seen evolution of more comprehensive measures of living standards. It is now a widely accepted fact that living standards are not determined by income and consumption alone. The non-economic measures of well-being include factors such as life expectancy, child mortality, and access to clean drinking water, electricity and public transport, etc. Measuring the level of living standards, Jafri (1999) suggested determination of the poverty line while Rashida (2001), investigated major variables correlated to poverty in order to have a better understanding of the poor.

Both poverty research and social policy employ a wide variety of poverty definitions. However, all definitions may be fitted into one of the following categories:

- Absolute Poverty
- Relative Poverty

2.1 Absolute poverty approach

The absolutist approach to define poverty begins with the concept of “minimum subsistence”, that is, some bundles of goods and services that are regarded as essential to physical need of an individual or a family. Those who do not possess economic resources to obtain these goods and services are considered poor. Usually, this bundle of economic goods consists of the minimum caloric intake essential to human existence, and perhaps some forms of shelter.

2.2 Relative Poverty Approach

According to the relativist approach to define poverty, the mean or median value of national income represents the economic indicator, which corresponds to the dominant life style. An individual or a family whose income is less than that value can be defined as being on the poverty threshold, with no means to live in that life style. For example, a person or family with less than one half of the average after-tax income can be said to be poor (Eva and Jackie, 1998).

The high poverty rates prevalent in the country are a reflection of both low incomes and an unequal income distribution. Pakistan has one of the most unequal income distributions in the world. According to World Bank (1999), only a few countries in the world have a worse income distribution than Pakistan. Another variable that the poor household profiles suggest as an important determinant of poverty, is the level of education of the household head. Suggesting a strong correlation between poverty and occupation of the household head, poverty incidence is higher for households whose head works in a rural occupation and it is lower for households whose head works in a professional occupation. The poverty profiles also showed that poverty rates are higher for households with certain specific characteristics, such as migratory household heads, large family size, and illiterate household heads.

Poverty has many dimensions; the poor not only have low incomes, but also lack of access to basic needs such as education, health, clean drinking water and proper sanitation. The latter undermines their capabilities, limits their opportunities to secure employment, results in their social exclusion and exposes them to exogenous shocks. Therefore, poverty is a state of multiple needs such as food, clothing, education, medical relief, job opportunity & income security and political & social freedom, all of which are essential for meaningful existence, (Ashraf, 2004).

2.3 Effects of Poverty

Poverty has wide-ranging and often devastating effects. Many of its effects, such as poor nutrition and physical health problems, result directly from having too little income or too few resources. As a result of poor nutrition and health problems, infant mortality rates among the poor are higher than average, and life expectancies are lower than average. Other effects of poverty may include infectious disease, mental illness, and drug dependence. In many cases, the primary effects of poverty lead to other problems. Extended hunger and lack of employment, for instance, may lead to depression.

3. Objectives and Methodology

The objectives of assessment were:

1. To estimate per capita income;
2. To estimate relative poverty; and,
3. To estimate distribution of income.

Since the purpose was to develop a poverty profile of Indus for All Programme sites through household survey data, the design was Descriptive Survey coupled with empirical analysis for measuring the poverty and inequality indices. The recommended sample sizes for various household populations were calculated using “Sample Size Calculator” which is online available at: <http://www.surveysystem.com/sscalc.htm>. A sample of 246 households were selected from Ketu Bunder, Thatta; 309 from Keenjhar, Thatta; 273 from Chotiari, Sanghar; and 236 from Pai Forest Nawabshah. Thus, a total sample of 1,064 households was selected for the detailed socio-economic baseline study. Two stage cluster sampling was applied to select a representative sample of households. In the first stage, villages were purposively selected considering size of villages and location while in the second stage households were selected using systematic sampling procedure. The survey data provided empirical basis for estimating poverty measures.

Table- 1. Village and Household Sample Sizes

Site/Area	Villages		Households		Error Rate (%)
	Total	Surveyed	Total	Surveyed	
Ketu Bunder, Thatta	31	17	1,844	246	5.8
Keenjhar Site, Thatta	41	26	5,015	309	5.4
Chotiari, Sanghar	30	24	5,000	273	5.8
Pai Forest, Nawabshah	26	10	2,820	236	6.1
Overall	161	77	14,679	1,064	2.26

Due to nonlinear relationship between sample and population, the overall error rate decreased to 2.26.

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4. Measurement of Poverty

4.1 Relative Poverty Line

Expenditure on calorie intake of 2350 calories per adult equivalent per day along with consumption expenditure on non-food items was aggregated to construct poverty line. For 2004-05, national poverty line was estimated at Rs. 878.64 (GoP, 2006). The available literature did not show any national poverty line for 2007-08. Using the inflation rate of 7.5 per year, new poverty line was worked out to be Rs. 1,000 per capita per month. Prevalence of poverty in the programme sites was estimated using both the poverty lines viz. Rs. 878.64 and 1,000 per capita per month.

4.2 Head Count Ratio

Head count ratio shows number or proportion of people or households whose level of income is less than some given fraction of typical incomes. This was calculated by using the following equation:

$$HCR = \frac{h}{n}$$

Where

HCR	=	Head count ratio
h	=	Number of poor
n	=	Population

4.3 The Average Poverty Gap

The measures of the average amount of income necessary to raise everyone whose income are below the poverty line. The average income short fall or average poverty gap (APG) of the poor is defined as;

$$APG = \frac{1}{H} \sum_{i=1}^H (y_p - y_i)$$

Where

APG	=	Total poverty gap
H	=	Number of the poor who fall below poverty line
y_p	=	Poverty line
y_i	=	Income of the poor

4.4 Sen Poverty Index

This index was developed by the Noble Laureate Dr. Amartya Sen. It takes into account both the number of poor and the extent of their poverty. Sen defined the index as:

$$SI = \frac{P}{N} \times \frac{B - A}{A}$$

Where:

P = number of people below the poverty line

N = total number of people in society

B = poverty line income

A = average income of those people below the poverty line

5. Distribution of Income

5.1 Lorenz curve

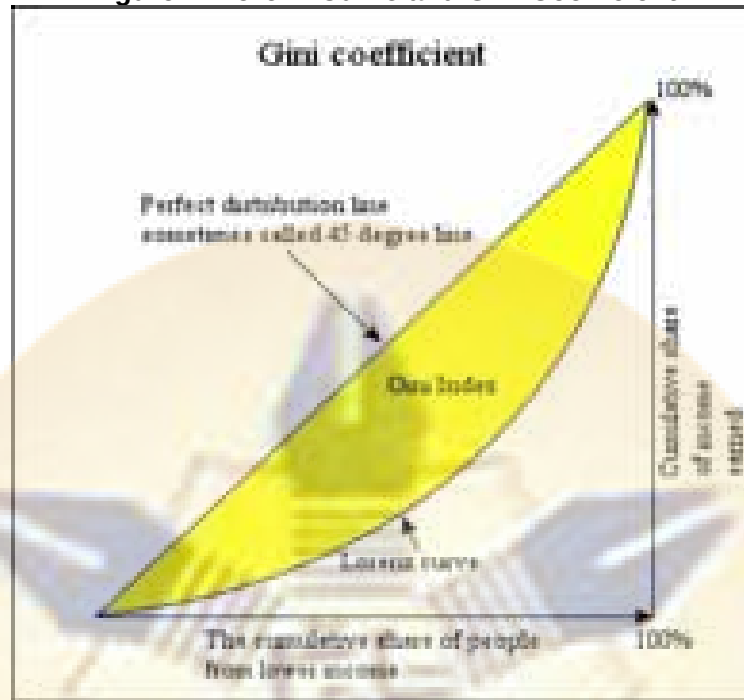
The Lorenz curve is a graphical representation of the cumulative distribution function of a probability distribution. The percentage of households is plotted on the x-axis, the percentage of income on the y-axis. It can also be used to show distribution of assets. In such uses, it represents social inequality. It was developed by Max O. Lorenz, in 1905 for depicting income distribution.

5.2 Gini coefficient

The Gini coefficient is a measure of inequality of a distribution. It is defined as a ratio with values between 0 and 1: the numerator is the area between the Lorenz curve of the distribution and the uniform (perfect) distribution line; the denominator is the area under the uniform distribution line. It was developed by an Italian statistician Corrado Gini and was published in his 1912 paper "Variabilità e mutabilità" ("Variability and Mutability"). The Gini index is the Gini coefficient expressed as a percentage, and is equal to the Gini coefficient multiplied by 100.

The Gini coefficient is often used as an income inequality metric where 0 corresponds to perfect income equality (i.e. everyone has the same income) and 1 corresponds to perfect income inequality (i.e. one person has all the income, while everyone else has zero income). The Gini coefficient can also be used to measure wealth inequality.

Figure 1: Lorenz Curve and Gini Coefficient



The Gini coefficient is also defined as a ratio of the areas on the Lorenz curve diagram. If the area between the line of perfect equality and Lorenz curve is A, and the area under the Lorenz curve is B, then the Gini coefficient is $A/(A+B)$. By applying quadratic function across pairs of intervals, or building an appropriately smooth approximation to the underlying distribution function, area of B is estimated in Lorenz curve.

5.3 Educational Index

Educational Index (EI) is calculated by giving two-third weight to Adult Literacy Index (ALI) of Age 15 years and older and one-third to combined Gross Enrolment Index (GEI) for primary, secondary and tertiary schools.

$$EI = \frac{2}{3} \times ALI + \frac{1}{3} \times GEI$$

where ALI and GEI are calculated by dividing adult literacy ratio (ALR) and Gross Enrolment Ratio (GER), respectively, by 100.

6. Literature Review

6.1 Poverty in Pakistan

World Bank (2002) reported that nearly 57 percent of the households were prone to falling into poverty as they were clustered around the poverty line. Of those prone to falling into poverty, 69 percent were found to be vulnerable. On the other hand, only 2 percent of households with mean expenditure levels larger than 1.25 times the poverty line could be classified as vulnerable; though some did experience an episode of transient poverty. These results indicated that vulnerability to poverty in rural Pakistan was due to both, low mean expenditure levels, and variation in expenditure due to shocks. The study found that 43 percent households were vulnerable and chronically poor and 6 percent households were not vulnerable but chronically poor. The study also reported that 41 percent households were vulnerable and transient poor, and 12 percent households were not vulnerable but transient poor.

World Bank (2003) reported that poverty, being a critical challenge to be addressed instantly, in Pakistan was increasing social problems. About one-third of Pakistan's population was below food poverty line rising from a level of twenty six percent in 1988 (Government of Pakistan, 2002); and about forty-four percent were below the poverty line on the human poverty index. A significant proportion of Pakistan's population did not have adequate levels of food, access to basic services and opportunities and hence were particularly vulnerable to economic, environmental and political shocks. Sixty five percent of Pakistan's population lived in rural areas majority (about two-third) of them were poor.

Shaheen (2003) stated that the Poverty has marginally declined in Pakistan. However, analysts believed that the government still had much to answer for in terms of spending on poverty alleviation and human development. It was stated that Pakistan was not doing well on health, education, water and sanitation; and there were rural and urban disparities too.

6.2 Poverty in Farm and Non-Farm Households

Qureshi and Arif (1999) reported a higher incidence of poverty among the non-farm households in all provinces of Pakistan based on the HIES data for 1993-94 and 1998-99. These estimates were based on a classification of households by professional status of the head of household. However, Arif, Nazli and Haq (2000) based on a more detailed classification did not find any significant difference between the levels of poverty of farm and non-farm workers.

Arif and Ahmed (2001) examined the levels of poverty of farm and non-farm households across agro-climatic zones for the years 1993-94 and 1998-99. Similar analyses were reported by Kemal (2003) for the data from the HIES (2001-02). These studies found a higher incidence of poverty among non-farm household in all zones except in barani Punjab in 1993-94 and 1998-99. For Barani Punjab there is a higher incidence of poverty among non-farm households than for farm households in 1998-99 while a reverse pattern was reported for 1993-94.

6.3 Reasons of Poverty in Rural Areas

Kemal (2003) reported that persistent drought and lack of irrigation resulted in a substantial decline in cotton production— the mainstay of the households. Because of decline in crop incomes the dependence on livestock increased considerably. In recent years, livestock appeared not only as an important source of income but also as important source for meeting the caloric requirement of the poor. However, poverty headcount was found to be highest for those who solely depended on livestock. It was possible that because of increasing incidence of soil degradation, the poor were relying solely on livestock. Poverty reduction was linked strongly to employment. The exploitation of labor in situations of poor governance and inadequate and thin labor markets was reported to be the major cause of increasing poverty.

Available studies indicated that increased resource degradation had led to declining productivity in agriculture. Comparison of Indian with Pakistani Punjab showed that higher productivities had been achieved in the former mainly due to greater efforts to tackle resource degradation. World Bank (2002) found that tenants under sharecropping arrangements had fewer incentives for investment in the preservation of soil quality. A greater incidence of poverty was found in the tenant categories. In the light of findings, it was suggested that there was a need to direct greater efforts towards the conservation of natural resources such as diversified crop rotations and incorporation of legumes in the cropping pattern.

Anwar *et al.*, (2005) discussed landlessness and poverty in Pakistan. Estimates of the research revealed that prevalence of rural poverty on official poverty line was far greater than the urban poverty; i.e. 42.9% of rural population compared to 26% of urban population was poor in 2001-02. Poverty was strongly correlated with lack of land, being principal asset in the rural economy of Pakistan. Prevalence of poverty was found to be the highest among landless at 54.6% and not only the poverty gap but also the degree of inequality among landless households was substantially high. A highly unequal land ownership pattern was reflected by the fact that merely 0.08% households owned greater than 2 hectares of land in Pakistan. Likewise, Gini Coefficient of land holding was considerably high at 0.6151 in 2001-02. Thus, highly unequal land distribution was reported to be the main manifestations of poverty in rural Pakistan.

Distribution of land holding at province level indicated that a very small portion of all households possess large farm size in all provinces. Notably, merely 0.05% households own greater than 2 hectares of land in Punjab as well as in Sindh suggesting a highly skewed land ownership pattern. Punjab had the highest Gini coefficient of land holding followed by NWFP, Sindh and Baluchistan in 2001-02. Gini coefficient of land ownership was substantially higher than the Gini Coefficient of expenditure and income. This was suggestive of high underreporting of expenditure and income by the richest households due to tax evasion. The highly unequal land distribution seems to have resulted in tenancy arrangements such as sharecropping causing high incidence of poverty particularly in Sindh. It was concluded that landlessness was the most important contributor to rural poverty in Pakistan; and high concentration of landownership and unfair tenancy contracts were major obstacles to agricultural growth and alleviation of poverty. Analysts were of the opinion that land redistribution was a source of increased efficiency, increased demand for labor and reduced poverty.

7. Poverty Analysis and Interpretation

7.1 Per Capita Income Per Month

Information on income and number of earners, summarized in table- 2, reveals that on an overall basis, average per capita income per month was Rs. 1,205. Comparative view of per capita incomes across programme sites unveiled that highest income (Rs. 1,708) was recorded in creek villages of Ketī Bunder followed by in Inland villages (Rs. 1,386); while overall per capita income at Ketī Bunder was Rs. 1,520 only per month.

Table- 2. Per Capita Income Per Month at the Programme Sites

Area/Site	Category of villages	Per Capita Income/month		Number of Earners			Proportion (%) of Earners to Family Size		
		Mean	Median	Male	Female	Total	Male	Female	Total
Ketī Bunder, Thatta	Creek	1,708	1,500	1.49	0.03	1.52	26.1	0.53	26.63
	Inland	1,386	1,167	1.51	0.05	1.56	29.0	0.96	29.96
	Site Average	1,520	1,250	1.50	0.04	1.54	27.8	0.74	28.54
Keenjhar, Thatta		971	800	1.70	0.26	1.96	23.6	3.61	27.21
Chotiari, Sanghar		1,143	829	1.45	0.18	1.63	21.6	2.69	24.29
Pai, Forest, Nawab Shah		1,256	894	1.38	0.30	1.68	20.0	4.35	24.35
Overall		1,205	929	1.52	0.20	1.72	23.0	3.03	26.03

Highest income of inhabitants of Ketī Bunder was due to marine fishing since the main occupation (of about 74% of households) was marine fishing. Besides, comparatively more proportion of male earners (28%) was enumerated in Ketī Bunder against overall proportion of 23%. On the other hand, the lowest proportion (0.74%) of female earners in Ketī Bunder was attributed to lack of access to market and the rough nature of marine fishing operations. In addition, meager proportion of 0.53% of female earners was recorded in villages in creeks, which is evident of restricted mobility of females due to seawater encircling the villages.

Although highest per capita income of Ketī Bunder was reported, highest costs incurred on the purchase of boat fuel and drinking water were responsible for plunging majority of population into poverty. Cost of food items was also found to be on high side at Ketī Bunder. The price of a liter of milk was reported to be Rs. 60-80 in creek villages as against Rs. 32 in major cities of Sindh. Powder milk was commonly used for tea making. Likewise, the price of wheat flour and sugar were also on high side.

The lowest per capita per annum income (Rs. 971) was recorded at Keenjhar, Thatta. About half of the population (52%) had fishing as a major profession. Labor and stone mining were livelihood source for 11% and 8% households respectively.

Almost similar per capita incomes at Chotiari, Sanghar (Rs. 1,143 per capital per month) and Pai Forest, Nawabshah (Rs. 1,256 per capita per month) were estimated. It was noted that both sites had almost the same proportion of male earners - Chotiari (22%) and Pai Forest (21%). Identical income estimates of both the areas may be attributed also to the similar agro-ecological (wheat-cotton) zone. Highest contribution (4.35) of female earners to total family size was observed in Pai Forest, Nawabshah mainly due to better female education- 8% of the females were matriculate against overall proportion of 1.5%. Furthermore, female education up to the university level was also reported in Pai Forest.

7.2 Head Count Ratio

On an overall basis, 48% of the households at all the Indus for All Programme sites, were categorized as poor on the basis of poverty line of Rs. 878.64 per capita per month.

One out of every 4 houses (25%) was found poor in Creek villages of Ketī Bunder, Thatta. Relatively more proportion (30%) of poor households was enumerated in Inland villages of Ketī Bunder. The highest poverty rate (58%) was found at Keenjhar, Thatta. Head count ratio in Chotiari and Pai Forest, being the representative areas of wheat-cotton zone of Sindh, were estimated to be 53.3% and 48.7% respectively.

On the basis of Rs. 1000 per capita per month, head count ratio was 51% for all programme sites. As against this, remarkably high head count ratio (62%) was computed for Keenjhar. Ketī Bunder Thatta had the HCR of about 29% (25.7% in Creeks and 31% in Inland villages) of poor households. Head count ratio was around 55% in wheat-cotton zone (57% in Chotiari and 54% Pai Forest) respectively.

Table- 3. Head Count Ratio

Area/Site	Category of villages	Head Count Ratio at Poverty Line	
		Rs. 878.64 Per Capita	Rs. 1000 Per Capita
Ketī Bunder, Thatta	Creek	24.8	25.7
	Inland	30.3	31.0
	Site Average	28.0	28.8
Keenjhar, Thatta		57.50	62.0
Chotiari, Sanghar		53.30	57.0
Pai Forest, Nawab Shah		48.70	53.5
Overall		47.70	51.2

On the national level, about one-third of the population is pronounced to be under poverty line by public sector institutions. However, the present assessment estimated much higher proportions than reported nation wide. These programme site poverty estimates are supported by Syed (2005) that one out of every two persons (50%) is under poverty line. These poverty estimates also exactly coincide with Arif and Ahmed (2001) who reported that in wheat-cotton zones of Sindh, the poverty incidence was about 57%. World Bank (2002) report also stated that in rural Pakistan, nearly 57% of the households are prone to falling into poverty when clustered around the poverty line.

7.3 Poverty Gap and Sen Index

Table 4 gives a comparative snapshot of poverty gap and Sen Index (severity of poverty). Based upon Rs. 878.64 per capita per month, lowest poverty gap of Rs. 253 (272 for creeks and Rs. 243 for Inland villages) was recorded for Ketu Bunder followed by Keenjhar Thatta (Rs. 280); Pai Forest, Nawabshah (Rs. 282); and Chotiari, Sanghar (Rs. 335). Sen index measuring the severity of poverty, which is the multiple factor of head count ratio and poverty gap, revealed that Chotiari, Sanghar was enduring poverty menace with more severity in comparison of other areas. A significant difference of index of 0.1 between two areas of wheat-cotton zone (Pai, Forest = 0.23 and Chotiari = 0.33), reflected the severity of poverty in Chotiari, presumably because of the poor resettlement plan and sub-merging of villages in the Chotiari reservoir since 2006.

Table- 4 Poverty Gap and Sen Index

Area/Site	Category of villages	Poverty Line			
		Rs. 878.64 Per Capita		Rs. 1000 Per Capita	
		Poverty Gap	Sen Index (Severity)	Poverty Gap	Sen Index (Severity)
Ketu Bunder, Thatta	Creek	272	0.11	382	0.16
	Inland	243	0.12	358	0.17
	Site Average	253	0.11	367	0.17
Keenjhar, Thatta		280	0.27	378	0.38
Chotiari, Sanghar		335	0.33	433	0.44
Pai, Forest, Nawab Shah		282	0.23	374	0.32
Overall		292	0.24	391	0.33

On an overall basis, Sen Index at Rs. 1000 per capita per month was enumerated to be 0.33- the lowest being for Ketu Bunder (0.16) and the highest for Chotiari Sanghar (0.44). Sen index for Pai Forest (0.32), which is close to overall index of 0.33, unveiled that Pai Forest was representative of the poverty scenario of all programme sites in terms of severity. The highest index of poverty for Chotiari provided enough justification for appropriate development interventions by the WWF and public & private sectors.

7.4 Distribution of Income and Inequalities

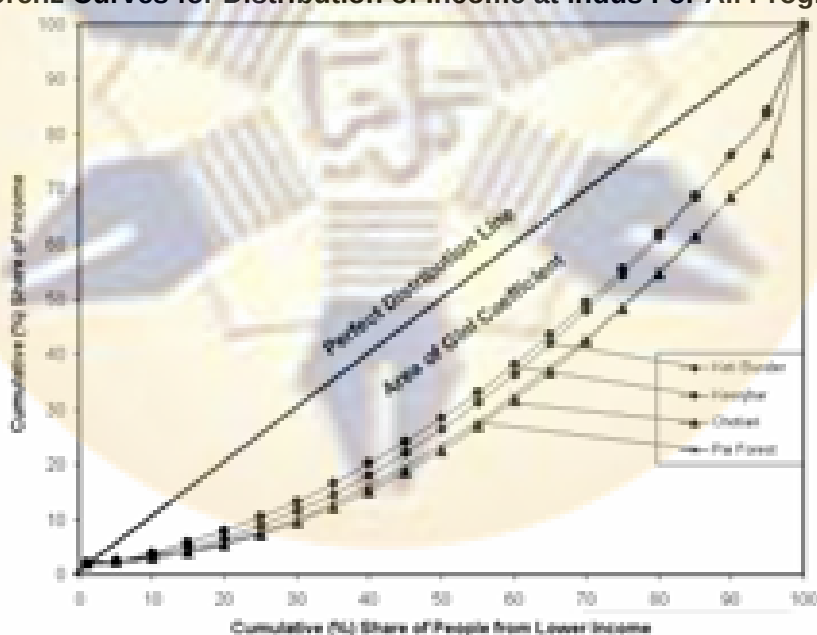
Table-5 presents profile of income distribution in quintiles and Gini coefficient. Higher ratios of income of richest 20% to poorest 20% for Chotiari (7.62) and Pai Forest (7.62%), was indicative of moderate skewed distribution of income in the above areas. This ratio was found to be lowest in Inland villages (4.51) of Ketu Bunder and Keenjhar (4.59). Gini Coefficient, a standard measure of resource distribution among population, depicted the similar picture. The lowest value of Gini Coefficient for Inland villages (0.31) of Ketu Bunder and Keenjhar while comparatively higher values for Chotiari (0.41) and Pai Forest (0.40) were reported.

Estimated Gini coefficient for all programme sites was 0.38, which reveals moderate inequality in distribution of income. This estimate is almost the same as estimated by Chaudhry (2003)- 0.36 for rural areas. The FES (2002) also reported a similar Gini coefficient of 0.41 for rural areas of Pakistan. Furthermore, the ratio of richest 20% to poorest 20% was reported to be 6.7, which is almost identical to 6.5 estimated in the present assessment.

Table-5 Distribution of Income and Inequalities

Area/Site	Category Of villages	Proportion (%) of Population					Ratio = <i>Richest 20%</i> <i>Poorest 20%</i>	Gini Coefficient
		Poorest 20%	21- 40	41- 60	61- 80	Riches 20%		
		Proportion (%) of Income						
Keti Bunder, Thatta	Creek	6.6	11.9	17.4	25.2	38.9	5.89	0.34
	Inland	8.2	13.2	17.4	24.1	37.0	4.51	0.31
	Site Average	7.4	12.2	17.2	23.7	39.5	5.34	0.33
Keenjhar, Thatta		8.5	13.1	16.6	22.8	39.0	4.59	0.31
Chotiari, Sanghar		6.3	10.1	14.4	21.2	48.0	7.62	0.41
Pai Forest, Nawabshah		6.1	11.5	14.9	21.5	46.0	7.54	0.40
Overall		6.8	11.3	15.5	22.3	44.2	6.50	0.38

Figure 2: Lorenz Curves for Distribution of Income at Indus For All Programme Sites



7.5 Educational Index

Table- 6 presents literacy rate, combined gross enrollment ratio and educational index. The highest literacy rate (41.6%) was recorded at Pai forest, Nawabshah followed by Keenjhar, Thatta (28.5%); Chotiari, Sanghar (24.2%); and, Keti Bunder, Thatta (10.1%). Segregated data of Keti Bunder, indicated that only 5% of the population was literate in creek villages. Likewise, very poor combined gross enrollment ratio of 1% only was recorded in creek villages. The accessibility of teachers in schools of creek villages of Keti Bunder was one of the top most reasons for poor enrollment ratio. Other reasons could be poor motivation of masses for getting education due to

lack of educational campaigns and poor accessibility to target audience even while using various methods of extension education, namely personal contacts, group discussions and mass media.

Table-6. Educational Index

Area/Site	Category of villages	Proportion (%)		Educational Index	Ranking
		Literacy Rate	Combined Gross Enrolment Ratio		
Keti Bunder, Thatta	Creek	4.6	0.7	0.03	VI
	Inland	14.2	45.3	0.25	V
	Site Average	10.1	23.9	0.15	IV
Keenjhar, Thatta		28.5	57.0	0.38	II
Chotiari, Sanghar		24.2	43.6	0.31	III
Pai Forest, Nawabshah		41.6	60.0	0.48	I
Overall		30.0	47.3	0.36	

Comparatively better educational profile of Pai Forest, Nawabshah was observed where literacy ratio was about 42% and combined gross enrollment ratio was 60%. Education index was estimated at 0.48, which was the highest among all programme areas. A significant gap between educational indices for Pai Forest Nawabashah (0.48) and Keenjhar, Thatta (0.38) was recorded. The overall educational index at all four areas was 0.36, which is about 10 points less than the national index (0.47) calculated for the year 2005-06 (GoP, 2006). Better educational profile of the Pai Forest can be attributed to nearby national high way (at a distance of about 5km) and major educational city & district headquarter, Nawabshah, (at distance of about 25km); where engineering university and medical college have been working successfully since last three decades.

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8. Summary of Findings

The poverty estimates revealed that average per capita income per month at the programme priority sites was Rs. 1,205 only. The highest average income (1,520) was reported for Ketu Bunder and the lowest for Keenjhar (Rs. 971). Using the poverty line of Rs. 1000 per capita per month, more than half (51.2%) of the households were categorized as poor. The least proportion (28.8%) of poor households was enumerated in Ketu Bunder (25.7% in Creek Villages and 31.0% in Inland villages). Despite highest income, living standard at Ketu Bunder was very low. A significant proportion of income of inhabitants of Ketu Bunder was reportedly spent on purchase of water and transportation through boats. Education, being an important factor of development, revealed that 90% of the population of age more than 15 years was illiterate and about one tenth of the household were sending their male children for primary education at Ketu Bunder when compared to overall proportion of 30% for all programme sites.

Pai Forest had the highest educational index of 0.48, followed by Keenjhar Thatta (0.38); Chotiari, Sanghar (0.31); and, Ketu Bunder, Thatta (10.1). Due to poor education and health facilities at Ketu Bunder and Chotiari, the Basic Capability Index of the households was also understood to be the poorest at these two sites followed by Keenjhar and Pai Forest respectively.

Moderate inequality of distribution of income (Gini coefficient =0.38) was calculated for the Indus for All Programme sites. The lowest value of Gini coefficient was estimated for Ketu Bunder, Thatta while the highest for Chotiari (0.41) followed by Pai Forest (0.40) and Keenjhar (0.31). The higher value of Gini Coefficient for Chotiari and Pai Forest was attributed to a variety of professions of households including agriculture, livestock, fishing, business, and public and private sector jobs.

On an overall basis, 48% of the households at all the Indus for All Programme sites, were categorized as poor on the basis of poverty line of Rs. 878.64 per capita per month. Head count ratio was around 55% in wheat-cotton zone (57% in Chotiari and 54% Pai Forest) respectively. Sen index measuring the severity of poverty, which is the multiple factor of head count ratio and poverty gap, revealed that Chotiari, Sanghar was enduring poverty menace with more severity in comparison of other areas. A significant difference of index of 0.1 between two areas of wheat-cotton zone (Pai, Forest = 0.23 and Chotiari = 0.33), reflected the severity of poverty in Chotiari, presumably because of the poor resettlement plan and sub-merging of villages in the Chotiari reservoir since 2006. The highest index of poverty for Chotiari provided enough justification for appropriate development interventions by the WWF- Indus for All Programme.

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