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Study on Knowledge, Attitudes & Practices of Fisherfolk Communities about Fisheries and Mangrove Resources

Keti Bunder
(Final Report)



2005

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Acronyms

BHU	Basic Health Unit
CBO	Community Based Organization
CIR	Center for Information and Research
EEZ	Exclusive Economic Zone
EPA	Environmental Protection Agency
FCS	Fishermen Cooperative Society
FDO	Fisherfolk Development Organization
GOP	Government of Pakistan
GOS	Government of Sindh
KPT	Karachi Port Trust
KWSB	Karachi Water and Sewerage Board
LHV	Lady Health Visitor
LHW	Lady Health Worker
NGO	Non-Governmental Organization
NIC	National Identity Card
PLA	Participatory Learning & Action
PRA	Participatory Rural Appraisal
RCD	Regional Cooperation for Development
RHC	Rural Health Center
SCLP	Sustainable Coastal Livelihood Project
SDO	Sonmiani Development Organization
SZABIST	Shaheed Zulfikar Ali Bhutto Institute of Science & Technology
UC	Union Council
WAPDA	Water & Power Development Authority
WWF	Worldwide Fund for Nature

Glossary of Local Terms

Bunder	Sea Port
Chhapra	Shed (For Fish Cleaning)
Chowki	picket
Ghatoo	Experienced Fisherman
Ghattoo	Most experienced fishermen
Ghut	Long fishing trip
Goth	Village
Hello	One Day Fishing Effort
Horho	Boat mostly used for fishing
Jaar	Net
Jawar	Half Moon
Jawar	High Sea Tide
Jhenga	Shrimps
Karigar	Expert in any Profession
Karkhano	Factory
Katra	Surrounding Net
Khalasi	Helper
Khalasi	Fishing Boat Crew Member
Laro	Fishing Effort without Success
Madarssah	Religious School
Mallah	Fishermen
Mangro	Shark Fish
Mirbahar	Fisherman
Nakho	Boat Captain
Nakho	Captain of the Boat
Otaq	A common village place where guests stay
Paras	Locality
Paro	Locality in Village
Patti	Share (of Fish Catch)
Rachh	Gillnet mainly for fish
Taluka	Subdivision
Thukri	Entangle Gillnet
Tonga	Horse cart
Zikirkhana	Worship place of Zikris
Zikri	A religious sect

1. Introduction

Pakistan has a coastline of about 1050 km along the Arabian Sea. It extends from Sir Creek on the Indian side in the east to Gwatar Bay on the Iranian border in the west. It has a territorial coastal zone of 23,820 sq. km and an Exclusive Economic Zone (EEZ) of more than 266,650 sq. km. The coast of Pakistan is divided into the coasts of Sindh and Balochistan. This coastal zone is endowed with abundant natural resources, especially fisheries resources and mangrove forests.

The total population living along Sindh coast (up to 2-5km inland) is estimated to be about 1,000,000. Similarly, the total population living along Balochistan coast is about 250,000. Accordingly, the average population density in densely populated area is 1785/sq.km, while the average population density in scarcely populated area is about 87/sq.km. The Karachi coastal belt has a population of about half a million. The local inhabitants are mostly fishermen, professional grazers and agriculturists.

The Balochistan coast extends to 770 kilometres from the mouth of Hub River in the east to the Iranian border in the west. Ancient raised beaches mark the landward boundary of the Balochistan coastal zone about 20 kilometres from the present coastline. The Makran Coast Range, which closely parallels the coast, effectively defines the zone and separates it physically, socially and economically from the rest of the province. A narrow continental shelf – in much of the area, only 15-50 kilometres wide at the 200-metre isobaths – defines the extent of the coastal waters. From here the continental slope dips sharply, delimiting an extensive, deep offshore zone. The only large island is *Astola*, near *Pasni*. It has an area of 20 square kilometres and is uninhabited. One smaller island lies just off the coast, but it has disappeared.

Majority of the coastal communities are solely dependent on the fisheries resources. The coastal waters of Pakistan are bestowed with a variety of fish and shrimp resources. The commercially important marine fisheries resources of Pakistan comprise about 350 different species. Some 240 are demersal fish, 50 are small pelagic, 10 are medium sized pelagic and 18 are large pelagic fish. In addition, there are 15 species of shrimps, 12 of squid/cuttlefish/octopus and 5 species of lobsters [Mangroves: Status and Management IUCN 2004].

The other important natural resources, on which the coastal communities largely depend, are the mangrove forests. These forests constitute an important productive ecosystem of the coastal regions of Pakistan. They provide a range of valuable forest products such as timber, fuel-wood and fodder. They also provide shelter and serve as nursery and breeding grounds for prawns, crabs and many species of fishes as well as habitat for certain species of birds and mammals. They bind silt, accrete shorelines, halt erosion of beaches and of coastline and buffer the impacts of cyclones, storms and tsunamis.

Both the fisheries and the mangrove resources are under grave stress due to a variety of factors which have resulted in their rapid degradation as well as impacted the livelihood and socio-economic conditions of dependent coastal communities.

WWF Pakistan is implementing European Commission supported “Tackling Poverty in Coastal Area of Pakistan through Sustainable Coastal Livelihood Project” which is being implemented with the participation of coastal communities of Sindh and Balochistan. The targeted areas are *Keti Bunder*, Sandspit in the Sindh province, *Sonmiani* and *Kalimat Khor* in the Balochistan province, covering the population of about 30,000. This project has a number of important components and activities. It is aimed at improving livelihoods of these communities by achieving sustainable use of the mangrove and fishing ecosystems on which their livelihood depends. Besides, WWF is also engaged in mangrove resource conservation activities in *Korangi Phitti* Creek along the Karachi Coast.

One of the major components of the projects is to conduct “Baseline Research on Knowledge, Attitudes and Practices of Fisheries and Mangrove Forests” in the target communities/ areas. For this purpose, WWF engaged **SZABIST** Center for Information and Research (CIR) to conduct objective and systematic baseline research in the project areas, using the Participatory Learning and Action (PLA) process for documenting knowledge, attitude and practices of local communities towards fisheries and mangrove resources.

2. Study Objectives

The research activity was aimed at understanding target communities’ attitudes and knowledge about their livelihood resources, besides the collection of vital information about their socioeconomic conditions and poverty levels. The research will also facilitate in understanding and involving the local communities in data collection as well as the preparation of community-based management and conservation plans for forestry and fisheries resources of these communities to ensure sustainable livelihood for them through mitigation of threats resulting in natural resources degradation and poverty.

3. Methodology

A participatory method, PLA (Participatory Learning and Action) was adopted in the research process. PLA is an umbrella term used for a wide range of similar approaches and methodologies, including Participatory Rural Appraisal (PRA), Rapid Rural Appraisal (RRA), Participatory Learning Methods (PLM), Participatory Action Research (PAR), and Farming Systems Research (FSR). The common theme to all these approaches is the full participation of people in the processes of learning about their needs and opportunities, as well as the actions required to address them.

Participatory approaches offer creative opportunities for investigating issues of concern to the people, and for planning, implementing, and evaluating development activities. They challenge prevailing biases and preconceptions about people's knowledge. The methods used range from visualization, to interviewing and group work. The common theme is the promotion of interactive learning, shared knowledge, and flexible, yet structured analysis. PLA has frequently been used for appraisal, analysis and research in natural resources

including forestry, fisheries and environment. This tool helps in participatory appraisal and planning as well as participatory implementation, monitoring and evaluation of programs. PLA tools also help in the formulation of Village Development Plans.

3.1 Team- Formation & Training

A rigorous exercise was done for selecting a skilled and experienced team to conduct field study. To ensure the participation of all community groups of the project areas, male and female teams were formed separately. Each team included field researchers, community development professionals and natural resource management experts. The selected team was imparted two days PLA/ PRA training at SZABIST Center for Information and Research to refresh their PLA skills before sending them in the field.

3.2 Research Process

A participatory approach was adopted to initiate research activities in the village by informing in advance the village CBO and other stakeholders about the research team visit and its objectives. Five days research activities were planned and carried out in the coastal villages, *Sonmiani, Dam Bunder, Baloch Goth and Bhira*.

A number of research tools were used to collect data from the villages. For example, village map was the key tool, which both, male and female teams of researchers used to collect accurate information about the background of the area/village including its history. The female and male community members of the village separately conducted this exercise. The village men and women were facilitated by the team to prepare village map. This exercise proved to be ice-breaking step, as it was during this process that the villagers and the research team came closer to each other. Preparation of village social map by the villagers generated ample information about demographic characteristics of the village. The information was further supplemented with other important PLA tools i.e. semi-structured interviews, timeline matrix, direct observations and transect walks.

The PLA tools helped in generating data about the key capital assets of the community including their human, physical and social capital. For example, village map and social map generated data about different assets available with the communities and preparation of mobility map by both, the women and men of the village helped in generating information about social capital including the levels of cooperation and conflict in the village.

Besides the preparation of village map and village resource map by the village women, the participatory exercises of resource picture cards and benefit analysis flow generated information about the gender based status and differences in the village. Such data was further supplemented with the preparation of separate daily activity clocks by male and female of the village. Semi- structured interviews of the women of the village also helped in the data generation and analysis.

In addition, both male and female teams conducted exercise of natural resource mapping as well as developing livelihood system diagram to generate information about the main natural resources of the area. Tools like seasonal calendar, transect walk towards the natural resources and daily activity clock also supplemented the data. Similarly, Village Resource Map and Livelihood System Diagram, coupled with semi-structured interviews, generated information about the pattern of natural resource exploitation. While, the participatory exercise of historical timeline of natural resource status provided valuable information about temporal status of the natural resources.

Community practises toward the natural resources conservation were analysed through the tools such as, direct observations, semi-structured interviews and daily activity charts of male and female members of the village. The exercise of transects walks also supplemented information in this regard. The key tool used in PLA exercise to analyse the village problems was Problem–Cause–Solution Matrix. This exercise was carried out with the male and female members of the village. Other PLA tools including semi-structured interviews etc. also supplemented the information.

Preparation of the village development plan through community based planning process was the important phase of PLA process in the village. The exercises for this phase were done on the last day of the PLA process after the collection of comprehensive information about the village, the people, the resources and the problems. For this purpose, separate gatherings of male and female were arranged, as the local traditions prohibit sitting of both men and women together. Before initiating the exercise, all the problems of the village, including social and natural resource problems, were written on a sheet of paper and presented before the villagers to show them whether their problems were properly reported and analysed by the PLA team.

After going through these problems, an exercise of Venn diagram of stakeholders and institutions was carried out with the villagers to know about the influence of different stakeholders on the issues and their expected role in the solution of such problems. After the completion of such exercise, problem prioritisation and solution exercises were done with the help of PLA tool Problem Ranking and Pair-wise Ranking Matrix.

In the end, through the PLA tool of Problem –Cause- Solution Matrix, first the solution of the problems, already prioritized by the local community, was identified and written into specific Matrix column and then the roles of community, local CBO, WWF and the Government were identified. The community gathering to prepare this community planning was joined by a large number of community members, office –bearers of local CBO, WWF - Pakistan staff and the councilors of local government.

4. Socio-economic Background of the Area

4.1 The Area Background

Keti Bunder is situated on one of the mouths of the River Indus called *Ochito*, which enters the sea through the *Hajamro* creek at a distance of 10 kilometers from the settlements and covers an area of 9,130 ha.

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 mangrove vegetation covers an area of 3,588 hectares. The rest of the area comprises of sand dunes, settlements and water channels. The area around the settlements consists of mudflats and is criss-crossed with water channels giving the appearance of a marsh to the place. The island has a number of channels on the eastern and western sides while on the other two sides there are deep and shallow water channels namely *Dabbo Creek*, *Hajamro Creek*, *Khobbar Creek* and *Qalandri Creek*.

Khobbar is the main creek through which the Indus River flows into the Arabian Sea during the flood season. For the rest of the year *Khobbar* is filled with seawater. The overall length of the creek is 20 kilometers. Generally salinity is low in the *Khobbar* Creek and the levels of salinities of surface water and deeper water at the mouth of the creek are significantly different. In the middle of the creek, the salinity is remarkably low (2.38 ppt). This indicates pronounced effect of freshwater in the creek. The upwards seawater penetration into the river during summer is of about 15 kilometers.

4.1.1 *Keti Bunder* Town

Keti Bundar is a historical town and former port city situated in the deltaic region of the Sindh province. Mr. Hudson, the then Commissioner Sindh, in his report of 1905, mentioned *Keti Bunder* as a central and commercial city of Sindh since 1848. In 1845, the population of *Keti Bunder* was recorded as 2542 and in 1932 the town was given status of a Municipal Committee. Mr. Ram Naraindas was the last Chairman of the then *Keti Bunder* Municipality. Municipal Committee was ceased off by British government as the large number of population migrated owing to the reduction in freshwater in the area due to construction of *Sukkur Barrage* in 1932.

Much before the establishment of modern irrigation system, when the Indus River was still in full swing, the entire land of *Keti Bunder* and its surrounding area was said to be rich in agriculture production. Red Rice was considered to be the main agricultural

Box: 1		Historical Timeline of Keti Bunder	
1932.	<ul style="list-style-type: none"> • Keti Bunder was given the status of Municipal Committee. • Mr. Narain Daas became its first Chairman 		
1941.	<ul style="list-style-type: none"> • Cyclone hit the different areas including <i>Chan Creek</i>, <i>Hajamro Creek</i>, <i>Patyani</i>, <i>Kangri</i> and <i>Turshan</i>. It did not damage <i>Keti Bunder</i>. 		
1947.	<ul style="list-style-type: none"> • Migration took place as a result of Pak-India partition. At least 7000 to 8000 Hindus migrated to India through Gorab Ship from <i>Keti Bunder</i> and surrounding towns and villages. • Population decreased. Sources of livelihood also decreased 		
1963	<ul style="list-style-type: none"> • Girls Primary school was established. 		
1964.	<ul style="list-style-type: none"> • Construction of <i>Ghulam Mohammad Barrage</i> reduced flows of freshwater. • Agricultural growth from the area started declining. 		
1973	<ul style="list-style-type: none"> • Bhutto Government approved and implemented water supply scheme 		
1994	<ul style="list-style-type: none"> • Road from <i>Baghan</i> to <i>Keti Bunder</i> was built 		
1996	<ul style="list-style-type: none"> • Electricity was provided during Ms. Benazir Bhutto government. The protective Band was also built during the same period. 		
1999	<ul style="list-style-type: none"> • Cyclone A-02 hit the area 		

commodity, which was exported to other countries. The area was ideal for the production of different kinds of fruits including, Banana, Coconut, Melon, and Watermelon. Considering the importance of the port, the British government of the time established a Customs Office at the *Keti Bunder* to maintain the record of landing ships vis-à-vis the primary system of navigation, monitoring and port taxation. *Keti Bunder* lost its glory due to gradual decrease in the Indus flow in the deltaic region. The construction of *Sukkur Barrage* in 1932 followed by two more barrages i.e. *Kotri Barrage* in 1955 and *Guddu Barrage* in 1962 curtailed the flow of River Indus downstream *Kotri Barrage*, affecting the freshwater supplies to *Keti Bunder* and its surrounding areas.

Keti Bunder, which was a rich agro-based area, lost its glory with the passage of time because of reduction in the freshwater flow from River Indus. The gradual reduction of livelihood resources had serious effect on people of the area. Those who were earlier well off have become poor. Now, the majority of people are poor and living in miserable condition. The decline in agriculture production has compelled the people to leave their toiling profession and majority of such people joined fishing profession. Earlier, only 20 percent people were engaged in fishing profession whereas, presently 80 percent population of the area is engaged in fishing.

4.1.2 Hajamro & Chan Creeks

The creek system in Indus Delta is spread over a large area extending from Karachi in the west to *Rann of Kutch* in the southeast. With the exception of a few, most of the creeks do not receive regular supplies of freshwater from the Indus River and are intruded by seawater through tidal excursions. *Gizri, Korangi, Gharo* and other big and small creeks also constitute a small creek system of Indus Delta, bordering the southern and south-eastern parts of Karachi coastline. These creeks show marked semi-diurnal tidal flows and receive seawater from open sea during high tides, as well as from adjacent creeks. These creeks support sparse mangrove vegetation in inter-tidal areas.



This study was confined to some selected villages of two creeks of Indus Delta i.e. *Hajamro* creek and *chan* creek. In *Hajamro* creek, the research team was divided into two groups who visited two villages namely *Ishaq Dablo* and *Hassan Dablo*. Two villages of *Chan* creek namely *Yousif Dablo* and *Baboo Dablo* were also visited by the research team to conduct field research using PRA techniques.

4.2 Demographic Characteristics

4.2.1 *Keti Bunder*

Keti Bunder is about 170 km from Karachi. The town itself is a Sub-division (Taluka) consisting on 21 Dehs and 195 villages. The total population of whole *Keti Bunder* taluka is about 27,405 and the number of households is 3915. The population of *Keti Bunder* town is around 1500 and the number of households is 130. *Keti Bunder* town is spread over about 35 acres and surrounded by seawater. 40 per cent of the houses in *Keti Bunder* are made of bricks and block masonry while remaining 60 per cent are *katcha* (un-metalled).



Focus Group Discussion at Keti Bunder

4.2.2 *Hajamro & Chan Creek Villages*

The villages selected for the study situated on the coastal creeks are accessible only by boat. One can reach the remotely located villages through a boat journey of three to four hours. The villages being studied on *Hajamro* Creek were *Ishaq Dablo* and *Hassan Dablo*.

Ishaq Dablo village consists of 34 houses and its total population is around 250. Fishing is the only source of livelihood for the villagers. People are living in the huts made up of wood. The area in which *Ishaq Dablo* village is situated was fertile in the past. The red rice was very famous agricultural commodity. The past glory of the area has gradually vanished and the people related to agricultural activities had either migrated to the inland towns e.g. *Sujawal*, *Thatta*, *Gharo*, *Ibrahim Hydri*, *Rehri* and *Khokhrapar* or converted their livelihood to fishing. *Ishaq Dablo* village was badly affected by cyclone in 1999, which caused a heavy damage to the houses of the fishermen.

Hassan Dablo village was established in *Hajamro* creek about 30 years back. The village consists of about 25 houses and the population is around 300. All the houses are basically wooden huts.

The villages being visited on *Chan* creek included *Yousif Dablo* and *Baboo Dablo*. *Yousif Dablo* is a typical village, situated on an Island. All the villagers belong to *Dablo* fishermen community. The total population of the village is about 75. The PLA team visited this village by boat. The journey took about one and half hour to reach the village. All people in the village belong to *Dabla* cast. Interestingly, the inhabitants stay in this village only for six months when there is fishing season, when the fishing season is off

they migrate to *Keti Bunder*. The area where *Yousif Dablo* village exists was once an agricultural land but due to gradual decrease in freshwater, the value of entire area was degraded.

Baboo Dablo village is also a makeshift village where people live only during fishing season. These fishermen come from nearby villages of *Keti Bunder*. There are about 7 households and the total population is about 40.

The other small villages of the area include *Yaqub Dablo* and, *Ayub Dablo*. They have a population of less than 100 each village. They are basically makeshift villages as the fishermen live here for only six months and migrate to the inland villages near *Keti Bunder* during summer season, when the sea becomes rough and high tides inundate the area.

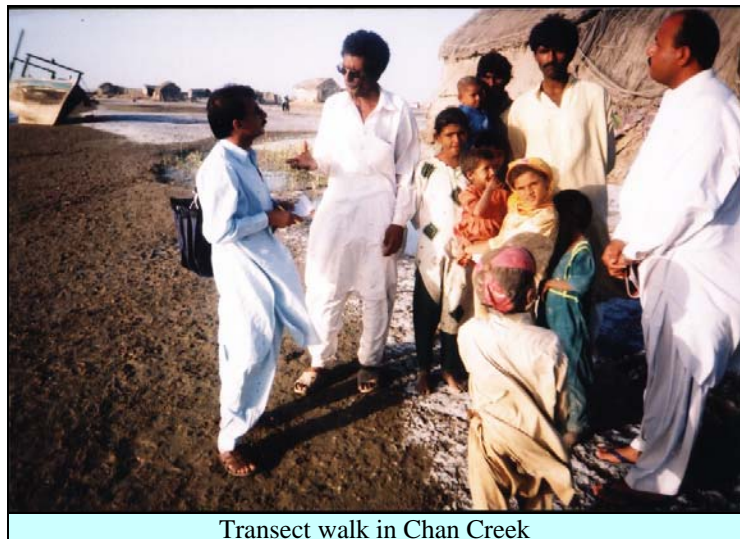
4.2.3 Social Fabric (social groups, clans tribes, languages)

Almost, 90% of people living in and around *Keti Bunder* are fishermen whose main source of livelihood is fishing. But the people of other casts also live there including, *Syed, Memon, Khaskhelly, Dhandhal, Ronjha, Jogi, Kachi, Kazi, Dabla, Katiyar, Boghani, Punjabi Khokhar, Sheedi, Bhatti, Wadha, Naya, Valasio, Malhia, Bukhari, Jeelani, Qadri, Barn, Qambrani, Bugdoo, Paleeja, Odhejo, Dumch* and *Jatt*. The *Memon* and *Syed* community are said to be well-off in terms of the financial resources as majority of them are in small-scale business and agriculture.

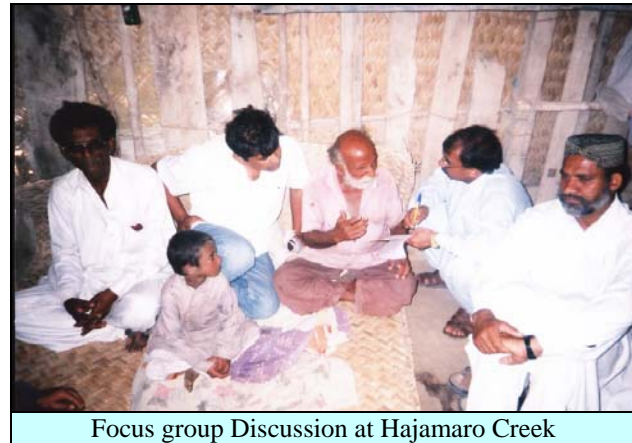
Almost all the people speak *Sindhi* language except few *Pathans* and *Punjabis*. The *Punjabis* are settled there since three generations and now they are part and parcels of the local community.

4.2.4 Livelihood Resources

The people of this area are involved in fishing in many ways. They work as fishermen, boat owners, helpers (*Khalasis*), boat captain (*Nakho*), workers in ice factories, merchant shops, transporters and drivers of fish carrier vehicles. While some clans like *Memons* and *Syeds* are associated with the local business and agriculture. Some of them have shops and hotels while others have small-scale business like *Paan* cabins, fruit shops and medical stores etc. Some people are employed in government jobs like teachers and paramedic staff.



Fishing is the main livelihood resource for the communities of creek villages *i.e. Ishaq Dablo, Hassan Dablo, Yousif Dablo and Baboo Dablo*. However, when the fishing season is off, the communities of the permanent villages collect wood from nearby Mangrove forests for their use or for selling them at *Keti Bunder* and other coastal towns. Though fishing is the predominant profession, some of the inhabitants are grazers having large herds of camels, which are exported to the Persian Gulf and other parts of Pakistan.



Non-availability of fresh water and degraded soil is the major reason for decline of the agriculture and livestock sectors. Due to inadequate alternate employment opportunities, the pressure on fisheries resources is more and is a source of diminishing fish catch, directly affecting the livelihoods of fishermen.

4.3 Wealth and Poverty Profile

The villagers have their own perception of poverty. According to their interpretation, the poor are those who are dependent only on the natural resources. The middleclass are those who have other resources along with the natural resources and can earn enough. The rich people are those who have more than one business or other kind of resources.

According to that interpretation of poverty 85% of the inhabitants of *Keti Bunder* are considered poor, 12% belong to middle class and only 8% are rich.

As per the same interpretation, all the households living in the creeks are poor and vulnerable, as there are no other livelihood resources for them except fishing, which in the present circumstances has become unreliable due to decreases in catches.

5. Key Capital Assets of the Community

5.1 Human Capital

5.1.1 Education / Literacy

The overall literacy ratio in *Keti Bunder* town is very low as compared to the district, provincial and national level average literacy ratio. The literacy among the male is 12% while among the female it is as low as 5%. The literacy ratio in the villages of *Hajamro* and *Chan* creek is almost zero, as not a single man or woman is literate.

Box: 2**Fishing season according local terminology**

The indigenous fishermen have their own terminology for fishing season. A fisherman of village Siddiq Ronhjo unfolded following fishing season according to folk terminology.

Kati Season: Kati season starts from 15th August and ends in the mid October in which the fishermen navigate into deep sea for fishing.

Kandi Season: This season starts in winter. This is also said to be deep-sea fishing season.

Charh: This season is limited to April and May in which fishermen catch Mangro, Suo, Khago, Paplet and other fish species.

Aakhir: This is the season of June, July and mid-August in which fishing is generally off due to high tides. The fishermen do not go into deep sea. Instead, they keep fishing in the creeks.

Growing poverty, lack of awareness, lack of physical infrastructure and human resources in education sector are the key causes of low levels of literacy in *Keti Bunder* and *creek* villages. There is a Primary and a High School for boys and a Girl's School in *Keti Bunder*. About 15 boys and 7 girls are said to be matriculate. As there is no Girls' High School, majority of the girls are deprived of secondary education after having completed primary education. The parents, who are interested in the higher education for their girls, allow them to receive education in the Boys' School. The standard of education in the schools is very low. As far as the creek villages are concerned, the physical location of the villages in the islands keep them disconnected from the inland schools depriving the children from education.

5.1.2 Health

A number of diseases are common in *Keti Bunder* as well as in the creek villages. These include TB, Hepatitis, Malaria, eye infections etc. The women also face gynaecological problems, especially during pregnancies. Shortage of clean drinking water is the key cause of illness. Lack of health facilities also contribute greatly to the increase in different diseases.

The Rural Health Center at *Keti Bunder* is working without a qualified doctor. The centre lacks medicines and equipment. Due to non-availability of lady doctor, the women face hardships. In emergency situation they have no option but to travel to hospitals in *Thatta* or *Karachi*. A lady doctor has been appointed in the Rural Health Centre and facilitated through provision of a residential quarter. However, she is reluctant to join her duties.

The villagers living in the villages of *Hajamro* and *Chan* creek have no health facility. For treatment, the villagers have to travel to Rural Health Centre, *Keti Bunder*.

5.2 Physical Capital

5.2.1 Land

As a part of PRA in *Keti Bunder*, the villagers were asked to prepare village map. One thing which was identified from the village map was that there is a little common land in *Keti Bunder*. A large number of inhabitants of *Keti Bunder* had their private lands in different dehs of *Keti Bunder* Taluka. However, due to growing seawater intrusion, their lands have been inundated.

5.2.2 Boats

Almost 80 percent of the fishermen of *Keti Bunder* own boats, while rest of them work as labourers who are locally known as *Khalasi*. Similarly, there are more than 50 big and small boats in village *Ishaq Dablo* and about 12 big and small boats in village *Hassan Dablo*.

The motor engines were introduced in the boats about 30 to 40 years back. The trend of these engines was followed from the villages of *Rehri* and *Ibrahim Hyderi* in Karachi. The size of big boat is 35 x 4 x 6 ft in which coaster engine is fixed. At least 10 to 12 people are accommodated in the boat at one time. The cost of big boat is around Rupees four to five lacs. The size of small boat is 22 x 3.5 x 4 ft. Boat engine is serviced fortnightly. The fishermen themselves repair their boats. However, for motor repairing they use to go to Karachi.

5.2.3 Fishing Gears

The fishermen of *Keti Bunder* and *Hajamro Creek* as well as in *Chan Creek* use different kinds of nets for catching fish. These nets are called as *Thukree*, *Raybiyoon*, *Dori* and *Rach Lara* in local terminology. According to indigenous fishermen, these nets are considered to be the most viable for fish catching.

5.3 Social Capital

5.3.1 Social Cooperation

Although the inhabitants of *Keti Bunder* belong to different casts and are divided into different *paras* but, they have close interaction with each other. Also, the residents of *Hajamro* creek and *Chan* creek belong to same cast; therefore they are in close interaction with each other.

5.3.2 Institutional Cooperation

The government institutions and NGOs, which exist in *Keti Bunder*, are Sindh Police, Forest Department, Coast Guard, Pakistan Navy, Pakistan Air Force, Education, Health and Customs Department. The NGOs active in *Keti Bunder* include WWF-Pakistan, Agha

Khan Foundation, and Pakistan Fisher Folk Forum. There is one *Madarssah* (religious institution) in the town.

The local government system is working in *Keti Bunder* town; however, it has not played an active role due to the fact that the same faces which had been running local bodies in the past are in the frontline under newly decentralized system. Majority of them belong to the influential *Memon* caste. However, some fishermen and women have also been elected as councillors. Non-availability of funds and conflicts on the power is hindering the overall working of the local governments.

The villages situated in creeks have no institutional cooperation as they are in remote areas. The PLA team during its exercise did not find any NGO in any of the villages, either in *Hajamro* creek or in *Chan* creek.

5.3.3 Social Conflicts

The major conflict of indigenous fisherfolk communities of *Keti Bunder* and surrounding villages is with the *Jaat* community who was engaged in agriculture and livestock previously but have now taken fishing as their profession, due to land degradation. According to the local fishing communities, due to a decrease in the grasses the camel rearing *Jaat* community has jumped into fishing. They are seen as competitors by the indigenous fishermen and are involved in use of harmful nets, especially *Boolo-Gujo* which is detrimental to the juvenile fish. *Boolo-Gujo* net is usually fixed at the mouth of any creek channel. It remains fixed during the low as well as high tides. During the high tides it catches fish species, including juvenile fish, coming from the deep sea to the creek and in the low tides the fish of moving with tide from creek to the sea.

Despite the ban on use of these nets, *Jaat* community people frequently use these nets with the support of the local influential, especially *Syed* family. In many cases, the influential belonging to both the *Jaat* and *Syed* community forcibly occupy the fishing channels and use harmful nets to deprive poor fishermen. According to poor fishermen, this is being done through the connivance of local police, who earns a share in the catch. Armed *Jatts* some times snatch the catch from poor fishermen.

However, according to the *Jaat* community they are not the only ones who use harmful nets but, the indigenous fishermen also use harmful nets such as, *Katra* net, which according to them is as harmful as *Boolo-Gujo*.

6. Gender Analysis

6.1 Gender & Social Status

Like other rural areas of Sindh, women are subjected to drudgery in this deltaic area. In fact, from the very childhood women are raised differently as compared to males. Their personality is moulded to be obedient, docile, self-sacrificing and submissive, less

articulate, compromising and more household loving. Girls are taught household roles by their mothers and are groomed to be good mother, good wife and a good house manager.

Sex segregation is introduced at the early age, in most cases before the five years age. Strict control over their mobility, clothes, education, and behaviours is imposed in early teens. In mid teens, she is made totally dependent upon others for making even simple decisions of her life.

Customs and discriminative traditions against women are common in the area as elsewhere in Sindh. Birth of a boy is considered to be a good omen as compared to that of a girl. The inequality between girls and boys exists in every sphere of life. Even in the matter of education, girls are deprived of it for one excuse or another. General belief is that there is no need to educate girls, as they will become part and parcel of another family after their marriages.



Women of Chan Creek preparing Village map

Like other patriarchal societies, male dominates in the family matters. This domination comes from the stereotype thought that male is superior to female. Woman's right to liberty is restricted in the name of modesty and adulteration. The male family members consider it their basic right to punish the women if they are considered to have deviated from overall social path guided by the male or from the societal traditions. The husband considers it his first and absolute right to resort to violence against his wife whenever she is found guilty of such deviation.

Traditionally women's access to land is limited due to cultural norms. Married women are expected to '*hiba*' the land in their name to their brother. *Hiba* is a legal term for 'gifts'. Marriage enhances women's decision-making role to some extent, subject to the family environment, her background and her industriousness. She gradually gains confidence and credibility within the extended family system about her role after marriage. Women have a major stake in wedding arrangements, family and children issues. Approximately, 98% girls in the area, like other rural areas of Sindh, are married without taking into consideration their choice. In some areas, young girls and unmarried women are not allowed to move out of their village, even for their *para* without permission. Bringing grocery and all articles of daily use is responsibility of men. However, on the occasion of wedding women usually go to the market to do shopping.

Women contribute significantly in the activities in house as well as outside. Household chores such as, cooking, washing, cleaning, collecting fuelwood, fetching water, cutting and chopping fodder, and rearing children are the main responsibilities of women. In addition, women folk also engage themselves in embroidery work during their free time, which due to little market access do not add substantially to the family income. The

domestic labour of women like other rural areas of Pakistan is neither recognized nor accounted for. The cultural, social and ethical roots of society are devised in such a manner that the labour of women is taken for granted.

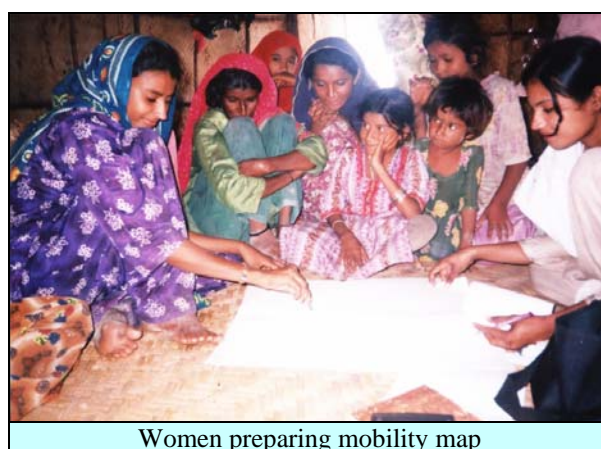
However, the indigenous fisherwomen of the area enjoy more liberty and freedom as compared to other women of the area. Since centuries, the fisherwomen have had greater role in the family matters due to the fact that the fishermen usually pass their much time in fishing. Therefore, the fisherwomen had to deal with all the family matters. It was due to such status that a number of fisherwomen had developed reputation of being the chiefs of not only their families but also of the locality or the entire clan. It was observed that the women had little restriction over their movement. Due to this, they seemed to be confident in communicating with outsiders. They also participate in the processions of Pakistan Fisherfolk Forum in *Thatta* and other cities. They also discuss their problems with the *Nazim* (Local Mayor).

Presently, two types of trends can be observed in fisherfolk communities with regard to the status of women. In the traditional fisherfolk communities there is still liberal thinking about the women. However, the agriculture communities who have converted their profession toward fisheries due to sea intrusion and reduction of freshwater in the Indus delta are rigid with regard to the status of women. In these communities women are considered a commodity whose ownership is claimed by male. As such, women are not only deprived of their basic rights and freedom but, are also confined within the house in the name of morality and decency. The veil system for the women to observe is still in practice. However, with the shift of profession towards fisheries the rigid practices are gradually getting diffused.

In a male dominated society, the women in *Keti Bunder* have a little say in their decisions. The incidents of domestic violence are common in the area. However, no honour-killing incident has ever occurred in *Keti Bunder*. The girls are married at the ages between 12 to 15 years and 75% marriages take place within families. Like other coastal areas, the divorce trend is common in *Keti Bunder*, even on minor issues the husbands divorce their wives. There are reported cases that some couples have got separated just after 15 days or one month after their marriages.

6.2 Gender Empowerment

During PLA exercise in and around *Keti Bunder* town, the overall condition of women was noticed to be wretched. They have little control over the household resources. They do not possess jewellery or other type of cash item. Poverty, starvation and deprivation are visible from their living standard. Women mostly remain engaged whole day in their household chores. They are not involved in fishing. Some women work in others houses on just Rs.5 per



Women preparing mobility map

day which mean they could earn Rs.150 in a month. They spend their earnings on their families. Some women run shops in their houses or do sewing work to earn income; others are involved in embroidery work. The women of *Keti Bunder*, just like the other parts of coastal areas get up early in the morning, at about 5:00 am and offer prayer. After that they start preparing breakfast and do other daily household chores.

With the reduced role in economic activities, the status and clout of fisherfolk women is also insignificant. In fact, fisherwomen have been impoverished by unbridled commercialism and prejudiced economic and business policies. With the expansion of fishing as an industry, women no longer have significant role in the business except that a very small number of them are involved in peeling of shrimps, weaving nets, making fish baskets, etc. Due to above-mentioned hostile environment, the economic conditions of fisherwomen have deteriorated and

Box: 4

Fatima Wants to be Educated

Fatima is a young girl who is getting private education from a teacher. She told that she was very much enthusiastic to get education for which she asked everyone to help her but no one listened to her. After a long struggle she managed to approach one lady teacher who agreed spare her time in the evening to teach her. Now she gets tuition from 7:00 to 9:00 pm daily at her home and is hopeful for her success.

Box 5: Fishing & Moon

Fishing activities of the fishermen largely depends on the moon. Fishing activities change and vary with the full moon and dim moon. The full moon is called *Jawar* and the half moon or dim moon is called *Bagi*. According to the Moon calendar prepared by the local fishermen *Jawar* starts from 9th of Islamic month and continues till 16th. During *Jawar* or the full moon, water levels remain high and the fish catch also increases. It is during *Jawar* that *Boolo – Gujo* is set in the coastal creek. However from 17th of the same month, moon becomes dull which is called as *Bagi* in the local terminology. During *Bhagi*, the water levels decreases and fishing activities also reduced and *Boolo-Gujo* is not used. This situation continues till the 23rd of the same month. From 24th, again it is *Jawar* and the peak fishing season, which continues till the 2nd of next month.

poverty and lack of empowerment among them has become endemic.

Meanwhile, the women living in creeks are cut off from rest of the world. They only remain engaged in their household affairs. The only entertainment for them is Cassette Players, which they have kept in their houses. The majority of women of *Keti Bunder* consume *Paan*, *guttka* and cigarettes which further negatively affects their incomes. Even minor children are involved in these bad habits.

6.3 Gender & Natural Resources

Due to lack of gas facility in *Keti Bunder* and surrounding villages, women rely on mangrove resources for fuelwood and fodder. They are concerned about drastic reduction in the mangroves forests; however, they find no alternatives to stop the use of mangroves.

7. Natural Resources

7.1 Fisheries Resources and their Status

Fish, shrimp and crabs are key natural resources for the communities of *Keti Bunder* and the villages situated in creeks. The peak fishing season continues from September to March. During winter season, more fish is caught from the coastal waters. The fish species caught are *Saou*, *Gand*, *Paplet*, *Sua*, etc. but, mostly the fishermen rely on small fish, which they call *Gand* (waste) which is used in chicken feed. The catch of shrimp and lobster is very low in the area.

Box: Katra Fishing

Fishing in the seawater through *Katra* net is usually done during full moon days, which is called locally as *Jawar*. A medium to full size boat is needed for *Katra* fishing as about 15 to 30 laborer can leave on boat for fishing trip. An amount to Rs 7000 to Rs. 10000 is needed for the boat oil and ration for the fishermen on board the boat. The fish catch is later on distributed as per *Patti* system. Under that system a big chunk of the earnings goes to the boat owner, as he claims six shares, one for the net, one for the boat and four shares for the engine while the remaining shares are distributed among the *Khalasis* on the equal basis. The overall incomes per trip ranges from 30,000 to 40,000. However in same cases, the fishermen return without substantial catch and in such case the owner of the boat sustains the loss.

The fish traders or middlemen who buy fish from these fishermen are influential persons who have built *chhapras* where they purchase fish and then send it to the Karachi market. The catch of fish and shrimp species, which has decreased during the recent years include *Goli*, *Dangri*, *Dandi*, *Phar*, *Patas*, and *Kiddi*, etc. Some of the fish species have nearly vanished. These include *Palla* fish, which is the most famous for its taste. The other fish species whose catch has reduced include, *Mato*, *Lour*, *Padan*, *Boska*, *Bora*, *Batoon*, *Ghanghra*, *Kachik*, *Paplet*, *Suo*, *Dangro*, and *Seeri*.

Status of Fish Species

S#	Name of Fish	Status 10 Years Back	Present Status	Cause of Reduction
1	Sua	Boat full of the fish was caught	It has almost vanished	Use of <i>Boolo-Gujo</i> net
2	Dangra	Boatful was caught	Almost vanished	Same
3	All	One fishing boat caught about 1000 to 2000 pieces	Hardly 500 pieces are caught	Deep sea trawlers
4	Paplet	Its catch was 200 to 300 kg in one trip.	One boat brings only 50 pieces.	Same
5	Seeri	Its catch was 1000 kg per fishing trip	Its catch has reduced to only 10 kg per fishing trip	<i>Boolo-Gujo</i> net
6	Danthi	Its catch was 100 to 200 kg per fishing trip.	It is only 10 to 20 kg	Use of <i>Boolo-Gujo</i>
7	Goli	Its catch was up to 100 kg per fishing trip.	It is only up to 5kg	Same
8	Sodi	Its catch was up to 400kg per fishing trip.	Now only up to 5 kg	Same
9	Khaga	Its catch was 1000 to 2000 pieces per fishing trip.	Now one boat brings hardly 20 to 50 pieces	Same
10	Palla	Boatful was caught	Completely vanished	<i>Boolo-Gujo</i> , reduction in fresh water from Indus River

Status of Shrimp Species

S#	Name of Shrimp	Status 10 Years Back	Present Status	Cause of Reduction
1	Jahira	Its catch was up to 500kg Per fishing trip.	Now it is hardly 5 kg per fishing trip	Use of <i>Boolo-Gujo</i> net Destruction of mangroves
2	Tiger	Its catch was up to 100 kg per fishing trip.	Hardly one piece is caught per fishing trip	Same

7.2 Mangrove Resources and their Status

The mangrove forests exist in the creeks near *Keti Bunder*. However, the forests have shrunk considerably, mainly because of reduction in freshwater flows into the Indus delta. In *Hajamro* creek, mangroves exist in small amount whereas, in *Kangro*, *Khober*, *Goro* and *Turchan* creeks, the mangrove forests have completely vanished. Some mangrove trees also exist in *Khobar* creek, which is said to be the last



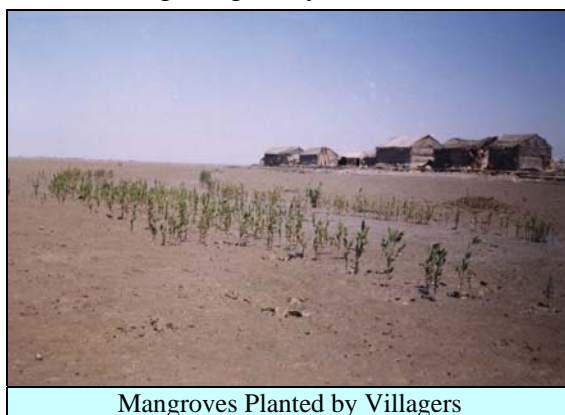
Mangrove Forests in Chan Creek

creek, situated on Pakistan-India border. Another cause of reduction is the use of mangroves as firewood and fodder. Almost, 70% reduction has occurred in the mangrove forests during last three to four decades. This reduction, as the villagers mentioned, has occurred mainly due to negligence on the part of the Forest Department.

Another reason for destruction of mangrove forest is commercial cutting mostly by the people of different sub-tribes of *Jaat* tribe, namely *Faqeerani* and *Heesbani* for income earning through their selling at *Ibrahim Hyderi* Karachi. The rate of mangrove wood is Rs. 40 per *maund*. At least 100 *maunds* of mangrove can be loaded on one boat.

The residents of *Yousif Dablo* informed that the officials of the Forest Department requested them to take responsibility of looking-after mangrove forests. But, as they are busy in fishing, they refused to take this responsibility. The Forest Department also planted mangroves but they could not sustain due to their negligence.

Since, most of the mangrove areas in *Keti Bunder* are under the control of Board of Revenue and they have remained stunted due to lack of protection against open grazing and cutting. However, the mangroves in *Dabbo* creek complex are healthy and thick due to protection by the Forest Department. This area is a major fishing ground. The *Keti Bunder* creek system also harbors a rich fauna including, migratory and resident birds (cranes, flamingoes, pelicans, cormorants, terns, waders, kites, sea gulls, herons etc.), mammals (wild boar, jackal, humpback and bottlenose dolphins) and some reptiles (snakes and lizards).



Besides, towards the west of *Keti Bunder*, on the opposite bank of the *Ochito* River, there is some vegetation comprising of salt bushes. These consist mainly of *Oryza* grass and *Tamarix* shrubs in the immediate vicinity of the settlements and mangroves at the distance of 4 to 5 kilometers from the settlements. In higher mudflats, not subject to daily inundation, there is a low scrub of *Salsola imbricata* and *Suaeda fruticosa* with scattered bunches of grasses such as *Urochondra setulosa* and *Halopyrum mucronatum*.

8. Problems' Analysis

8.1 Reduction in Fresh Water Indus Flows in the area

The drastic reduction in flows of the Indus River in deltaic region and its consequences in the form of environmental and livelihood degradation have begun with the construction of mega irrigation infrastructure upstream. Indus water flows to delta started declining way back in 1890s when the Punjab irrigation system was developed. The construction of *Sukkur* Barrage in 1932, *Kotri* in 1955 and *Guddu* Barrage in 1962 further curtailed the quantity of freshwater reaching the Indus Delta resulting in massive degradation of land,

agriculture, forestry and other natural resources in the deltaic region, including *Keti Bunder*.

8.2 Illegal Cutting and Browsing of Mangrove Resources

An indifferent attitude of the local people towards the conservation of mangroves is one of the two most important factors, besides scarcity of freshwater in the region, contributing towards rapid degeneration of the natural resources. The local population depends extensively on mangroves to meet their fuelwood needs and for grazing their animals. This situation is further aggravated by the lack of community role and interest in replanting of mangroves, a duty that has been assigned to nature and officials of the Forest Department. The result is, that mangrove cover is shrinking year by year.



Degraded mangrove area in Chan Creek

8.3 Lack of Health Facilities

Lack of health facilities is one of the key problems of *Keti Bunder* and the surrounding villages. There is only one RHC in *Keti Bunder* and one dispensary run by the Fishermen Cooperative Society. Non-availability of doctors and other paramedical staff due to remoteness of the area and lack of communication infrastructure is another problem. There is also a problem of shortage of medicines in the health centre. According to local doctors, various diseases common in the area include Hepatitis-B, acute respiratory tract infection, malaria, typhoid, tuberculosis, etc. Majority of these diseases are water borne and women and children suffer most from such diseases.

8.4 Lack of Fish Landing Facilities

One of the main problems being faced by the fishermen of the area is the lack of any fishing *Jetty*. As a result, the fishermen face difficulties in fish landing. Even there is no *Jetty* in the Taluka Headquarter, *Keti Bunder*. Similarly, lack of local marketing system is one of the main causes of exploitation of the local fishermen by the middlemen (fish traders). This is because smaller fishermen cannot afford to transport their fish catch to Karachi; hence, they have to sale their catch to the middlemen on throwaway prices.

Box: Difference between <i>Katra</i> and <i>Boolo-Gujo</i>	
Katra	Boolo- Gujo
<ul style="list-style-type: none"> • It is used in seawater therefore is little damaging. • It is not fixed at one place but it is roaming along with the water current. • It catches juvenile fish species. • It is used only for six months. 	<ul style="list-style-type: none"> • It is fixed at the mouth of the channel stopping the movement of the fish species. • It is fixed during the <i>Jawar</i> (the high tide) thus, does not allow fish species to approach shallow waters for reproduction. • It is fixed at one place. It remains fixed in June and July, the breeding season of the fish and shrimps. • By remaining fixed for many days it pollutes the seawater with dead fish caught in it. • Fishermen and their boats are some times caught and damaged in the net. • It catches each and every fish and shrimp species including <i>Paplet</i>, trash fish, <i>Sana</i> etc. • Those using <i>Boolo-Gujo</i> earn substantial amounts.

8.5 Use of Harmful Nets

With the passage of time, entry of non-indigenous people, especially of those with clear motives of moneymaking has resulted in increasing use harmful fishing nets such as, *Boolo-Gujo* and *Katra*. These destructive nets are being used in creeks, as well as in the open sea. Use of such nets results in the genocide of fish and shrimps. Sindh Government under a notification issued in 1995 had banned the use of *Boolo-Gujo* and other destructive nets. However, due to lack of proper enforcement of the law, these deadly nets are being used widely. This affects the livelihood of poor fishermen who own small boats and fish in creeks waters only

Use of *Boolo-Gujo* is also causing environmental hazards as it remains fixed for many days. Normally, the fisherman takes out this net after eight days. Therefore, the fish trapped into it dies before they are taken out, creating pollution in the sea. The *Boolo-Gujo* has been introduced by Bengali fishermen but, now the local fishermen also use it.

Similarly *Katra* net is fixed surrounding the areas of fish/shrimp population. When taken out it collects the whole fish/shrimp population, along with the juvenile fish, while sweeping the whole ground. The influential and wealthy people usually use this net because, the entire system, which operates this net including, boat and net, called "*Karkhana*" is much costly. The influential and wealthy middlemen usually purchase the whole *Karkhana* and handover the same to experienced fishermen locally named as "*Ghatoo*", on share basis. *Katra* net was introduced about 50 to 60 years ago. According to fishermen, *Katra* net is not as harmful as *Boolo-Gujo*. The fishermen stop *Katra* net in June and July.

8.6 Occupation of Coastal waters by the Influential People

The influential of the area have virtually occupied creeks as their private properties wherein they allow their favourites to use *Boolo-Gujo* nets. During the high tide, seawater enters into the creeks bringing larger quantities of shrimp and fish, including juveniles which get trapped in the net, usually fixed at the middle of creek. The catch of juveniles leads to no or inadequate recruitment of fish reaching the maturity. The juvenile fish caught in the net has no market value and being trapped into the net for a long period of time; it dies and pollutes the creek waters.

8.7 Seawater Intrusion

As the freshwater of Indus River buffers the highly saline water in the deltaic area, the reduction in its flow has led to inland intrusion and encroachment of fertile land by the seawater. Vast areas of *Keti Bunder* taluka, which were used to be productive, have now been under the seawater. On the other hand wave action along the creeks results in erosion of creeks and the fertile land. One could see thousands of acres of land encroached by sea or eroded in the area, leading to a reduction in productive resource base for the local communities.

8.8 Decline in Alternative source of Livestock

Since centuries livestock has remained the key livelihood resource for the coastal communities besides fisheries and agriculture. Feeding their cattle was never a problem in the past, as the coastal lands had green pastures that used to appear on fertile mudflats

Box:

Role of camel in local Economy

The female camel gives birth after 12 months and feeds the baby camel for about 12 months. The female camel stops reproducing at the age of 20 years. Majority of female camels become pregnant in winter season. *Jatts* sell male baby camel at the price of RS.12000 while female baby camel at the rate of RS.15000. The adult female camel is sold at 25000 rupees. About one week after birth, *Jatts* use the milk produced by the female. They make curd from the milk of female that is locally referred as *Khatto*. Every *Jatt* keeps a herd of 10 to 12 camels which includes one or two males and rest of it females.

Jatts of *Keti Bunder* rear *Kachi* breed of camels while other types of breeds include *Makrani* and *Sindhi*. The camel is also used for sacrifice on the occasions of *Eid-ul-Azha*, marriages and other celebrations. *Jatts*, after selling their camels get boats for fishing. The skin of camel is locally used for making bags for carrying water. The butchers from Karachi buy minor camels at the rate of Rs.3000.

The ailments among camel include cough, urinary and abdominal diseases which become fatal sometimes. The sick camels are given different kinds of indigenous treatment which includes *Gomadir Boti* for fever and *Saunf* for pain in abdomen and Black Pepper in case of flue. In case of urinary problem, they are subject to burns on the back of their bodies. In case of certain unknown ailments, they consult veterinary doctor located at *Mirpur Sakro*, who charges RS.100 to 200 for treatment. According to local knowledge, a camel consumes 25 gallons of water in a day. According to them, as camel feeds on salty mangrove leaves, it drinks more water. Due to decrease in mangrove cover and freshwater availability, the number of camels kept has decreased.

formed in the deltaic areas due to silt deposition. People used to keep livestock in large

numbers and the dairy products (for example, butter) were one of the major export items of the area. Local communities regularly gathered mangrove leaves for cattle, buffalo and donkey fodder. Herds of camel are left to browse on many mangrove islands along the coast.

However, with the reduction in Indus flow in the area reduction in the mangrove forests, as well as growing seawater intrusion resulting in loss of green pastures, the local communities have started losing their livestock livelihood resource.

8.9 Degradation of Agriculture Land

Before the construction of dams and barrages, the freshwater discharge from the Indus River was large enough to push back the sea currents up to a hundred miles from the shore. Due to this enormous quantity of fresh water and the silt deposition, the deltaic lands were believed to be the richest in the area. Agriculture yields were high. People of *Keti Bunder* would grow a variety of crops after the recession of floods in *Kharif* season. The silt brought during high floods would settle in the vast catchments and provide a fertile bed for *Rabi* cropping and pastures for livestock grazing. Once, the red rice used to be major cash crop of the area, exported to the coastal regions of India and Gulf countries. The harbours of *Keti Bunder* were full of boats from *Dawarka*, *Gumti*, *Muscat*, and the *Persian Gulf* ports.

However, with the reduction in fresh water flow, major ecological changes are taking place. Cultivation of agriculture crops in the flood plains has decreased. Red rice cultivation has also vanished in the area. Similarly, orchards of banana, papaya and guava cultivation has declined impacting the livelihoods of local communities drastically.

8.10 Reduction in Fish Catch

Presently, fishing is the key livelihood resource for the communities at *Keti Bunder*. However, fish catch has drastically reduced due to increase in number of fishing boats, as well as the fishermen population. All the commercially valuable fish and shrimp species, which were important source of export earnings for the country and the local population have come under severe threat.

8.11 Drinking Water Shortage

Drinking water shortage is one of the key problems of the local communities in and around *Keti Bunder*. Drinking water is a rare commodity for the majority of the population. Water is fetched from the irrigation channels, some 10-20 km distance from the town, through tankers. The local communities pay Rs. 700 to 1200 per water tanker. However, all the communities cannot purchase the complete water because of the two major reasons. Firstly, they are unable to pay such an amount due to poverty and secondly, they have no storage tanks to accumulate water. The local communities usually purchase small size cans of 33 liters capacity at the cost of Rs.10-20. Few villagers have

established water ponds for storage while the others have constructed cemented water tanks to store drinking water.

Reduction in freshwater flows of Indus River has further aggravated the drinking water shortage in the area due to increase in salinity of underground aquifers and non availability of surface water in the creeks, that was previously used by the fishermen communities for drinking purposes. Resultantly, not only a large amount of their earning is spent on the purchase of drinking water, but also a lot of time and energy is wasted in the procurement of water. The villagers from the remote areas bring empty cans to *Keti Bunder* to purchase water, which consumes almost half of the day. Similarly, the villagers living in the islands use their boats for commuting between their villages and *Keti Bunder* to purchase water.

Besides this, as the sea tides have engulfed creeks, the villages established on creek banks have been converted into islands, as they have been completely disconnected from the land.

8.12 Exploitative System of Informal Credit

With the conversion of traditional fisheries into mechanized fisheries, this sector has been greatly influenced by the middlemen. As the exploitation of fisheries resources needed boats, nets and other necessary equipments, the poor fishermen have been rendered unable to compete with rich fishermen. This has created a role for middlemen who bring the poor fishermen under their “bondage” in two ways. They either extend credit payments to the poor fishermen for the purchase of necessary fishing equipments including boats and nets, or provide them those equipments to work for them. In both the conditions, the poor fishermen are converted into slaves. They are made bound to sell their fish catch to the middlemen rather than selling in open market. The middlemen

Box:

Venn Diagram

During the Venn diagram exercise in *Keti Bunder*, the villagers gave much importance to the middlemen & shopkeepers. According the villagers, both despite being exploitative, are the key part of their fishing livelihood system. The middlemen provide loans to the fishermen when they go for fishing trips to cover their emergency expenditures while the shopkeepers provide them the items of daily use on credit which they pay back during the fishing seasons. Interestingly, despite the restructuring of the local governance, the institution of local government has remained of little benefit to the local communities.

purchase their fish catch on throwaway prices under the terms and conditions of bondage. This bondage situation continues for generations because the poor fishermen are not able to pay back heavy loans due to little income. Also, in some cases, the middlemen do not show interest in receiving back the loan money and continue to exploit the poor fishermen. This bondage results in the slavery of entire family including, men, women and children who are compelled to catch more and more fish for the maximum benefit of middlemen. The middlemen also compel the poor fishermen to fish for long hours and use harmful nets, resulting in overfishing and degradation of fisheries resources.

9. Village Development Plan: Community based planning

9.1 Stakeholder Analysis

The key stakeholders of *Keti Bunder* town are fishermen; people with other small and medium business and the middlemen, local government, provincial fisheries and forest departments, Fishermen Cooperative Society, WWF-Pakistan and Pakistan Fisherfolk Forum (PFF).

People of *Keti Bunder* did not seem to be satisfied with the performance of PFF which, according to them, has done nothing for the welfare of fishermen. They complained that during the last years' rainy season, PFF received a huge amount of relief funds from the donors but, the poor fishermen of *Keti Bunder* did not receive a single penny. They informed that the unit in charge of PFF *Keti Bunder* also uses *Boolo- Gujjo*, against which the PFF has been raising a voice.

During the PLA exercise, women were asked to prepare Venn diagram so as to know which institutions/organizations are helpful for the villagers. The women showed interest in school and *Memon* community. The school provides education for girls whereas *Memons* are mostly businessmen and give loan to the villagers and help them on many other occasions. Some of them complained that *Memon* community sell essential commodities at expensive rates and take higher interest on money credited by them.

The women were seemed to be very much concerned over the use of *Boolo-Gujjo* nets, as their use results in the reduction of fish catch. They doubt that if the same situation persists, the fish stock would completely vanish in their area. The women also complained about the lack of school in the village as result of which their children are being deprived of getting education. Interestingly they did not like Rural Health Centre (RHC), Police *Chowki* and *Cholani* cast. According to them there is no benefit of RHC, as no qualified male and female doctor is available there.

9.2 Prioritisation of the Problems by Male (*Keti Bunder*)

1. Drinking water Shortage
2. Harmful nets
3. Lack of education facilities
4. Lack of health facilities
5. Commission and loan system
6. Migration of different villagers
7. Lack of alternate source of jobs in June and July
8. Lack of proper system for the protection from natural calamities
9. Lack of electricity in surrounding villages of *Keti Bunder*
10. Inefficient telephone system
11. Reduction of fish and shrimp catch
12. Occupation of coastal waters by sea lords
13. Threat to protection band (embankment) from sea intrusion
14. Lack of *Jetty*

15. Reduction of freshwater of River Indus
16. Destruction of agricultural lands by seawater
17. Lack of drainage system
18. Reduction of mangrove forest
19. Problems of fishermen of round nets
20. Increased number of Street dogs

9.3 Prioritisation of the Problems by Male (*Hajamro Creek*)

1. Lack of drinking Water
2. Lack of education facilities
3. Lack of health facilities
4. Use of harmful nets
5. Low rate of fish catching/lack of marketing
6. Lack of protected band for village
7. Lack of tanks for the storage of drinking water

9.4 Prioritisation of the Problems by Male (*Chan Creek*)

1. Shortage of drinking water
2. Reduction in mangroves
3. Low rate of fish catching
4. Use of harmful nets

9.5 Prioritisation of the Problems by Female (*Keti Bunder*)

1. No proper hospital for women
2. Shortage of drinking water
3. Lack of drainage system
4. Use of *Boolo-Gujjo*
5. Monopoly of sea lords
6. Police/Rangers tax
7. Unpaved streets
8. Lack of gas supply
9. Lack of girl high school
10. Poverty
11. Lack of transport facilities
12. Reduction in mangrove forests

9.6 Prioritisation of the Problems by Females (*Hajamro Creek*)

1. Lack of education
2. Lack of electricity
3. Poverty
4. Unemployment
5. Health problem
6. Reduction in mangroves
7. No drainage system
8. Lack of transport
9. Reduction in fish catch

9.7 Community Based Planning by Male

#	Problem	Solution	Community Role	WWF Role
1	Shortage of Drinking Water	<ul style="list-style-type: none"> • Maintain Pipeline System • Build Water Tanks • Provide water through boats • Build big water tanks at the shore of the river • Discharge water in Indus 	Take care of water tanks	Contact with concerned authorities
2	Use of Harmful Wire Nets	Provide alternate jobs against the ban on harmful nets		<ul style="list-style-type: none"> • Ensure easy credit. • Scientific research
3	Lack of Education facilities	<ul style="list-style-type: none"> • Appoint teachers • Open Training Institutions • Establish Schools where they are not available 	<ul style="list-style-type: none"> • Send their children to school. • Monitor the teachers 	<ul style="list-style-type: none"> • Provide environmental training • Coordination for schools
4	Lack of Health facilities	<ul style="list-style-type: none"> • Appointment of Lady Doctor • Ambulance Service • Mobile Dispensary • Dispensaries in other villages • Health education • Medicines for snake bite 	Coordination with doctors	Fishermen Cooperative Society Training for health
5	Loan and Commission System	<ul style="list-style-type: none"> • Easy Loan • Fishermen's Bank • Saving and Loan System 	Saving	Developing Linkages
6	Threat of drowning of villages	Build Protected Bands	Give time Look after Bands	Raise concern with concerned agencies
7	Lack of alternative Jobs	<ul style="list-style-type: none"> • Compensation • Tourism & Build Huts 	Ready to do work	Training for tourism

9.8 Community Based Planning by Female

#	Problem	Cause	Solution	Community Role	CBO Role	WWF Role
1	Shortage of Drinking water	No water supply. Sweetwater has been saline	Provision of water supply	Community will cooperate with the government	CBO will raise the issue to concerned authorities	Will help
2	Non-availability of lady doctor. Insufficient health facilities in hospital	Lady doctor does not stay in <i>Keti Bunder</i> due insufficient facilities.	Facilities should be provided in the hospital and ensure the availability of lady doctor.	Villagers ask the head of the <i>Keti Bunder</i> .	Will cooperate and approach the government.	Help to contact with government.
3	Poverty	Villagers don't have boats	Boats should be given on easy loan	Will cooperate	Will take initiatives	Cooperation
4	Unemployment	Reduction of fish and shrimp	Open vocational Training Centre	Cooperation	Take initiate with head and Nazim of village	Raise issue with govt. along with CBO.
5	Reduction in fish catching	Use of harmful nets	Stop the harmful nets	Meeting with head of the village	Help	Hold meetings, Raise awareness
6	Electricity	Over billing	Correct billing	Cooperation	Approach concerned authorities	Raise issue up to government
7	Gas	No gas is available	Provide gas connection	Cooperation with the government	Cooperation	Raise issue up to government
8	Drainage System	No drainage system	Provide drainage system	Cooperation	Contact with the government	Raise issue up to government
9	Police Tax	Take more tax	Tax should be eliminated	Will ask government	Hold processions	Raise issue up to government
10	Occupation of sea lords on coastal waters	Police supports them	Control should be eliminated	Join hands with each other	Come into contact with government	Raise issue up to government
11	Filth in the streets	Streets are non-paved	Streets should be paved	Villagers keep dustbins in their streets	Meet with Nazim on this issue	Raise issue up to government
12	Girls' High School	No High School for girls	Provide Girls High School	Will provide land for school	Take initiatives along with the villagers	Raise issue with the government
13	Drugs in the area	No restriction on drugs.	Impose ban on drugs	Cooperation	Raise issue up to government	Raise issue with govt. Aware people.
14	Street dogs	Filth in the streets	Poison stray dogs	Cooperation	Raise issue with govt.	Raise issue with govt.

10 Training Needs Assessment

10.1 Training and Capacity Building Needs of the local Communities

- Alternative Skills
- Community organization
- Saving and Credit System
- Community based management of natural resources

10.2 Training Needs of local CBOs and NGOs

- Organizational management
- Financial management
- Natural resource management
- Project management

10.3 Training Needs of Line Departments and WWF

- Social Mobilization
- Community Based natural resource management
- Project management

11. Conclusion

The natural livelihood resources of *Keti Bunder* and its surrounding areas are under constant threat of depletion and degradation. The resource base of the local communities has already shrunk to a greater extent. The productive resources such as, agriculture and livestock have almost vanished and the communities' dependency has largely increased on fisheries resources. This further threatens this remaining natural resource. The key cause of reduction and depletion of natural resources in the area is reduction in the flow of Indus in the area, coupled with other natural and man made pressures.

Reduction in the freshwater flows downstream the Kotri Barrage has not only affected the mangrove forests in the form of reduction in their acreage, quality and decrease in diversity of species but, has induced inland seawater intrusion which has resulted in degradation of agricultural lands. Thousands of acres of fertile land have been encroached by this phenomenon which used to produce red rice, cotton, wheat and vegetables previously.

Besides, the ground water aquifers have been made saline by seawater, resulting in shortage of drinking water for local consumption. The previous green and grassy lands around *Keti Bunder* are currently depicting the picture of degradation and desertification and the size of this picture is increasing with every passing day. Consequences of this degradation are quite evident in the area. With the degradation of land, vanishing of green pastures, reduction in agriculture products and livestock population, as well as fish catch, the poverty and displacement have haunted the area.

Annex: I: Study Team

- Sikander Brohi Principal Researcher
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- Fayyaz Rasool
- Faiz A Siddiqui
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- Hamida Maznani
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- Fakhrunisa Jatoi
- Rubina Bhatti
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Annex: II: List of PRA Tools Used in the Field

The teams used following key tools to collect data from the field:

- Observation
- Semi-structured interviews of individuals, key informants and groups
- Focus Group Discussions
- Village Social Maps
- Village Resources Maps
- Transect walks
- Timeline
- Trend Lines
- Venn Diagrams
- Wealth Ranking
- Daily Activity Clocks
- Seasonal Calendars
- Resource Picture Cards
- Income & Expenditures Matrices
- Pair-wise Ranking / Problem Ranking
- Problem Analysis Chart
- Community Action Plan