

# **Land Acquisition and Resettlement Plan**

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## **PAK: 48078-005 MFF II Power Transmission Enhancement Program (PTEIP II), Tranche 3**

### **Draft Land Acquisition and Resettlement Plan for Grid Connected Battery Energy Storage System Pilot Project**

#### **Prepared by:**

Environment & Social Impact Cell of National Transmission and Despatch Company (NTDC), WAPDA House, Lahore.

This Land Acquisition and Resettlement Plan (LARP) is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

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**NATIONAL TRANSMISSION AND DESPATCH  
COMPANY, PAKISTAN**

**2<sup>nd</sup> POWER TRANSMISSION ENHANCEMENT  
INVESTMENT PROGRAM Funded By ADB through MFF 2**

**(Tranche 3)  
Social Due Diligence Report (DDR)  
Sub-Project 4: Grid Connected Battery Energy Storage System  
Pilot Project**

18<sup>th</sup> May 2018



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## ABBREVIATIONS

ADB	Asian Bank Development
DDR	Due Diligence Report
DPC	Displaced Person Committee
EMA	External Monitoring Agency
ESIC	Environment and Social Impact Cell
GOP	Government of Pakistan
GRC	Grievance Redress Committee
GS	Grid Station
kV	Kilo Volt
LAA	Land Acquisition Act
LAC	Land Acquisition Collector
LAR	Land Acquisition and Resettlement
LARF	Land Acquisition and Resettlement Framework.
LARP	Land Acquisition and Resettlement Plan
M&E	Monitoring and Evaluation
MFF	Multi Financing Facility
MVA	Mega Volts Ampere (Capacity)
NTDC	National Transmission and Despatch Company
PC-1	Planning Commission-1
PIU	Project Implementation Unit
PTEIP	Power Transmission Enhancement Investment Program
RADC	Review and Approval of Document
SPS	Safeguard Policy Statement
TA	Telegraph Act 1885
T/L	Transmission Line
TOR	Terms of Reference
WAPDA	Water and Power Development Authority

## Definition of Terms

<b>Displaced Household</b>	All members of a subproject affected household residing under one roof and operating as a single economic unit, who are adversely affected by the Project or any of its components; may consist of a single nuclear family or an extended family group.
<b>Displaced Persons</b>	In the context of involuntary resettlement, displaced persons are those who are physically displaced (relocation, loss of residential land, or loss of shelter) and/or economically displaced (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.
<b>Compensation</b>	Payment in cash or in kind of the replacement cost of the acquired assets.
<b>Carriageway</b>	Part of the road that is available for traffic. It does not include the shoulders.
<b>Construction Limit</b>	Maximum extent of the area in which the contractor may work.
<b>Corridor of Impacts</b>	This is the area that is likely to be physically affected by the construction, including locations adjacent to the actual construction that may be affected by noise, vibration, etc.
<b>Cut-of-Date</b>	The completion date of the census of project-displaced persons is usually considered the cut-off date. A cut-off date is normally established by the borrower government procedure that establishes the eligibility for receiving compensation and resettlement assistance by the project displaced persons. In the absence of such procedures, the borrower/client will establish a cut-off date for eligibility.
<b>Encroachers</b>	People who have trespassed onto private/community land to which they are not authorized. If such people arrived before the entitlements cut-off date, they are eligible for compensation for any structures, crops or land improvements that they will lose.
<b>Entitlement</b>	Range of measures comprising compensation, income restoration, transfer assistance, income substitution, and relocation, which are due to displaced persons, depending on the nature of their losses, to restore their economic and social base.
<b>Formation Width</b>	Outer boundary of the construction including the embankment (if any).
<b>Economic Displacement</b>	Loss of land, assets, access to assets, income sources, or means of livelihood because of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.
<b>ESC:</b>	Environment and Social Cell.
<b>Involuntary Resettlement</b>	Land and/or asset loss, which results in a reduction of livelihood level. These losses have to be compensated for so that no person is worse off than they were before the loss of land and/or assets.
<b>Irish Crossing</b>	Where a road crosses a water course in the absence of a bridge or culvert. This is also known as a ford or causeway.
<b>Meaningful Consultation</b>	Is a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.
<b>Physical displacement</b>	Meaning relocation, loss of residential land, or loss of shelter a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions or land use or on access to legally designated parks and protected areas.
<b>Pavement Width</b>	Generally understood to be the width of the carriageway, but may include the shoulders if these are sealed.
<b>Rehabilitation</b>	Compensatory measures provided under the ADB Policy Framework on Involuntary Resettlement other than payment of the replacement cost of acquired assets.

<b>Replacement Cost</b>	The rate of compensation for acquired housing, land and other assets will be calculated at full replacement costs. The calculation of full replacement cost will be based on the following elements: (i) fair market value; (ii) transaction costs; (iii) interest accrued, (iv) transitional and restoration costs; and (v) other applicable payments, if any. In applying this method of valuation, depreciation of structures and assets should not be considered.
<b>Squatters</b>	Meaning those people who do not own the land but are possessing and using it for residential, commercial, agricultural or other economic purposes, and as such they usually not entitled to land compensation but sometimes provided with assistance if they are found vulnerable; they are, however, entitled to compensation for the loss of built-up structures, trees, crops and other assets.
<b>Vulnerable Groups</b>	Distinct group of people who may suffer disproportionately from resettlement effects. The policy defines vulnerable groups as households below the poverty line, the elderly, those without legal title to assets, landless, women, children and indigenous people.

## **Executive Summary**

1. This Due Diligence Report (DDR) has been to the ADB funded Power Transmission Enhancement Project Tranche 3 for the installation of Grid connected Battery energy storage system proposed by the NTDC the Government of Pakistan. The proposed sub-project will involve the Lithium-ion Battery Packs (5 MWh) and Balance of system including inverters (20MW). All project activities will be conducted within the boundaries of the existing Jhimpir-1 sub-station located in Jhimpir in Thatta district in Sindh province of Pakistan.
2. The building will also be constructed to house this electronic hardware consisting of the battery packs and inverters and thus civil works for development of this building which shall be of a limited scope will also be conducted under this proposed sub-project. This sub-project will contribute to the improvement of the overall performance of the power distribution sector, improving distribution efficiency, broadly widening access to power to drive economic opportunities. The major beneficiaries of this sub-project will be the general public and the industry in the country and all other consumers that use power distribution services directly or indirectly.
3. Since the project scope is very limited and all types of project civil works activities will be carried out within the existing sub-station boundaries, hence no land acquisition and resettlement is involved. The project falls in category “C” of IR (Involuntary Resettlement) policy and IR policy will not trigger off here unless there is change in the scope of the study.
4. The project area is also confirmed not to have presence of any IPs communities while the installation work will not cause any economic and physical dislocation of local peoples. The subproject has been categorized as “C” of indigenous peoples. Therefore, no compensation of any kind is applicable in this subproject.
5. No further safeguards documentation work is needed unless there is any change in the impacts situation, which NTDC (if it happens so) will inform ADB in advance for appropriate actions.

## I. INTRODUCTION

### A. Overview

1. Under Tranche III of NTDC Power Transmission Enhancement Investment Program II (MFF II), this fifth sub-project i.e. 'Grid Connected Battery Energy Storage System Pilot Project' consists of the following activities:
  - Lithium-ion Battery Packs (5 MWh)
  - Balance of system including inverters (20MW)
2. The GOP has requested the Asian Development Bank (ADB) to provide finance for the proposed subproject, to fulfill the overall objective of the MFF to encourage economic growth and improve transmission efficiency by creating a series of national improvements.
3. The project is part of the NTDC's overall power development program and is proposed to strengthen the transmission system to fulfill the need of secure, safe and reliable power supply and to meet not only the existing requirement but also the future demand of the country for sustained economic growth.
4. This Social Due Diligence Report (DDR) has been prepared to the ADB funded Power Transmission Enhancement Project Tranche 3 for Grid connected Battery energy storage system proposed. The proposed sub-project will involve the Lithium-ion Battery Packs (5 MWh) and Balance of system including inverters (20MW). All project activities will be conducted within the boundaries of the existing Jhimphir-1 sub-station located in Jhimpir in Thatta district in Sindh province of Pakistan.
5. The building will also be constructed to house this electronic hardware consisting of the battery packs and inverters and thus civil works for development of this building which shall be of a limited scope will also be conducted under this proposed sub-project. This sub-project will contribute to the improvement of the overall performance of the power distribution sector, improving distribution efficiency, broadly widening access to power to drive economic opportunities. The major beneficiaries of this sub-project will be the general public and the industry in the country and all other consumers that use power distribution services directly or indirectly.
6. The National Transmission and Despatch Company (NTDC), Government of Pakistan is the project executing agency (EA). The Environment and Social Impact Cell (ESIC) is addressing the day-to-day land acquisition and resettlement impacts of the project. Moreover, a Resettlement Specialist hired as an individual consultant provide technical assistance to ESIC in matters related involuntary resettlement.
7. Due diligence was conducted from May 07 to 13 2018 by the Resettlement Specialist with assistance from the ESIC. The primary objective of the due diligence was to identify and assess whether the NTDC improvements work would entail any land acquisition or resettlement (LAR) impacts and to prepare Land Acquisition and Resettlement Plans (LARP), where required, in accordance with ADB's Safeguard Policy Statement 2009 (SPS) and applicable national/provincial laws and regulations.
8. The aim of the due diligence was to (a) verify if there are involuntary resettlement risks or impacts of the proposed civil works; (b) determine if there are feasible technical/engineering



solutions to avoid such risks or impacts; and (c) confirm whether a land acquisition and resettlement plan (LARP) needs to be prepared.

## **B. Need for Sub-Project**

9. Pakistan is a country with an economy of improving performance with a wide network of power distribution. However, the standards and conditions of the power distribution are inadequate to meet rapidly growing power demand. This situation limits reliable power distribution and therefore the contribution of the power sector to national development and economic growth. To cope with the constraints, the existing power distribution infrastructure has to be improved and upgraded. The overall contribution of power infrastructure also requires institutional arrangements and capacity that support strategic management of the sector, and planning and management of investments.

10. This sub-project will contribute to the improvement of the overall performance of the power distribution sector, improving distribution efficiency, broadly widening access to power to drive economic opportunities. The beneficiaries of the sub-project will be people, companies, and government and non-government agencies in Pakistan that use power distribution services directly and indirectly. Communities indirectly served by the sub-project will benefit from improved, secure faster distribution services. Power users will benefit in terms of secure power and improved power safety and potentially increased productivity.

11. In order to achieve economic growth and poverty reduction, it is essential to ensure a reliable power supply to an increasing number of industrial, agricultural, commercial and domestic consumers. Average increase in power demand of country during next 10 years is about 4.96% per annum. To cope with this growth in demand, additional capacity will be required annually.

## **C. Design Aspects**

### **C1 Battery Energy Storage System (BESS)**

12. Battery energy storage is a versatile technology that offers advantages for both power and energy applications by selecting from a variety anode and cathode materials to meet the needs of the specific application. The choice of battery chemistry depends on the application (power or energy), the depth of discharge and the number of charge/discharge cycles per year. Short-duration discharge (such as for frequency regulation) can be from a few hundred milliseconds up to about 15 minutes, depending on the application. In general, frequent discharge of short duration storage implies hundreds of discharges over the course of a year.

13. As an energy source, a BESS has electrical characteristics that are quite different from a traditional, mechanical generator, which with a rotating mass that has a finite ramp rate. The absence of inertia allows the BESS to respond to load fluctuations orders of magnitude faster than any engine or combustion turbine in an electric power system. However, BESSs are limited in their available energy depending on their state of charge (SOC) at any given point in time. Practical size considerations and inherent characteristics of most battery chemistries generally limit the maximum energy storage times to between two and six hours for deep discharges.

14. Generally, an application that requires a shallow discharge or a series of shallow charge/discharge cycles over a sustained period can be successfully combined with a deep discharge application, as long as controls are in place to reserve the capacity needed for the deep discharge as and when needed. This is the case for the frequency regulation application combined with the deep discharge required for spinning reserve application. In this case there is

a control to ensure that the frequency regulation duty does not push the battery below a set SOC, such as the 70–75 % SOC level for lead-acid batteries. Thus, the remaining energy capacity of the battery is always available as spinning reserve, as required by any spinning reserve duty source. The proposed site of Grid connected Battery energy storage system is shown in Fig 1.1.

Fig 1.1: Location map of Battery energy storage system



## II METHODOLOGY

### A. Purpose and Methodology of Due Diligence

15. The ADB's Safeguard Policy Statement (SPS) 2009 (for IR policy) aims to "avoid involuntary resettlement wherever possible; to minimize involuntary resettlement by exploring project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups.". Following this aim of the SPS, the proposed foot prints of Grid connected battery has been carefully reviewed to identify any potential land acquisition or resettlement impacts. The due diligence identified that none of the LAR impacts were present.

### B. Approach

16. The following approach was adopted for conducting due diligence for land acquisition and resettlement for sub project to define the LAR impacts:

- Review of available project information and proposed project foot print,
- Field site visits to identify and assess project impacts.
- Public consultations with the surrounding communities living in the project area to seek their views on the project and to discuss probable project impacts and mitigation measures.
- Field site visits to confirm whether the new design adequately addressed the issues.

17. Public consultations included meetings, interviews and focus group discussions (FGD) were held with the local community and other stakeholders. These were carried out in accordance with the IR policy requirements of ADB's SPS 2009 and are discussed further in the next section. Consultations were also held with the ESIC and ADB Senior Safeguard Officer.

### III. Findings

#### FINDINGS OF DUE DILIGENCE WORK

18. Key findings of due diligence work are presented below:

##### A. Brief history of Wind Power Plant

19. The sub-project Grid Connected Battery Energy Storage System Pilot Project will be constructed at the Jhimpir Wind Power Plant, located at Jhimpir with the coordinate 25°02'29.9"N and 68°00'19.6"E. It fall in Thatta District and is 120 kilometres North-East of Karachi. The 1st phase of the wind form project was completed in 2013 while the 2nd phase was constructed in 2015. In total more than 106 megawatts electricity has so far been included in the national power transmission system when the wind energy projects of FFCEL and Zorlu Energy became operational and started generating electricity. Currently, 45 wind power projects of around 3,200 MW capacity are under process.

##### B. Socioeconomic Survey and Community/Gender Consultations

20. Detailed socioeconomic survey and consultations with male and female members of communities living in the surrounding villages was carried out in May 2018 in which more than 125 community members (males and females) participated. 100 people were consulted through individual interview and 25 people participated in the consultation meetings. These local people were happy with the sub-project provided the electricity and jobs are provided to local people. No adverse impacts were observed on local people including women. Annex 3, 4 & 5 are showing the finding of socio economic, local participants in the consultation meetings and photographs of these events respectively.

##### C. Scop of Land Acquisition and Resettlement

21. The project will not entail physical or economic displacement. A total of 3,852 acres of flat, rocky and unproductive state land was leased by the Government of Sindh for the development of the wind farm. The closest household is around 500 meters away from the site boundary. The sub-project will be erected in the already leased out state land. Hence, no land acquisition and resettlement is involved for the construction of Grid Connected Battery Energy Storage System. Annex-I.

##### D. Indigenous Peoples Category

22. The DDR team carefully assessed the project area for presence of any IPs communities and met with local people who turned out to be Muslims living in harmony with national laws and local culture. They did not recognize them to the IPs or any tribal group as defined under ADB's SPS 2009. Therefore, the project is categorized as C for IPs and thus an Indigenous Peoples Development Plan (IPDP) is not required for this project.

##### E. Land Acquisition and Resettlement Framework (LARF):

23. Although the sub-project is not expected to cause any LAR and IPs impacts, the NTDC has still prepared and endorsed the LARF for its implementation. NTDC has done this in compliance with the requirements of ADB's SPS 2009 and to address any unanticipated LAR and IPs impacts of construction of Grid Connected Battery Energy Storage System. The framework

provides guideline about LAR impacts, entitlements and compensation payments, public consultation and disclosure and institutional arrangements and implementation schedules (for preparation, implementation and monitoring of the land acquisition and resettlement plans where needed) and grievance redress mechanism to address any grievances of affected peoples.

## **F. Institutional Arrangements**

24. NTDC has established an environment and social impact cell (ESIC) which is managed by a Director Social and Environment, assisted by assistant and deputy directors social and environment specialists. The ESIC works closely with project consultants, reviews LARPs, DDRs, Corrective Action Plans (CAP) and acts as quality control and safeguards compliance unit for NTDC for projects funded by ADB and other financiers. ESIC also undertakes internal monitoring of the implementation of safeguards plans and will do the same for the construction of Grid Connected Battery Energy Storage System, Thatta.

## **G. Grievance Redress Mechanism**

25. The LARF provides for field level grievances to be addressed through a local grievance redress committee (GRC) to be formally constituted by the EA/IA under each sub-project. The GRC, headed by a Project Director, will consist of a grievance officer, a representative from the DPs, locally present NGO representative, the ESU's resettlement specialist and concerned revenue staff. The GRC needs to be formally notified and established at the project site.

## **H. Unanticipated Impacts**

26. The ESIC through Project Management Consultant (PMC) will identify any unanticipated safeguards (LAR) impacts during implementation of project. If any such impacts are found, these will be addressed in accordance with LARF of project and SPS 2009.

## **IV Conclusions and Recommendations**

### **A. Conclusions**

27. Due Diligence work included a site visit to the wind Station and consultations with NTDC/ESIC, GS officials and local community and review of project documents. Based on the findings of this due diligence work, it is confirmed that the Grid connected attery energy storage system work will be strictly undertaken within the boundary wall of the existing wind energy station and will not cause any LAR impacts. The National Transmission and Despatch Company (executing agency implementing the investment program). The project area is also confirmed not to have presence of any IPs communities while the installation work will not cause any dislocation of indigenous people.

28. No further safeguards documentation work is needed unless there is any change in the impacts situation, which NTDC (if it happens so) will inform ADB in advance for appropriate actions.

29. The DDR team makes following recommendations for implementation before any construction activities commence:

- i. Set up a grievance redress mechanism and identify GRM officials and their roles and responsibilities in resolution of any grievances of local people.
  - ii. Provide schedule of installation work (replacement/installation of new equipment) and prepare quarterly progress report.
  - iii. In case of any emerging or unanticipated LAR impact during implementation, prepare resettlement plan and obtain ADB's approval prior to its implementation.
  - iv. In case a LARP has to be prepared at any stage of the project implementation, engage external monitoring agency or an individual specialist to certify implementation of LARP before startup of civil works activities. Further monitoring (internal as well as external) will be undertaken in line with monitoring frequency as specified in the LARP.
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## Annexures

## **Socio Economic Information**

### **3.1 Administrative Setup**

1. The proposed project area falls in the administrative jurisdiction of District Thatta. The district is headed by deputy commissioner who performs the function of District Magistrate as well as collector. He is also responsible for the coordination of function of all departments at district level. On the judicial side he is assisted by an Additional District Magistrate and Sub Divisional Magistrate (SDMs). While on the revenue side he is assisted by Additional Deputy Commissioner and 3 Assistant Commissioners.

### **3.2 Demographic Characteristics**

2. Jhimpir being in the administrative control of Thatta district is unique in terms of population sensibility and characteristic. The population of Thatta district presently comprising nine talukas is 1113.19 thousands in 1998 as compared to 761.04 thousands in 1981 recording an increase of 46.27 percent over the last 17 years i.e., 1981-98. This increase was relatively high during the 1961-72 at 87.65 percent in comparison to 25.86 percent during 1951-61 and 12.57 percent during 1972-81.

3. The average annual growth rate of population during this period was 2.26 percent which was increased from 1.41 percent during 1972-81. If we go further back to 1961-72 it was abnormally high at 5.54 percent compared to a moderate rate of 2.35 percent during 1951-61. If the population continues to grow at its present rate i.e., 2.26 percent per annum, it will double in about 31 years.

4. The area of the district is 17355 square kilometers showing an overall population density of 64.1 persons per square kilometer in 1998.

#### **3.2.3 Household Size**

5. Average household size of the district is 5.1 persons in 1998. Among talukas it varies from 5.6 persons of Thatta taluka being highest to 4.5 persons of Shah Bunder taluka being lowest. If we compare rural/urban areas the household size is 4.96 persons in rural and 6.00 persons in urban areas.

#### **3.2.4 Rural/Urban Distribution**

6. The rural population of the district is 988 thousands constituting 88.80 percent of the total population in the district. The average annual growth rate of rural population during 1981-98 is



2.15 percent which has increased from 1.86 percent during 1972-81. If we go further back to 1961-72 it was substantially high at 4.84 percent which was 2.08 percent in 1951-61.

7. The urban population of the district is 125 thousands which constitutes 11.20 percent of its total population of the district in 1998. The average annual growth rate of urban population has increased to 3.22 percent in 1998 as compared to 2.11 percent in 1981. It was abnormally high at 13.01 percent in 1972 and 8.03 percent in 1961 censuses.

### **3.2.5 Religion**

8. The population of the district is predominantly Muslim which constitutes 96.72 percent of the total population, with a higher share in rural areas at 97.45 percent as compared to 90.93 percent in urban areas. Hindus (Jati) are 2.70 percent in the district as whole who are most concentrated as 7.69 percent in urban areas compared to only 2.07 percent in rural areas. Presence of other minorities in the district as well as in rural and urban areas is quite insignificant.

### **3.2.6 Mother Tongue**

9. Sindhi is the major mother tongue which is spoken by 95.66 percent of the total population in the district. It is more predominantly in rural areas at 96.23 percent as compared to 91.09 percent in urban areas. The next prominent group is of Urdu speaking who are at 1.20 percent in the district, mostly concentrated in urban areas having 2.43 percent compared to only 1.04 percent in rural areas. The percentages of the remaining mother tongue languages spoken are quite insignificant in the district.

### **3.2.7 Ethnicity / Tribes**

10. Baloch, Jokhio, Soomra, Sammo, Syed, Memon, Khoja and Meerbahar are the main tribes of Thatta District. Several other casts such as rind, Lashari, Barohi, Mikrani, Chandio, Jat, Burfat, Chang, Jahkra, Palara, Sheikh, quraishi, Gada, Khaskheli, Ghandra and Machhi live in the District. A large number of Hindus also live in the district.

### **3.2.8 Culture, Custom and Tradition**

11. Thatta district is rich in his heritage of pre historic Arabian culture. The old and ancient traditions of Sindh are still in existence. The people at large are religious minded and devoted to the teachings of Islam. The marriages take place in exchange. The people mostly avoid marrying with other communities. The cultural pattern is purely Sindhi of old days. Women observe pardah and confined themselves to household work. In the rural areas however, they help their males in the agriculture pursuits.

12. Betrothal ceremony is simple; groom goes to the parents of the bride. The family members of both sides assemble in the otaq or a mosque in the neighborhood. Sweets and presents are

exchanged among the two parties showing the consent of the both sides. Thanks giving prayers is offered and people are then entertained to a feast. The marriage ceremony is characterized by the nikkah performed by the priest/Niakah khwan, feasts are given by both parties in order to celebrate marriage. In towns the marriage procession (barat) is taken round the bazars with the bridegroom in an open car or horseback sometimes accompanied by a band.

### **3.2.9 Literacy**

13. The literacy in 1998 census is defined as the “ability of a person to read a newspaper or write a simple letter in any language”. The literacy is measured in terms of literacy ratio and computed as percentage of literate persons among the population aged 10 years and above. The literacy ratio of the district is 22.14 percent. The male literacy ratio is about three times higher at 31.58 percent as compared to 11.40 percent for females in 1998. There are sharp differences in the literacy ratio by sex and area. The ratio in urban area is much higher at 45.92 percent compared to only 18.99 percent in rural areas. Male literacy ratio is more than three times higher at 28.31 percent in rural areas as compared to female literacy ratio at only 8.34 percent. Similarly it is 56.98 percent for males as against 33.90 percent for females in urban areas.

### **3.2.10 Educational Attainment**

14. The percentage of educated persons is 21.55 of the total population aged 10 years and above including those below primary in the district. The remaining 78.45 percent either have attained no educational level or never attended any educational institutions.

15. A large variation exists in the ratios of educated persons in rural and urban areas as well as for males and females. Male education is three times higher at 30.92 percent as compared to 10.90 percent for females in the district. There is wider gap between males and females in rural areas which is 27.63 percent for males against 7.85 percent for females. The gap is of lesser magnitude is observed in urban areas i.e., 56.46 percent for males and 33.38 percent for females.

### **3.2.11 Migration**

16. Migration data covers movement of population in terms of shifting the residence from one district to another in the same province or from one province to another. It does not cover persons who change their place of residence within their own district because of the questionnaire.

### **3.2.12 Industry and Trade**

17. From industrial point of view Thatta district has progressed considerably. There are several industrial units established in Dhabeji and Gharo. The details of industrial units contains sugar mills (5), textile mills (9), Paper mills (2), Jute mills (1), Flour mills (3), Salt works (3), P.V.C industry (1), Garment Industry (1), Industrial Gases (1), Specialized Textile (1) and Ice Factory (2).

18. Stone from Mkahli hill and Kohistanis supplied to Pakistan Steel Mill and Thatta Cement factory. There are large coal deposits in Sunda area in Thatta taluka.

### **3.2.13 Trade and Trade Centers**

19. The important item for trade in this district is rice, leather and wool. The district is surplus in rice which is supplied to other parts of Pakistan. Beside bananas of good quality are exported to Iran and Middle East countries.

### **3.2.14 Communication**

20. The district is well linked by roads with the other districts. National Highway from Karachi to Peshawar passes through Thatta for a length of 200 kilometers. All major towns of the districts are connected with metteled road of 1585 kilometer in length.

21. The district is also connected by main railway line from Karachi to Peshawar. The principal railway stations are Jangshahi, DhabejiandJamphir.

22. Steamer service is employed of river Indus and coastal areas for transportation purposes. District are also equipped with digital and non-digital telecommunication system beside postage and telegraph.

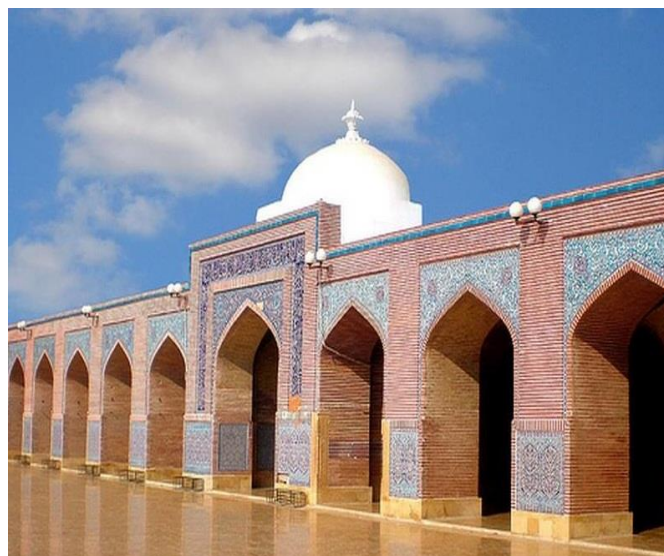
### **3.2.15 Archaeological and Cultural Characteristics**

23. Following are the famous archaeological and cultural sites are existed in the area;

#### **Shah Jahan Mosque**

24. It was built by a grateful Emperor Shahjahan, builder of the famous TajMahal, who had once found refuge in Sindh, when he was Sindh and engaged in war. The mosque is a glorious example of Muslim architecture. Its construction commenced in 1644 and completed in 1647, the eastern range, including the greater pathway, was added in 1958-59. The mosque is in the form of a great quadrangle and its plan differs from the usual scheme, in that, to balance the main prayer chamber on the west side, and equally large chamber has been provided on the east. The two are linked by means of a double acoustical purpose as they enable the voice of the leader or 'Imam' to be heard in all corners of the mosque. The pride of the building their glazed tiles work, which is the most complete surviving specimen of its type. The interior of the main dome is a superb starry vault in blue and white. The spandrels of the arches are filled with conventional floral compositions in mosaic technique while on the friezes are ornamental inscriptions.

Fig 3.1: Shah Jahan Mosque



## Makli Hills

25. At Thatta's Makli Hill, a vast necropolis extends as far as the eye can see. The burial area spreads over 15 1/2 square kilometer to be exact. But Thatta's graves are not ordinary graves. He is eternal sleep lie kings and queens, saints and scholars, philosopher and soldiers of a bygone era- an era distinguished for its culture and learning. The graves and mausoleums are well worth exploring. Each is a masterpiece of the ancient art of stone carving and perforated stonework. There are graves of different eras and different dynasties, which can easily be distinguished by their ornamentation.

Fig 3.2: View of Makli Hill



### 3.3 Survey Findings (Data Collected from Primary Source)

26. Detailed findings of the survey comprising of different parameters are discussed in the following section.

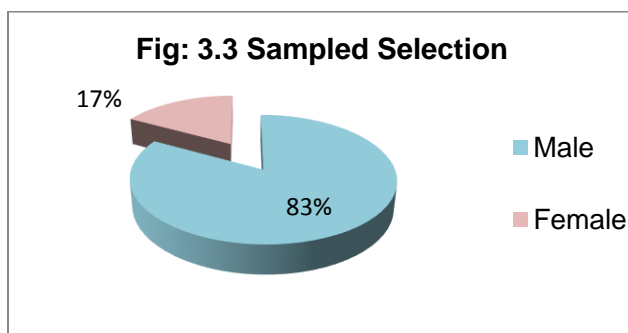
#### 3.3.1 Gender Ratio of the Respondents

27. About 100 respondents were in order to carry out social impact assessment survey. It comprised of 83% males and 17% females. Table 3.1 shows Gender ratio of the respondents interviewed during the survey.

Table 3.1: Gender Distribution of Respondents

Sr. No.	Gender	Number of Respondents	Percentage (%)
1	Male	83	83
2	Female	17	17
Total		100	100

Source: Socioeconomic Survey



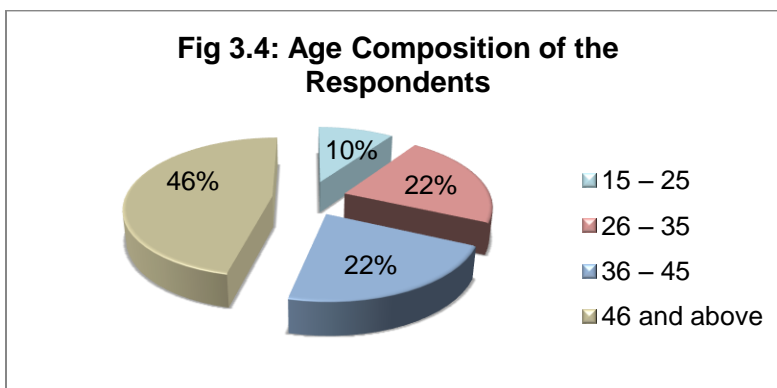
### 3.3.2 Age Composition of Respondents

28. The demographic characteristics of the sample survey show (Table 3.2) that 10% of the respondents were up to 15-25 years of age. About 22% of the respondents were between the age group of 26 – 35 years, and same number of respondents fall between the age group of 36 – 45 years and 46% respondents were bearing more than 46 years of age. These age brackets of the respondent show that by and large respondents were mature enough to express& record their opinion/concerns about the modeling and rehabilitation of Keenjhar Lake and its allied components.

**Table 3.2: Age Composition**

Sr. No.	Age Distribution	Number of Respondents	Percentage (%)
1	15 – 25	10	10
2	26 – 35	22	22
3	36 – 45	22	22
4	46 and above	46	46
Total		100	100

Source: Socioeconomic Survey



### 3.3.3 Family Size

29. Average household size in the settlements along the project alignment was analyzed during socio economic survey. The families who fall between the range of 6-10 members were 41

percent of the total respondents and 22% respondents reported their family size between 1-5 persons and 37% were those who have average household size more than 10 persons.

**Table 3.3: Average Household Size**

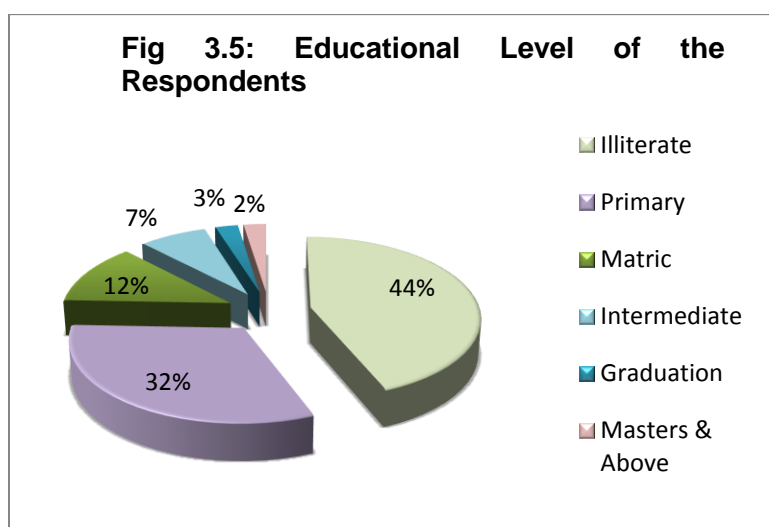
Sr.No.	Family Size	Number of Respondents	Percentage
1	1-5	22	22
2	6-10	41	41
3	>10	37	37
Total		100	100

### 3.3.4 Educational Status of Respondents

30. Educational distribution of the respondents in the project area is shown in Table 4.3. The data in the table represents that 44% of the respondents were illiterate, 32% were educated up to primary level, 12% were matriculate and 07% were educated up to intermediate level. The respondents with graduation and master degree were same in number i.e. only 02 percent for each.

**Table 3.4: Educational Status of Respondents**

Sr. No.	Educational Level	Number of Respondents	Percentage
1	Illiterate	44	44
2	Primary	32	32
3	Matric	12	12
4	Intermediate	07	07
5	Graduation	02	02
6	Masters & above	02	02
Total		100	100



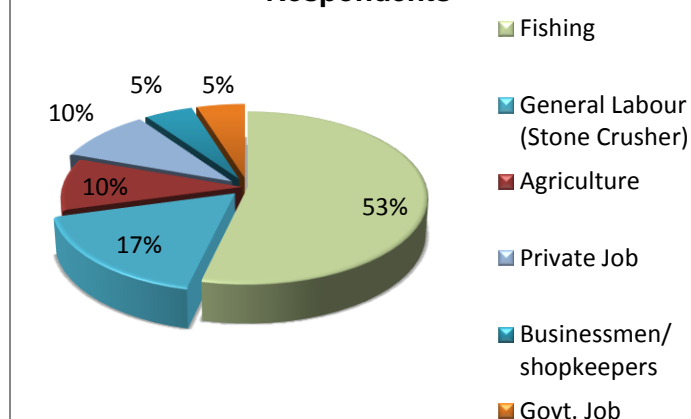
### 3.3.5 Occupation / Professional Status

31. Numerous income generating activities are practiced in the project area. Farm income is not the only earning source of the people of the project area, but they also earn their livelihood from off-farm incomes. About half of the sampled respondents i.e. 54 percent were involved in fishing activity. Whereas, 17 percent of the total respondents were those who getting their incomes from labor like stone crushing or supply of stones to other places of city and mat making from raw bushes. Some of the respondents, i.e. 10% were doing private jobs in various sectors for livelihoods, and same number of samples were associated with agriculture sector. While, 5 percent respondents were running their personal business shops and same number of respondents reported themselves as Government employee like teacher, police man and working at agriculture / health department. During survey, efforts were made to interact with the people representing all walks of life. The detailed statistics regarding occupational status of the respondents are presented in Table 3.5.

**Table 3.5: Occupational Status of Respondents**

Sr. No.	Primary Profession	Number of Respondents	Percentage
1	Fishing	54	54
2	General Labor (Stone Crusher)	17	17
3	Agriculture	10	10
4	Private Job	10	10
5	Businessmen/ shopkeepers	05	05
6	Govt. Job	05	05
Total		100	100

**Fig 3.6: Occupational Status of the Respondents**



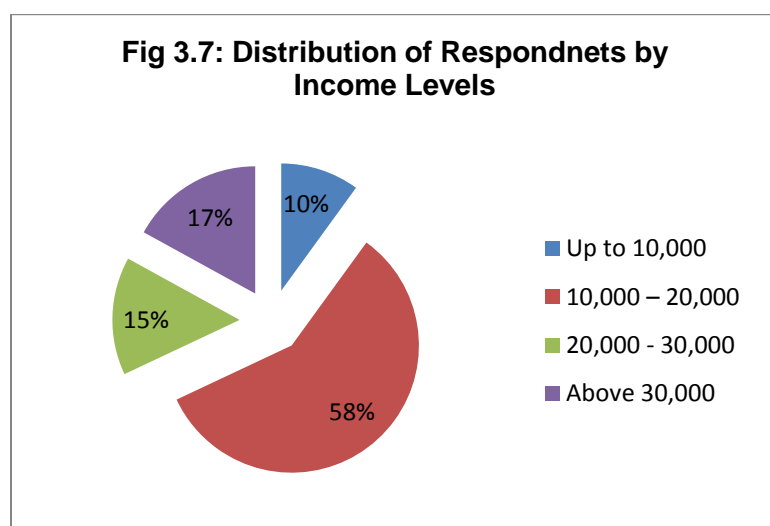
### 3.3.6 Average Monthly Income

32. About half of the respondents 58% were earning between the income range of PKR10,000-20,000, 15% respondents fall within the income range of PKR 20,000 – 30,000 per month.

The respondents who reported their incomes above PKR 30,000 were 17 percent of the total respondents. Only 10% respondents were those whose income level was up to 10,000 per month. Table 3.6 presents income status of the respondents.

Table3.6: Average Monthly Income of Respondents

Sr. No.	Income Levels	Number of Respondents	Percentage
1	Up to 10,000	10	10
2	10,000 – 20,000	58	58
3	20,000 - 30,000	15	15
4	Above 30,000	17	17
<b>Total</b>		<b>100</b>	<b>100</b>



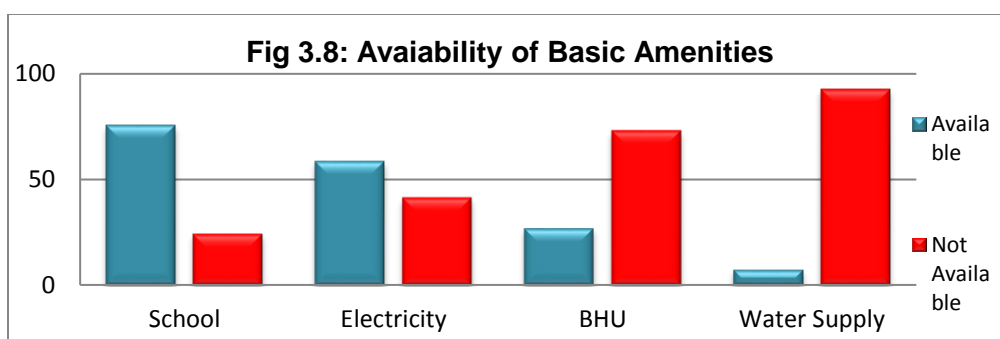
### 3.3.7 Basic Amenities in the Project Area

33. The situation of available basic amenities in the project area including electricity, water supply, educational and health institutions is depicted in Table 3.7. It shows that 59 percent respondents have the facility of electricity in project area. Contrary to this, 41 percent were deprived of electricity; they have no other source of light and using the oil lamps. The water supply provided by govt. is only reported by the 7 percent of total sample size. However, 76 percent have educational facility up to primary level for both boys & girls and 27 percent were enjoying the medical facility through the availability of Basic Health Units (BHUs) near their settlements.



**Table 3.7: Availability of Basic Amenities**

Sr. No.	Basic Amenities	Available	Not Available
1	School	76	24
2	Electricity	59	41
3	BHU	27	73
4	Water Supply	07	93

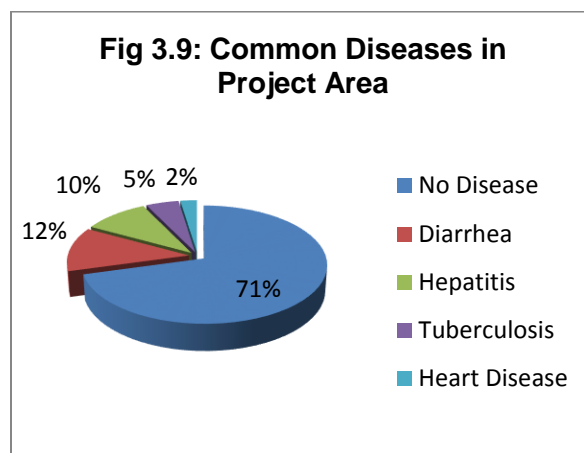


### 3.3.8 Common Diseases in Project Area

34. Health status of study respondents was also examined during field investigations. They were generally found hale and hearty and enjoying a healthy life. The table 3.8 shows that large number of respondents 71 percent were not suffering from any serious health problem. There were very few cases of Diarrhoea and Hepatitis reported by 12 and 10 percent respectively. Likewise, Tuberculosis and heart patient were found 5 percent and 2 percent for each correspondingly.

**Table 3.8: Common Diseases in Project Area**

Sr. No.	Common Diseases in Project Area	Number of Respondents	Percentage
1	No Disease	71	71
2	Diarrhoea	12	12
3	Hepatitis	10	10
4	Tuberculosis	05	05
5	Heart Disease	02	02
<b>Total</b>		<b>100</b>	<b>100</b>

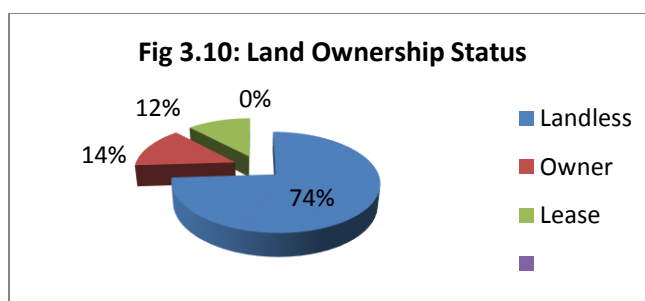


### 3.3.10 Land Ownership Status

35. Table 3.9 reveals the land ownership status of the sampled respondents. About 74 percent respondents were land less and 14 percent were holding agricultural land along the project area. Rest of the respondents, 12 percent was holding land on lease basis.

**Table 3.9: Land Ownership Status in Project Area**

Sr. No.	Land Ownership status	No of Respondents	Percentage
1	Landless	74	74
2	Owner	14	14
3	Teantn (Lease)	12	12
	<b>Total</b>	<b>100</b>	<b>100</b>

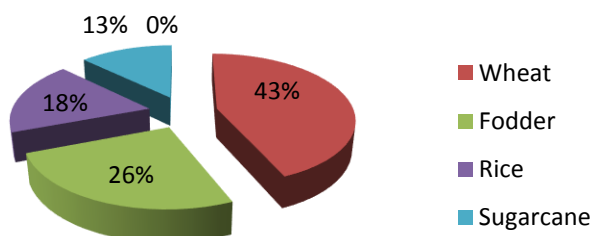


### 3.3.11 Major Crops in Project Area

36. Field study indicates that most of the project area is barren and under the rocks. Table 3.10 represents that main crops of project area are wheat, fodder, rice and sugarcane etc. About 44 percent of respondents were growing wheat and 26 percent reported themselves as fodder grower for livestock rearing. Rice and sugarcane was also under cultivation but ar very limited scale, 18 and 13 percent sampled respondents respectively.

**Table 3.10: Distribution of Crop Growers**

Sr. No.	Major Crops in Area	No of Respondents	Percentage
1	Wheat	17	44
4	Fodder	10	26
2	Rice	7	18
3	Sugarcane	5	13
<b>Total</b>		<b>100</b>	<b>100</b>

**Fig 3.11: Percentage of Crop Growers in the Project Area**

### 3.3.12 Social Organization

37. In the Project area, society is structured on kinship basis. Brotherhood is gradually losing its importance. Most of the decisions are made within family or at the household level. The land lord and influential people are accepted as community leader; especially in collective welfare and development of the area. Also, the traditional leader in the village / Goth is the “Vadera”, the elder who has respect in the community.

### 3.3.13 Conflicts Resolution Mechanism

38. The Study area has relatively a peaceful environment. No serious enmity is reported in the areas. Common conflicts including kids issues, occupying the place of fishing net issues often arise and are resolved at community level or Outaq level. Generally, the people of the study area prefer to settle their disputes by Jirga System. However, in case of serious conflict the people adopt the legal procedures.

### 3.3.14 Availability of Non-Government Organizations (NGOs)

39. The study investigation describes the presence of a small number of working NGOs & Rural Water Conservation Associations in project area. However, 37% respondents showed the availability of NGOs in their respective areas. The areas of interest of Organizations were socio economic development through the provision of Solar Energy Panels, Bio Gas Projects, provision of Fishing Nets, Boats and also Capacity Building Training Programme for Youth on Fish Farming and Livestock Management etc.

### **3.3.15 Perceived Impacts of Project**

40. Almost all the respondents showed the benefit of the project provided the electricity is provided to the surrounded villages. They told the the grid station is there but electricity is not given to them even the jobs were not provided to local people. Their living standard can be improved if the electricity and jobs were provided to local people. The project can help them to install the pumping station for irrigation purposes.

## **3.3 Gender Analysis**

41. Gender analysis is integral to the social analysis. Like social analysis, gender analysis has been applied to get a focused examination of the differences in vulnerabilities between women and men, as well as the reasons for and implications of these differences. Having a deeper understanding of these differences allowed for a better identification of appropriate interventions to ensure social inclusion and equal access to resources and basic services (health, education and economic infrastructure), which are required to enable equitable and sustainable economic growth.

42. Considering the diversity of Pakistani society, female empowerment has different meanings for women from different strata. Her status is always lower than the male partner. She is underprivileged in getting education, food, health care and freedom of choice of partner, number of children and other essentials of life. The women have no recognized role in the authority structure of the villages despite representing about 52% of the population of the project area; the literacy rate of the female population is only 4% due to lack of educational facilities and traditional attitude of not sending the girls to schools.

### **3.4.1 Women's Role in Economic Activities**

43. Majority (87%) of the women involved in both household and economic chores including fishing / farming, handicrafts, ornaments, stitching, embroidery and Sindhi Rali making activities for an average day beginning at 5 am at ending at 8 pm. The activity that the greatest amount of time is spent upon appears to be washing clothes and dishes, fetching water from Lake Site and collection of woods for domestic use probably because of large families. This is followed by cooking, works in agricultural activities, livestock rearing and other income earning activities on a slightly smaller scale. This type of work done by females appears to be associated with female mobility outside the home. Thus the women work more on activities such as household chores, weeding, and harvesting, crop storage and fish farming etc.

### **3.7.2 Participation in Decision Making Process**

44. Women have a vital role in maintaining domestic functions. During the field survey the question was asked from the female respondents about their participation in different activities of daily life and their role or membership status in village based committees/organizations for social development. Study findings clearly indicates that an overwhelming, 86% do not have any

membership in these committees and they are not allowed to participate in decision making processes, as their role in such activities is totally ignored by the male community.

45. It was realized that women make decisions only in domestic matters /arrangements like what is eaten, fetching water, take caring of children etc. However, when it comes to greater decision making, it is men who rule and authorized for dealing the matters. However, major decisions such as marriages, marketing of fishing, agriculture products and livestock, and buying/selling of property are not even shared with the women of the area. As far as the female's education attainment, they are given less importance as compared to male's education. The lack of educational infrastructures is another important hindrance in getting education by female in the interior Sindh.

46. The findings of the survey revealed that participation of women in various household activities in the project area. The women participation in the child caring and household activities is (100%) it is drift that women are mainly responsible for the child caring & household activities. Women of the area help their male family member in income generation activities and their participation in the livestock rearing and agro farming is 72% and 63% respectively. The women participation is only 1 percent in the sale and purchase of the items and livestock, usually, sales and purchase mostly done by the male members of the family. In addition, the women participation is zero in local representation which is disappointing. As showing in Table 3.11 below;

**Table 3.11: Women Participation in the Various Activities**

Sr. No.	Activities	Physical Participation Level
1	Household	100%
2	Child caring	100%
3	Livestock	72%
4	Farming	63%
5	Employment	03%
6	Sale & Purchase of properties	01%
7	Social obligations (marriage, birthday & other functions)	17%
8	Local representation (councilor/political gathering)	0%

Source: Field Survey

### 3.7.3 Women Needs

During the survey following issues related to the women highlighted by the respondents which are prioritized as under;

- Women's empowerment and participation in daily household business
- Access to public transport
- Availability of portable water
- Access to medical treatment
- Access to education
- Skill development

- Toilet facilities
- Development of marketing linkages for income generation activities.

## Annexure – II

## LIST OF PARTICIPANTS

Table 3.12: Focused Group Discussion and List of Participants

Sr. No.	Village Name	No.	Participants	
			Name	Father Name
1	Jhampir	10	Muslim Mir Bher Mukhtiar Ali Summo Shoukat Ali Summo WakeelAhemd Ali Akbar Abdul Rehman Chaman Din Muhammad Hussain  Ali Muhammad Summo Ali Muhammad Palijo	Hussain Mir Bher Allah BuxSummo Jabbar Ali Summo Nawaz Ahmed AbdurRasheed Hassan Ali Shah Muhammad Noor Din  Faqir Muhammad Summo Ahmed Din Palijo
2	MangiLudo	6	Ibrahim Jokhyo Mehboob Ali Zikar Din Sher Ali KaroSummro AyazQadir	Nawaz Ali Jokhyo Karam Ali Walyat Muhammad Faraz Allah Bux Muhammad Qadir
3	MoldiMiani&LalB akhshManchri	9	Dawood Pyar Ali Asghar Ali Muhmmad Musa Manchri Haji Karam Dad NabiBukhshPalari SadiqHussain Atta Muhammad Kamal Palari	Sher Din Muhammad Yousaf Hussain Ali PirBukhshManchri Ahmed Yar Hammed Palari Muhammad Jamshed Muhammad Din Jan Muhammad Palari







Women consultation meeting at at Mangi Ladoin (Jhimpir)



Discussion with women at Moldi Miani (Jhimpir)





Consultation Meeting at Ali Muhammad Summo



consultation with the local at village



Data collection at village Moldi Miani



Preparation of fishing net in village Moldi Mian



View of Basic Health Unit at Jhampir



View of Primary school at Jhampir





View of Bio Gas project and Solar Panel by WWF



View of wheat crop in the project area



View of Village mosque in the project area