RESETTLEMENT ACTION PLAN WBMIFMP

West Bengal Major Irrigation and Flood Management Project
(WBMIFMP)
Irrigation and Water Ways Department
Government of West Bengal

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Contents

Executive Summary *6*
Chapter 1: Introduction *11*
1.1 Project Background **11**
1.2 Project Components **11**
1.3 Implementing Agency **13**
1.4 Need for Displacement / Relocation **14**
1.5 Project Cost **14**
1.6 Structure of the Report **14**
Chapter 2: Approach and Methodology *15*
2.1 Introduction **15**
2.2 The Approach **15**
2.3 Methodology **15**
2.4 Data Collection **17**
2.5 Tools **17**
2.6 Definitions of Terms and Phrases **17**
2.7 Limitations of the Study **19**
Chapter 3: Socio-Economic Profile: *20*
3.1 District Profile **20**
3.1.1 Demographic Profile of the District 20
3.1.2 Literacy 21
3.1.3 Economy of the District 21
3.1.4 Land Type and Land Use 23
3.1.5 Physiographic Condition of the Project Locations 24
3.1.6 Hydro-Geology 28
3.1.7: Soil Quality 29
3.1.8 Climatic Condition 31
3.2 Socio-Economic Profile of the Affected Area **35**
3.3 Socio-Economic Condition of the Affected People **36**
3.3.1 Social Category of the Affected Households: 36
3.3.2 Distribution of Head of the Household by Age Group: 36
3.3.3 Women Headed Families: 36
3.3.4 Economic Condition: 37
3.3.5 Access to Entitlements: 38
3.3.6 Structures in Project Locations: 39
3.3.7 Structures with Amenities: 53
Chapter 4: Stakeholder Analysis and Consultation *55*
4.1 Objective of Public Consultation **55**
4.2 Methodology **55**
4.3 Stakeholder Analysis **55**
4.3.1 Primary Level Stakeholders 56
4.3.2 Secondary Stakeholders: 57
4.4 FGD and Census Survey **57**
4.5 Consultation Meeting with Govt. Departments: **60**
4.6 Stakeholder's Concerns / Opinion **60**
4.7 Issues addressed in RAP / ESMP **61**
4.8 Information Disclosure **62**
Chapter 5: Impact Assessment *64*
5.1 Positive Impacts **64**

5.2 Adverse Impact 64
5.3 The Project Component / Activities that give rise to Displacement 64
5.4 The Zone of Impact of Such Component or Activities 65
5.5 Impact on Structures / Households 65
5.5.1 Affected Households and Displacement 65
5.5.2 Project Affected Population: 65
5.5.3 Structural Ownership: 66
5.6 Distribution of Structures by Social Groups: 67
5.7 Impact on Common Property Resources / Facilities / Utilities 70
5.8 Loss of Income and Livelihood 70
5.9 The Alternatives Considered to Avoid or Minimize Resettlement 71
Chapter 6: Resettlement 73
6.1 Objective of The Resettlement Action Plan (RAP) 73
6.2 Act / Policy / Scheme Applicable for RAP 73
6.2.1 GITANJALI Scheme 73
6.2.2 World Bank Policy on Involuntary Resettlement (OP 4.12) 74
6.3 Cut-Off Date 74
6.4 Need for Land and Resettlement 74
6.5 Eligibility 75
6.6 Principles of Resettlement Action Plan 75
6.7 Temporary Occupation of Land 76
6.8 Use of Irrigated Multi-Cropped Land 77
6.9 Entitlement Matrix 77
6.9.1 Compensation for Community Structures 78
6.9.2 Compensation for Private Structures 79
6.9.3 Compensation for Trees 79
6.9.4 Right to Salvage Affected Materials 79
6.9.5 Compensation Disbursement 79
6.9.6 Temporary Relocation 79
Chapter 7: Institutional Arrangement and Implementation Structure 84
7.1 Introduction 84
7.2 Institutions for Policy, Planning, Implementation, Monitoring and Evaluation 84
7.3 RAP Implementation Organization 85
7.3.1 Formation of District Level Committee: 85
7.3.2 Formation of Block Level Committee: 86
7.3.3 Association of BDO for Land Clearance and Eviction: 86
7.3.4 Role and Responsibilities: 86
7.3.5 Competent Authorities 87
7.4 Implementation Schedule for RAP 88
Chapter 8: Monitoring and Evaluation 90
8.1 Introduction 90
8.2 Concurrent Monitoring 90
8.3 Mid-Term Review and Impact Evaluation 90
8.4 Monitoring and Evaluation Frame: 91
8.5 Institutional Strengthening and Monitoring Support 91
Chapter 9: Grievance Redressal Mechanism 93
Chapter 10: RAP Budget 95

List of Tables

Table 1: Stages of Data Collection 17
Table 2: Primary and Secondary Data Collection 17
Table 3: Demographic profile of whole project district 20
Table 4: Project district wise SC & ST population concentration 20
Table 5: Literacy Rate in Project District 21
Table 6: Worker and Non-Worker Population 21
Table 7: Male Work Force (Main and Marginal) 21
Table 8: Female Work Force (Main and Marginal) 22
Table 9: Project district wise land holding status 22
Table 10: Land Holding Pattern 23
Table 11: Operational Holding Pattern among Farmers in Project Districts 23
Table 12: Project district wise land use pattern 23
Table 13: Land Use (LU) and land Cover (LC) of Project Locations 24
Table 14: Physiographic Condition of Project Districts 24
Table 15: Project district wise major soil class and area coverage 29
Table 16: Mean Maximum and Minimum Temperature in Project Area for 2014 31
Table 17: Season wise average annual rainfall 33
Table 18: Total Seasonal Rainfall in different Rain-gauges during Monsoon, 2016 33
Table 19: Month wise rainfall from 2013-17 in Bankura 33
Table 20: Month wise rainfall from 2013-17 in Bardhaman 34
Table 21: Month wise rainfall from 2013-17 in Hooghly 34
Table 22: Month wise rainfall from 2013-17 in Howrah 34
Table 23:Relative Humidity (in %) by station and month 35
Table 24: Social Categories of the Affected Households 36
Table 25: Distribution of Head of the Households by Age Group 36
Table 26: Distribution of Head of Household by Sex 37
Table 27: Average Income of the Families in Different Project Locations 37
Table 28: Average Income by Social Categories in Project Locations 37
Table 29: Schematic Enrolment 38
Table 30: Schematic Enrolment by Social Category in Project Locations (in %) 38
Table 31: Distribution of Different Structures in the Project Area 39
Table 32: Structures by Project Locations 39
Table 33: Structures by Project Locations 39
Table 34: Residential Structures in Different Sides of Embankments 40
Table 35: Typology of Residential Structures 40
Table 36: Type of Residential Structures 40
Table 37: Average Area of the Structure 41
Table 38: Encroacher, Squatter and Ownership Status of Residential Structures 42
Table 39: Structural Ownership by Project Locations 42
Table 40: Residential Cum Business Structures in Project Locations 42
Table 41: Structure Types 43
Table 42: Structure Types by Project Locations 43
Table 43: Average Area of the Structure 44

Table 44: Encroachment, Squatting and Ownership 44
Table 45: Ownership Category of Structures and Its Location 44
Table 46: Types of Residential Cum Business Structures by Encroacher, Squatter & Ownership 44
Table 47: Boundary Wall Categories 45
Table 48: Structural Typology by Project Locations 45
Table 49: Encroacher, Squatter and Ownership 46
Table 50: Ownership Status by Project Locations 46
Table 51: Structures of Toilets 47
Table 52: Toilets by Project Locations 47
Table 53: Encroacher, Squatters and Ownership 47
Table 54: Encroacher / Squatter by Project Locations 47
Table 55: Cattle Shed in Project Locations 48
Table 56: Structural Prevalence by Project Location 48
Table 57: Structural Ownership 49
Table 58: Location of Cattle Shed and Nature of Ownership 49
Table 59: Type of Structures in Different Project Locations 49
Table 60:Types of Structures in Different Sites of the Project Locations 50
Table 61: Location and Ownership of Structures 50
Table 62: Business Shops in Project Locations 50
Table 63: Number of Sheds in Project Locations 51
Table 64: Structure Types in Different Project Locations 51
Table 65: Structural Ownership 51
Table 66: Distribution by Structural Ownership by Project Locations 52
Table 67: Number of Bedis in Project Locations 52
Table 68: Bedis in Different Project Locations 52
Table 69: Structural Ownership 53
Table 70: Distribution of Structures by Project Locations 53
Table 71: Structures with Amenities 54
Table 72: FGD with stakeholder community 58
Table 73: Concerns / Opinion of Stakeholders 60
Table 74: Issues Addressed in ESMP 61
Table 75: No. of Existing Households and Structures on the Studied Locations 65
Table 76: Project Affected Persons by Age and Sex 66
Table 77: Structural Ownership by Social Categories 66
Table 78: Distribution of Households by Ownership Categories 67
Table 79: Structural Typology by Social Groups 68
Table 80: Average Area of the Structures by Social Groups 69
Table 81: Anticipated Impact on Common Utilities / Facilities 70
Table 82: Entitlement Matrix 81
Table 83: Competent Authorities for Approvals 87
Table 84: Implementation Schedule for RAP 88
Table 85: Monitoring and Evaluation 91
Table 86: Grievance Redressal 93
Table 87: RAP Budget 95

Abbreviations

APD	Additional Project Director
BDO	Block Development Officer
BL&LRO	Block Land and Land Reform Officer
BL&LRO	Block Land and Land Reform Officer
BLC	Block Level Committee
DL&LRO	District Land and Land Reform Officer
DL&LRO	District Land and Land Reform Officer
DLC	District Level Committee
DM	District Magistrate
DPIU	District Project Implementation Unit
DPMU	District Project Management Unit
DVC	Damodar Valley Corporation
FGD	Focus Group Discussion
GoWB	Government of West Bengal
GoWB	Government of West Bengal
GP	Gram Panchayat
GRC	Grievance Redressal Committee
HR	Human Resource
IAY	Indira Awas Yojana
IWD	Irrigation and Water Ways Development Department
LBMC	Left Bank Main Canal
MIS	Management Information System
NGO	Non-Government Organisation
OP	Operational Policy
PAF	Project Affected Families
PAP	Project Affected Person
PD	Project Director
PMAY	Pradhan Mantri Awas Yojana
PMC	Project Management Consultant
PMC	Project Management Consultant
R&R	Rehabilitation and Resettlement
RAP	Resettlement Action Plan
RBMC	Right Bank Main Canal
RFCTLARR	Right to Fair Compensation & Transparency in Land Acquisition, Resettlement and Rehabilitation
ROR	Record of Rights
ROW	Right of Way
RRI	River Research Institute
SHG	Self-Help Group
SPMU	State Project Management Unit
WBMIFMP	West Bengal Major Irrigation and Flood Management Project
WRIDD	Water Resources Investigation and Development Department

Executive Summary

Project Background: The Government of West Bengal is planning to implement "West Bengal Major Irrigation and Flood Management Project (WBMIFMP)" with the objective of augmenting water supply in the canal distribution network, improving irrigation management to ensure sustainable conjunctive use of water resources in the DVC command area in the State and reducing impact of flood and drainage congestion in the Lower Damodar Sub-Basin by various structural measures. The project will be implemented by Irrigation and Waterways Department (IWD) in the districts of Purba (East) & Paschim (West) Bardhaman, Bankura, Hooghly and Howrah districts of the State. The project has four components, i.e., (1) Component A: Irrigation Management,(2) Component B: Modernization of Irrigation Infrastructure, (2), (3) Component C: Flood Management and (4) Component D: Project Management.

Need of Land and Relocation: The project activities such as embankment strengthening, desilting and flood wall construction will be taken up in the existing structures and within the right-of-way / river bed. So, no additional private land is required for the project purpose and no land acquisition is proposed under the project. But, the embankment / the right-of-way has been encroached upon in many places and structures are existing on the identified working zones which may be impacted due to project activities. Majority of such structures, by different structural categories, are constructed by the encroachers and squatters who are likely to be impacted apart from the structures existing on legal lands. The project does not require additional land beyond the land already in possession of the government. Further, permanent acquisition of land in terms of provision of LARR Act, 2013 or direct purchase of land as per prevailing policy of the Government of West Bengal will not be required. The project activities have been designed and planned to create the least obstruction / interference on the land and other assets of people as well as various utility structures, lying in the vicinity of working zone.

Methodology of RAP Preparation: For the preparation of RAP, a detail study was conducted, adopting an integrated approach of primary data collection of affected households, secondary source information collection, physical observation of the situation, stakeholder consultation, meetings in different identified project locations, discussions with key informants and conducting FGDs. The study followed an observational design entailing both qualitative and quantitative methods. The methodology covered interview with the project affected families / persons, focus groups discussion with the local community, observation of the structures presents and interview of structure owner, discussion with local project authorities and other local institutions and discussion with other key stakeholders.

Project District Overview: Among all the project districts, Howrah is having highest population density and Bankura has the lowest. The sex ratio of Hooghly district is highest and the decadal growth rate of project district varies from 9.5 percent in Hooghly to maximum of 13.5 percent at Howrah. All these districts have Scheduled Caste (SC) population and average SC population (31.2%) in project districts is marginally below the state average (32.65%). All five Project districts have a presence of tribes. Bankura has the highest percentage of tribal population (11 percent of the total population), followed by Bardhaman (7 percent) and Hooghly (4 percent). The tribal population in Howrah is less than one percent of the total population.. The average literacy rate (78.7) in project districts is higher than state (76.3%) and national (73%) average. There is a gap between male and female literacy, which is most pronounced in Bankura. Elsewhere the gender gap is less than the national average (16.2%).

The male worker population in the project districts is around 51.0 percent and female worker population is around 49.0 percent. Male main worker and marginal worker population is higher than female worker population whereas female non-worker population is higher than male.All the project districts are having significant percentage of marginal and small farmers. The study conducted adjacent to the project sites in project blocks reveals that the average land holding of farmers / families in the project areas (villages near the project sites in the project blocks) found to be 77 Katha or 1.28 acres (one acre is equal to 60 Katha). The average land holding in West Bardhaman is found to be highest with 162 Katha (2.7 acres) and lowest in Howrah (53.28 Katha) and Hooghly (61.47 Katha). In Bankura, the average land holding is 82.95 Katha and 98.81 Katha in East Bardhaman.

Socio-Economic Profile of the Affected Area: The project sites are dominated with population of other categories (65.38 percent) followed by scheduled caste population (33.78 percent). Among the affected families, the tribal population is marginal with 0.84 percent, though project districts have larger tribal population.Majority of the head of affected families in the project locations belongs to 18 to 60 age group (77.9 percent) followed by 60+ age category (22.0). About 9.7 percent families are headed by women out of total 2253 identified potentially affected families.Of the total households, 38.3 percent are below the average annual income of Rs.50,000/- whereas majority of 42.6 percent are in the average annual income category of Rs.50,000 to Rs.1,00,000/-. Percentage of households in the higher income group such as income level more than Rs.3,00,000 are less in comparison to lower income groups. Around 99.69 percent families have access to different schemes of the government (single or multiple schemes).

Structures in Project Locations:The identified project locations are having a total of 2637 structures of different nature. Of the different type of structures, majority are the residential structures to the tune of 40.8 percent, followed by business shops (26.3 percent) and cattle sheds. (12.4 percent).

Residential Structures: Among the residential structures, 34.20 percent are pucca houses, 40.33 percent are semi-pucca, 18.96 percent are kutcha houses and 5.67 percent are bamboo sheds. The average area of the residential structures assessed to be 469.80 Sq. Ft., irrespective of the type of residential structure. Majority of the residential structures are owned by the family of other categories (for whom the legality of ownership could not be verified as they could not produce proper records or documents in support of their claim) (48.1 percent) followed by squatters (39.4 percent) and encroachers (12.6 percent).

Residential Cum Business Structure:There are 78 residential cum business structures of which 44.9 percent are pucca whereas 47.4 percent are semi-pucca structures. Percentage of kutcha, bamboo shed and other structures are relatively less in the project locations.Average area of the residential cum business structures is about 452.42 Sq. Ft.Of the total, 19.2 percent are structures in the encroached area, 44.9 percent are of different squatters and 35.9 percent belongs to other categories.

Business Shop: The project area is having 694 business shops of which 53.6 percent are semi-pucca structures followed by 40.2 percent pucca, 3.3 percent bamboo and 2.2 percent are kutcha structures. About 11.4 percent shops are in encroached area (constructed by encroachers), 55.5 percent are by the squatters and 33.0 percent are of other categories.

Other Structures: The project locations are also having other structures, such as sheds (169 temporary / permanent; around 3.0 percent encroachers are having such structures whereas 50.3 percent by squatters and 46.7 percent by other categories); BEDIs (13 Bedis of which 46.2 percent are of squatters and 53.8 percent by other categories); Boundary walls (61 boundaries of which 67.2 percentpucca, 29.5 percentsemi-pucca, 9.8 percent are in the encroached land and 31.1 percent are of squatters and remaining 59.0 percent are in different other category); toilets

(158 toilets of which 81.5 percent are semi-pucca and 15.9 percentpucca structures, 3.8 percent are in encroached area and 55.1 percent by the squatters while remaining 41.1 percent are by other categories) and Cattle sheds (328 cattle sheds of which 3.7 percent are pucca, 42.1 percent are semi-pucca, 27.4 percent are kutcha and remaining 26.8 percent are bamboo sheds. About 5.8 percent are in encroached land, 60.1 percent are under squatters and remaining 34.1 percent are of other categories)

Potential Impact: The project will have long term positive impact on socio-economic condition of the people in the command after its completion along with environmental benefits. But short term and reversable adverse impact is anticipated on encroachers / squatters and the structures that are already constructed or under construction. The project would have such adverse impact, mainly of temporary nature, on certain categories of people, mostly encroachers and squatters, and also on some utility structure and community assets due to construction activities. The project Component C which is basically designed for flood management through embankment strengthening and flood wall construction will give rise resettlement / relocation. The zone of impact of such activities will be limited to the area proposed for embankment strengthening and flood wall construction in two project districts, i.e., Hooghly and Howrah.

The project is likely to affect 2253 families / households with differential degree. All the anticipated affected families do not have residential structures in the identified working zones. On the other hand, few families also have more than one type of structure (residential, house cum shop, business shops etc.), which are temporary or permanent in nature.There are 2579 structures existing in the project locations and all these structures belong to 2253 households. In the residential structures, majority are semi-pucca (40.3 percent) and pucca (34.2 percent) followed by kutcha structures (19.0 percent). Similar distribution is observed in case of residential house cum shop where majority are semi-pucca (47.4 percent) and pucca (44.9 percent) structures. In case of business shops also, 53.9 percent are semi-pucca and 40.1 percent are pucca structures. Prevalence of other types of structures are less.The project is likely to affect 7270 persons in 2253 households, i.e., average of 3.23 persons per affected family. About 57.76 percent of the likely to be affected persons are male and remaining 42.24 percent are female.

Among the affected households, Encroachers and squatters together comprise 51.9 percent in residential structures, 64.1 percent in residential cum business units (house cum shop), 41.0 percent in case of having boundary walls, 58.9 percent in having toilets, 65.9 percent in having cattle sheds and 66.8 percent in terms of having business units / shops, 53.3 percent having sheds and 46.2 percent having Bedi.

Different common property resources and utilities such as electric pole / light post, platforms for religious rituals (pandals / BEDI), pump house, transformer, drinking water sources (tube well) etc. may require relocation / replacement due to construction activities which may create inconvenience for the local people for a short duration (during shifting period).

The project will have minimal impact on the income and livelihood of people. The loss of income and livelihood will occur to the persons who have their commercial establishments / shops on or near to the embankment (work sites only) and the owners of the land whose land may have to be occupied on temporary basis, not exceeding three years from the date of such need-based occupation.

Consideration of Alternatives: The project is not causing any displacement due to acquisition of land that are permanent in nature. To avoid resettlement of encroachers / squatters, the project has been taking several measures in terms of (1) identification of areas for construction works that have no or minimum impact on habitation / settlements, (2) preparing structural designing that are conducive, (3) minimizing area coverage on both the sides of the embankment particularly country side and (4) keeping ROW accessible, through existing or new roads. Strategically, the project will also take steps for temporary

relocation of PAFs / PAPs during construction phase (temporary relocation refers to a situation where during working period, the encroachers / squatters will shift to other places and may come back to the site after the work is completed) instead of permanent relocation, where ever feasible, without compromising the overall objective of the project.In case of legal title holders having structure/s on their own land; the project will adopt multifold strategies such as avoiding demolition of concrete structures as it may act as a flood protective cover, making required change in the design, taking alternative decision on flood wall and/or embankment strengthening measure etc.

Cut-Off Date: The cut-off date is considered as 10th of October 2018 as census was done before that date. Any PAF left out during the census would be given due opportunity to register the demand for compensation, to the RAP Implementing Authority, through a grievance redressal mechanism, and the cut-off date may suitably be extended for this specific cases / purpose.

Eligibility for Compensation: A person / household will be eligible for compensation / assistance in case of having structures of different nature which are to be affected due to project activities; community structures, temporary use of land for project purposes, affected trees and impact on crops due to project activities. As no land is proposed for acquisition, no compensation will be provided for land.

Compensation Entitlement: All the affected persons, including encroachers and squatters who have structures on the identified work zones, will be compensated under "GITANJALI" Housing Scheme of the State Government at the present rate of Rs. 1,20,000. All the affected families / persons will be entitled to compensation depending upon the nature of ownership rights on affected assets.Of the total compensation package of 1.2 lakh, 50.0 percent of the compensation will be paid before the demolition of the structure and remaining 50.0 percent after the demolition of the structure. However, compensation in full will be disbursed before the commencement of the work.

Compensation for Community Structures: The project will bear cost of shifting / relocation of different facilities along with repairing / new construction of community structures based on the degree of impact.

Right to Salvage Affected Materials: Even after payment of compensation for structures, the affected families would be allowed to take away the materials salvaged from their dismantled structures and no charges will be levied upon them for the same. A notice to this effect will be issued intimating that the PAFs / PAPs can take away the materials so salvaged within 15 days of their demolition; otherwise, the same will be disposed-off by the project authority without giving any further notice.

Institutional Arrangement and Implementation Structure: The Resettlement Action Plan (RAP) will be implemented by a joint team of project officials of the IWD and other Departments, and Block Administration, under the overall leadership of the District Magistrate of the concerned project district. Engagement of Self-Help Groups, Support Organization and NGOs will be permitted for effective implementation of the RAP, if felt necessary by the District Magistrate. Local Bodies (Panchayat) may also be involved in this process, to the extent required.

In order to make the land available for the execution of planned activities and to address the entitlement of the affected households, there will be a District Level Committee (DLC)at the project level in each project district, headed by the Collector and District Magistrate as chairperson.In the similar line, there will be a Block Level Committee (BLC) at each project blocks, headed by the BDO of the concerned block

Monitoring and Evaluation: There will be both internal and external monitoring mechanism for the effectiveness of the RAP implementation. The internal monitoring will be conducted by DPMU along with DLC from time to time to assess the progress in addressing the issues. The committee at the district

level will review the progress from time to time and BDO will monitor the activities at the field level. The APD-DPMU will also conduct periodic monitoring along with Social Expert of the SPMU. This will be monitored during concurrent monitoring, mid-term assessment and end-line evaluation. The external M&E agency along with the PMC will also monitor the activities from time to time.

Grievance Redressal Mechanism: The project will have a robust grievance redressal mechanism in place, including web-based grievance recording and disposal system. The local Gram Panchayat and Community level organizations will serve as the first-tier mechanism to handle complaints and grievances. The local Sarpanch of the Gram panchayat will be the focal point for grievance redressal. Required support will be extended by the BDO and local SPMU / DPMU. In case, the grievance remains unresolved to the satisfaction of the aggrieved person, she/he may place his/her grievance to the state level grievance cell (Tier II) and if not settled amicably, she/he may approach the Judiciary system.

RAP Budget: The total budget of RAP implementation, estimated to be Rs. 3481.82 Lakh which comprises cost of compensation for the structures likely to be affected, cost of RAP implementation, restoration of common property resources etc.

Chapter 1: Introduction

1.1 Project Background

The Irrigation and Waterways Department (IWD) of Government of West Bengal is planning to implement "West Bengal Major Irrigation and Flood Management Project (WBMIFMP)". The project aims at modernization of irrigation system, with special emphasis on conjunctive use of ground and surface water in the Damodar Valley Project Command Area of the State. The project will be executed in the districts of Purba (East) & Paschim (West) Bardhaman, Bankura, Hooghly and Howrah districts of the State. Prime objective of proposed project is to rejuvenate and rehabilitate existing irrigation network for sustainable development in DVC area and management of floods in Lower Damodar Sub-Basin in West Bengal. The project has the objective of (1) Augmenting water supply in the canal distribution network and improving irrigation management to ensure sustainable conjunctive use of water resources in the command area of Damodar Valley in the State of West Bengal, (2) Reducing impact of flood and drainage congestion in the Lower Damodar Sub-Basin by various structural measures.

1.2 Project Components

Component A: Irrigation Management
This component will improve the management of the DVC irrigation scheme. The component four sub-components, i.e., (a) Establishment of MIS, (b) Improving the Quality of Service Delivery, (c) Introduction of Performance Management, and (d) Capacity Strengthening.

Sub-Component A1: Establishment of MIS and Performance Monitoring
The Project will establish a robust Management Information System (MIS) and a network/system for data capture, transmission and management. The design of the MIS will not only support the monitoring needs specific to this project, but also all the departmental (IWD) schemes and projects. The MIS will have the following modules.

1. Administrative Functions and Maintenance (Administration) modules, including procurement, design approvals, project management and physical progress, finance and expenditure benchmarking, and HR;

2. Irrigation Operations and Decision Support Systems (Operations), including a water balance module for conjunctive water availability; a disaster management module including irrigation infrastructure operational thresholds, flood warning and alerts; and an asset health and management module, including asset maintenance records, current status, date of next service. These modules will be tied together with a high-level dashboard for decision makers/water managers. The Project will pilot use of satellite services for irrigation scheduling;

3. Performance Monitoring and Irrigation Efficiency Evaluation (Performance), including service delivery performance module measured as a factor of quantity and timeliness of delivery with subsequent benchmarking at outlets, personnel performance, beneficiary registration and engagement, service delivery verification and citizen's feedback, grievance redressal, diagnostics tracking and high-level performance review dashboard.

Sub-Component A2: Improving Service Delivery
The Project will improve the quality of service delivery through (a) introduction of performance-based operation of irrigation canals at distributary canal and below, (b) support for individual irrigation service providers, and (c) introduction of accountability and transparency.

The Project will introduce performance-based irrigation operation through Private Irrigation Operators. The Operators will become responsible for operating distributary canals and below (10,000 hectares on average). They will sign a multi-year framework contract that lays down the broad principles, and annual water supply contracts that are based on the amount of water available in the upstream reservoirs in that particular year. The Operators will also sign a bulk water delivery contract with IWD, and separate output-based service delivery contracts for promoting micro-irrigation and market linkages. Operators will be paid on a per hectare basis by IWD.

The Project will also promote individual service providers to provide irrigation services to farmers and farmer groups. This could include mobile pump services, pump repair services, weather information services, and others. The project will support these service providers through capacity strengthening, assistance in the preparation of business plans and credit requests to banks, and support for the development of small-scale on-farm water storage. The Project will support rational asset management, including establishment of a geo-tagged asset database, budget planning, development of maintenance standards, and reporting on these. The Project will strengthen accountability and transparency and staff management

Sub-Component A3: Capacity Strengthening
The Project will strengthen capacity of IWD staff, operators, WUAs and farmers to improve the quality of service delivery. A capacity strengthening needs assessment will be conducted during the first year of the project, and will be updated annually, based on feedback from beneficiaries. IWD staff will be trained in effective contract design and contract management, negotiation and monitoring. The Project will transform the River Research Institute (RRI) into a center of excellence and will award M. Sc. and Ph. D degrees in River Engineering, and Hydrology and Hydro-informatics, Finance and Project management.

Component B: Modernization of Irrigation Infrastructure
This component looks at the modernization of irrigation infrastructure at main, distributary, minor and chak level. The component includes three sub-components, i.e., (a) Main and Distribution Canal Modernization, (b) Minor Canal and Chak Infrastructure Modernization, and (c) Groundwater Recharge.

Sub-Component B.1: Main and Distribution Canal Modernization
This sub-component will support in modernization and upgradation of RBMC and LBMC and the Distribution Canals by desiltation, slope stabilization and refurbishment as well as remodeling of regulating structures. There are 39 Distribution Canals in the command area, with an average service area of 10,000 hectares. The modernization will bring in stabilsation of flow, better flow control and the systematic maintenance of “full supply” water levels. In order to reduce the risk of bank erosion, selected sections of canals will be lined.

Sub-Component B.2: Minor Canal and Chak Infrastructure Modernization
There are 220 Minor and sub-Minor Canals in the project area, with an average command area of 2,000 ha. The project will upgrade these canals, rehabilitate the cross-regulators, modern closable and lockable outlet structures and selected lining. The project will install pressurized supply system. To that end, the minor canal will be converted into a reservoir, and solar panels and pump station will be installed on top of the canal to avoid resettlement, reduce evaporation and enhance the operational efficiency of the panels. Within the associated chaks, the Project will install sub-surface pressurized pipe systems that will

deliver water to faucets on each plot. Farmers who so wish can connect these to a micro-irrigation system. Others who wish to practice flood irrigated crops can continue doing so.

The Project will promote adoption of micro irrigation technologies by farmers. This will be done through (a) awareness and capacity building, (b) support for the preparation of loan requests to bridge the time between purchase and receipt of the govt. subsidy, and cover the beneficiary's contribution. Where possible, group purchase will be encouraged to increase credit worthiness. The Project will sign contracts with the irrigation Operators and remunerate them on the basis of the number of loans signed between the bank and farmers for the purchase of micro irrigation.

Sub-Component B3: Aquifer Management
The Project will establish groundwater monitoring system that will be managed by the Water Resources Investigation and Development Department (WRIDD). The monitoring system would measure actual groundwater withdrawal. Through the MIS, the Project will collect baseline data on groundwater use, levels and quality. WRIDD will operate a service that will issue alerts when groundwater levels drop below 20 and 30 meters, and will disclose geo-tagged groundwater level information through a mobile phone app. The Project will also invest in the groundwater knowledge base by conducting a study into the groundwater situation in the project area. The study would aim to establish a more accurate water balance (including in particular sub-surface in and outflow), identify opportunities for groundwater recharge, and define levels for sustainable groundwater withdrawal.

Component C: Flood Management
This Component will invest in structural measures to reduce flooding in the project area. Overall, the objective is to provide protection of at least 1 in 25-year flood return period for the left side of the Amta Channel and to prevent annual recurrence floods to the extent possible in the right bank and also to manage Amta right bank overspills to pass to channels and areas where resultant damage can be minimized. If possible, the right bank area would be largely protected from substantive damage up to a 1 in 10-year event. The intervention will ensure that flood flow discharge is more evenly shared between the Mundeswari and Amta Channels. Increasing flood discharge capacity in Mundeswari requires de-siltation to restore/increase the low flow to moderate flood discharge capacity to reduce/limit peak discharge that will still be needed in the Amta for all flood events. The project will also install two inflatable rubber dams at key locations.

As flood in the lower Damodar cannot be fully avoided, the project will support flood management to moderate the frequency and extent of flooding. The project will improve the conveyance capacity of the Mundeshwari River, controlling and reducing discharge into the Amta Channel under high flow conditions, implementing small improvements and modifications to the Amta Channel left bank, and improving several sluice gates to facilitate more rapid evacuation of flood water.

Component D: Project Management
This component will strengthen IWD and the SPMU's capacity for project management, including monitoring and evaluation (M&E), procurement and financial management. The project will support in staffing the SPMU and allied district level project implementation structures. A Project Management Consultant (PMC) will be recruited to assist the SPMU in managing and coordinating project activities. A Construction Supervision Consultant (CSC) will be recruited to assist the SPMU in supervising construction works.

1.3 Implementing Agency

Irrigation & Waterways Department, Government of West Bengal is the nodal agency to implement West Bengal Major Irrigation and Flood Management Project (WBMIFMP). To manage and oversee

implementation of the project, there will be a State Project Management Unit (SPMU) and two District Project Management Units (DPMUs). The SPMU is headed by a Project Director in the rank of Chief Engineer and the DPMUs are headed by Additional Project Directors in the rank of Superintending Engineers (Civil). In addition to the dedicated SPMU and 2 DPMUs, four Irrigation Divisions (i.e. Howrah Irrigation Division, Hooghly Irrigation Division, Bardhaman Irrigation Division and Right Bank Irrigation Division) under the Irrigation & Waterways Directorate have been identified for implementing field works of the project exclusively, and these Divisions are designated as District Project Implementation Units (DPIUs). Apart from IWD, Department of Food Processing Industries and Horticulture, Agriculture Marketing Dept., Agriculture Dept. and Fisheries Department of Government of West Bengal will also be associated in the implementation of the project activities. There will be one Project Management Consultant (PMC) at SPMU level to assist SPMU in implementing entire project.

1.4 Need for Displacement / Relocation

All the project activities that require land, i.e., embankment strengthening, de-siltation and flood wall construction will be taken up in the existing structures and within the right-of-way / river bed. So, no additional private land is required for the project purpose and no land acquisition is proposed under the project. Further, the embankment / the right-of-way has been encroached upon in many places entailing impact to commercial and residential structures as well as small temples and other common facilities. Though, the project will not involve in any land acquisition, it will impact on encroachers and squatters.

None of the interventions under the WBMIFMP require additional land beyond the land already in possession of the government or create perpetual interference on land or other assets of private persons. As such, permanent acquisition of land in terms of provision of LARR Act, 2013 or direct purchase of land as per prevailing policy of the Government of West Bengal will not be required. Also, the project activities have been planned in such a manner so as to create the least obstruction / interference on the land and other assets of people as well as various utility structures, lying in the vicinity of working zone.

1.5 Project Cost

The project is to be co-financed by the World Bank and Asian Infrastructure Investment Bank (AIIB), jointly in equal proportion for USD 145 million each of the total loan amounting to USD 290 million (70% of the total estimated project cost of USD 413 million). Remaining 30% of the project cost, i.e. USD 123 million would be borne by the State Government.

1.6 Structure of the Report

Chapter 1: Project Introduction
Chapter 2: Approach and Methodology
Chapter 3: Socio-Economic Profile
Chapter 4: Stakeholder Consultation and Analysis
Chapter 5: Impact Assessment
Chapter 6: Resettlement
Chapter 7: Institutional Arrangement & Implementation Structure
Chapter 8: Monitoring and Evaluation
Chapter 9: Grievance Redressal Mechanism
Chapter 10: RAP Budget

Chapter 2: Approach and Methodology

2.1 Introduction

This section deals with the approach and methodology followed for the collection and analysis of data. The project followed both quantitative and qualitative approach for data collection. Social impact assessment and resettlement planning component has following elements:

2.2 The Approach

The preparation of RAP was driven by collection and analysis of different data, collected from primary and secondary sources. A participatory and consultative approach was followed throughout the process, involving both primary and secondary stakeholders at different stages. Attempt made to cover all the households that occupy different structures on either side of the working zone and on the ROW, covering five meters (as decided by Government) on both the sides of the embankment at working zones and entire area on ROW. As fresh land acquisition for the project activities is ruled out by the Govt., and project intends to confined its working zone within the currently available govt. land, the approach of the study was (1) to identify different structures that are available on both the sides of the embankment and on the ROW, within the stipulated working zones, which are likely to be affected, and (2) preparing a list of families / households / persons who owns such structures so that compensation can be paid as per the norm finalized by the govt. As, majority of the structures belongs to encroachers / squatters, temporary and / or permanent eviction is required from the identified work zones. So, the overall study approach was to identify such areas of eviction, existence of different structures, both community and individual ownership based, and person / families who own such structures. As Govt. of West Bengal has decided to cover all the affected families / households under GITANJALI scheme, taking residential / non-residential structures as the unit, the census survey approach was adopted accordingly. However, any change in specific project / activity location may require further assessment to identify persons to be affected in such changed locations.

2.3 Methodology

The study adopted an integrated approach of collecting required data / information which includes primary census survey of affected households, secondary source information collection, physical observation of the situation, stakeholder consultation, meetings in different identified project locations, discussions with key informants and conducting FGDs. Efforts were made to collect required information from the families through discussion on various aspects. Effort was made to involve all the potential affected households in the identified project location in the process of data collection so as to have a representative view of the household on the issues of displacement, compensation and rehabilitation. The methodologies selected for conducting the study were to satisfy the objective and scope of the study as mentioned in the TOR. The study followed an observational design entailing both qualitative and quantitative methods. The methodology covered (1) interview with the project affected families / persons, (2) focus groups discussion with the local community, (3) observation of the structures present, (4) discussion with local project authorities and other local institutions and (5) discussion with other key stakeholders.

2.4 Data Collection

The study had a systematic process for collecting information from affected households in different project locations. The strategic process of the study followed is as follows;

Table 1: Stages of Data Collection

Sl. No.	Stages of the Study	Details
1	Stage 1	Exploratory visit to the project locations and discussion with local people / community. Discussion with habitants living nearer to the project locations in country and river sides.
2	Stage II	Collection of available secondary information and its analysis to understand the socio-economic condition and related aspects
3	Phase III	Designing of tools, piloting of tools and its administration for primary data collection
4	Phase IV	Data Entry, its analysis and submission of report

Table 2: Primary and Secondary Data Collection

SL. No.	Primary Data	Secondary Data
1	Census Survey of affected households through structured schedule	Information, maps etc. provided by the IWD Department
2	Site specific structures / infrastructure and socio-cultural property survey using checklist, observation and consultation with local people	Relevant Acts and policy guidelines of Govt. of India and Govt. of West Bengal
3	Focus Group Discussion	Other Study reports, including feasibility study report of the project
4	Discussion with the district and local level functionaries of the Department/s	Secondary literature, including district statistical hand book, economic survey report, census data of 2011, agriculture statistics etc.

2.5 Tools

Structured schedules and FGD checklist were used for conducting socio-economic and census surveys of the affected area. Study schedule was prepared to capture relevant socio-economic data of the affected persons / households. In addition to the structured schedule, separate FGD check list was also administered in different project locations, involving local people / community.

Apart from study schedules for capturing primary data, a checklist was also prepared to list and record secondary data. Secondary information about the socio-economic profile of the district and project area was collected from authentic sources and published government documents and maps. Primary data on different socio-economic aspects were collected from site surveys. The different types of primary and secondary data collected are listed in following table:

2.6 Definitions of Terms and Phrases

The following terms, words and phrases have been referred to and used in this RAP Report for better clarification of the reader. Though, some of the terms are indicated in the Act and Rules, for the purpose of relevance and importance the definition and connotation of all relevant words, terms and phrases are furnished below:

Affected Area:Means such area as identified as the working zone by IWD Department of Govt. of West Bengal. As no land acquisition is proposed, it is not notified by the Government of West Bengal.

Governments: Central Government means the Government of India and State Government means Govt. of West Bengal.

Cut-off Date:For the purpose of compensation for different assets / structures,cut-off date is the date,as decided by the Govt. of West Bengal, before or after the commencement of the RAP study.

District Collector:Means the officer appointed by the State Government as a Collector and District Magistrate of a District.

Project:In this document, project refers to West Bengal Major Irrigation and Flood Management Project (WBMIFM)which is proposed to be executed in five districts of West Bengal.

Encroacher: A person who has trespassed Government/ private/community Land, adjacent to his or her land or asset to which he/she is not entitled and who derives his/her livelihood and housing there from prior to the cutoff date.

Squatter: A squatter is a person who has settled on publicly owned land for housing or livelihood without permission or who has been occupying publicly owned building without authority prior to the cutoff date.

Other Category: Other category of persons / households in structural ownership category include those households who have structures on land in the identified stretch of working zone and their legality could not be confirmed due to non-availability of verifiable records in support of their claim.They are accordingly,placed under the same category of encroachers till further verification.

Landless/Agriculture Labour: A person who does not hold any agriculture land and has been deriving his main income by working on the lands of others as sub-tenant or as an agriculture labour prior to the cut-off date.

Tenants:Tenants are those persons having bona fide tenancy agreements, prior to the temporary use of the land for project purposes, with a property owner, with clear property titles, to occupy a structure or land for residence, business or other purposes.

Vulnerable Groups: Persons such as differently abled, widows, and women headed household, persons above sixty years of age, Scheduled Caste and Scheduled Tribes and other groups as may be specified by the State Government.

Women Headed Household:Means a family headed by a woman and does not have a male earning member or the Male member is not earning/ not capable of earning. This woman may be a widow, separated or deserted woman.

Project Affected Person: Person who is likely to be affected due to the project activities in respect of ownership of the structure thereon, trade and occupation.

Project Displaced Person: A displaced person is a person who is compelled to change his/her place of residence and/or work place or place of business, due to the project on permanent basis.

Projected Affected Family: Family includes a person, his or her spouse, minor children, minor brothers and minor sister's dependent on him. Provided that widows, divorcees and women deserted by families shall be considered separate families;

Land Owner: Land owner includes any person - whose name is recorded as the owner of the land or building or part thereof, in the records of the authority concerned; or any person who is granted forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or under any other law for the time being in force; or who is entitled to be granted Patta rights on the land under any law of the State including assigned lands; or any person who has been declared as such by an order of the court or authority.

Marginal Farmers: Marginal farmer means a cultivator with an un-irrigated land holding up to one hectare or irrigated land holding up to one half hectare, or as may be defined by the concerned state government.
Small Farmer: Small farmer means a cultivator with an un-irrigated land holding up to two hectares or irrigated land holding up to one hectare, but more than the holding of a marginal farmer, or as may be defined by the concerned state government.

2.7 Limitations of the Study

The study is having limitations with regard to collecting sensitive data / information from the household level. The limitations can be viewed in terms of reviewing land records of the families who claim to have land rights in certain project locations and total land holding of the family. As getting willingness of the identified affected family to show the land records was a constraint, the total area under the possession of the household count not be ascertained fully, apart from taking the view of the family. Secondly, collection of income level data remains always sensitive however, majority of the family members shared their current level of income from different sources. The area estimated to be affected due to project activities are based on its availability in the working zone and affected area is estimated based on the consultation with the IWD officials in the ground, concerned owner of the structure and based on the physical observation.

Chapter 3: Socio-Economic Profile:

3.1 District Profile

3.1.1 Demographic Profile of the District

The population density among the project districts is highest at Howrah and lowest at Bankura. The sex ratio is highest at Hooghly district, which is marginally higher than the state value. Decadal growth rate in project district varies from 9.5% in Hooghly to maximum of 13.5% at Howrah.

Table 3: Demographic profile of whole project district

Indicators	Bankura	Bardhaman (E&W)	Howrah	Hooghly
Population (No.)	7,14,599	77,17,563	48,50,029	55,19,145
Decadal growth rate (%)	12.65	11.9	13.5	9.5
Population Density	523	1099	3306	1753
Sex Ratio	957	932	939	961
Work Participation Rate (%)	40.77	37.7	37.5	39.0
Main Workers (%)	25.48	28.1	30.9	31.1
Literacy Rate (%)	70.26	76.2	80.0	81.8
Scheduled Caste (%)	32.65	27.41	14.82	24.35
Scheduled Tribe (%)	10.25	6.34	0.31	4.15
Urban Population (%)	8.33	39.89	63.4	38.6

Note: This table represents total figure of project districts.

ST & SC Population: The SC population is predominant in all project district. Average SC population (31.2%) in project districts is marginally below state average (32.65%). Secondary study reveals that ST population is present in all project blocks. In Bankura district, ST concentration is lowest (1.64%) at Barjora block and highest (3.5%) at Sonamukhi block. In West Bardhaman ST concentration is highest (10.2%) at Kanksa and lowest (6.9%) at Faridpur Durgapur. In East Bardhaman, ST concentration is more than 10% in 8 project blocks and less than 5% in 7 project blocks. ST concentration is highest at Memari – II (18.4%), followed by Kalna – II (17.28%), Memari – I (15.7%), Jamalpur (15.1%) and Ausgram - II (14.4%) in East Bardhaman district. In Howrah district, ST population is lowest (0.04%) at Uluberia-II block, followed by Shyampur – II block (0.05%) and highest (1.03%) at Jagatballavpur block. In 4 blocks of Hooghly district, ST population concentration is more than 9% and remaining 11 blocks has less than 7% ST concentration..

Table 4: Project district wise SC & ST population concentration

Items	Bankura	Bardhaman (E)	Bardhaman (W)	Howrah	Hooghly	Total (in 51 Blocks)
Household	151,989	806,809	42,590	372,070	706,281	2,079,739
Population	688,813	3,459,154	188,964	1,688,303	3,053,642	9,078,876
SC Population	291,761	1,161,884	70,652	376,505	929,574	2,830,376
ST Population	17,508	299,879	19,927	3,820	195,422	536,556
% of SC Population	42.4	33.6	37.4	22.3	30.4	31.2
% of ST Population	2.5	8.7	10.5	0.2	6.4	5.9

Note: This table represents only rural population of 51 project blocks (41- Irrigated and 10 – Flood affected) of these five districts

3.1.2 Literacy

According to the 2011 census, the average literacy rate (78.7) in project districts is much more than state (76.3%) as well as country (73%) average. Average urban literacy rate is above 80% in all the project districts and rural literacy rate is below 80 percent in all the project districts. Bankura has rural literacy rate (71%) below state as well as national average. There is a gap between male and female literacy, which is most pronounced in Bankura. Elsewhere the gender gap is less than the national average (16.2%).

Table 5: Literacy Rate in Project District

District	Literacy Rate (%)	Male literacy rate			Female literacy rate			Gender gap in literacy		
		T (%)	R (%)	U (%)	T (%)	R (%)	U (%)	T (%)	R (%)	U (%)
Bankura	71	80	79.1	90.1	60.1	58.3	78.5	20	20.8	11.6
Bardhaman (E&W)	77.2	82.4	79.1	87.3	69.6	65.9	75.3	12.8	13.3	12
Howrah	83.9	87	84.7	88.2	79.4	75	82	7.5	9.8	6.2
Hooghly	82.6	87	84.8	90.5	76.4	72.1	83.1	10.7	12.7	7.4
Project Average	78.7	84.1	81.9	89.0	71.4	67.8	79.7	12.8	14.2	9.3

Note: This table represents total figure of project districts (T: Total; R: Rural; U: Urban)

3.1.3 Economy of the District

Working Population: The male worker population in the project districts is around 51.0 percent and female worker population is around 49.0 percent. Male main worker and marginal worker population is higher than female worker population whereas female non-worker population is higher than male.

Table 6: Worker and Non-Worker Population

District	Male Population				Female Population			
	Main Worker	Marginal Worker	Non-Worker	Total	Main Worker	Marginal Worker	Non-Worker	Total
Bankura	24.2	6.6	20.5	51.2	5.2	6.3	37.3	48.8
Bardhaman (East)	24.6	6.8	19.7	51.0	5.0	5.0	39.0	49.0
Bardhaman (West)	19.7	10.3	21.7	51.6	3.6	7.2	37.5	48.4
Howrah	25.1	6.0	20.1	51.2	3.2	3.3	42.2	48.8
Hooghly	25.8	6.0	19.0	50.8	4.5	4.4	40.3	49.2
Average (Project District)	23.8	7.1	20.2	51.2	4.3	5.3	39.3	48.8

Note: This table represents only rural population of 51 project blocks (41- Irrigated and 10 – Flood affected) of these five districts

Livelihood: The livelihood profile of the state varies widely across the districts. The proportion of cultivators is the largest in Bardhaman (E&W) and Bankura district, and the smallest in Howrah. In the latter district, there is a large percentage of household industrial workers. In Howrah, there are a large percentage of female household industrial workers followed by Bardhaman and Hooghly district. Other workers have a large presence in Bardhaman, Howrah and Hooghly.

Table 7: Male Work Force (Main and Marginal)

District	Male Worker (Both Main and Marginal) (% Distribution)								
	Cultivator		Agricultural Labourer		Household Industrial Worker		Other (Worker)		Total
	% of State	% of District	% of State	% of District	% of State	% of District	% of State	% of District	% of State
Bankura	6.16	57.75	5.17	80.29	2.69	6.26	2.63	74.81	3.93

Bardhhaman (E&W)	7.09	66.54	9.40	146.07	5.81	13.51	8.86	252.02	8.58
Howrah	1.58	14.84	2.15	33.47	17.85	41.49	7.82	222.58	5.61
Hooghly	5.32	49.95	5.58	86.73	5.98	13.89	7.26	206.74	6.41

Note: This table represents total figure of project districts.

Table 8: Female Work Force (Main and Marginal)

District	**Female Worker (Both Main and Marginal) (% Distribution)**								
	Cultivator		**Agricultural Labourer**		**Household Industrial Worker**		**Other (Worker)**		**Total**
	% of West Bengal	% of District	% of West Bengal	% of District	% of West Bengal	% of District	% of West Bengal	% of District	% of West Bengal
Bankura	5.31	16.04	9.59	128.50	2.33	15.38	2.66	43.57	5.17
Bardhaman (E&W)	3.74	11.29	9.97	133.57	4.43	29.27	7.87	128.68	7.69
Howrah	1.53	4.61	0.77	10.35	7.32	48.39	5.76	94.23	4.00
Hooghly	3.27	9.87	6.12	82.02	3.35	22.14	6.19	101.15	5.46

Note: This table represents total figure of project districts.

Operational Holding: Land holding pattern reflects that all the project districts are having significant percentage of marginal and small farmers. In Bankura, 68.0 percent farmers are having less than 1.0 Ha. of land and percentage of holding to total holding is 36.0 percent. Of the total farmers, 21.0 percent are having 1.0 to 2.0 Ha. of land with 31.0 percent of the total land whereas only 11.0 percent farmers are in the holding category of greater than 2.0 Ha. of land with 33.0 percent of the total area of holding.

Table 9: Project district wise land holding status

District	**Item**	**Classification of Holding**	**<= 1 Ha**	**> 1 to <= 2 Ha**	**>2 Ha**	**Total**
Bankura	Holding	Nos.	278414	85292	44325	408031
		% to Total	68	21	11	100
	Area	Ha.	148494	125064	133850	407408
		% to Total	36	31	33	100
Bardhaman	Holding	Nos.	325565	88410	38892	452867
		% to Total	72	20	8	100
	Area	Ha.	191610	149896	130612	472118
		% to Total	41	32	27	100
Howrah	Holding	Nos.	256387	22339	5369	284095
		% to Total	90.24	7.86	1.9	100
	Area	Ha.	81880	26669	13242	121791
		% to Total	67.23	21.9	10.87	100
Hooghly	Holding	Nos.	293535	40363	8633	342531
		% to Total	86	12	3	100
	Area	Ha.	128989	61311	25855	216155
		% to Total	60	28	12	100
Total	**Holding**	**Nos.**	**1153901**	**236404**	**97219**	**1487524**
		% to Total	**77.57**	**15.89**	**6.54**	**100.00**
	Area	**Ha.**	**550973**	**362940**	**303559**	**1217472**
		% to Total	**45.26**	**29.81**	**24.93**	**100.00**

Source: NABARD
Note: This table represents total figure of project districts.

In Bardhaman, less than 1.0 Ha. of land holding is more prominent as 72.0 percent farmers are in this category with holding of 41.0 percent of the total land. About 20.0 percent farmers who have holding size of 1.0 to 2.0 Ha. having 32.0 percent of the total land and remaining 27.0 percent land belongs to 8.0

percent farmers who have average holding of more than 2.0 Ha. of land. Similar trend is observed in other two project districts, i.e., Howrah and Hooghly.

The study conducted adjacent to the project sites in project blocks reveals that the average land holding of farmers / families in the project areas (villages near the project sites in the project blocks) found to be 77 Katha or 1.28 acres (one acre is equal to 60 Katha). The average land holding in West Bardhaman is found to be highest with 162 Katha (2.7 acres) and lowest in Howrah (53.28 Katha) and Hooghly (61.47 Katha). In Bankura, the average land holding is 82.95 Katha and 98.81 Katha in East Bardhaman.

Table 10: Land Holding Pattern

Project District	Average land Holding		Median Value of Land Holding	Distribution of Households (%)
	In Katha	In Acre		
Bankura	82.945	1.38	70.00	9.6
East Bardhaman	98.809	1.65	70.00	30.1
Hooghly	61.471	1.02	40.00	29.6
Howrah	53.281	0.89	40.00	26.3
West Bardhaman	162.040	2.70	100.00	4.4
Total	**77.008**	**1.28**	**50.00**	**100.0**

Source: Field Study

The operational holding of the families is marginally higher than own legal holding because of share-in / leased-in land used for cultivation.

Table 11: Operational Holding Pattern among Farmers in Project Districts

Project District	Average land Holding		Median Value of Land Holding	Distribution of Households (%)
	In Katha	In Acre		
Bankura	93.60	1.56	80.00	8.1
East Bardhaman	107.96	1.80	80.00	26.5
Hooghly	48.98	0.82	30.00	33.0
Howrah	61.21	1.02	50.00	28.1
West Bardhaman	195.70	3.26	110.00	4.3
Total	**77.97**	**1.30**	**50.00**	**100.0**

Source: Field Study

3.1.4 Land Type and Land Use

Total geographical area of the project blocks is 10,55,866.3. The gross cropped area is 136.1 percent of total geographical area. The net sown area is 68.45 percent to total geographical area. Area sown more than once is 97.53 percent of the net sown area. Project district as well as block wise information on different land use pattern is tabulated below.

Table 12: Project district wise land use pattern

	Area under Agriculture (ha)							
District	**Total Geographical Area**	**Gross cropped Area**	**Net sown Area**	**Area sown more than once**	**Cropping Intensity (%)**	**Area under Forest**	**Area under Wasteland**	**Area under other uses**
Bankura	134090.3	140335	82580	57755	168	23079.7	4728.5	25251.4
Bardhaman (East)	480464	675377	356949	318428	193	11793	2853	108870
Bardhaman (West)	56697	29596	24850	4746	119	10230	4490	17127
Howrah	115593	138738	74180	54706	188	0	0	41413

Hooghly	269022	453338	184134	269204	244	528	1133	0

Source: District Irrigation Plan (DIP), 2016

The land utilisation pattern of the project districts reflects that 61.59 percent of the total geographical area is the net sown area in Bankura whereas 74.29 percent of district geographical area is the net sown area in Bardhaman (east), 43.83 percent in Bardhaman (west) which is lowest among all the project districts, 64.17 percent in Howrah and 68.45 percent in Hooghly. Among all the project districts, highest cropping intensity observed in Hooghly (244 percent) followed by Bardhaman (east) with 193 percent. Lowest cropping intensity is in Bardhaman (west) among all the project districts with 119 percent.

As Land use refers to "man's activity and the various uses which are carried on land" and land cover refers to "natural vegetation, water bodies, rock/soil, artificial cover and others resulting due to land transformation". The study area (project sites and the buffer zone) is having different types of land uses. The Land use/Land cover map of the study area is prepared based on the satellite imagery. Area under agriculture / crop / plantation is highest in all the project sites (including buffer zone) followed by area under settlement. Sandy area is observed in Mundeswari river region. The satellite imagery map showing the present land use and land cover in the study area is presented in figure.

Table 13: Land Use (LU) and land Cover (LC) of Project Locations

LU&LC Classification	**Project Area (in Ha.)**					
	Hurhura	**Madaria Khal**	**Upper Rampur**	**Damodar**	**Mundeswari**	**41 Canals**
Agriculture/Crop/Plantation	7425.71	6580.97	11494.50	9758.21	13087.25	27544.09
Built Up/Settlement	3147.13	2908.62	4171.88	3161.60	3029.70	11116.03
Water Body	834.76	632.63	1338.63	666.63	793.74	2289.62
Sandy Area	-	-	-	-	568.60	-
Total	**11407.60**	**10122.22**	**17005.01**	**13586.44**	**17479.29**	**40949.74**

3.1.5 Physiographic Condition of the Project Locations

The project area is flat and plain areas and topographically, it is a vast low lying plain. The area is devoid of hill locks and terrine is smooth. It is the alluvial plane area and known for agricultural activities.

Table 14: Physiographic Condition of Project Districts

Sl. No.	**Project Locations**	**Physiography**
1	Mundeswari River	1. River bed of entire stretch proposed for de-siltation is almost 2-meter-high than Damodar (Amta) channel. Entire 20 km. stretch remain almost dry throughout the year except presence of water only in few pockets. 2. Embankment on both side of river is in-continuous (due to incomplete activity under Lower Damodar Improvement Project). 3. Both side of river is almost unapproachable due to non-presence of permanent embankment. 4. Sand mining is very common practice in this stretch. 5. Human settlement on immediate either side of river is very less. However moderately dense habitat observed at a distance of 1 km. 6. Entire terrain is flat and plain. River bed and nearby settlement and agricultural land height is almost equal throughout the stretch proposed for de-siltation. 7. Entire land is very much fertile. Potato is main cash crop in this area. Paddy cultivation during rainy season is very common practice in this flood prone area. No agricultural land found un-cultivated during our field visit in the month of September, 2018. 8. Set back zone is almost 200- 300 meter (width) throughout the 20 km. stretch. Settlement on river side is relatively less on either side of river. Any kind of agriculture practice is not observed on set-back zone (mainly due to heavy deposition of fine sand).

Sl. No.	Project Locations	Physiography
		9. There exists no forest patch within work zone as well as 3 km. buffer zone. Biological diversity is relatively rich with compared to any other project area. Small and medium size tree is present on either side of the river. 10. Occurrence of 2-3 breaching / year is very common in this area. 11. Presence of wetland/ water body within 3 km buffer zone is relatively more than Damodar left embankment. 12. Socio-economic condition of near around villages are relatively poor with respect to Damodar Right and Left embankment – mainly due to regular flood occurrence. Few pucca house observed in this stretch. 13. Within village road infrastructure is mostly concrete and good enough to connect with nearby small towns. 14. Human settlement areas are almost 3-4 feet above the level of agricultural land or berm land level. 15. Any water scheme is not withdrawing water from this stretch. Presence of any manufacturing industry is void because of dryness of river throughout the year except rainy season. There exist no manufacturing or polluting industry within 3 km buffer zone. 16. Education infrastructure like- school, college library is relatively less than Damodar left and right embankment area. 17. Presence of burning ghat, mandir, bedi, club house, shop, electric post, pump house and etc. on alongside of river is relatively less with compared to Damodar left and right embankment side. 18. Few households practice fishing mainly on Damodar river- as Mundeswari remain dry throughout the year except rainy season. Fisherman practice fishing on Mundeswari river only during monsoon season. 19. Drinking water is mainly provided by means of hand pump. However, many of them are slightly saline affected mainly due to saline water ingression during flood. 20. There exists no natural drain within 3 km radius on both side of Mundeswari. However, more than 50 nos. of canal crisscrossing in Hooghly district- which are mainly rainfed.
2	Damadar Left Embankment	1. Entire terrain is flat and plain. 2. Entire land is very much fertile. 3. There exists no forest patch within work zone as well as 3 km. buffer zone. However, Huge number of small, medium and long size tree is present on either bank of embankment. 4. Huge number encroachers / squatters present within work zone of flood wall construction and embankment strengthening. Human settlement is observed majorly on country side of the embankment throughout the linear stretch of embankment. Villages located along embankment are relatives less developed with respect to other villages located beyond 3 km. radius. 5. Educational infrastructure like – college, library is not present within 3 km. radius of work zone. 6. However, primary school, secondary and higher secondary school and primary health center is located within villages located within 3 km. radius. District hospital is located at nearby town Amta. 7. Anganwadi centre is located within 3 km. radius of work zone. 8. Presence of wetland/ water body within 3 km buffer zone is less with compared to right bank. 9. Any water scheme is not withdrawing water from this stretch. Presence of any manufacturing industry is almost nil because of dryness of river throughout the year except rainy season. There exist no manufacturing or polluting industry within 3 km buffer zone. 10. Nearby small town Amta is only approx. 2 km away from 0.0 km chainage of

Sl. No.	Project Locations	Physiography
		Damodar left embankment 11. Presence of burning ghat, mandir, bedi, club house, shop, electric post, pump house and etc. within work zone. 12. Many people practice fishing on river water. 13. Village roads are either Pucca or Murom layered. 14. Drinking water is mainly provided by means of hand pump. 15. Sand mining is not observed in this stretch.
3	Damodar Right Embankment	1. Entire terrain is flat and plain. This portion of land is low lying with compared to left bank side. 2. Entire land is very much fertile. However, many lands are not being cultivated during monsoon season in fear of flood occurrence. 3. Few Agri. land located on set-back zone have lost fertility due to sand deposition – mainly around breach area. 4. There exists no forest patch within work zone as well as 3 km. buffer zone. Biological diversity is relatively less with compared to left bank. Very few numbers of small, medium and long size tree are present on either bank of embankment. 5. Number of encroacher encroachers / squatters within work zone is very less-mainly due to regular occurrence of flood. Nearby settlement (dense in nature) is observed only at Village- Tokapur, Muslim para (East). Concrete flood is already in place in this Muslim para area. 6. Educational infrastructure like – college, library is not present within 3 km. radius of work zone. 7. However, primary school, secondary and higher secondary school and primary health center is located within villages located within 3 km. radius. District hospital is located at nearby town Amta – which is almost 20 km. away from Dihivursut bus stand. 8. 2 - Anganwadi centre is located within 3 km. radius of work zone. 9. Bakpota children park is located adjacent to Damodar Right embankment near Bakpota river over bridge. 10. Occurrence of 2-3 breaching / year is very common in this area. 11. Presence of wetland/ water body within 3 km buffer zone is relatively more than right bank. 12. Ferry survive over river is observed at two location, i.e., Dihivursut and near to Muslim para. 13. Bathing practice on river water is observed in this stretch. 14. Socio-economic condition of near around villages are fairly good even though embankment breaching and flood occurrence is regular phenomenon. Many double stored / single stored pucca house observed in this stretch. However, human settlement is almost 0.5 km away from embankment site. 15. Within village road infrastructure is good enough with compared to embankment road. 16. Ring band is observed at this side almost all along the river. 17. Human settlement areas are almost 3-4 feet above the level of agricultural land or berm land level. 18. Any water scheme is not withdrawing water from this stretch. Presence of any manufacturing industry is void because of dryness of river throughout the year except rainy season. There exist no manufacturing or polluting industry within 3 km buffer zone. 19. Nearby small town located at Dihivurshut area- less than 1 km. away from Dihivursut ferry ghat (0.0 km. chainage of DR embankment). 20. Presence of burning ghat, mandir, bedi, club house, shop, electric post, pump house and etc. within work zone is negligible with compared to left bank. Establishment within work zone.

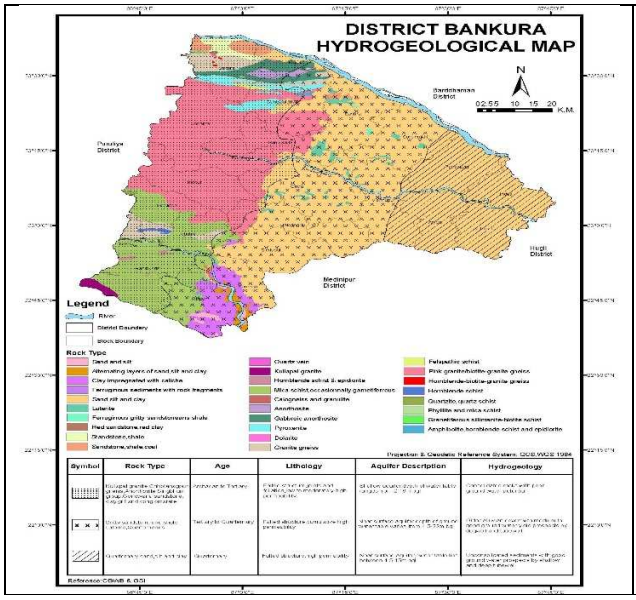
Sl. No.	Project Locations	Physiography
		21. Fishing practice on river water on is relatively less with compared to left bank area. 22. Drinking water is mainly provided by means of hand pump. However, many of them are slightly saline affected mainly due to saline water ingression during flood. 23. Sand mining is not observed in this stretch. 24. There exist many natural as well as man-made drain within buffer zone.
4	Hurhura Left Embankment	1. Proposed work zone falls in two blocks namely- Khanakul-II and Amta-II. It intersects Palashpur, Hayatpur, Sibgeche and Salbaga. 2. Entire terrain is flat and plain. 3. Agricultural land on country side is very much fertile. 4. There exists no forest patch within work zone as well as 3 km. buffer zone. However, number of trees of different girth is present on either bank of embankment. 5. Number of encroachers / squatters present within work zone of flood wall construction and embankment strengthening. 6. Nearby small town Chapadanga is approx. 20 km away from this left embankment 7. Presence of burning ghat, mandir, bedi, club house, shop, electric post, pump house and etc. within work zone as well as buffer zone. 8. Human settlement is observed at Mastafa-para on country side. 9. Many people practice fishing on canal water. 10. Village roads are mostly kutcha or morum layered. 11. Drinking water is mainly provided by means of hand pump.
5	Upper Rampur	1. Proposed work zone of Left embankment of Upper Rampur is situated over 3 blocks namely Udainarayanpur, Khanakul-I & II. It intersects almost 13 villages [Mastafapur, Balaichak, Chingra, Chabbish (24) pur, Ramsaran, Dhara simul, Kangrai, Pacharul, Etarai, Goza, Piar pur, Horal and Rampur) 2. Entire terrain is flat and plain. 3. Agricultural land on country side is very much fertile. Setback zone is almost nil throughout the canal stretch. 4. There exists no forest patch within work zone as well as 3 km. buffer zone. However, number of small, medium and large trees is present on either side of the embankment. 5. Number of encroachers / squatters present within work zone of flood wall construction and embankment strengthening. 6. Nearby small town Chapadanga is approx. 30 km away from the left embankment 7. Presence of burning ghat, mandir, bedi, club house, shop, electric post, pump house and etc. within work zone as well as buffer zone; 8. Human settlement is observed at 24-pur Bazar area. 9. Bibhudhar Gramin Hospital is located almost 2.5 km away from Rampur canal. 10. Shemro Pvt. School is located almost 3 km. away from Rampur canal. 11. Jute is prime cash crop after potato. Through-out the canal Jute cultivation is a common practice. 12. Entire embankment road is kutcha. 13. Village roads are mostly kutcha or morum layered. 14. Drinking water is mainly provided by means of hand pump.

3.1.6 Hydro-Geology

The area is basically comprising of sand, silt and clay whereas some part is having laterite and sandstone. The hydrogeological maps of the project locations by block are present below. The project area is mainly covered by alluvial and deltaic of Sub-Recent and Recent time geographical area occupied by the unconsolidated sedimentary deposits of the Quaternary period.

Howrah and Hooghly districts of project area are a part of the Bengal basin located close to the main sea (Bay of Bengal). The area forms a part of the lower Gangetic delta plain underlain by Recent to Tertiary sediments. The top most sediment, belonging to recent alluvium consisting of clay, *kankar* and at some places, laterite gravel. Again clay, silt, sand and gravel constitute the major sub-surface geology of the area. In this region, alluvial sediments occur in rhythmic pattern represented by alternate layers of sand, silt and clay. Sand beds are grayish, micaceous, find to course grained, which is very important from the point of ground water storage. Fairly persistent clayey layers separate these sand beds generally. In deeper level (>290m) the unconsolidated sediments are generally argillaceous and do not hold much scope for ground water development. The lithology of the project districts and state as whole is given in below Table.

Sl. No.	Formation Type	Age Group	Lithology
I	Semi Consolidated/ Unconsolidated Formations	Quaternary Upper Tertiary	Recent Alluvium, Clay, Silt, Sand, Gravel, Pebble, Calcareous Concretion etc
			Older Alluvium and Laterites, Silt, Sand, Ferruginous Concretions, Lithomargic Clay, Gravels, Pebbles, Cobbles etc.
		Tertiary Mesozoic Upper Palaeozoic	Siltstone, Claystone, Grit, Sandstone, Shale, Conglomerate, Limestone, including intrusive
2	Consolidated Formations, Sedimentaries Meta-Sedimentaries Effusive Basal Crystalline	Mesozoic Palaeozoic	Basalt with inter-trapped clay
		Tertiary Pre-Cambrian	Sandstone, Dolomite, Limestone
		Pre-Cambrian	Slate, Quartzite, Phyllite, Schist, Gneiss, Marble
		Achaean	Gneissic complex and associated intrusive (Post - Achaean)



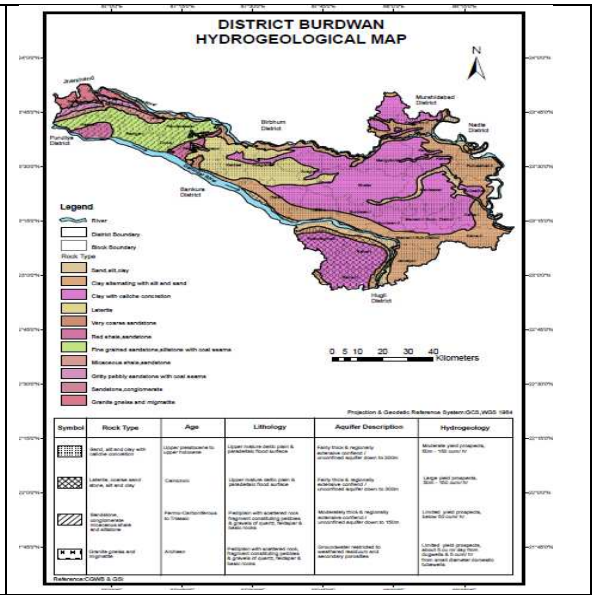


Figure 1: Geohydrology map of Project District Bankura, West Bengal

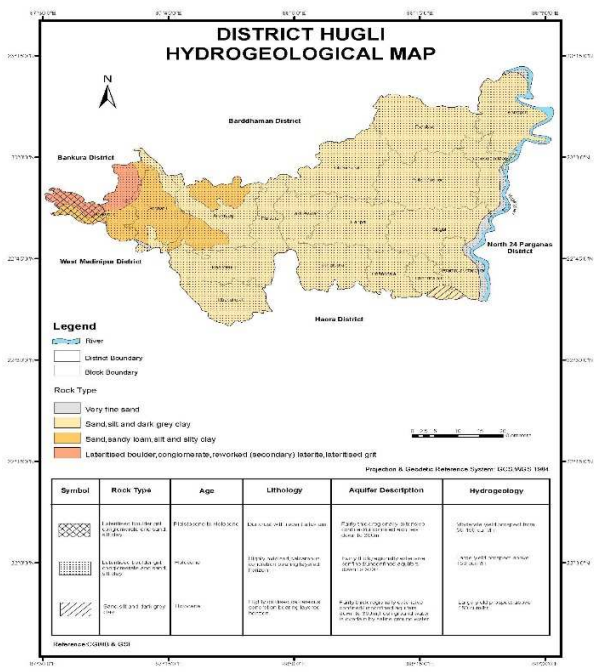


Figure 2: Hydrogeological map of Project District Bardhaman, West Bengal

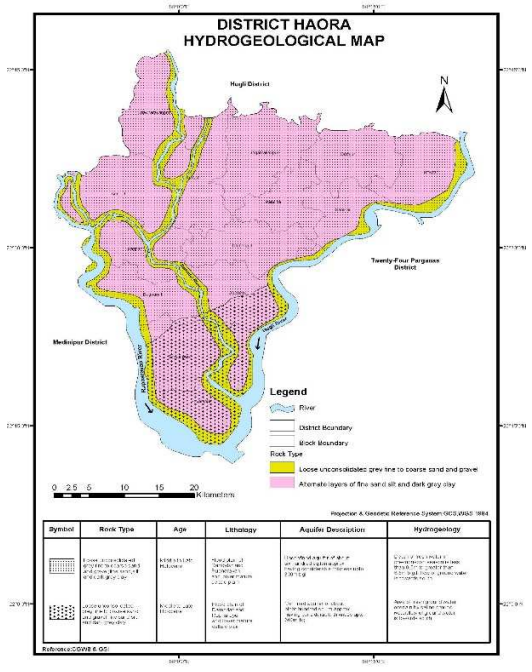


Figure 3: Hydrogeological map of Project District Hooghly, West Bengal

Figure 4: Hydrogeological map of Project District Howrah, West Bengal

3.1.7: Soil Quality

Physio-graphically, the soil of the project area can be classified into several groups depending on their texture, structure, colour, porosity and nutrient content. Broadly, the soils of Rarh tract lying to the west of Bhagirathi-Hooghly are mostly lateritic or red soil. The soils along the eastern deltaic tract and along the western flood plain are younger alluvium. The water infiltrates quickly in this soil. Further south, soil is again classed as younger alluvium but grains are coarser than southern deltaic. The texture and structure of the soil are two important factors controlling runoff infiltration ratio. It has been observed that in lateritic area, the hard crust does not allow easy infiltration and generate more runoff. In the Rarh uplands, the presence of a rock layer in the subsurface does not allow the infiltration of water into the deeper aquifer.

Effective soil depth governs root development and is a source of moisture and nutrient supply to the plants. The extent of depth classes which affect crop growth presents that the project district Bankura is having two depth classes of soil, i.e., shallow depth (25-50 cm.) and moderately shallow soil depth (50-75 cm). Bardhaman district is having moderately shallow soil (50-75 cm.) in some parts of the district.

Table 15: Project district wise major soil class and area coverage

Sl. No.	District	Major Soil Classes	Area (Ha.)	Sl. No.	District	Major Soil Classes	Area (Ha.)
1	Bankura Total	Inceptisol	104114	3	Bardhaman West	Sandy	3200
		Alfisol	7750			Sandy Loam	25724
		Entisol	22224			Red &Lateritic	7410
2	Bardhaman East	Sandy	21537	4	Howrah	Recent alluvial plain	12659
		Sandy Loam	147714			Coastal Plain	11392
		Clay, Clay loam	246286			Older alluvial plain	38387

		Red &Lateritic	14777	5	Hooghly	Recent Alluvial	77812
		Clay Loam	611			Older Alluvial	191210

Note: This table represents 51 project blocks (41- Irrigated and 10 – Flood affected) of these five districts

Bankura District: Major soil types found in Bankura are (1) Loamy (307.6 thousand Ha.; 44.7 percent of the total geographical area), (2) Gravelly Clay Loamy (46.7 thousand Ha., 6.8 percent of the total geographical area), (3) Loamy Sandy (27.3 thousand Ha.; 4.0 percent of the total geographical area) and (4) Clayey Loamy (7.8 thousand Ha.; 1.1 percent of the total geographical area).Soil taxonomy of Bankura district reveals major soil classes are Inceptisol, followed by Alfisol and Entisol.

Bardhaman District: Major soil types found in Bardhaman are (1) Loamy (357.6 thousand Ha.; 51.2 percent of the total geographical area), (2) Gravelly Loamy (42.3 thousand Ha., 6.1 percent of the total geographical area), (3) Clayey (37.6 thousand Ha.; 5.4 percent of the total geographical area), (4) Clayey Loamy (28.2 thousand Ha.; 4.0 percent of the total geographical area) and (5) Loamy Sandy (4.7 thousand Ha.;0.7 percent of the total geographical area). Soil types by east and west Bardhaman district is presented in the Table 15.

Howrah District: The district is having three major soil types, i.e., (1) Clayey (13.82 thousand Ha.; 16.0 percent of the total geographical area), (2) Clayey Loamy (42.35 thousand Ha.; 49.0 percent of the total geographical area) and (3) Loamy (30.25 thousand Ha.; 35.0 percent of the total geographical area).

Hooghly District: Three major soil types are found in the district, i.e., (1) Clayey (64.84 thousand Ha.; 29.0 percent of the total geographical area), (2) Clayey Loamy (80.50 thousand Ha.; 36.0 percent of the total geographical area) and (3) Loamy (76.26 thousand Ha.; 35.0 percent of the total geographical area).

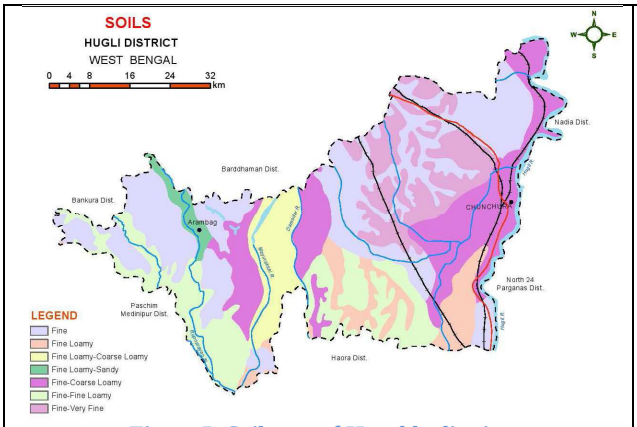


Figure 5: Soil map of Hooghly district

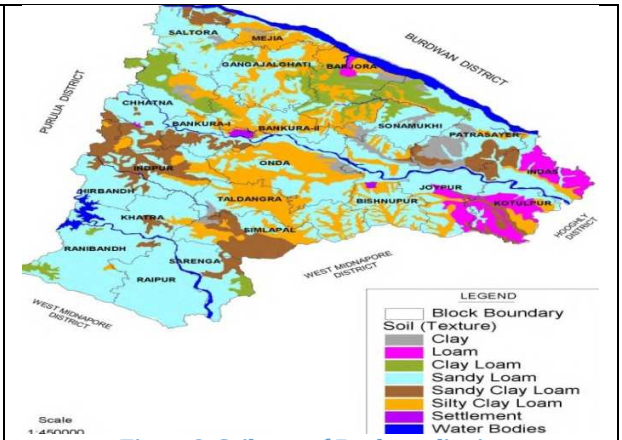


Figure 6: Soil map of Bankura district

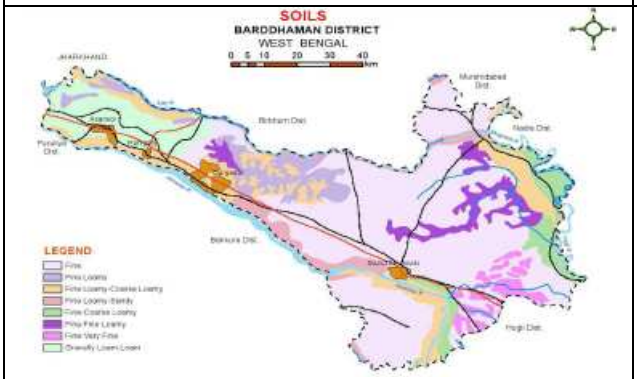


Figure 7: Soil map of Bardhaman district

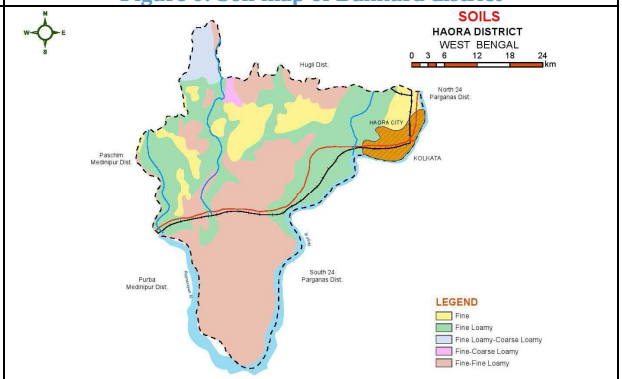


Figure 8: Soil map of Howrah district

The entisols is prevalent in the project area that sub-classified into younger alluvial, coastal alluvial and bhabar soils. The soils have been formed from the alluvium deposited by Ganga and its tributaries and sub tributaries – Damodar. These soils are greatly variable in their morphological, physical and chemical properties depending upon the geomorphic situations, moisture regime and degree of profile development. The soils are intensively cultivated for rice, wheat, potato and oilseed crops. Frequent inundation of low-lying areas results in stagnation of water for certain times of the year. Besides flood hazards also affect the normal dry land crop yields. The soils of this sub-region have high nutrient content and mineral resource with a high potential for a large variety of agricultural and horticultural crops.

3.1.8 Climatic Condition

Temperature: To study the meteorological parameters of the study area, available IMD data was used which are reflected in *Table 16*. The project locations witness hot summer from March to June and the maximum temperature has been recorded as high as 41 ^{0}C in the month of April. July onwards the area experiences the monsoons. The project area gets rainfall from South Western monsoon. The usual rainfall occurs for a period of four months (June to September) during monsoon. Maximum rainy days during this four-month period are around 107 days in Hooghly district. The South-West monsoon lasts from mid-June to mid-September and the area receives more than 80% of the annual rainfall during the period. The normal annual rain fall in project area varies between 1422 mm to 1625 mm. Winters season extends between the months of October to February. These months experience a maximum temperature of 33 °C in October and minimum temperature of 12 °C in the month of December as well as January. During study period the predominant wind direction was Southerly.

Table 16: Mean Maximum and Minimum Temperature in Project Area for 2014

Station Name	January	February	March	April	May	June

	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Mogra	23	13	27	17	33	20	39	27	38	29	35	28
Bardhaman	25	12	28	15	33	19	38	26	39	26	37	26
Uluberia	24	12	29	16	32	20	38	27	37	26	34	26
Bankura	26	13	29	15	34	19	41	24	39	25	38	26
Max	*26*	*13*	*29*	*17*	*34*	*20*	*41*	*27*	*39*	*29*	*38*	*28*
Min	*23*	*12*	*27*	*15*	*32*	*19*	*38*	*24*	*37*	*25*	*34*	*26*

Station Name	July		August		September		October		November		December	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Mogra	33	26	33	26	33	28	32	25	28	20	24	15
Bardhaman	32	26	31	26	32	25	31	24	--	--	--	--
Uluberia	34	26	33	25	34	27	33	26	30	20	26	13
Bankura	33	26	33	26	33	26	32	23	31	16	27	12
Max	*34*	*26*	*33*	*26*	*34*	*28*	*33*	*26*	*31*	*20*	*27*	*15*
Min	*32*	*26*	*31*	*25*	*32*	*25*	*31*	*23*	*28*	*16*	*24*	*12*

Source: Meteorological Department, Govt. of India

Rainfall: There are three rain gauge station namely Durgapur, Champadanga and Amta situated within entire project area. Month wise cumulative rainfall data as recorded in these three rain gauge stations during monsoon season are presented in the tables below by district. The normal annual rainfall in the project area varies from 1422 to 1625 mm. The season wise and annual rainfall in the project districts is presented in the table below.

Table 17: Season wise average annual rainfall

Sl. No.	District	Normal Rainfall in mm		
		Monsoon	Non-monsoon	Total
1	Bankura	1109	313	1422
2	Bardhaman	1140	356	1496
3	Howrah	1208	417	1625
4	Hooghly	1137	386	1523
	Average	1148.5	368	1516.5

Source: Ground Water Year Book of West Bengal & Andaman & Nicobar Islands (2014-15)

Damodar, Mundeswari and Amta channel are the main three rivers flowing in DVC command area. Many irrigation and drainage canal receive water mainly from these three rivers. There are total 14 rain gauge station installed by different agency on these three rivers. Out of total 8 rain gauge stations located over river Damodar 4 falls in Jharkhand district. Rainfall measurements of these rain gauge indicates substantial amount of rainfall receive by these three rivers system.

Table 18: Total Seasonal Rainfall in different Rain-gauges during Monsoon, 2016

Sl. No.	River	District	Location of Rain Gauge Station	Type	District wise Normal Annual Rainfall (mm)	Total Seasonal Rainfall (mm)
1	Damodar	Kodarma	Tilaiya	CWC	1116.20	1195.40
2		Bokaro	Tenughat	CWC	1247.50	1051.10
3		Dhanbad	Maithon	CWC	1355.20	1473.60
4		Dhanbad	Panchet	CWC		1423.80
5		Bardhaman	Asansol	CWC	1315.20	1227.40
6		Bardhaman	Durgapur	CWC		1257.92
7		Bardhaman	Bardhaman	ORG		1125.50
8		Bankura	Sonamukhi	ARG	1330.90	1128.95
9	Mundeswari	Bardhaman	Seharabazar	ORG	1315.20	827.00
10		Bardhaman	Raina	ORG		599.00
11	Amta Channel (Damodar)	Hooghly	Champadanga	ORG	1418.70	636.75
12		Hooghly	Singur	ORG	1600.00	979.75
13		Howrah	Amta	ORG		1273.00
14		Howrah	Domjur	ORG		1002.72
	Total (Damodar + Mundeswari + Amta)				1337.36	1085.85

Note: CWC: Central Water Commission, ORG: Optimal Rain Gauge, ARG: Automated Rain Gauge

Bankura: It is evident that during 2014 and 2015, quantum of rainfall was less in comparison to other three years, i.e., 1075.5 mm and 1127.2 mm. respectively. However, in 2013, the district received 60.21 percent of total annual precipitation during JJAS (June, July August and Sept.) which increased gradually till 2016 and marginally reduced during 2017 (82.46 percent during 2014, 84.0 percent during 2015, 86.41 percent during 2016 and 77.49 percent during 2017). So, monsoon months are gradually experiencing high rainfall and rainfall during post-monsoon months have decreased.

Table 19: Month wise rainfall from 2013-17 in Bankura

YEAR	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEPT		OCT		NOV		DEC	
	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP
2013	0.9	-93	15.0	-17	22.9	4	72.6	100	342.4	412	369.7	72	289.8	-4	368.4	27	260.8	8	398.0	278	0.0	-100	0.0	-100
2014	0.8	-93	38.3	113	8.0	-64	3.3	-91	84.7	27	85.7	-60	313.7	3	323.4	11	164.1	-32	53.2	-49	0.0	-100	0.3	-97
2015	17.4	45	1.5	-91	7.1	-68	85.6	136	55.9	-16	152.2	-29	467.5	54	230.6	-21	96.5	-60	12.7	-88	0.0	-100	0.2	-98
2016	6.1	-49	10.2	-43	15.6	-29	0.8	-98	101.3	51	175.1	-19	264.8	-13	445.5	53	268.9	11	46.9	-55	0.7	-93	0.0	-100
2017	0.0	-100	0.0	-100	16.9	-23	27.9	-23	76.3	14	228.8	6	634.2	109	330.4	14	186.1	-23	249.1	137	25.3	159	5.2	-45

Source: Customized Rainfall Information System (CRIS), Hydromet Division, India; Meteorological Department, Ministry of Earth Sciences; <http://hydro.imd.gov.in/hydrometweb/(S(vuluke45w5upcxmigpsnmt55))/DistrictRaifall.aspx>

Bardhaman: The district Bardhaman also reflect more or less similar trend like that of Bankura. In 2013, the district received 61.71 percent of the total annual rainfall in the monsoon months (JJAS) and rest rainfalls were in the pre-monsoon and post-monsoon period. In the year 2014, 2015 and 2016, the district received maximum rainfall during monsoon (85.18 percent in 2014, 85.55 percent in 2015 and 84.10 percent in 2016) and rainfall in other months was relatively less. In 2017, the district received 69 percent of the total annual rainfall during monsoon of the total rainfall of 1668 mm.

Table 20: Month wise rainfall from 2013-17 in Bardhaman

YEAR	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEPT		OCT		NOV		DEC	
	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP
2013	6.8	-36	17.5	-21	4.6	-77	41.5	10	175.1	122	210.2	6	145.5	-51	341.1	20	250.7	0	342.5	243	0.0	-100	0.0	-100
2014	1.1	-90	35.1	58	32.0	62	0.7	-98	74.6	-5	233.9	18	280.6	-5	256.5	-10	195.3	-22	23.9	-76	0.0	-100	0.7	-88
2015	8.5	-20	10.1	-54	29.4	48	76.3	102	64.2	-19	338.1	71	587.3	100	285.8	0	111.8	-55	34.1	-66	0.0	-100	0.9	-85
2016	13.5	26	29.3	32	15.0	-24	0.0	-100	120.0	52	182.5	-8	263.9	-10	463.5	62	274.5	9	44.3	-56	1.9	-84	0.0	-100
2017	1.2	-88	0.0	-100	32.6	65	28.3	-25	171.2	117	255.8	29	464.1	58	252.9	-11	178.2	-29	260.1	161	14.5	27	9.1	51

Source: Customized Rainfall Information System (CRIS), Hydromet Division, India Meteorological Department, Ministry of Earth Sciences<http://hydro.imd.gov.in/hydrometweb/(S(vuluke45w5upcxmigpsnmt55))/DistrictRaifall.aspx>

Hooghly: Between 2013 to 2017, the district received average annual rainfall of 1336.96 mm with variance in receipt of rainfall during pre-monsoon, monsoon and post monsoon. The rainfall received during monsoon was 67.30 percent of the total annual rainfall which increased during 2014-2017. In the year 2013, percentage of departure from actual rainfall during June was (-)8.0 which increased to (-)23.0 during 2017. Similarly, highest percentage of departure in the month of July was in the year 2015, i.e., 112 percent and highest negative departure in 2015 in the same year (2015). In post-monsoon months, i.e., in November and December, percentage of departure was (-)100.0 percent during 2013 and 2014 and 188 percent during 2017.

Table 21: Month wise rainfall from 2013-17 in Hooghly

YEAR	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEPT		OCT		NOV		DEC	
	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP
2013	2.1	-82	8.9	-67	2.4	-91	56.5	12	93.7	-14	223.9	-8	221.4	-30	287.0	8	186.6	-23	282.8	177	0.0	-100	0.0	-100
2014	0.0	-100	44.0	65	19.5	-31	0.1	-99	78.6	-28	218.3	-10	239.9	-24	289.1	9	190.5	-22	34.4	-66	0.0	-100	0.0	-100
2015	9.1	-24	4.1	-85	16.0	-43	62.4	23	54.0	-50	299.5	23	671.6	112	188.0	-29	215.3	-11	27.2	-73	0.1	-99	1.8	-74
2016	1.3	-89	14.0	-47	20.3	-28	0.0	-100	85.3	-21	166.2	-32	253.0	-20	347.1	31	242.8	0	75.9	-26	12.7	-21	0.0	-100
2017	0.0	-100	0.0	-100	23.9	-15	11.8	-77	115.2	6	186.6	-23	434.6	37	227.0	-14	180.8	-26	212.4	108	25.2	58	19.9	188

Source: Customized Rainfall Information System (CRIS), Hydromet Division, India Meteorological Department, Ministry of Earth Sciences<http://hydro.imd.gov.in/hydrometweb/(S(vuluke45w5upcxmigpsnmt55))/DistrictRaifall.aspx>

Howrah: The district received major part of its annual rainfall during monsoon months (JJAS), ranging between 72.10 percent during 2013 to 86.68 percent during 2015 and 74.83 percent during 2017.Trend of percent of departure from the actual rainfall is more or less same to other project districts. However, there is a negative departure in the month of June and September in all the five years whereas negative departure from actual rainfall observed in three years during July and August.

Table 22: Month wise rainfall from 2013-17 in Howrah

YEAR	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEPT		OCT		NOV		DEC	
	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP
2013	5.8	-52	9.6	-61	9.9	-69	40.2	-24	99.4	-21	228.1	-2	310.2	-10	550.0	67	249.1	-18	352.6	256	0.0	-100	0.0	-100
2014	0.1	-99	54.2	118	19.5	-39	0.0	-100	103.6	-18	161.8	-31	224.9	-34	362.6	10	280.4	-8	24.0	-76	0.0	-100	1.2	-88
2015	9.8	-20	4.2	-83	10.0	-69	101.1	92	68.3	-46	227.9	-2	854.4	149	180.8	-45	202.2	-34	25.7	-74	0.0	-100	6.0	-41
2016	0.4	-97	104.1	318	8.8	-73	0.0	-100	52.0	-59	119.0	-49	334.6	-3	309.5	-6	214.1	-30	74.4	-25	59.0	88	0.0	-100
2017	0.1	-99	0.0	-100	71.5	123	11.3	-79	65.4	-48	174.7	-25	629.6	83	281.8	-14	155.5	-49	223.1	125	32.3	3	14.0	38

Source: Customized Rainfall Information System (CRIS), Hydromet Division, India Meteorological Department, Ministry of Earth Sciences<http://hydro.imd.gov.in/hydrometweb/(S(vuluke45w5upcxmigpsnmt55))/DistrictRaifall.aspx>

Note: (1) The District Rainfall in millimetres (R/F)
(2) % Dep. are the Departures of rainfall from the long period averages of rainfall for the District.
(3) Blank Spaces show non-availability of Data

Relative Humidity: Normally, June to January months are humid and February to May are dry. The relative humidity (expressed in percentage) is maximum in the month of July, October and January. It touches 90% (in Bankura) in the month of October and lowest being 71 % (in Bankura &Bardhaman) respectively in the month April and February. The maximum relative humidity ranges from 71 to 90% in morning hours and 50 to 65% in the evening hours. Relative humidity is given in below table

Table 23:Relative Humidity (in %) by station and month

Station	January	February	March	April	May	June	July	August	September	October	November	December
Bankura	88	77	72	71	73	74	89	87	87	90	85	85
Bardhaman	82	71	75	74	75	78	88	85	85	88	72	73
Kolkata (Adjacent to Howrah)	84	75	79	76	75	78	86	86	84	87	78	73
Krishnagar (Adjacent to Hooghly)	87	84	85	84	85	84	88	86	83	85	75	79

Source: West Bengal State Marketing Board

Wind: The predominant wind direction in the DV command area is Southerly during both morning (22% of time), and evening hours (24% of time). The calm period prevails for 5.1% of time during morning hours and 61% of time in the evening hours. The mean wind speed ranges between 2.6 km/h and 9 km/h. Generally, April to June is windy as compared to other months. The region has clear visibility even more than 20 km for over 250 days in a year. The occurrence of thunders in the state area ranges between 18 and 58 days. The cyclonic storms over the Bay of Bengal particularly in the south and south western parts of the state cause widespread dark rain bearing clouds, which in turn lowers the temperature and cause high relative humidity and sultry weather conditions.

3.2 Socio-Economic Profile of the Affected Area

The proposed area of the project is located on both the sides of the embankments, i.e., country side and river side. The entire project area is basically rural in nature. The work zones in the project area is owned by the Govt. along with private ownerships in certain pockets in both the sides of the embankment within 5 meters work zones. In course of time encroachers and squatters started settling down there including people / families who were awarded legal rights over the land by the Government. The proposed project area is extended over 51 blocks in four districts covering a number of villages on both the sides of the embankment and canals. The habitation in these areas consists of multi-caste people such as Scheduled Caste (SC), Scheduled Tribes (ST), Other Backward Classes and population belonging to General category.

The households in the affected settlement areas are located in a compact manner in most of the locations and in a scattered manner in some points, mostly in Damodar right. The habitations near the project locations (country side of the embankment) have different facilities and services, such as schools, Anganwadi centres, cultural mandaps, temples etc. The settlements in the country side of the embankment also have small market places. In the identified working zones, most of them are squatters and they have adopted different occupations such as petty shops, trading, vending, fish business, wage labour, job holders etc. A significant percentage of them are economically poor and have been adopting different means of livelihood. Most of the households have access to Govt. schemes and programmes. With the initiative of the Govt. dirking water, electricity and other facilities have been provided to the habitations near the embankments / canals.

With regard to educational status of the families living, majority of the population are found to be literate and education level is high up to graduation and above. Higher level of education like Graduate, Post Graduate and technically qualified persons are very insignificant. Generally, they speak Bengali language and many of them understand and can speak Hindi.

3.3 Socio-Economic Condition of the Affected People

The objective of the present study is to assess the impact of proposed project on the people living on both the sides of the embankment (country side and river side) that are identified as the working zone for flood wall construction and strengthening of the embankments. A detailed survey has been done in order to collect necessary information for the preparation of RAP and for a better planning towards resettlement of the affected population.

As per detailed survey within the impact corridor, a total number of 2253household will be affected due to the proposed project. The project site wise details are presented in the table below. It is evident from the table that major concentration of affected households is in Damodar Left.

3.3.1 Social Category of the Affected Households:

The SIA and RAP study reveals that the project sites are dominated with population of other categories (65.38 percent) followed by scheduled caste population (33.78 percent). Tribal population is marginal with 0.84 percent.

Table 24: Social Categories of the Affected Households

Project Sites	SC		ST		Other		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Damodar Left	417	34.43	18	1.49	776	64.08	1211	53.75
Damodar Right	90	23.87	0	0.00	287	76.13	377	16.73
Hurhura Left	193	51.19	0	0.00	184	48.81	377	16.73
Upper Rampur Left	61	21.18	1	0.35	226	78.47	288	12.78
Total	**761**	**33.78**	**19**	**0.84**	**1473**	**65.38**	**2253**	**100.00**

3.3.2 Distribution of Head of the Household by Age Group:

Majority of the head of affected families in the project location belongs to 18 to 60 age group (77.9 percent) followed by 60+ age category (22.0). Percentage of head of the affected families in 60+ age group found to be highest in upper Rampur (27.1 percent) followed by Damodar right. However, a significant percentage of families are having aged persons of 60+ age group in project locations.

Table 25: Distribution of Head of the Households by Age Group

Project Locations	Distribution of Head of the Households by Age Group							
	>=6 &<18		>=18 &<60		>=60 Years		Total	
	No.	%	No.	%	No.	%	No.	%
Damodar Left	0	0.0	976	80.6	235	19.4	1211	100.0
Damodar Right	0	0.0	278	73.7	99	26.3	377	100.0
Hurhura Left	0	0.0	293	77.7	84	22.3	377	100.0
Upper Rampur	1	0.3	209	72.6	78	27.1	288	100.0
Total	**1**	**0.0**	**1756**	**77.9**	**496**	**22.0**	**2253**	**100.0**

3.3.3 Women Headed Families:

About 9.7 percent families are headed by women out of total 2253 affected families. In remaining cases, male is the head of the family. Of the total affected households in any project location, highest percentage of women headed households found in Damodar left (10.6 percent) followed by Hurhura left (10.3 percent) and Damodar right (9.8 percent).

Table 26: Distribution of Head of Household by Sex

Project Locations	Male		Female		Total	
	No.	%	No.	%	No.	%
Damodar Left	1083	89.4	128	10.6	1211	100.0
Damodar Right	340	90.2	37	9.8	377	100.0
Hurhura Left	338	89.7	39	10.3	377	100.0
Upper Rampur	274	95.1	14	4.9	288	100.0
Total	**2035**	**90.3**	**218**	**9.7**	**2253**	**100.0**

3.3.4 Economic Condition:

The economic condition of the families in terms of average annual income is collected from the surveyed households, taking all sources of income in to account. The households are grouped in to six categorized, i.e., (1) < 50,000, (2) >= 50, 000 and less < 1,00,000, (3) >= 1,00,000 and < 2,00,000, (4) > 2,00,000 and < 3,00,000, (5) > 3,00,000 and < 4,00,000 and (6) >= 4,00,000/-.

Table 27: Average Income of the Families in Different Project Locations

Location	<50000		>=50000 &<100000		>=100000 &<200000		>=200000 &<300000		>300000 &<400000		>=400000		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	415	37.7	486	44.2	134	12.2	46	4.2	7	0.6	12	1.1	1100	100.0
Damodar Right	109	30.6	157	44.1	59	16.6	20	5.6	4	1.1	7	2.0	356	100.0
Hurhura Left	156	46.7	132	39.5	27	8.1	11	3.3	4	1.2	4	1.2	334	100.0
Upper Rampur Left	100	40.2	94	37.8	37	14.9	12	4.8	4	1.6	2	0.8	249	100.0
Total	**780**	**38.3**	**869**	**42.6**	**257**	**12.6**	**89**	**4.4**	**19**	**0.9**	**25**	**1.2**	**2039**	**100.0**

Note: Income level data is available for 2039 households out of total 2253 total affected households.

Of the total households, 38.3 percent are below the average annual income of Rs.50,000/- whereas majority of 42.6 percent are in the average annual income category of Rs.50,000 to Rs.1,00,000/-. Percentage of households in the higher income group such as income level more than Rs.3,00,000 are less in comparison to lower income groups. Details are presented in the table.

Table 28: Average Income by Social Categories in Project Locations

	<50000		>=50000 &<100000		>=100000 &<200000		>=200000 &<300000		>300000 &<400000		>=400000		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left														
SC	156	37.6	175	36.0	33	24.6	8	17.4	1	14.3	1	8.3	374	34.0
ST	8	1.9	3	0.6	3	2.2	0	0.0	0	0.0	0	0.0	14	1.3
OBC	27	6.5	41	8.4	15	11.2	4	8.7	0	0.0	0	0.0	87	7.9
General	224	54.0	267	54.9	83	61.9	34	73.9	6	85.7	11	91.7	625	56.8
Total	**415**	**100.0**	**486**	**100.0**	**134**	**100.0**	**46**	**100.0**	**7**	**100.0**	**12**	**100.0**	**1100**	**100.0**
Damodar Right														
SC	34	31.2	40	25.5	12	20.3	1	5.0	0	0.0	0	0.0	87	24.4
OBC	7	6.4	10	6.4	6	10.2	2	10.0	0	0.0	0	0.0	25	7.0
General	68	62.4	107	68.2	41	69.5	17	85.0	4	100.0	7	100.0	244	68.5
Total	**109**	**100.0**	**157**	**100.0**	**59**	**100.0**	**20**	**100.0**	**4**	**100.0**	**7**	**100.0**	**356**	**100.0**
Hurhura Left														
SC	99	63.5	64	48.5	4	14.8	3	27.3	2	50.0	1	25.0	173	51.8
OBC	4	2.6	8	6.1	2	7.4	0	0.0	0	0.0	0	0.0	14	4.2
General	53	34.0	60	45.5	21	77.8	8	72.7	2	50.0	3	75.0	147	44.0
Total	**156**	**100.0**	**132**	**100.0**	**27**	**100.0**	**11**	**100.0**	**4**	**100.0**	**4**	**100.0**	**334**	**100.0**
Upper Ramour Left														
SC	28	28.0	17	18.1	8	21.6	1	8.3	0	0.0	0	0.0	54	21.7
ST	0	0.0	1	1.1	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4
OBC	17	17.0	18	19.1	4	10.8	1	8.3	1	25.0	0	0.0	41	16.5

General	55	55.0	58	61.7	25	67.6	10	83.3	3	75.0	2	100.0	153	61.4
Total	**100**	**100.0**	**94**	**100.0**	**37**	**100.0**	**12**	**100.0**	**4**	**100.0**	**2**	**100.0**	**249**	**100.0**
Total														
SC	**317**	**40.6**	**296**	**34.1**	**57**	**22.2**	**13**	**14.6**	**3**	**15.8**	**2**	**8.0**	**688**	**33.7**
ST	**8**	**1.0**	**4**	**0.5**	**3**	**1.2**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**15**	**0.7**
OBC	**55**	**7.1**	**77**	**8.9**	**27**	**10.5**	**7**	**7.9**	**1**	**5.3**	**0**	**0.0**	**167**	**8.2**
General	**400**	**51.3**	**492**	**56.6**	**170**	**66.1**	**69**	**77.5**	**15**	**78.9**	**23**	**92.0**	**1169**	**57.3**
Total	**780**	**100.0**	**869**	**100.0**	**257**	**100.0**	**89**	**100.0**	**19**	**100.0**	**25**	**100.0**	**2039**	**100.0**

Note: Income level data is available for 2039 households out of total 2253 total affected households.

Average annual income by social categories reveals that higher percentage of SC and general category people are in most of the income slabs due to their higher prevalence in the locality in comparison to ST households. Distribution of households by their social category in different income slabs are presented in the table.

3.3.5 Access to Entitlements:

Consultation with persons / families revealed that they have access to different government entitlements based on their eligibility as per the schematic norms. Of the total 2255 persons / households having residential or non-residential structures, either in the country side or in the river side or on the ROW, 99.69 percent families have access to different schemes of the government (single or multiple schemes). Old Age Pension is availed by 0.13 percent families whereas Disability Pension under National Social Security Scheme is accessed by 0.09 percent families. Around 0.31 percent families have Widowhood Pension and 8.63 percent families have accessed IAY / PMAY. Highest percentage of families (89.68 percent) have accessibility to Public Distribution System (PDS). Remaining 1.16 percent have accessibility to different other schemes.

Table 29: Schematic Enrolment

SN	Entitlements / Schemes	No. of Households	Percentage
1	Old Age Pension	3	0.13
2	Widow Pension	7	0.31
3	Disability Pension	2	0.09
4	IAY/PMAY	194	8.63
5	PDS	2016	89.68
6	Other	26	1.16
	Total	**2248**	**100.00**

Of the total families who have accessed different schemes, 53.07 percent are in Damodar Left, 17.84 percent in Damodar Right, 16.41 percent in Hurhura left and 12.68 percent in upper Rampur left. Caste wise distribution of schematic accessibility reflects that of the total, 37.0 percent are from Scheduled Caste (SC) community, 1.0 percent from Scheduled Tribe (ST) community and 62.0 percent from other social groups.

Table 30: Schematic Enrolment by Social Category in Project Locations (in %)

Project Locations		Old Age Pension	Widow Pension	Disability Pension	IAY/PMAY	PDS	Other
		(In Percentage)					
Damodar Left	SC	33	33	100	64	35	25
	ST	33	-	-	4	1	-
	Other	33	67	-	32	63	75
	Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Damodar Right	SC	-	33	-	49	23	-
	ST	-	-	-	-	-	-
	Other	-	67	-	51	77	100
	Total	-	**100.0**	-	**100.0**	**100.0**	**100.0**

Hurhura Left	SC	-	-	100	77	52	67
	ST	-	-	-	-	-	-
	Others	-	100	-	23	48	33
	Total	-	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Upper Rampur Left	SC	-	-	-	62	21	92
	ST	-	-	-	-	-	-
	Others	-	-	-	38	78	8
	Total	-	**-**	-	**100.0**	**100.0**	**100.0**
Total	SC	33	29	100	62	34	69
	ST	33	-	-	2	1	-
	Other	33	71	-	36	65	31
	Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

3.3.6 Structures in Project Locations:

The project locations, as identified for intervention of different flood management activities, such as flood wall construction, embankment strengthening etc. are having a total of 2637 structures of different nature. There are households who have more than one type of structure, either on the river side or in the country side or in both the sides of the proposed location. Of the different type of structures, majority are the residential structures to the tune of 40.8 percent, followed by business shops (26.3 percent) and cattle sheds. (12.4 percent).

Table 31: Distribution of Different Structures in the Project Area

Project Locations	Residential	House Cum Shop	Boundary Wall	Toilets	Cattle Shed	Business Shop	Sheds	Bedi	Other	Total
Damodar Left	34.9	3.5	2.0	6.6	13.5	31.1	6.0	0.4	2.0	100.0
Damodar Right	51.7	1.2	5.4	7.9	9.5	13.4	6.4	0.8	3.7	100.0
Hurhura Left	55.3	2.2	0.5	2.9	14.8	15.6	6.9	0.5	1.4	100.0
Upper Rampur	31.7	4.4	1.3	4.4	9.2	38.7	7.6	0.3	2.2	100.0
Total	**40.8**	**3.0**	**2.3**	**6.0**	**12.4**	**26.3**	**6.4**	**0.5**	**2.3**	**100.0**

Note: BEDI refers to cemented / non-cemented platforms used for individual / community purposes / socio-cultural use.

The project area is having a total of 1076 residential structures with highest concentration in Damodar left (46.0 percent) followed by Damodar right (23.2 percent) and Hurhura left (21.5 percent). Highest percentage of business shops are observed in Damodar left (63.7 percent) followed by upper Rampur (17.6 percent). House cum shop is observed highest in Damodar left (62.8 percent) and upper Rampur (17.9 percent). Distribution of other types of structures based on its prevalence in different project locations are presented in the table.

Table 32: Structures by Project Locations

Project Location	Residential		House Cum Shop		Boundary Wall		Toilets		Cattle Shed	
	No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	495	46.0	49	62.8	29	47.5	94	59.5	191	58.2
Damodar Right	250	23.2	6	7.7	26	42.6	38	24.1	46	14.0
Hurhura Left	231	21.5	9	11.5	2	3.3	12	7.6	62	18.9
Upper Rampur	100	9.3	14	17.9	4	6.6	14	8.9	29	8.8
Total	**1076**	**100.0**	**78**	**100.0**	**61**	**100.0**	**158**	**100.0**	**328**	**100.0**

Table 33: Structures by Project Locations

Project Location	Business Shop		Sheds		Bedi		Other		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	442	63.7	85	50.3	6	46.2	29	48.3	1420	53.8
Damodar Right	65	9.4	31	18.3	4	30.8	18	30.0	484	18.4
Hurhura Left	65	9.4	29	17.2	2	15.4	6	10.0	418	15.9
Upper Rampur	122	17.6	24	14.2	1	7.7	7	11.7	315	11.9

Total	**694**	**100.0**	**169**	**100.0**	**13**	**100.0**	**60**	**100.0**	**2637**	**100.0**

Note: 693 persons / households having 695 Business shops

3.3.6.1 Residential Structures:

Number of Residential Structures:

The survey finds a total of 1076 residential structures in four project locations that are identified for the intervention. Of the total housing structures, 46.0 percent are in Damodar left embankment, 23.23 percent in Damodar right, 21.47 percent in Hurhura left and lowest of 9.29 percent in upper Rampur left embankment.

Table 34: Residential Structures in Different Sides of Embankments

Project Location	**River Side**		**Country Side**		**ROW**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	205	41.41	288	58.18	2	0.40	495	100.00
Damodar Right	115	46.00	135	54.00	0	0.00	250	100.00
Hurhura Left	80	34.63	150	64.94	1	0.43	231	100.00
Upper Rampur Left	31	31.00	69	69.00	0	0.00	100	100.00
Total	**431**	**40.06**	**642**	**59.67**	**3**	**0.28**	**1076**	**100.00**

Of the total residential structures, 40.06 percent are in the river side and 59.67 percent are in the country side. Lowest number of residential structures (structure in part or in complete form) are observed on the ROW (0.28 percent). Among the river side residential structures, highest is in Damodar left (47.56 percent), followed by Damodar right (26.68 percent). In country side, highest number of residential structures are observed in Damodar left (44.86 percent), followed by Hurhura left (23.36 percent). Similar trend is observed in case of residential structures present on the ROW. Distribution of residential structures in different project locations are presented in the table.

Types of Residential Structures:

The residential structures found to be of different categories of which 34.20 percent are pucca houses, 40.33 percent are semi-pucca, 18.96 percent are kutcha houses and 5.67 percent are bamboo sheds. Other type of sheds having asbestos shed are very minimal and only 0.84 percent are found in project locations. Distribution of residential structures by its type and project locations are presented in the table.

Table 35: Typology of Residential Structures

Project Locations	**Pucca**	**Semi-Pucca**	**Kutcha**	**Bamboo Shed**	**Metal / Concrete / Asbestos Shed**	**Total**	**Percentage**
Damodar Left	101	230	137	22	5	495	46.0
Damodar Right	115	105	22	7	1	250	23.23
Hurhura Left	90	78	32	28	3	231	21.47
Upper Rampur	62	22	14	6	0	100	9.29
Total	**368**	**434**	**204**	**61**	**9**	**1076**	**100.0**
Percentage	**34.20**	**40.33**	**18.96**	**5.67**	**0.84**	**100.00**	

Table 36: Type of Residential Structures

Project Location		**Pucca**		**Semi-Pucca**		**Kutcha**		**Bamboo Shed**		**Metal / Concrete / Asbestos Shed**		**Total**	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	River	46	45.5	106	46.1	37	27.0	15	68.2	1	20.0	205	41.4

	Country	55	54.5	123	53.5	99	72.3	7	31.8	4	80.0	288	58.2
	ROW	-	-	1	0.4	1	0.7	-	-	-	-	2	0.4
	Total	**101**	**100.0**	**230**	**100.0**	**137**	**100.0**	**22**	**100.0**	**5**	**100.0**	**495**	**100.0**
Damodar Right	River	47	40.9	55	52.4	11	50.0	2	28.6	-	-	115	46.0
	Country	68	59.1	50	47.6	11	50.0	5	71.4	1	100.0	135	54.0
	Total	**115**	**100.0**	**105**	**100.0**	**22**	**100.0**	**7**	**100.0**	**1**	**100.0**	**250**	**100.0**
Hurhura Left	River	27	30.0	30	38.5	11	34.4	10	35.7	2	66.7	80	34.6
	Country	62	68.9	48	61.5	21	65.6	18	64.3	1	33.3	150	64.9
	ROW	1	1.1	-	-	-	-	-	-	-	-	1	0.4
	Total	**90**	**100.0**	**78**	**100.0**	**32**	**100.0**	**28**	**100.0**	**3**	**100.0**	**231**	**100.0**
Upper Rampur	River	19	30.6	6	27.3	4	28.6	2	33.3	-	-	31	31.0
	Country	43	69.4	15	68.2	9	64.3	2	33.3	-	-	69	69.0
	Total	**62**	**100.0**	**22**	**95.5**	**14**	**92.9**	**6**	**66.7**	**-**	**-**	**100**	**100.0**
Total	**River**	**139**	**37.8**	**197**	**45.4**	**63**	**30.9**	**29**	**47.5**	**3**	**33.3**	**431**	**40.1**
	Country	**228**	**62.0**	**236**	**54.4**	**140**	**68.6**	**32**	**52.5**	**6**	**66.7**	**642**	**59.7**
	ROW	**1**	**0.3**	**1**	**0.2**	**1**	**0.5**	**-**	**-**	**-**	**-**	**3**	**0.3**
	Total	**368**	**100.0**	**434**	**100.0**	**204**	**100.0**	**61**	**100.0**	**9**	**100.0**	**1076**	**100.0**

Area of the Structure:

The study attempted to assess the area of the residential structures that are present in different project locations by observation and consultation with the owner / possessor of the structure. The average area of the residential structures assessed to be 469.80 Sq. Ft. with the median value of 375.0. About 34.72 percent households with pucca houses having average structural area of 625.29 Sq. Ft., 40.68 percent are semi-pucca with structural area of 409.88 sq. ft., and 18.26 percent are kutcha houses of average sq. ft. of 365.59 sq. ft.

Table 37: Average Area of the Structure

Residential House: Type of Structure (Area in Sq. Ft.)	Mean	Median	No. of Households	Percentage of Households
Pucca	625.29	540.00	367	34.72
Semi-Pucca	409.88	340.00	430	40.68
Kutcha	365.59	300.00	193	18.26
Bamboo Shed	273.97	224.50	58	5.49
Metal/Concrete/Asbestos Shed	488.78	450.00	9	0.85
Total	**469.80**	**375.00**	**1057**	**100.00**

Years of Existence of Residential Structures:

The residential structures is normally having years of existence in the locality, ranging from a minimum of one year to more than 35 years with an average of around 22 years.

Encroacher, Squatter and Structural Ownership:

Based on the opinion of the persons / families residing in the residential structures, it is observed that majority of the residential structures are "differently owned[1]" by the family residing in the structure (48.1 percent) followed by squatters (39.4 percent) and encroachers (12.6 percent). So, squatters and encroachers together comprise 52.0 percent of the total residential structures. Of the total encroachers, highest number are in Damodar left (42.86 percent) followed by Hurhura left (30.08 percent), Damodar right (21.05 percent) and lowest in upper Rampur left (6.02 percent). Same trend in observed in case of squatters where highest percentage of squatters are in Damodar left (90.87 percent) and lowest in upper Rampur left (1.92 percent). Households that opine of having "different ownership" of the structure found to be highest in Damodar right (40.55 percent) followed by Hurhura left (33.07 percent), upper Rampur

[1]Different ownership / differently owned / other category refers to structures that are on land claimed to be owned but could not be verified / ascertained due to non-availability of records to verify such claims.

(16.34 percent) and Damodar left (10.04 percent). Ownership details of distribution of structures by encroacher, squatter and "different ownership" is presented in the table.

Table 38: Encroacher, Squatter and Ownership Status of Residential Structures

Project Area	Encroacher		Squatter		Different Ownership (Other)		Total	
	No.	%	No.	%	No.	%	No.	%
Damodar Left	57	11.7	378	77.8	51	10.5	486	100.0
Damodar Right	28	11.4	12	4.9	206	83.7	246	100.0
Hurhura Left	40	17.7	18	8.0	168	74.3	226	100.0
Upper Rampur	8	8.1	8	8.1	83	83.8	99	100.0
Total	**133**	**12.6**	**416**	**39.4**	**508**	**48.1**	**1057**	**100.0**

Note: As per the assessment, 1057 households own 1076 residential structures, existing in different project locations. Different ownership also synonymously referred as "other" category in this report.

Table 39: Structural Ownership by Project Locations

Embankment		Encroacher		Squatter		Other		Total	
		No.	%	No.	%	No.	%	No.	%
Damodar Left	River Side	19	33.3	157	41.5	27	52.9	203	41.8
	Country Side	38	66.7	220	58.2	24	47.1	282	58.0
	ROW	0	0.0	1	0.3	0	0.0	1	0.2
	Total	**57**	**100.0**	**378**	**100.0**	**51**	**100.0**	**486**	**100.0**
Damodar Right	River Side	18	64.3	3	25.0	90	43.7	111	45.1
	Country Side	10	35.7	9	75.0	116	56.3	135	54.9
	Total	**28**	**100.0**	**12**	**100.0**	**206**	**100.0**	**246**	**100.0**
Hurhura Left	River Side	7	17.5	11	61.1	60	35.7	78	34.5
	Country Side	32	80.0	7	38.9	108	64.3	147	65.0
	ROW	1	2.5	0	0.0	0	0.0	1	0.4
	Total	**40**	**100.0**	**18**	**100.0**	**168**	**100.0**	**226**	**100.0**
Upper Rampur	River Side	1	12.5	2	25.0	27	32.5	30	30.3
	Country Side	7	87.5	6	75.0	56	67.5	69	69.7
	Total	**8**	**100.0**	**8**	**100.0**	**83**	**100.0**	**99**	**100.0**
Total	**River Side**	**45**	**33.8**	**173**	**41.6**	**204**	**40.2**	**422**	**39.9**
	Country Side	**87**	**65.4**	**242**	**58.2**	**304**	**59.8**	**633**	**59.9**
	ROW	**1**	**0.8**	**1**	**0.2**	**0**	**0.0**	**2**	**0.2**
	Total	**133**	**100.0**	**416**	**100.0**	**508**	**100.0**	**1057**	**100.0**

3.3.6.2 Residential Cum Business Structure:

Number of Residential Cum Business Structures:

The project locations are having a total of 78 structures that can be categorized as residential cum business structures. The term refers to the business structures which area also used for residential purposes. Of the total such structures, 62.8 percent are in Damodar left, 17.9 percent are in upper Rampur, 11.5 percent are in Hurhura left and 7.7 percent are in Damodar right. Of the total such structures, 73.1 percent are in river side and 26.9 are in country side of the project locations.

Table 40: Residential Cum Business Structures in Project Locations

Project Loations		Number of Structures	
		No.	%
Damodar Left	River Side	40	81.6
	Country Side	9	18.4
	Total	**49**	**100.0**
Damodar Right	River Side	4	66.7
	Country Side	2	33.3

	Total	**6**	**100.0**
Hurhura Left	River Side	7	77.8
	Country Side	2	22.2
	Total	**9**	**100.0**
Upper Rampur Left	River Side	6	42.9
	Country Side	8	57.1
	Total	**14**	**100.0**
Total	**River Side**	**57**	**73.1**
	Country Side	**21**	**26.9**
	Total	**78**	**100.0**

Type of Structure:

Among the residential cum business structures, 44.9 percent are pucca structures whereas 47.4 percent are semi-pucca structures. Percentage of kutcha, bamboo shed and other structures are relatively less in the project locations.

Table 41: Structure Types

Project Location	**Pucca**		**Semi-Pucca**		**Kutcha**		**Bamboo Shed**		**Metal/Concrete/Asbestos Shed**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	17	34.7	27	55.1	3	6.1	1	2.0	1	2.0	49	100.0
Damodar Right	3	50.0	2	33.3		0.0	1	16.7		0.0	6	100.0
Hurhura Left	4	44.4	5	55.6		0.0		0.0		0.0	9	100.0
Upper Rampur	11	78.6	3	21.4		0.0		0.0		0.0	14	100.0
Total	**35**	**44.9**	**37**	**47.4**	**3**	**3.8**	**2**	**2.6**	**1**	**1.3**	**78**	**100.0**

Table 42: Structure Types by Project Locations

Location		**Pucca**		**Semi-Pucca**		**Kutcha**		**Bamboo Shed**		**Metal / Concrete / Asbestos Shed**		**Total**	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	River Side	14	82.4	23	85.2	1	33.3	1	100.0	1	100.0	40	81.6
	Country Side	3	17.6	4	14.8	2	66.7	0	0.0	0	0.0	9	18.4
	Total	**17**	**100.0**	**27**	**100.0**	**3**	**100.0**	**1**	**100.0**	**1**	**100.0**	**49**	**100.0**
Damodar Right	River Side	3	100.0	1	50.0			0	0.0			4	66.7
	Country Side	0	0.0	1	50.0			1	100.0			2	33.3
	Total	**3**	**100.0**	**2**	**100.0**			**1**	**100.0**			**6**	**100.0**
Hurhura Left	River Side	2	50.0	5	100.0							7	77.8
	Country Side	2	50.0	0	0.0							2	22.2
	Total	**4**	**100.0**	**5**	**100.0**							**9**	**100.0**
Upper Rampur	River Side	5	45.5	1	33.3							6	42.9
	Country Side	6	54.5	2	66.7							8	57.1
	Total	**11**	**100.0**	**3**	**100.0**							**14**	**100.0**
Total	**River Side**	**24**	**68.6**	**30**	**81.1**	**1**	**33.3**	**1**	**50.0**	**1**	**100.0**	**57**	**73.1**
	Country Side	**11**	**31.4**	**7**	**18.9**	**2**	**66.7**	**1**	**50.0**	**0**	**0.0**	**21**	**26.9**
	Total	**35**	**100.0**	**37**	**100.0**	**3**	**100.0**	**2**	**100.0**	**1**	**100.0**	**78**	**100.0**

Area of the Structure:

Average area of the residential cum business structures calculated to be 452.42 Sq. Ft. Of the total such structures, 44.87 percent pucca houses are having average of 565.94 Sq. Ft., 47.44 percent semi-pucca houses are having average area of 356.14 sq. mt. and kutcha houses (3.85 percent) are having average area of 189.33 sq. ft. The average area of the bamboo sheds is 290 sq. ft. whereas 1.28 percent asbestos sheds are having average area of more than 1000 sq. ft. Area of different category of structures is presented in the table.

Table 43: Average Area of the Structure

House cum Shop: Type of Structure	Mean	Median	No. of Households	Percentage
Pucca	565.94	500.00	35	44.87
Semi-Pucca	356.14	300.00	37	47.44
Kutcha	189.33	168.00	3	3.85
Bamboo Shed	290.00	290.00	2	2.56
Metal/Concrete/Asbestos Shed	1156.00	1156.00	1	1.28
Total	**452.42**	**360.00**	**78**	**100.00**

Encroacher, Squatter and Structural Ownership:

Of the total residential cum business structures, 19.2 percent are structures in the encroached area, 44.9 percent are of different squatters and 35.9 percent claim to be the other owner of the structure. Of the total encroacher and squatter having such structures, highest area in Damodar left. Details are presented in the table below.

Table 44: Encroachment, Squatting and Ownership

Project Locations	Encroacher		Squatter		Other		Total	
	No.	%	No.	%	No.	%	No.	%
Damodar Left	10	20.4	33	67.3	6	12.2	49	100.0
Damodar Right		0.0		0.0	6	100.0	6	100.0
Hurhura Left	2	22.2	1	11.1	6	66.7	9	100.0
Upper Rampur Left	3	21.4	1	7.1	10	71.4	14	100.0
Total	**15**	**19.2**	**35**	**44.9**	**28**	**35.9**	**78**	**100.0**

Table 45: Ownership Category of Structures and Its Location

Embankment		Encroacher		Squatter		Other		Total	
		No.	%	No.	%	No.	%	No.	%
Damodar Left	River Side	8	80.0	28	84.8	4	66.7	40	81.6
	Country Side	2	20.0	5	15.2	2	33.3	9	18.4
	Total	**10**	**100.0**	**33**	**100.0**	**6**	**100.0**	**49**	**100.0**
Damodar Right	River Side					4	66.7	4	66.7
	Country Side					2	33.3	2	33.3
	Total					**6**	**100.0**	**6**	**100.0**
Hurhura Left	River Side	1	50.0	1	100.0	5	83.3	7	77.8
	Country Side	1	50.0	0	0.0	1	16.7	2	22.2
	Total	**2**	**100.0**	**1**	**100.0**	**6**	**100.0**	**9**	**100.0**
Upper Rampur	River Side	2	66.7	0	0.0	4	40.0	6	42.9
	Country Side	1	33.3	1	100.0	6	60.0	8	57.1
	Total	**3**	**100.0**	**1**	**100.0**	**10**	**100.0**	**14**	**100.0**
Total	**River Side**	**11**	**73.3**	**29**	**82.9**	**17**	**60.7**	**57**	**73.1**
	Country Side	**4**	**26.7**	**6**	**17.1**	**11**	**39.3**	**21**	**26.9**
	Total	**15**	**100.0**	**35**	**100.0**	**28**	**100.0**	**78**	**100.0**

Table 46: Types of Residential Cum Business Structures by Encroacher, Squatter & Ownership

Embankment		Encroacher		Squatter		Other		Total	
		No.	%	No.	%	No.	%	No.	%
Damodar Left	Pucca	5	50.0	8	24.2	4	66.7	17	34.7
	Semi-Pucca	4	40.0	21	63.6	2	33.3	27	55.1
	Kutcha	0	0.0	3	9.1	0	0.0	3	6.1
	Bamboo Shed	0	0.0	1	3.0	0	0.0	1	2.0
	Metal/Concrete/Asbestos Shed	1	10.0	0	0.0	0	0.0	1	2.0
	Total	**10**	**100.0**	**33**	**100.0**	**6**	**100.0**	**49**	**100.0**
Damodar Right	Pucca					3	50.0	3	50.0

	Semi-Pucca					2	33.3	2	33.3
	Bamboo Shed					1	16.7	1	16.7
	Total					**6**	**100.0**	**6**	**100.0**
Hurhura Left	Pucca	1	50.0	0	0.0	3	50.0	4	44.4
	Semi-Pucca	1	50.0	1	100.0	3	50.0	5	55.6
	Total	**2**	**100.0**	**1**	**100.0**	**6**	**100.0**	**9**	**100.0**
Upper Rampur	Pucca	2	66.7	1	100.0	8	80.0	11	78.6
	Semi-Pucca	1	33.3	0	0.0	2	20.0	3	21.4
	Total	**3**	**100.0**	**1**	**100.0**	**10**	**100.0**	**14**	**100.0**
Total	**Pucca**	**8**	**53.3**	**9**	**25.7**	**18**	**64.3**	**35**	**44.9**
	Semi-Pucca	**6**	**40.0**	**22**	**62.9**	**9**	**32.1**	**37**	**47.4**
	Kutcha	**0**	**0.0**	**3**	**8.6**	**0**	**0.0**	**3**	**3.8**
	Bamboo Shed	**0**	**0.0**	**1**	**2.9**	**1**	**3.6**	**2**	**2.6**
	Metal/Concrete/Asbestos Shed	**1**	**6.7**	**0**	**0.0**	**0**	**0.0**	**1**	**1.3**
	Total	**15**	**100.0**	**35**	**100.0**	**28**	**100.0**	**78**	**100.0**

3.3.6.3 Boundary Wall:

Number of Structures:
The identified work zones are having a number of boundary walls of different residential / non-residential structures, including facility centres. A total of 61 such boundaries are identified of which 47.5 percent are in Damodar left, 42.6 percent in Damodar right, 6.6 percent in upper Rampur and 3.3 percent in Hurhura left.

Types of Structures:
There are three different types of boundary structures, i.e., pucca structures (67.2 percent), semi-pucca structures (29.5 percent) and asbestos based shed types structures (3.3 percent). Of the boundary walls, 39.3 percent are in the river side and 60.7 percent are in the country side.

Table 47: Boundary Wall Categories

Project Location	**Pucca**		**Semi-Pucca**		**Metal / Concrete / Asbestos Shed**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	14	48.3	14	48.3	1	3.4	29	100.0
Damodar Right	21	80.8	4	15.4	1	3.8	26	100.0
Hurhura Left	2	100.0	-	-	-	-	2	100.0
Upper Rampur	4	100.0	-	-	-	-	4	100.0
Total	**41**	**67.2**	**18**	**29.5**	**2**	**3.3**	**61**	**100.0**

Table 48: Structural Typology by Project Locations

Embankment		**Pucca**		**Semi-Pucca**		**Metal / Concrete / Asbestos Shed**		**Total**	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	River Side	7	50.0	5	35.7	0	0.0	12	41.4
	Country Side	7	50.0	9	64.3	1	100.0	17	58.6
	Total	**14**	**100.0**	**14**	**100.0**	**1**	**100.0**	**29**	**100.0**
Damodar Right	River Side	9	42.9	1	25.0	1	100.0	11	42.3
	Country Side	12	57.1	3	75.0	0	0.0	15	57.7
	Total	**21**	**100.0**	**4**	**100.0**	**1**	**100.0**	**26**	**100.0**
Hurhura Left	Country Side	2	100					2	100
	Total	**2**	**100**					**2**	**100**

Upper Rampur	River Side	1	25.0					1	25.0
	Country Side	3	75.0					3	75.0
	Total	**4**	**100.0**					**4**	**100.0**
Total	**River Side**	**17**	**41.5**	**6**	**33.3**	**1**	**50.0**	**24**	**39.3**
	Country Side	**24**	**58.5**	**12**	**66.7**	**1**	**50.0**	**37**	**60.7**
	Total	**41**	**100.0**	**18**	**100.0**	**2**	**100.0**	**61**	**100.0**

Encroacher, Squatter and Structural Ownership:
About 9.8 percent boundary walls are in the encroached land and 31.1 percent are of squatters. Majority of the boundary walls (59.0 percent) are in lands of other categories. Distribution of boundary walls by encroacher, squatter and project location is presented in the tables below.

Table 49: Encroacher, Squatter and Ownership

Project Locations	**Encroacher**		**Squatter**		**Other**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	4	13.8	17	58.6	8	27.6	29	100.0
Damodar Right	1	3.8	2	7.7	23	88.5	26	100.0
Hurhura Left	1	50.0		0.0	1	50.0	2	100.0
Upper Rampur		0.0		0.0	4	100.0	4	100.0
Total	**6**	**9.8**	**19**	**31.1**	**36**	**59.0**	**61**	**100.0**

Table 50: Ownership Status by Project Locations

Embankment		**Encroacher**		**Squatter**		**Other**		**Total**	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	River Side	1	25.0	11	64.7	0	0.0	12	41.4
	Country Side	3	75.0	6	35.3	8	100.0	17	58.6
	Total	**4**	**100.0**	**17**	**100.0**	**8**	**100.0**	**29**	**100.0**
Damodar Right	River Side	1	100.0	1	50.0	9	39.1	11	42.3
	Country Side	0	0.0	1	50.0	14	60.9	15	57.7
	Total	**1**	**100.0**	**2**	**100.0**	**23**	**100.0**	**26**	**100.0**
Hurhura Left	Country Side	1	100			1	100	2	100
	Total	**1**	**100**			**1**	**100**	**2**	**100**
Upper Rampur	River Side					1	25.0	1	25.0
	Country Side					3	75.0	3	75.0
	Total					**4**	**100.0**	**4**	**100.0**
Total	River Side	2	33.3	12	63.2	10	27.8	24	39.3
	Country Side	4	66.7	7	36.8	26	72.2	37	60.7
	Total	**6**	**100.0**	**19**	**100.0**	**36**	**100.0**	**61**	**100.0**

3.3.6.4 Toilets:

Number of Structures:
There are 158 toilets identified in the proposed work zones of which 59.5 percent are in Damodar left, followed by 24.2 percent in Damodar right, 8.9 percent in upper Rampur and remaining 7.6 percent are in Hurhura left.

Types of Structures:
Majority of the toilets are either semi-pucca (81.5 percent)or pucca (15.9 percent) structures.

Table 51: Structures of Toilets

Project Location	Pucca		Semi-Pucca		Kutcha		Bamboo Shed		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	12	12.8	80	85.1	1	1.1	1	1.1	94	100.0
Damodar Right	3	7.9	35	92.1					38	100.0
Hurhura Left	4	33.3	8	66.7					12	100.0
Upper Rampur Left	6	42.9	6	42.9			2	14.3	14	100.0
Total	**25**	**15.8**	**129**	**81.5**	**1**	**0.6**	**3**	**1.9**	**158**	**100.0**

Table 52: Toilets by Project Locations

Project Area		Pucca		Semi-Pucca		Kutcha		Bamboo Shed		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	River Side	6	50.0	36	45.0	1	100.0	0	0.0	43	45.7
	Country Side	6	50.0	44	55.0	0	0.0	1	100.0	51	54.3
	Total	12	100.0	80	100.0	1	100.0	1	100.0	94	100.0
Damodar Right	River Side	1	33.3	10	28.6					11	28.9
	Country Side	2	66.7	25	71.4					27	71.1
	Total	3	100.0	35	100.0					38	100.0
Hurhura Left	River Side	4	100.0	4	57.1					8	72.7
	Country Side	0	0.0	3	42.9					3	27.3
	Total	4	100.0	7	100.0					11	100.0
Upper Rampur	River Side	2	33.3	5	83.3			1	50.0	8	57.1
	Country Side	4	66.7	1	16.7			1	50.0	6	42.9
	Total	6	100.0	6	100.0			2	100.0	14	100.0
Total	**River Side**	**13**	**52.0**	**55**	**43.0**	**1**	**100.0**	**1**	**33.3**	**70**	**44.6**
	Country Side	**12**	**48.0**	**73**	**57.0**	**0**	**0.0**	**2**	**66.7**	**87**	**55.4**
	Total	**25**	**100.0**	**128**	**100.0**	**1**	**100.0**	**3**	**100.0**	**157**	**100.0**

Encroacher, Squatter and Structural Ownership:

Of the total toilets, 3.8 percent are constructed in encroached area and 55.1 percent by the squatters. Remaining 41.1 percent are of other category oriented. Distribution of toilets by project locations are presented in the table.

Table 53: Encroacher, Squatters and Ownership

Project Location	Encroacher		Squatter		Other		Total	
	No.	%	No.	%	No.	%	No.	%
Damodar Left	4	4.3	82	87.2	8	8.5	94	100.0
Damodar Right	2	5.3	1	2.6	35	92.1	38	100.0
Hurhura Left					12	100.0	12	100.0
Upper Rampur Left			4	28.6	10	71.4	14	100.0
Total	**6**	**3.8**	**87**	**55.1**	**65**	**41.1**	**158**	**100.0**

Table 54: Encroacher / Squatter by Project Locations

Project Locations		Encroacher		Squatter		Other		Total	
		No.	%	No.	%	No.	%	No.	%
Damodar Left	River Side	4	100	35	43	4	50	43	46
	Country Side	0	0	47	57	4	50	51	54
	Total	**4**	**100**	**82**	**100**	**8**	**100**	**94**	**100**
Damodar Right	River Side	1	50	1	100	9	26	11	29
	Country Side	1	50	0	0	26	74	27	71
	Total	**2**	**100**	**1**	**100**	**35**	**100**	**38**	**100**
Hurhura Left	River Side					8	66.7	8	67

	Country Side					4	33.3	4	33
	Total					**12**	**100**	**12**	**100**
Upper Rampur Left	River Side			3	75	5	50	8	57
	Country Side			1	25	5	50	6	43
	Total			**4**	**100**	**10**	**100**	**14**	**100**
Total	**River Side**	**5**	**83**	**39**	**45**	**26**	**41**	**70**	**45**
	Country Side	**1**	**17**	**48**	**55**	**38**	**59**	**87**	**55**
	Total	**6**	**100**	**87**	**100**	**64**	**100**	**158**	**100**

3.3.6.5 Cattle Shed:

Number of Structures:
There are 328 cattle sheds identified in the working zone of which 58.2 percent are in Damodar left, 18.9 percent in Hurhura left, 14.0 percent in Damodar right and remaining 8.8 percent are in upper Rampur.

Table 55: Cattle Shed in Project Locations

Project Locations	Pucca		Semi-Pucca		Kutcha		Bamboo Shed		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	9	4.7	90	47.1	59	30.9	33	17.3	191	100.0
Damodar Right	1	2.2	25	54.3	6	13.0	14	30.4	46	100.0
Hurhura Left	1	1.6	10	16.1	17	27.4	34	54.8	62	100.0
Upper Rampur Left	1	3.4	13	44.8	8	27.6	7	24.1	29	100.0
Total	**12**	**3.7**	**138**	**42.1**	**90**	**27.4**	**88**	**26.8**	**328**	**100.0**

Of the total cattle sheds, only 3.7 percent are pucca, 42.1 percent are semi-pucca, 27.4 percent are kutcha and remaining 26.8 percent are bamboo sheds. Around 36.9 percent cattle sheds are in river side and majority of 63.1 percent are in country side.

Table 56: Structural Prevalence by Project Location

Locations		Pucca		Semi-Pucca		Kutcha		Bamboo Shed		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	River Side	5	55.6	22	24.4	11	18.6	15	45.5	53	27.7
	Country Side	4	44.4	68	75.6	48	81.4	18	54.5	138	72.3
	Total	9	100.0	90	100.0	59	100.0	33	100.0	191	100.0
Damodar Right	River Side	1	100.0	14	56.0	1	16.7	6	42.9	22	47.8
	Country Side	0	0.0	11	44.0	5	83.3	8	57.1	24	52.2
	Total	1	100.0	25	100.0	6	100.0	14	100.0	46	100.0
Hurhura Left	River Side	1	100.0	2	20.0	7	41.2	25	73.5	35	56.5
	Country Side	0	0.0	8	80.0	10	58.8	9	26.5	27	43.5
	Total	1	100.0	10	100.0	17	100.0	34	100.0	62	100.0
Upper Rampur	River Side	1	100.0	4	30.8	2	25.0	4	57.1	11	37.9
	Country Side	0	0.0	9	69.2	6	75.0	3	42.9	18	62.1
	Total	1	100.0	13	100.0	8	100.0	7	100.0	29	100.0
Total	**River Side**	**8**	**66.7**	**42**	**30.4**	**21**	**23.3**	**50**	**56.8**	**121**	**36.9**
	Country Side	**4**	**33.3**	**96**	**69.6**	**69**	**76.7**	**38**	**43.2**	**207**	**63.1**
	Total	**12**	**100.0**	**138**	**100.0**	**90**	**100.0**	**88**	**100.0**	**328**	**100.0**

Encroacher, Squatter and Structural Ownership:
The cattle sheds in 5.8 percent cases are in encroached land where as 60.1 percent are under squatters and remaining 34.1 percent are of other categories. Detail distribution of cattle sheds by project location are presented in the table.

Table 57: Structural Ownership

Project Locations	Encroacher		Squatter		Other		Total	
	No.	%	No.	%	No.	%	No.	%
Damodar Left	6	3.1	175	91.6	10	5.2	191	100.0
Damodar Right	1	2.2	5	10.9	40	87.0	46	100.0
Hurhura Left	8	12.9	15	24.2	39	62.9	62	100.0
Upper Rampur Left	4	13.8	2	6.9	23	79.3	29	100.0
Total	**19**	**5.8**	**197**	**60.1**	**112**	**34.1**	**328**	**100.0**

Of the total cattle sheds in the encroached area, majority are in country side (63.2 percent). Similar trend is observed in case of squatters where 66.0 percent are in the country side. In case of cattle shed of other categories, 42.0 percent are in the river side and 58.0 percent are in the country side.

Table 58: Location of Cattle Shed and Nature of Ownership

Locations		Encroacher		Squatter		Other		Total	
		No.	%	No.	%	No.	%	No.	%
Damodar Left	River Side	3	50.0	49	28.0	1	10.0	53	27.7
	Country Side	3	50.0	126	72.0	9	90.0	138	72.3
	Total	6	100.0	175	100.0	10	100.0	191	100.0
Damodar Right	River Side	0	0.0	5	100.0	17	42.5	22	47.8
	Country Side	1	100.0	0	0.0	23	57.5	24	52.2
	Total	1	100.0	5	100.0	40	100.0	46	100.0
Hurhura Left	River Side	3	37.5	12	80.0	20	51.3	35	56.5
	Country Side	5	62.5	3	20.0	19	48.7	27	43.5
	Total	8	100.0	15	100.0	39	100.0	62	100.0
Upper Rampur	River Side	1	25.0	1	50.0	9	39.1	11	37.9
	Country Side	3	75.0	1	50.0	14	60.9	18	62.1
	Total	4	100.0	2	100.0	23	100.0	29	100.0
Total	**River Side**	**7**	**36.8**	**67**	**34.0**	**47**	**42.0**	**121**	**36.9**
	Country Side	**12**	**63.2**	**130**	**66.0**	**65**	**58.0**	**207**	**63.1**
	Total	**19**	**100.0**	**197**	**100.0**	**112**	**100.0**	**328**	**100.0**

3.3.6.6 Business Shop

Number of Structures:
The project area is having a total of 694 business shops of which 63.5 percent are in Damodar left, 17.6 percent in upper Rampur, 9.5 percent in Hurhura left and 9.4 percent are in Damodar right.

Types of Structures:
Of the total structures, highest of 53.6 percent are semi-pucca structures followed by 40.2 percent pucca, 3.3 percent bamboo and 2.2 percent are kutcha structures. Distribution of structures by its type in different project locations are presented in the table.

Table 59: Type of Structures in Different Project Locations

Project Locations	Pucca		Semi-Pucca		Kutcha		Bamboo Shed		Metal/Concrete/Asbestos Shed		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	128	29.0	291	66.0	11	2.5	7	1.6	4	0.9	441	100.0
Damodar Right	25	38.5	34	52.3	2	3.1	4	6.2		0.0	65	100.0
Hurhura Left	39	59.1	22	33.3		0.0	4	6.1	1	1.5	66	100.0
Upper Rampur	87	71.3	25	20.5	2	1.6	8	6.6		0.0	122	100.0
Total	**279**	**40.2**	**372**	**53.6**	**15**	**2.2**	**23**	**3.3**	**5**	**0.7**	**694**	**100.0**

Note: 693 persons / households having 694 business shops

Majority of the business shops are existing in the river side (68.7 percent) whereas remaining structures are in the country side of the identified working zones (31.3 percent).

Table 60:Types of Structures in Different Sites of the Project Locations

Location		Pucca		Semi-Pucca		Kutcha		Bamboo Shed		Metal / Concrete / Asbestos Shed		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	River Side	89	69.5	224	77.0	6	54.5	5	71.4	4	100.0	328	74.4
	Country Side	39	30.5	67	23.0	5	45.5	2	28.6	0	0.0	113	25.6
	Total	**128**	**100.0**	**291**	**100.0**	**11**	**100.0**	**7**	**100.0**	**4**	**100.0**	**441**	**100.0**
Damodar Right	River Side	14	56.0	16	47.1	2	100.0	2	50.0			34	52.3
	Country Side	11	44.0	18	52.9	0	0.0	2	50.0			31	47.7
	Total	**25**	**100.0**	**34**	**100.0**	**2**	**100.0**	**4**	**100.0**			**65**	**100.0**
Hurhura Left	River Side	32	82.1	12	54.5			2	50.0	1	100.0	47	71.2
	Country Side	7	17.9	10	45.5			2	50.0		0.0	19	28.8
	Total	**39**	**100.0**	**22**	**100.0**			**4**	**100.0**	**1**	**100.0**	**66**	**100.0**
Upper Rampur	River Side	46	52.9	16	64.0	2	100.0	4	50.0			68	55.7
	Country Side	41	47.1	9	36.0	0	0.0	4	50.0			54	44.3
	Total	**87**	**100.0**	**25**	**100.0**	**2**	**100.0**	**8**	**100.0**			**122**	**100.0**
Total	**River Side**	**181**	64.9	**268**	72.0	**10**	66.7	**13**	56.5	**5**	100.0	**477**	68.7
	Country Side	**98**	35.1	**104**	28.0	**5**	33.3	**10**	43.5	**0**	0.0	**217**	31.3
	Total	**279**	**100.0**	**372**	**100.0**	**15**	**100.0**	**23**	**100.0**	**5**	**100.0**	**694**	**100.0**

Note: 693 persons / households having 694 business shops

Encroacher, Squatter and Structural Ownership:

Of the total 694 business shops, 11.4 percent are in encroached area constructed by encroachers, whereas highest of 55.5 percent are by the squatters and 33.0 percent are of other categories. Details are presented in the table.

Table 61: Location and Ownership of Structures

Project Locations	Encroacher		Squatter		Other		Total	
	No.	%	No.	%	No.	%	No.	%
Damodar Left	34	7.7	360	81.6	47	10.7	441	100.0
Damodar Right	7	10.8	12	18.5	46	70.8	65	100.0
Hurhura Left	9	13.6	5	7.6	52	78.8	66	100.0
Upper Rampur Left	29	23.8	8	6.6	85	69.7	122	100.0
Total	**79**	**11.4**	**385**	**55.5**	**229**	**33.0**	**694**	**100.0**

Table 62: Business Shops in Project Locations

Locations		Encroacher		Squatter		Other		Total	
		No.	%	No.	%	No.	%	No.	%
Damodar Left	River Side	24	70.6	262	72.8	42	89.4	328	74.4
	Country Side	10	29.4	98	27.2	5	10.6	113	25.6
	Total	**34**	**100.0**	**360**	**100.0**	**47**	**100.0**	**441**	**100.0**
Damodar Right	River Side	3	42.9	9	75.0	22	47.8	34	52.3
	Country Side	4	57.1	3	25.0	24	52.2	31	47.7
	Total	**7**	**100.0**	**12**	**100.0**	**46**	**100.0**	**65**	**100.0**
Hurhura Left	River Side	4	44.4	4	80.0	39	75.0	47	71.2
	Country Side	5	55.6	1	20.0	13	25.0	19	28.8
	Total	**9**	**100.0**	**5**	**100.0**	**52**	**100.0**	**66**	**100.0**
Upper Rampur	River Side	3	10.3	4	50.0	61	71.8	68	55.7
	Country Side	26	89.7	4	50.0	24	28.2	54	44.3
	Total	**29**	**100.0**	**8**	**100.0**	**85**	**100.0**	**122**	**100.0**

Total	**River Side**	34	43.0	279	72.5	164	71.3	477	68.7
	Country Side	45	57.0	106	27.5	66	28.7	217	31.3
	Total	**79**	**100.0**	**385**	**100.0**	**230**	**100.0**	**694**	**100.0**

3.3.6.7 Sheds:

Number and Type of Structures:
There are 169 sheds identified in project locations of which majority are in Damodar left (50.3 percent), followed by 18.3 percent in Damodar right, 17.2 percent in Hurhura left and remining 14.2 percent are in upper Rampur.

Table 63: Number of Sheds in Project Locations

Project Locations	Pucca		Semi-Pucca		Kutcha		Bamboo Shed		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	2	2.4	25	29.4	11	12.9	47	55.3	85	100.0
Damodar Right	1	3.2	17	54.8	3	9.7	10	32.3	31	100.0
Hurhura Left			5	17.2	9	31.0	15	51.7	29	100.0
Upper Rampur	1	4.2	2	8.3			21	87.5	24	100.0
Total	**4**	**2.4**	**49**	**29.0**	**23**	**13.6**	**93**	**55.0**	**169**	**100.0**

Of the total sheds, majority are bamboo sheds (55.7 percent) followed by semi-pucca structures (28.1 percent) and kutcha structures (13.8 percent). Pucca sheds are observed to be less, i.e. to the tune of 2.4 percent of total.

Table 64: Structure Types in Different Project Locations

Location		Pucca		Semi-Pucca		Kutcha		Bamboo Shed		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
Damodar Left	River Side	2	100.0	11	44.0	1	9.1	26	55.3	40	47.1
	Country Side	0	0.0	14	56.0	10	90.9	20	42.6	44	51.8
	ROW	0	0.0	0	0.0	0	0.0	1	2.1	1	1.2
	Total	**2**	**100.0**	**25**	**100.0**	**11**	**100.0**	**47**	**100.0**	**85**	**100.0**
Damodar Right	River Side	1	100.0	6	35.3	2	66.7	7	70.0	16	51.6
	Country Side	0	0.0	11	64.7	1	33.3	3	30.0	15	48.4
	Total	**1**	**100.0**	**17**	**100.0**	**3**	**100.0**	**10**	**100.0**	**31**	**100.0**
Hurhura Left	River Side			3	60.0	5	55.6	13	86.7	21	72.4
	Country Side			2	40.0	4	44.4	2	13.3	8	27.6
	Total			**5**	**100.0**	**9**	**100.0**	**15**	**100.0**	**29**	**100.0**
Upper Rampur	River Side							11	52.4	11	45.8
	Country Side	1		2	100.0			10	47.6	13	54.2
	Total	**1**		**2**	**100.0**			**21**	**100.0**	**24**	**100.0**
Total	**River Side**	**3**	**75.0**	**20**	**40.8**	**8**	**34.8**	**57**	**61.3**	**88**	**52.1**
	Country Side	**1**	**25.0**	**29**	**59.2**	**15**	**65.2**	**35**	**37.6**	**80**	**47.3**
	ROW	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**1**	**1.1**	**1**	**0.6**
	Total	**4**	**100.0**	**49**	**100.0**	**23**	**100.0**	**93**	**100.0**	**169**	**100.0**

Encroacher, Squatter and Structural Ownership:
Around 3.0 percent encroachers are having such structures whereas majority belongs to squatters (50.3 percent) and other categories (46.7 percent).

Table 65: Structural Ownership

Project Locations	Encroacher		Squatter		Other		Total	
	No.	%	No.	%	No.	%	No.	%
Damodar Left	2	2.4	77	90.6	6	7.1	85	100.0

Damodar Right			1	3.2	30	96.8	31	100.0
Hurhura Left	3	10.3	4	13.8	22	75.9	29	100.0
Upper Rampur Left			3	12.5	21	87.5	24	100.0
Total	**5**	**3.0**	**85**	**50.3**	**79**	**46.7**	**169**	**100.0**

Table 66: Distribution by Structural Ownership by Project Locations

Location		**Encroacher**		**Squatter**		**Other**		**Total**	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	River Side	2	100.0	33	42.9	5	83.3	40	47.1
	Country Side			43	55.8	1	16.7	44	51.8
	ROW			1	1.3			1	1.2
	Total	**2**	**100.0**	**77**	**100.0**	**6**	**100.0**	**85**	**100.0**
Damodar Right	River Side			1	100.0	15	50.0	16	51.6
	Country Side					15	50.0	15	48.4
	Total			**1**	**100.0**	**30**	**100.0**	**31**	**100.0**
Hurhura Left	River Side	1	33.3	4	100.0	16	72.7	21	72.4
	Country Side	2	66.7			6	27.3	8	27.6
	Total	**3**	**100.0**	**4**	**100.0**	**22**	**100.0**	**29**	**100.0**
Upper Rampur	River Side			2	66.7	9	42.9	11	45.8
	Country Side			1	33.3	12	57.1	13	54.2
	Total			**3**	**100.0**	**21**	**100.0**	**24**	**100.0**
Total	**River Side**	**3**	**60.0**	**40**	**47.1**	**45**	**57.0**	**88**	**52.1**
	Country Side	**2**	**40.0**	**44**	**51.8**	**34**	**43.0**	**80**	**47.3**
	ROW	**0**	**0.0**	**1**	**1.2**	**0**	**0.0**	**1**	**0.6**
	Total	**5**	**100.0**	**85**	**100.0**	**79**	**100.0**	**169**	**100.0**

3.3.6.8 BEDIs:

Number and Type of Structures:
There are 13 Bedis identified in project locations of which majority are in Damodar left (46.2 percent), followed by 30.8 percent in Damodar right, 15.4 percent in Hurhura left and remining 7.7 percent are in upper Rampur.

Table 67: Number of Bedis in Project Locations

Project Locations	**Pucca**		**Semi-Pucca**		**Bamboo Shed**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	3	50.0	2	33.3	1	16.7	6	100.0
Damodar Right	1	25.0	3	75.0			4	100.0
Hurhura Left	1	50.0		0.0	1	50.0	2	100.0
Upper Rampur	1	100.0		0.0			1	100.0
Total	**6**	**46.2**	**5**	**38.5**	**2**	**15.4**	**13**	**100.0**

Of the total Bedis, majority are pucca (46.2 percent) and semi-pucca (38.5 percent) structures followed by bamboo sheds (15.4 percent). About 41.7 percent Bedis area in river side and 58.3 percent are in country sides.

Table 68: Bedis in Different Project Locations

Location		**Pucca**		**Semi-Pucca**		**Bamboo Shed**		**Total**	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	River Side	1	50.0	1	50.0	0	0.0	2	40.0
	Country Side	2	50.0	1	50.0	1	100.0	4	60.0
	Total	**3**	**100.0**	**2**	**100.0**	**1**	**100.0**	**6**	**100.0**
Damodar Right	River Side	0	0.0	1	33.3			1	25.0
	Country Side	1	100.0	2	66.7			3	75.0

	Total	**1**	**100.0**	**3**	**100.0**			**4**	**100.0**
Hurhura Left	River Side	1	100			1	100	2	100
	Total	**1**	**100**			**1**	**100**	**2**	**100**
Upper Rampur	Country Side	1	100					1	100
	Total	**1**	**100**					**1**	**100**
Total	**River Side**	**2**	**40.0**	**2**	**40.0**	**1**	**50.0**	**5**	**41.7**
	Country Side	**4**	**60.0**	**3**	**60.0**	**1**	**50.0**	**7**	**58.3**
	Total	**6**	**100.0**	**5**	**100.0**	**2**	**100.0**	**13**	**100.0**

Encroacher, Squatter and Structural Ownership:

Around 46.2 percent squatters are having such structures whereas majority belongs to persons of other categories (53.8 percent).

Table 69:Structural Ownership

Project Locations	**Squatter**		**Other**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	6	100.0		0.0	6	100.0
Damodar Right			4	100.0	4	100.0
Hurhura Left			2	100.0	2	100.0
Upper Rampur Left			1	100.0	1	100.0
Total	**6**	**46.2**	**7**	**53.8**	**13**	**100.0**

Table 70: Distribution of Structures by Project Locations

Locations		**Squatter**		**Other**		**Total**	
		No.	**%**	**No.**	**%**	**No.**	**%**
Damodar Left	River Side	2	33.3			2	33.3
	Country Side	4	66.7			4	66.7
	Total	**6**	**100.0**			**6**	**100.0**
Damodar Right	River Side			1	25.0	1	25.0
	Country Side			3	75.0	3	75.0
	Total			**4**	**100.0**	**4**	**100.0**
Hurhura Left	River Side			2	100	2	100
	Total			**2**	**100**	**2**	**100**
Upper Rampur	Country Side			1	100	1	100
	Total			**1**	**100**	**1**	**100**
Total	**River Side**	**2**	**33.3**	**3**	**42.9**	**5**	**38.5**
	Country Side	**4**	**66.7**	**4**	**57.1**	**8**	**61.5**
	Total	**6**	**100.0**	**7**	**100.0**	**13**	**100.0**

3.3.7 Structures with Amenities:

The structures present on the project locations, including residential and non-residential households are having different basic amenities. About 78.74 percent having tube well / open well as drinking water sources. Majority of the structures having tube well / open well as drinking water source observed to be in Damodar left (54.74 percent), followed by Damodar right (17.36 percent) and Hurhura left (15.90 percent). Pipe water supply to the available structures are less to the tune of 6.79 percent of the total. The residences / business units also have toilet facility in 77.10 percent cases, of which 56.25 percent structures are in Damodar left, 18.60 percent in Damodar right and 13.01 percent are in Hurhura left. Highest of 85.26 percent structures in these project locations are having electricity connection and highest are in Damodar left (54.40 percent) followed by Damodar right (17.75 percent) and Hurhura left (15.72 percent). The structures in different project locations that are having such facilities are presented in the table.

Table 71: Structures with Amenities

Project Locations	**Drinking Water**		**Toilet Facility**		**Electricity Connection**		**Pipe Water Supply**	
	No.	**Percent**	**No.**	**Percent**	**No.**	**Percent**	**No.**	**Percent**
Damodar Left	971	54.74	977	56.25	1045	54.40	81	52.94
Damodar Right	308	17.36	323	18.60	341	17.75	38	24.84
Hurhura Left	282	15.90	226	13.01	302	15.72	12	7.84
Upper Rampur Left	213	12.01	211	12.15	233	12.13	22	14.38
Total	**1774**	**100.00**	**1737**	**100.00**	**1921**	**100.00**	**153**	**100.00**
% of Total	**78.74**		**77.10**		**85.26**		**6.79**	

Chapter 4: Stakeholder Analysis and Consultation

Community consultation has been taken up as an integral part of environmental and social assessment process of the project. In this regard, Focus Group Discussion (FGD) and household level interactions were conducted to understand people's opinion on the project and to inform and educate stakeholders about the proposed project and its activities. It helped in identification of the problems associated with the project as well as the needs of the population likely to be impacted. This participatory process helped in reducing the public resistance to change and enabled the participation of the local people in this development process

4.1 Objective of Public Consultation

The public consultations and survey were organized during the ESIA study with the following objectives:

1. To identify the major environmental and social issues;
2. To promote public awareness and understanding about the project;
3. To support in preparing effective mitigation measures;
4. To identify potential areas of impact on the families and structures existing on the working zone; and
5. To assess the number of persons / households anticipated to be affected in the identified working zones;

4.2 Methodology

Consultation activities were carried out in different phases during the ESIA process. At the first stage, people residing nearer to the project locations (habitations near the project areas in project districts) were consulted on the anticipated socio-economic impacts due to the proposed project. The potential PAPs / PAFs were identified through socio-economic census in the identified work zones. Several meetings were organized with the local residents of the areas and FGDs were held to assess the environmental and social impacts in and around the project corridor. The identified Project Affected Persons (PAPs) / Project Affected Families were consulted to assess their loss of properly and structures. A structured scheduled was administered to capture the impact and opinion of people residing on the project corridor. In the local level meetings and FGDs, the participants were informed about the purpose and preliminary design of the project and feedbacks were received on their issues of concern. Consultations / FGDs were held in all the identified working zones covering proposed project districts.

4.3 Stakeholder Analysis

As a part of participatory process different stakeholders have been identified who could be involved in the process of identification of critical issues, identification of impacts, resettlement, project execution, monitoring and evaluation. The stakeholders have been categorized in to primary and secondary stakeholders. The project has a public purpose and therefore, needs multiple stakeholder involvement for its success. Moreover, the project requires minimal area on temporary basis for executing its works where encroachers and squatters have settled down long back. Therefore, their temporary / permanent relocation / displacement from public working sites are of paramount importance. This requires a participatory process from the beginning of project initiation. People in common have been considered as primary stakeholders and others include the service providers, authorities who are associated directly in the project etc. The details of the identified stakeholders are described below.

4.3.1 Primary Level Stakeholders

The primary stakeholders are (1) people who are anticipated to be affected directly due to the execution of the project, and (2) the concerned authorities

Directly Affected People:

1. People losing assets
2. People losing employment / current engagement / livelihoods
3. Community affected due to the loss of facilities and services, including religious structures, cultural properties, etc.

The people, expected to be displaced from the identified working zones in the project area, temporarily or on permanent basis, could be further specified, including their occupational involvement, such as;

1. Petty shop owners
2. Lease holders
3. Share croppers
4. Cultivators on encroached land
5. Vendors
6. Daily wage earners
7. Persons in different temporary and permanent service
8. Fishermen
9. SC Communities in different occupational engagements
10. ST communities in different occupational engagements
11. Women associated with different farm and non-farm activities
12. Unemployed youth

Indirectly affected people:

Certain people may be affected temporarily due to project activities, which covers (1) project side habilitations / villagers prone to air and noise pollution, accidents, communicable diseases, etc. and (2) settlements expected to lose access during construction activities for temporary period

The institutions / organizations who are the potential stakeholders, identified for the project are (1)local Gram Panchayats,(2)local CBOs / NGOs,(3)ground force of extension service providers of different Govt. departments such as agriculture, horticulture, animal husbandry, fishery etc.

The Concerned Authorities:

1. Irrigation and Waterways Department (IWD), Govt. of West Bengal
2. Forest Department;
3. Local Panchayat Samiti;
4. Revenue Department;
5. Electricity Department;
6. Department for Drinking Water Supply;
7. District Collector and Magistrate;
8. District Land and Land Settlement Officer
9. Block Land and Land Settlement Officer
10. Pollution Control Board authority

4.3.2 Secondary Stakeholders:

The secondary stakeholders are mostly Govt. institutions who are expected to play a role in the project execution, such as;

1. IWD Department, Govt. of West Bengal
2. Central Water Commission
3. Panchayati Raj Department
4. Department of Forest
5. Dept. of Environment
6. Fisheries Department
7. Agriculture Department
8. Horticulture Department
9. Drinking Water and Sanitation
10. Electricity Department
11. State Pollution Control Board

4.4 FGD and Census Survey

Stakeholder consultation is an integral part of the environmental and social assessment which provides inputs for the preparation of Social and Environment Management Plan (ESMP). The overall objective of such consultations was to document the concerns of the stakeholders with specific reference to the project planned interventions. The consultation meetings were organized basically for two important purposes, i.e., (1) to share project objectives and proposed project interventions with the identified stakeholder groups and (2) to consult with the stakeholders and document their concern, with particular reference to social and environmental impacts of the proposed project interventions. During the field assessment, community consultations were taken up as an integral part of social and environmental assessment process of the project. Public participation has been viewed as a continuous two-way process, i.e., developing people's understanding on the project, activities and process of ESIA and capturing their opinion on expected environmental and social concerns / issues.

To understand the expected project benefits / risks and people's perception on the project, field visits were conducted to different places within the planned project jurisdiction. In the process of assessment, mapping of stakeholders was done in the visited areas to understand how the project is going to impact upon the stakeholders. The field visit and stakeholder consultations were conducted in five project districts, namely Bankura, Bardhaman (E), Bardhaman (W), Hooghly and Howrah. The interaction with different stakeholders covered farmers of different social and economic categories, women group like SHG, fisherman, people / households expected to be affected due to the project, local service providers etc. in project districts to understand their concerns.

Project Area Coverage under Assessment

In the process, stakeholder consultations were carried out in all the five project districts, covering different stakeholders such as farmers of different holding category, local service providers, state and district level line departments and agencies, extension institutions (for example, ATMA and Krishi Vigyan Kendra) etc. The details of consultations held in the five districts are given in Table 72.

Consultation with Potential PAFs / PAPs:

The consultation meetings were conducted with the encroachers / squatters who have the establishment near the left embankment of Damodar, Mundeswari, Hurhura and Rampur Khal and right embankment of Damodar. Discussion was primarily on project planned improvement and strengthening measures and its anticipated impact on their livelihood, accessibility to utilities and services. District level workshop/s were conducted in each project district during finalization of project activities. Environmental and social

concerns of each project activities were thoroughly discussed to find out suitable project alternatives. Generic environmental and social concerns of each alternatives were disseminated among all stakeholders to bring out baseline environmental and social concerns.

Focus Group Discussion

A number of Focused Group Discussions (FGD) were conducted with the villagers residing adjacent to the aforementioned embankment and in different project locations in the DVC command area to understand their opinion on the project dimensions. Opinion of SHG / FPO local CBOs were also noted during FGD. Discussions were conducted at different points of time during the assessment phase. The discussions were primarily related to the project and its activities, people's current livelihood engagement and expected environmental and social implications of the project. Project activity wise generic environmental and social issues were discussed with different people / groups and location as well as activity specific environmental concern were captured. However, people/ community were much more interested about project activities without enough environmental and social concern. The details of community consultations/ FGD held in the five districts are given in the below table.

Table 72: FGD with stakeholder community

District	Date	Place	No. of Participant	Name of Participant
Bankura	20th March, 2018	Vill.- Kendra Bedia, G.P.- Kharari, Bargora	7	1. Mrs. Riju Datt, 2. Thulikala Dutta, 3. Mrs. Mita Roy, 4. Mrs. Susma Roy, 5. Prodeep Roy, 6. Sanjib Dutta, 7. Rathin Rakshit
	21st March, 2018	Vill. - Patrasayer, GP. - Patrasayer, Block- Patrasayer	8	Female: 1. Simanti Murmu, Male: 1. Sk. Imam, 2. Siraj Mallik, 3. Ajizul Mallik, 4. Sushanta Murmu, 5. Akbar Midda, 6. Sk Hafijul, 7. Nur Alam Midda
	21st March, 2018	Vill. – Baganpara, GP.- Patrasayer, Block- Patrasayer	7	1. Mrs. Sukhir Hansda, 2. Mrs. Sakuntala Murmu, 3. Mrs. Putul Baski, 4. Mrs. Keya Hembrom 5. Mrs. Krishna Murmu, 6. Mongal Baske, 7. Kanchan Hansda,
Purba Bardhaman	11th March, 2018	Vill.- Bizara, GP.- Amodpur, Block- Memari-I	6	1. Mrs. Bhabna Sadhukha, 2. Mrs. Fatema Bibi, 3. Nilanjan Rudra, 4. Mafik Mahammad, 5. Seikh Ysuf, 6. Seikh Ansar Ali
	11th March, 2018	Vill.- Shajpur, GP.- Shamsundar, Block- Raina-1	7	1. Mrs. Chandana pandit, 2. Mrs. Suchitra Dutta, 3. Samar Dutta, 4. Dilip Mandal, 5. Sunil Mallick, 6. Madhu Sudan Bag, 7. Chanchala Majumdar
	22nd March, 2018	Vill.- Tilkoria, GP.- Jarugrame, Block- Jamalpur	9	1. Atanu Mandal, 2. Somnath Ghosh, 3. Raghupati Ghosh, 4. Chinmay Ghosh, 5. Tanmay Ghosh, 6. Mahadeb Bhumik, 7. Debashis mondal, 8. Kuntal Ghosh, 9. Bimalendu Dey
	22nd March, 2018	Vill.- Kaligram, GP.- Belkash, Block- Bardhaman- 1	11	1. Tina Ghosh, 2. Buddhadev Gorai, 3. Joydev Gorai, 4. Saif Ahammed Mirza, 5. Sahalom Mirza, 6. Sk Robiul Alam, 7. Samir Pandit, 8. Jaydeb Ghorui, 9. Naba Ghoroi, 10. Sanat Majhi, 11. Jagai Loher
Paschim Bardhaman	21st March, 2018	Vill.- Malandighi, GP.- Malandighi,	7	Female: 1. Mrs. Ila Mukherjee Male: 1. Tapan Kesh, 2. Avijit Garai,

		Block- Kanksa		3. Mr. Prahlad Chandra, 4. Mr. Parimal Kumbhakar, 5. Monasa Ruidas, 7. Uday Badyakar
	21st March, 2018	Vill.- Kuldiha, GP.- Molandighi, Block- Kanksa	6	1. Mrs. Sabita Mallik, 2. Mrs. Chandana ruydas, 3. Sannasi Hazra, 4. Ajit Hazra 5. Bhujanga Roy, 6. Nitai Mondal
Hooghly	13th March, 2018	Vill.- Nandanpur, GP.- Jagatpur, Block- Khanakul-II	10	Female: 1. Tukun Kar 1. Sasanka Shekhar Dolui, 2. Prasanta Majhi, 3. Sishir Dolui, 4. Bhaskar Dolui, 5. Rabibdranath Mandal, 6. Ashok Bera, 7. Bibhutibhusan Kar, 8. Ashok Kumar Samanta, 9. Utpal Bera
	13th March, 2018	Vill.- Fatepur, GP.- Chilidangi, Block- Pursura	7	1. Shyam Sundar Mandal, 2. Sushanta Sasmal, 3. Ganesh Chandra Dhank, 4. Mrinmoy Bera, 5. Gopinath Ghosh, 6. Subhendu Adhikary, 7. Raghudeb Mondal
	13th March, 2018	Ratanpur, Kather Pool, Singur II, Singur II	6	1. Mrs. Sita Soren, 2. Mrs. Kabita Soren, 3. Mrs. Tusumani Saran, 4. Bappa Hembram, 5. Bapi Dule, 6. Srikanta Kisku
	14th March, 2018	Vill.- Ratanpur, GP.- Singur-II, Block- Singur	8	2. Mamoni Soren, 2. Mrs. Sita Soren 1. Ganesh Nayek, 2. Sandip Jana, 3. Kartik Nayek, 4. Ashok Rui Dash, 5. Susanta Manna, 6. Mr. Srikanta Kisku,
	10th May, 2018	Vill.- Kashipur, Samaspur II, Dhania Khali	5	1. Kripa Sindhu Ghosh, 2. Madan Mohan dey, 3. Narayan Santra, 4. Lakshan Santra, 5. Nishapati Ghosh
	14th May, 2018	Vill.- Kulgachia, Ghospur, Khanakul I	6	1. Mita Jana, 2. Bharat Maity, 3. Satya Pramanik, 4. Sankar Pramanik, 5. Asit Jana, 6. Rabindra Duari
	14th May, 2018	Vill.- Kulat, Ghospur, Khanakul I	6	1. Padmalochon Sasmal, 2. Sital Roy, 3. Debendo Dayari, 4. Narayan Manna, 5. Ganteswar Parui, 6. Subrata Manna
Howrah	11th March, 2018	Vill.- Sarpai, GP.- Banichak, Block- Amta-I	9	1. Kanika Dalui, 2. Mamuni Dalui, 3. Dipa Paramanik, 4. Dipali Dalui, 5. Aruti Dalui, 6. Animesh Roy, 7. Raj Kumar Patra, 8. Tapan Dalui, 9. Raghunath Dalui
	11th March, 2018	Vill.- Kankari, GP.- Pancharul, Block- Udayanarayanpur	7	1. Sujala Koley, 2. Gita Santra, 3. Mohali Baruai, 4. Sanat kabati, 5. Nakul hazra, 6. Kirtik Khanran, 7. Modhon Karti
	12th March, 2018	Vill.- Rajapur, GP.- Bonibon, Block- Uluberia-II	7	1. Sampa Mondal, 2. Pramila Patra, 3. Aparana Mandal, 4. Ranjan Ghorui, 5. Alaka Mondal, 6. Dipika mondal, 7. Gora chand Gohri
	17th March, 2018	Baidyanathpur, BB Pur, Bagnan-II	7	1. Kajal Khanar, 2. Promila Pattna, 3. Kaplana Dhak, 4. Susanta Jashu, 5. Abhijit Garami, 6. Surajit Maji, 7. Atanu Mondal
	8th September,	Dihivursut, Bus	7	1. Prasanta Kara, 2. Adhir Samai,

	2018	Stand, Block-Udayanarayanpur		3. Mohananda Dhok, 4. Ranjit Samanta, 5. Raju Adhikari, 6. Pradip Roy, 7. Radha Dhok
	8th September, 2018	Dihivursut, Bus Stand, Block-Udayanarayanpur	5	1. Biswanath Kara, 2. Dilip Bhakta, 3. Ratikanta Maiti, 4. Subhas Maiti, 5. Gunadhar Kara

4.5 Consultation Meeting with Govt. Departments:

A range of consultation meetings were organized with local officials of different departments to understand their views on different aspects of the project. Stake-holders departments who have specific interest / stake in proposed project from environmental and social dimensions are listed below.

1. Department of Agriculture
2. Dept. of Agri-marketing
3. Dept. of Fisheries
4. Water Resources Investigation & Development Department
5. Department of Horticulture and Food Processing
6. Department of Irrigation
7. West Bengal Pollution Control Board
8. State Water Investigation Directorate
9. West Bengal Biodiversity Board
10. Department of Forest
11. Institute of Environmental Studies & Wetland Management (IESWM)
12. West Bengal State Electricity Distribution Corporation Limited (WBSEDCL)
13. West Bengal State Watershed Development Agency
14. University of Calcutta

4.6 Stakeholder's Concerns / Opinion

The ESMP addresses all such issues that are identified to have potential for adverse impact. The plan takes care of encroachment and land alienation issues building upon avoidance principles. Involvement of small and marginal holders is ensured through inclusion and equity norms in different project activities. Further, women participation and their safety and security are addressed in the camp (labour camp) establishment and management plan. Pollution and environment related issues are taken care in the ESMP under environment management plan.

Local communities are much more concerned about project activities and infrastructure facilities to be provided under this project. Communities focus were mainly concentrated on encroachment related issues, land acquisition, loss of agricultural land and agricultural land pollution due to staking of construction material on agricultural land. Majority of local peoples are expecting improvement of road infrastructure and construction of bridge along with flood management and irrigation modernization. Very negligible percentage of people are concern about environmental pollution during project implementation. All concerned govt. departments were very much active in their respective domain in terms of environmental pollution prevention and mitigation aspects. Stakeholder wise environmental and social issues and are tabulated below.

Table 73: Concerns / Opinion of Stakeholders

SN	Project Phases	Social
1	Pre-Implementation	1. No land shall be acquired under the project;

SN	Project Phases	Social
		2. Enough compensation shall be provided for any kind of relocation or loss of assets; 3. Spreading of water borne diseases after flood is commonly observed which need to be addressed;
2	Implementation	1. No activity shall be carried out during monsoon season and night time; 2. Canal embankment where encroachment has occurred, shall be avoided from rehabilitation work; 3. Contractor shall engage woman workers from nearby community; 4. Contractor shall provide equal wage for women workers and shall not force them to work during night time; 5. Separate toilet block shall specifically be provided for women workers; 6. Small temple located on embankment shall not be disturbed at any circumstances; 7. Non-availability of sufficient agricultural value chain actors for different crop may not support xcrop diversification. So, a suitable mechanism should be developed for agribusiness promotion (Agriculture).
3	Post-Implementation	1. Proper water delivery schedule and mechanism shall be developed and maintained to equally distribute water among tail as well as head users; 2. Spreading of water borne diseases after flood is commonly observed which need to be addressed appropriately; 3. Loss of standing crop in Bankura district by periodic attack by the wild elephants for which farmers needs to be compensated; 4. Modernisation of irrigation infrastructure will ultimately lead to more agriculture coverage which could trigger excess use of pesticide and fertilizer. Practice of vermi-compost may be introduced; 5. Less or almost non-availability of irrigation water during Rabi & Boro season in current scenario which need to be focused upon; 6. Emphasis should be given for agribusiness promotion

4.7 Issues addressed in RAP / ESMP

The ESMP addresses all such issues that are identified to have potential for adverse impact. The plan takes care of encroachment and land alienation issues building upon avoidance principles. Involvement of small and marginal holders is ensured through inclusion and equity norms in different project activities. Further, women participation and their safety and security are addressed in the camp (labour camp) establishment and management plan. Pollution and environment related issues are taken care in the ESMP under environment management plan. Further, to mitigate the adverse impact of the use of pesticides, project may support in promoting IPM with focus on adoption of other means of treatment when crop loss is above economic threshold level.

Table 74: Issues Addressed in ESMP

Social / Agricultural	
Issues	**Addressed in RAP / ESMP**
No private land shall be acquired	Project is not intended to acquire any private land. However, RAP is proposed for encroachment related issues, limiting to 5 m. on both sides of the embankment.
Enough compensation shall be provided for any kind of relocation or loss of assets	The package to be provided is elaborated in detail in RAP which will be as per the State Govt. norms.
Spreading of water borne diseases after flood is commonly observed which need to be addressed	As project will reduce occurrence of flood, so also related diseases will be reduced.

Social / Agricultural	
Issues	**Addressed in RAP / ESMP**
appropriately	Periodic health check-up camps to be organized for workers staying in labour camps.
No activity shall be carried out during monsoon season and night time	ESMP suggests specific activities which will not be taken up during night and monsoon period.
Contractor shall employ local labour during construction and operation	Contractor will be appropriately oriented to engage local labour force in the work to the possible extent based on the required skill base. It will be a part of the contractor's obligation.
Canal embankment where encroachment has occurred, shall be avoided from rehabilitation work	Avoidance as one of the principles and in cases, where it is highly necessary for the project and cannot be avoided, RAP will be followed.
Contractor shall engage woman workers from nearby Adivasi community	Inclusion principles are made a part of the ESMP
Contractor shall provide equal wage for women workers and shall not force them to work during night time	Equal wage for equal work will be followed and included in the plan.
Separate toilet block shall specifically be provided for women workers	Included in ESMP as a part of labour camp management plan.
Small temple located on embankment shall not be disturbed at any circumstances	No such cultural properties envisaged to get affected by the project.
Local farmers organisation / Gram Panchayat involvement	For water management, local farmers organisation will play a role along with GP.
Drip/ sprinkler irrigation may be introduced for horticulture with 50-70% subsidy	Under irrigation efficiency and productivity improvement, micro irrigation promotion is made a part of the ESMP.
Excess use of pesticide and fertilizer. Practice of vermi-compost may be introduced	Crop diversification will reduce use of fertilizer / pesticides. However, ESMP suggests adoption of IPM to minimize pesticide related impact.
Less or almost non-availability of irrigation water during Rabi & Boro season in current scenario which need to be focused upon	Improvement in irrigation structure and system along with promotion of conjunctive water use will improve water availability.
Emphasis should be given for agribusiness promotion	Agribusiness promotion is one of the interventions of the project.

4.8 Information Disclosure

The draft ESMP will be disclosed for public knowledge through the website of the IWD and the World Bank. The Executive Summary of the ESIP will also be disclosed in both Bengali and English languages in the web. Following information shall be displayed / disclosed / disseminated, wherever applicable.

i. Project specific information need to be made available at each project site (hard / soft / display);
ii. Project information brochures shall be made available at all the construction sites as well as the office of SPMU / DPMU / DPIU and the office of Engineer in charge.
iii. Reports and publications, as deemed fit, shall be expressly prepared for public dissemination e.g., English versions of the ESIA, EMP and RAP and Executive Summary of ESIA, EMP and RAP in local language.
iv. Wherever civil work will be carried out a board will be put up for public information which will disclose all desired information to the public, as a part of pro-active and Suo-motto disclosure, transparency and accountability.
v. All information will be translated into local language and will be disclosed to the public through the Panchayat, District Magistrate's office, concerned project offices, websites of IWD.

Chapter 5: Impact Assessment

The project will have positive impact on socio-economic condition of the people in the command after its completion along with environmental benefits. But from implementation view point, the project will have impact on encroachers / squatters and the structures that are already constructed or under construction. The project would have some impact, mainly of temporary nature, on certain categories of people, mostly encroachers and squatters, and also on some utility structure and community assets due to construction activities. These need to be mitigated before the commencement of project implementation, as mandated in the operational policy of the World Bank. The potential impacts of the project in this aspect are discussed below.

5.1 Positive Impacts

The project will have significant positive impact on the people and environment, after its completion. The overall project benefits will be in the following aspects, taking the project design and approach in to account.

1. Minimization of occurrence of flood and loss of life and livelihood on people;
2. Improved ecosystem services;
3. Improved irrigation coverage supporting agriculture and allied activities;
4. Reducing cost of production with the improved organic farming system;
5. Making irrigation available to agriculture fields through pressurized irrigation system;
6. Additional creation of employment in agriculture and allied sectors;
7. Minimizing water foot print and reducing gap ayacut;
8. Enhanced scope for fishery and strengthening related livelihood of fishers;
9. Enhancement in farm income of the farmers through crop diversification and HYV seed promotion;
10. Improvement in capacity of FPOs and their business linkage with different markets; etc.

5.2 Adverse Impact

The assessed adverse social impacts are temporary in nature and will persist during the execution phase of the project. Anticipated adverse impacts are;

1. Temporary loss of livelihood during construction / work phase;
2. Temporary / permanent relocation from the public sites that are under work zones;
3. Impact on different categories of structures / utilities / services / cultural properties; etc.

5.3 The Project Component / Activities that give rise to Displacement

The project Component C which is basically designed for flood management through embankment strengthening and flood wall construction will give rise resettlement / relocation. Though, project will not require any additional land, the eviction from the public / Govt. land, i.e., eviction of encroachers / squatters is necessary so that the worksite remain available for construction activities. Secondly, eviction of encroachers / squatters is also required from safety and security point of view which could arise during the construction works.

5.4 The Zone of Impact of Such Component or Activities

The zone of impact of such activities will be limited to the area proposed for embankment strengthening and flood wall construction in two project districts, i.e., Hooghly and Howrah.

5.5 Impact on Structures / Households

There are various structures on and near to the embankment. These structures may be affected due to construction work by the project. The structures, anticipated to be affected can be generally categorized in to three types, i.e., (1) residential structures (category 1), (2) commercial structures including residential-cum commercial (category 2) and (3) government and community structures / facilities, which includes tube well, well, pump house, electric pole etc. (category 3). All these structures are expected to be affected fully or partially and temporary or permanent relocation is required for these structures.

5.5.1 Affected Households and Displacement

Based on the assessment conducted in the finalized project locations, the project is likely to affect 2253 families / households. The degree of impact will be different for different category of structures and families possessing such structures. All the affected families do not have residential structures in the identified working zones. On the other hand, few families also have more than one type of structure (residential, house cum shop, business shops etc.), which are temporary or permanent in nature.

Table 75: No. of Existing Households and Structures on the Studied Locations

Type of Structure	No of Structures	No. of Households (Cumulative)	Construction Type of Structures					
			Pucca	Semi-Pucca	Kutcha	Bamboo	Asbestos	Total
Residential	1076	1057	368	434	204	61	9	1076
House Cum Shop	78	78	35	37	3	2	1	78
Boundary Wall	61	61	41	18			2	61
Toilets	158	158	25	129	1	3		158
Cattle Shed	328	328	12	138	90	88		328
Business Shop	696	693	279	375	15	23	4	696
Sheds	169	169	4	49	23	93		169
BEDI	13	13	6	5	2			13
Total	**2579**	**2557**	**770**	**1185**	**338**	**270**	**16**	**2579**

There are 2579 structures existing in the project locations and all these structures belong to 2253 households (2557 households in cumulative). In the residential structures, majority are semi-pucca (40.3 percent) and pucca (34.2 percent) followed by kutcha structures (19.0 percent). Similar distribution is observed in case of residential house cum shop where majority are semi-pucca (47.4 percent) and pucca (44.9 percent) structures. In case of business shops also, 53.9 percent are semi-pucca and 40.1 percent are pucca structures. Prevalence of other types of structures are less.

5.5.2 Project Affected Population:

The project is likely to affect 7270 persons in 2253 households, i.e., average of 3.23 persons per affected family. About 57.76 percent of the likely to be affected persons are male and remaining 42.24 percent are female. Age group wise distribution of affected population reflects that of the total male, 71.52 percent male are in the age group of 18-60 years, followed by 13.36 percent in 60+ age group and 11.98 percent

are in 6-18 years age group. In case of female, highest percentage of are in 18-60 years age group (71.48 percent) followed by 14.85 percent in 6-18 years age group and 8.69 percent in 60+ age group. Distribution of Households by Age and Sex is presented in the table.

Table 76: Project Affected Persons by Age and Sex

Age Group	Male		Female		Total	
	No. of Persons	%	No. of Persons	%	No. of Persons	%
< 6 Years	132	46.32	153	53.68	285	100
>=6 &<18 Years	503	52.45	456	47.55	959	100
>=18 &<60 Years	3003	57.77	2195	42.23	5198	100
>= 60 Years	561	67.75	267	32.25	828	100
Total	**4199**	**57.76**	**3071**	**42.24**	**7270**	**100**

5.5.3 Structural Ownership:

Structural ownership refers to ownership of the structures by encroachers, squatters and otherpersons. In case of residential structures, encroacher and squatter percentage of STs is comparatively less than other social groups and scheduled caste families. In case of residential cum shops, major encroachers and squatters belong to other social groups and scheduled caste, including structures on own land. The pattern remains more or less uniform across different other structures that are identified during the study. Details are presented in the table.

Table 77: Structural Ownership by Social Categories

Structure	SC		ST		Other		Total	
Residential	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Encroacher	48	36.09	1	0.75	84	63.16	133	100.00
Squatter	245	58.89	15	3.61	156	37.50	416	100.00
Other	196	38.58	0	0.00	312	61.42	508	100.00
Total	**489**	**46.26**	**16**	**1.51**	**552**	**52.22**	**1057**	**100.00**
Residential Cum Shop								
Encroacher	2	13.33	0	0.00	13	86.67	15	100.00
Squatter	10	28.57	0	0.00	25	71.43	35	100.00
Other	3	10.71	0	0.00	25	89.29	28	100.00
Total	**15**	**19.23**	**0**	**0.00**	**63**	**80.77**	**78**	**100.00**
Boundary Wall								
Encroacher	1	16.67	0	0.00	5	83.33	6	100.00
Squatter	5	26.32	0	0.00	14	73.68	19	100.00
Other	4	11.11	0	0.00	32	88.89	36	100.00
Total	**10**	**16.39**	**0**	**0.00**	**51**	**83.61**	**61**	**100.00**
Toilet								
Encroacher	1	16.67	0	0.00	5	83.33	6	100.00
Squatter	34	39.08	1	1.15	52	59.77	87	100.00
Other	20	30.77	0	0.00	45	69.23	65	100.00
Total	**55**	**34.81**	**1**	**0.63**	**102**	**64.56**	**158**	**100.00**
Cattle Shed								
Encroacher	6	31.58	0	0.00	13	68.42	19	100.00
Squatter	68	34.52	6	3.05	123	62.44	197	100.00
Other	40	35.71	0	0.00	72	64.29	112	100.00
Total	**114**	**34.76**	**6**	**1.83**	**208**	**63.41**	**328**	**100.00**

Business Shop								
Encroacher	13	16.46	0	0.00	66	83.54	79	100.00
Squatter	122	31.77	3	0.78	259	67.45	384	100.00
Other	26	11.30	2	0.87	202	87.83	230	100.00
Total	**161**	**23.23**	**5**	**0.72**	**527**	**76.05**	**693**	**100.00**
Sheds								
Encroacher	2	40.00	0	0.00	3	60.00	5	100.00
Squatter	34	40.00	1	1.18	50	58.82	85	100.00
Other	32	40.51	0	0.00	47	59.49	79	100.00
Total	**68**	**40.24**	**1**	**0.59**	**100**	**59.17**	**169**	**100.00**
Bedi								
Squatter	1	16.67	0	0.00	5	83.33	6	100.00
Other	1	14.29	0	0.00	6	85.71	7	100.00
Total	**2**	**15.38**	**0**	**0.00**	**11**	**84.62**	**13**	**100.00**

Number of households having such structures are hereby categorized in to encroacher, squatter and others as per the opinion of the families on structures and its legality. Encroachers and squatters together comprise 51.9 percent in residential structures, 64.1 percent in residential cum business units (house cum shop), 41.0 percent in case of having boundary walls, 58.9 percent in having toilets, 65.9 percent in having cattle sheds and 66.8 percent in terms of having business units / shops, 53.3 percent having sheds and 46.2 percent having Bedi.

Table 78: Distribution of Households by Ownership Categories

Type of Structure	No. of Households	Holding Categories of Structures			
		Encroachers	Squatters	Other	Total
Residential	1057	133	416	508	1057
House Cum Shop	78	15	35	28	78
Boundary Wall	61	6	19	36	61
Toilets	158	6	87	65	158
Cattle Shed	328	19	197	112	328
Business Shop	693	79	384	230	693
Sheds	169	5	85	79	169
BEDI	13	-	6	7	13
Total	**2557**	**263**	**1229**	**1065**	**2557**

Note: Other categories refer to households whose status could not be ascertained due to non-availability of verifiable documents based on their claim.

5.6 Distribution of Structures by Social Groups:

Residential Structures: With less concentration of ST population, 1.6 percent of the existing residential structures belong to scheduled tribes. Highest percentage of residential structures belong to other categories (52.0 percent) followed by scheduled caste (46.4 percent). (Note: 1076 structures own by 1057 families).

House Cum Shop: Tribal households do not have any residential cum business establishment (house cum shop). Highest percentage of such structures belong to families of other social categories (80.8 percent) followed by scheduled caste (19.2 percent).

Boundary Wall: Majority of the boundary wall belongs to families of other social category (83.6 percent) followed by scheduled caste (16.4 percent). Boundary walls belonging to ST families could not be observed in the studied locations.

Toilet: Around 64.6 percent toilets belong to families of other social categories and 34.8 percent to scheduled caste and only 0.6 percent belongs to tribal families.

Cattle Sheds: Ownership pattern of cattle sheds remain more or less same to that of earlier structures. The families of other social categories having highest ownership (63.4 percent) followed by scheduled caste families (34.8 percent) and tribal families (1.8 percent).

Table 79: Structural Typology by Social Groups

Structures	**SC**		**ST**		**Other**		**Total**	
Residential	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Pucca	95	25.8	0	0.0	273	74.2	368	100.0
Semi-Pucca	225	51.8	9	2.1	200	46.1	434	100.0
Kutcha	128	62.7	7	3.4	69	33.8	204	100.0
Bamboo Shed	48	78.7	1	1.6	12	19.7	61	100.0
Asbestos Shed	3	33.3	0	0.0	6	66.7	9	100.0
Total	**499**	**46.4**	**17**	**1.6**	**560**	**52.0**	**1076**	**100.0**
House Cum Shop								
Pucca	3	8.6	0	0.0	32	91.4	35	100.0
Semi-Pucca	10	27.0	0	0.0	27	73.0	37	100.0
Kutcha	2	66.7	0	0.0	1	33.3	3	100.0
Bamboo Shed	0	0.0	0	0.0	2	100.0	2	100.0
Asbestos Shed	0	0.0	0	0.0	1	100.0	1	100.0
Total	**15**	**19.2**	**0**	**0.0**	**63**	**80.8**	**78**	**100.0**
Boundary Wall								
Pucca	8	19.5	0	0.0	33	80.5	41	100.0
Semi-Pucca	1	5.6	0	0.0	17	94.4	18	100.0
Asbestos Shed	1	50.0	0	0.0	1	50.0	2	100.0
Total	**10**	**16.4**	**0**	**0.0**	**51**	**83.6**	**61**	**100.0**
Toilet								
Pucca	10	40.0	0	0.0	15	60.0	25	100.0
Semi-Pucca	44	34.1	1	0.8	84	65.1	129	100.0
Kutcha	0	0.0	0	0.0	1	100.0	1	100.0
Bamboo Shed	1	33.3	0	0.0	2	66.7	3	100.0
Total	**55**	**34.8**	**1**	**0.6**	**102**	**64.6**	**158**	**100.0**
Cattle Sheds								
Pucca	2	16.7	0	0.0	10	83.3	12	100.0
Semi-Pucca	37	26.8	4	2.9	97	70.3	138	100.0
Kutcha	26	28.9	0	0.0	64	71.1	90	100.0
Bamboo Shed	49	55.7	2	2.3	37	42.0	88	100.0
Total	**114**	**34.8**	**6**	**1.8**	**208**	**63.4**	**328**	**100.0**
Business Shop								
Pucca	55	19.7	2	0.7	222	79.6	279	100.0
Semi-Pucca	93	25.0	3	0.8	276	74.2	372	100.0
Kutcha	3	20.0	0	0.0	12	80.0	15	100.0
Bamboo Shed	10	43.5	0	0.0	13	56.5	23	100.0
Asbestos Shed	0	0.0	0	0.0	4	100.0	4	100.0
Total	**161**	**23.2**	**5**	**0.7**	**527**	**76.0**	**693**	**100.0**

Sheds								
Pucca	0	0.0	0	0.0	4	100.0	4	100.0
Semi-Pucca	18	36.7	0	0.0	31	63.3	49	100.0
Kutcha	10	43.5	1	4.3	12	52.2	23	100.0
Bamboo Shed	40	43.0	0	0.0	53	57.0	93	100.0
Total	**68**	**40.2**	**1**	**0.6**	**100**	**59.2**	**169**	**100.0**
Bedi								
Pucca	1	16.7	0	0.0	5	83.3	6	100.0
Semi-Pucca	0	0.0	0	0.0	5	100.0	5	100.0
Kutcha/Bamboo Shed	1	50.0	0	0.0	1	50.0	2	100.0
Total	**2**	**15.4**	**0**	**0.0**	**11**	**84.6**	**13**	**100.0**

Business Shop: Of the total business units / shops that are observed, 76.0 percent belong to other classes and 23.2 percent to scheduled caste families. Ownership of business shops by tribal families is limited to 0.7 percent of the total such identified units.

Sheds: Different other types of sheds are observed in the studied locations, of which 59.2 percent belong to other social categories and 40.2 percent to scheduled caste families. Tribal families having such shed/s is minimal.

Bedi: Of the total bedis identified in the project locations, tribal families do not have this structure whereas majority of bedis belong to other social categories (84.6 percent) and scheduled caste families (15.4 percent).

Table 80: Average Area of the Structures by Social Groups

Structures	**SC**		**ST**		**Other**		**Total**	
Residential	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
<500 Sq. Ft.	341	51.82	14	2.13	303	46.05	658	100.00
>=500 Sq. Ft.	148	37.09	2	0.50	249	62.41	399	100.00
Total	**489**	**46.26**	**16**	**1.51**	**552**	**52.22**	**1057**	**100.00**
Residential Cum Shop								
<500 Sq. Ft.	11	23.91	0	0.00	35	76.09	46	100.00
>=500 Sq. Ft.	4	12.50	0	0.00	28	87.50	32	100.00
Total	**15**	**19.23**	**0**	**0.00**	**63**	**80.77**	**78**	**100.00**
Residential Cum Shop								
<100 Sq. Ft.	7	15.91	0	0.00	37	84.09	44	100.00
>=100 Sq. Ft.	3	17.65	0	0.00	14	82.35	17	100.00
Total	**10**	**16.39**	**0**	**0.00**	**51**	**83.61**	**61**	**100.00**
Toilet								
<35 Sq. Ft.	43	39.81	1	0.93	64	59.26	108	100.00
>=35 Sq. Ft.	12	24.00	0	0.00	38	76.00	50	100.00
Total	**55**	**34.81**	**1**	**0.63**	**102**	**64.56**	**158**	**100.00**
Cattle Shed								
<200 Sq. Ft.	69	35.38	5	2.56	121	62.05	195	100.00
>=200 Sq. Ft.	45	33.83	1	0.75	87	65.41	133	100.00
Total	**114**	**34.76**	**6**	**1.83**	**208**	**63.41**	**328**	**100.00**
Business Shop								
<275 Sq. Ft.	112	23.48	2	0.42	363	76.10	477	100.00

>=275 Sq. Ft.	49	22.69	3	1.39	164	75.93	216	100.00
Total	**161**	**23.23**	**5**	**0.72**	**527**	**76.05**	**693**	**100.00**
Sheds								
<150 Sq. Ft	43	44.33	0	0.00	54	55.67	97	100.00
>=150 Sq. Ft.	25	34.72	1	1.39	46	63.89	72	100.00
Total	**68**	**40.24**	**1**	**0.59**	**100**	**59.17**	**169**	**100.00**
Bedi								
<150 Sq. Ft.	1	20.00	0	0.00	4	80.00	5	100.00
>=150 Sq. Ft.	1	12.50	0	0.00	7	87.50	8	100.00
Total	**2**	**15.38**	**0**	**0.00**	**11**	**84.62**	**13**	**100.00**

5.7 Impact on Common Property Resources / Facilities / Utilities

The embankment / ROW / identified area for construction / stabilization work, including areas that are required to facilitate construction and strengthening work are having different common property resources and utilities such as electric pole / light post, platforms for religious rituals (pandals / BEDI), pump house, transformer, drinking water sources (tube well) etc. These structures may be impacted upon during the construction activities.

Table 81: Anticipated Impact on Common Utilities / Facilities

SL. No.	Community Utilities / Facilities (Repair/Relocation)	Unit	No.
1	School	No.	1
2	Anganwadi Centre	No.	1
3	Club	No.	19
4	Office of Political Parties	No.	4
5	Temple	No.	31
6	Bedi	No.	46
7	Burning Ghat	No.	3
8	Bus Stop	No.	4
9	Bridge	No.	6
10	Transformer	No.	9
11	Tube well	No.	12
12	Electric Pole/EP	No.	396
13	Light Post	No.	1
14	RLI (Pump house)	No.	9
15	Pond	No.	38
	Total		**580**

5.8 Loss of Income and Livelihood

The project will have minimal impact on the income and livelihood of people. The loss of income and livelihood will occur to the persons who have their commercial establishments / shops on or near to the embankment (work sites only) and the owners of the land whose land may have to be occupied on temporary basis, not exceeding three years from the date of such need-based occupation.

Nature of impact and categories of impact and likely affected persons / groups / organizations eligible for rehabilitation / compensation as per World Bank's norms are reflected in the table below.

Sl. No.	Nature of impact and affected structures	Broad categories of affected persons / groups /	Remarks

		organizations	
1.	Temporary / permanent impact on small shops, hutments, semi-permanent dwelling units, located in government land with the Right of Way (RoW), generally considered in between countryside toe to riverside toe of embankments, river / canal bank.	Squatters / encroachers with-out valid legal rights.	RAP will be implemented before the commencement of the work (actual field execution).
2.	Temporary impact on agricultural land during construction period, located on countryside or riverside slope of embankments or river beds, due to use of such lands either for temporary storage of materials, or as a part of temporary haul roads.	Legal title holders, family with traditional land right, patta-holders, leaseholders and share croppers.	RAP to be implemented before the start of work/s at identified site/s.
3.	Permanent impact on service (utility) and community structures, requiring shifting, such as electrical posts, water supply lines, small pump houses, drainage structures, drinking water sources (tube wells or wells), Anganwadi Centres etc.	Concerned Service Providers, State Government Department / State Owned or Private Companies, Panchayats, responsible for maintenance of the assets.	RAP to be implemented with the support of different service providing government entities, including IWD, before the commencement of works.
4.	Temporary impact on private properties or community properties such as places of worships, Mandaps, Cremation Ground etc. during construction period, due to movement of machinery, transport of materials etc. However, permanent shifting or relocation would not be required.	Legal title holders, family with traditional land rights, ROR / patta holders, lease holders of concerned service provider or community, preserving / looking after the assets.	RAP to be implemented.

5.9 The Alternatives Considered to Avoid or Minimize Resettlement

The project is not causing any displacement due to acquisition of land that are permanent in nature. There are encroachers and squatters who will be temporarily / permanently relocated or their economic activities will be affected during the construction period. To avoid resettlement of encroachers / squatters, technical steps have been taken by the project in terms of (1) identification of areas for construction works that have no or minimum impact on habitation / settlements, (2) preparing structural designing that are conducive, (3) minimizing area coverage on both the sides of the embankment particularly country side and (4) keeping ROW accessible, through existing or new roads. Strategically, the project will also take steps for temporary relocation of PAFs / PAPs during construction phase (temporary relocation refers to a situation where during working period, the encroachers / squatters will shift to other places and may come back to the site after the work is completed) instead of permanent relocation, where ever feasible, without compromising the overall objective of the project.

1. Avoid demolition of any double story building with equal to or more than 10-inch-thick wall (without plaster) located on country side. Country side strengthening work will not be done in this section. However, flood wall may be provided on river side in such cases as an alternative. Else, any intervention will not be made in this section, as foundation of such double story structure will act as strengthening mechanism similar to flood wall.
2. Single story building with concrete roof and equal to or more than 10-inch-thick wall (without plaster) located on country side will also be avoided.
3. In case, there are more numbers of settlers, irrespective of holding categories, and structural density is high in country side within the identified work zone; flood wall/ sheet pile will be provided on river side in-lieu of country side embankment strengthening work.

4. Similarly, if such situation exists in the river side (for flood wall/ sheet pile); country side embankment strengthening work will be adopted in-lieu of river side flood wall/ sheet piling.
5. In case, if such situation persists in any stretch of working zone on both the sides of the embankment; possibility will be explored to construct flood wall/ sheet piling with required design change/ alternative to minimize effect on the structures.
6. In cases, where it is anticipated that flood wall and/or embankment strengthening may give rise to social issues, any intervention will not be made in that section.

Chapter 6: Resettlement

6.1 Objective of The Resettlement Action Plan (RAP)

This RAP is project specific resettlement action plan and has been guided by World Bank's Operational Policy (OP/BP) 4.12 on Involuntary Resettlement. The RAP is based on the findings during field assessment, socio-economic surveys and consultations with various persons in the project area. The primary objective of the RAP is to identify impacts and to plan measures to mitigate various losses that are expected due to the project. The specific objectives of the RAP are as follows.

1. To spell out arrangements for PAP identification, consultation, grievance redress, payment of compensation and R&R benefits, and monitoring and evaluation
2. To outline the eligibility and entitlements for the affected persons for payment of compensation and assistance for establishing the livelihoods
3. To Develop communication mechanism to establish harmonious relationship between the project and Project Affected Persons (PAPs)
4. To ensure adequate mechanism for budget allocation for implementation of RAP
5. To spell out the institutional mechanism including implementation schedule, monitoring and evaluation of the RAP.

6.2 Act / Policy / Scheme Applicable for RAP

6.2.1 GITANJALI Scheme

The scheme is being implemented by the Department of Housing of Government of West Bengal. As per the scheme guidelines, the houses would be constructed by beneficiaries themselves and no contracting agency will be engaged for the purpose. The revised guidelines came into effect from 01/04/2014. As per the revised guidelines, the scheme serves the purpose of three categories of beneficiaries, i.e., (a) Poor People in Rural and Urban areas, (b) Poor People in Erosion/ Flood/ Other calamity affected/ Disaster prone areas, and (c) Poor People affected by Government Projects (As part of rehabilitation measures). The scheme follows the income-based criteria, i.e., the people having family income of Rs 6,000/- per month or less whereas people in the BPL list gets priority.The scheme is applicable to all over the state of West Bengal including Rural and Urban areas.

Provision of Land:The scheme is being implemented in rural areas on the land of the beneficiary. As per the guidelines, required land is to be provided by the beneficiary of his / her own land / patta land and must be free from all encumbrances. In case of urban areas where land of beneficiaries is not available, the Group Housing may be built on the land supplied by District Administration, Municipality or any Development Authority.The dwelling unit is in IAY (currently PMAY-G) pattern. It is mandated that district authority will provide a low-cost toilet in every case.

Cost of the Dwelling Units: The cost of dwelling unit is in line with the PMAY-G scheme, i.e., Rs.1.20 lakhs per unit of housing.

Implementation Modalities: The scheme is being implemented by Housing Department through District Magistrate of the concerned District. He will nominate one of the Additional District Magistrate of the District to look after daily activities of the scheme on his behalf. District Planning Officer of the District acts as the Nodal Officer of the scheme.

6.2.2 World Bank Policy on Involuntary Resettlement (OP 4.12)

The overall objectives of the Bank's policy on involuntary resettlement are;

1. Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs;
2. Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs;
3. Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

The policy covers direct economic and social impacts that both result from Bank-assisted investment projects, and are caused by (a) the involuntary taking of land resulting in relocation or loss of shelter; loss of assets or access to assets; or loss of income sources or means of livelihood, whether or not the affected persons must move to another location; or (b) the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.

The operational policy defines displaced persons by classifying them in to three categories, i.e., (a) those who have formal legal rights to land (including recognized customary and traditional rights), (b) those who do not have formal legal rights to land at the time the census begins but have a claim to such land or assets--provided that such claims are recognized under the laws of the country or become recognized through a process identified in the resettlement plan, and (c) those who have no recognizable legal right or claim to the land they are occupying. The persons covered under category (a) and (b) are provided compensation for the land they lose, and other assistance. Whereas, persons covered under category (c) are provided resettlement assistance in lieu of compensation for the land they occupy, and other assistance, as necessary, if they occupy the project area prior to a cut-off date. The policy stipulates that persons who encroach on the area after the cut-off date are not entitled to compensation or any other form of resettlement assistance. Persons included in category (c) are provided compensation for loss of assets other than land.

6.3 Cut-Off Date

As the project will not acquire additional land, notification in this regard is not required. For non-titleholders (encroachers and squatters) the date of project census survey for each sub-project that involve clearing the encroachments / squatting will be the cut-off date. Encroachments/squatting after the cut-off date will not be entertained and will not be eligible for any assistance under the project. The cut-off date is considered as 10th of October 2018 as census was done before that date. Any PAF left out during the census would be given due opportunity to register the demand for compensation, to the RAP Implementing Authority, through a grievance redressal mechanism, and the cut-off date may suitably be extended for this specific cases / purpose.

6.4 Need for Land and Resettlement

All the project activities that require land, i.e., embankment strengthening, desilting and flood wall construction will be taken up in the existing structures and within the right-of-way / river bed. So, no additional private land is required for the project purpose and no land acquisition is proposed under the project. Further, the embankment / the right-of-way has been encroached upon in many places entailing

impact to commercial and residential structures as well as small temples and other common facilities. Though, the project will not involve in any land acquisition, it will impact on encroachers and squatters.

None of the interventions under the WBMIFMP require additional land beyond the land already under the possession of the government or land already having embankments or create perpetual interference on land or other assets of private persons. As such, permanent acquisition of land in terms of provision of LARR Act, 2013 or direct purchase of land as per prevailing policy of the Government of West Bengal will not be required. Also, the project activities have been planned in such a manner so as to create the least obstruction / interference on the land and other assets of people as well as various utility structures, lying in the vicinity of working zone.

6.5 Eligibility

A person / household will be eligible for compensation / assistance (not for land as no land is proposed for acquisition) in the following cases;

1. Persons / households having their business or residential establishments before the cut-off date, i.e., 10th of October 2018 will be eligible for compensation for the structures to be affected and will be treated as Project Affected Family / Project Affected Person.

2. Non-titleholder PAPs will not be eligible for compensation of land occupied by them, however, they will receive compensation for the investment made by them on the land such as replacement value of structures and other assets as per Gitanjali scheme. Therefore, they will be eligible for compensation for non-land assets.

3. Families of other categories have to establish their entitlement in shape of acceptable documents for the verification of authorities. In case of establishment of their rights and entitlement, such households will be paid compensation for the structure, irrespective of its type.In case of establishment of a title holder of his/her rights, land ownership right will rest with the concerned person and will not change or transfer to any other entity due to project activity. As detailed out earlier, project will not acquire additional land or forcefully evict such persons from their land.

4. In case, a PAF could not be enumerated during the census because of non-availability during census or any other reasons, but they have reliable evidence to prove his/her presence before the cut-off date, shall be included in the list of PAPs after proper verification by the project authority.

5. In case of Community structures / utilities / facilities that are in the public places and required to be demolished or relocated due to construction activities, compensation will be paid at the market price to the appropriate authority (Gram Panchayat, concerned department management committee etc.) or to be reconstructed / restored in current location or suitable place, to be identified by the local GP / concerned committee / Concerned Govt. Department.

6. Temporary use of land of title holders may be required for project activities. In such cases, compensation to the title holder/s will be paid as mentioned in the entitlement matrix.

6.6 Principles of Resettlement Action Plan

The project will adopt following resettlement principles based on the State Government Act/Scheme and the World Bank policy.

1. Screening of the sub-projects in identified project locations will be done to identify involuntary resettlement requirements, its impacts and risks. The scope of resettlement planning will be determined through a census and socio-economic survey of affected persons, including a gender analysis, specifically related to resettlement impacts and risks. Required measures will be taken to avoid and minimize involuntary resettlement impacts;

2. Where involuntary relocation, temporary or permanent in nature, is unavoidable; project will take measures to improve, or at least restore, the livelihoods of all such persons / families through compensation at fixed replacement cost for assets that are to be impacted due to the project activities;

3. The project will ensure that affected persons / families without titles to land or any recognizable legal rights to land are eligible for compensation for loss of non-land assets at fixed replacement value;

4. Improving the standards of living of the affected poor and other vulnerable groups, including women, to national minimum standards or standard before the project, whichever is higher, by continuing their current accessibility to different entitlements / schematic enrolments;

5. The project will carry out meaningful consultations with the identified project affected persons and inform all identified PAFs / PAPs of their entitlements. Attention to the needs of vulnerable groups, especially those below who are economically poor, the landless, the elderly, women and children, and indigenous peoples, and those without legal title to land, and ensure their participation in consultations.

6. Disclosing the RAP in local language and documentation of the consultation process;

7. Paying a minimum of 50.0 percent compensation to the eligible persons / families before physical or economic displacement and before commencement of civil works. Remaining amount of compensation will be paid after vacating the land and possession taken by the department for the work purpose;

8. Establishing a grievance redressal mechanism to receive and facilitate resolution of the concerns of affected / displaced persons / aggrieved persons;

9. Conducting monitoring and assessing resettlement outcomes, their impacts on the standard of living of affected persons, and whether the objectives of the resettlement plan have been achieved by considering the baseline conditions and the results of resettlement monitoring.

6.7 Temporary Occupation of Land

Though, the project is not intended to acquire any land for the project activities on permanent basis, in certain cases, temporary occupation of land for project purposes will be required for staking of desilted materials, placing of machinery or establishment of work camps. As availability of fallow land / unutilised land / waste land is minimal is nature and may not serve the purpose of the project requirements, project may use private land, on temporary occupation basis.

1. In case of requirement of land for temporary staking of desilted materials, construction equipment, placing of machinery etc., the project may take / occupy / use available land, waste or arable land, on temporary basis, not exceeding three years from the commencement of such occupation in specific project locations.

2. The extent of requirement of such lands either for temporary storage of construction or other materials or for use in haul road / ramps, to access the main road from river / channel / canal bed to the road on top of embankment / bank, will be determined by the working agencies, after issue of Award of Contract (AoC) and such requirement of lands will be intimated to the project officials of the IWD, by these agencies.

3. Crop compensation as per scale and standard to be decided by the District Magistrate in consultation with Agriculture / Horticulture Departments will be paid by the working agencies to the affected persons for the period for which the land would be used for temporary storage of materials or haul roads together with deemed rental charges for the said period. In case land cannot be restored after the completion of project activities to its previous condition, additional compensation at prescribed rate of 25% of the original compensation would be payable.

4. The District administration, headed by the Collector and District Magistrate, shall thereupon give notice in writing to the owner (ROR holder) of the identified land, based on the earlier discussion with the concerned person. The project will pay compensation to the concerned person, either in a gross sum of money or by monthly or other periodical payments, as per the written agreement of both the parties. For arable land, compensation will be provided for the crops for the period of occupancy. Such rate of compensation is to be decided by the Collector and District Magistrate in consultation with line departments of government. For non-arable land, compensation can be paid on a rental basis, as decided by the Collector and District Magistrate of the concerned district.

5. In case of disagreement on compensation amount, the matter will be referred to the Project Director of the WBMIFMP, IWD for final decision.

6. On payment of such compensation or on execution of the agreement by both the parties, the land can be taken under possession and use or permit the use thereof in accordance with the agreement.

7. On the expiration of the term, compensation will be paid to the land holder for the damage, if any, done to the land and for the restoration of land. If the land needs development and restoration to its original position after its use for the project purpose, additional compensation will be paid to the ROR holder. For the restoration of land to its previous condition, additional compensation at prescribed rate of 25% of the original compensation would be payable.

6.8 Use of Irrigated Multi-Cropped Land

To safeguard the food production and food security, the project will not use irrigated multi-cropped land for staking of construction materials, desilted materials, placing machinery and related construction equipment and establishing work / labour camps. Such land may be used subject to the condition that no alternative option is available in the locality and only in exceptional circumstances. In such cases, willingness of the land owner / ROR holder would be essential. Based on the willingness of the concerned entitle holder, compensation will be paid for the period land is planned to be used for project purposes as per the entitlement matrix.

6.9 Entitlement Matrix

As discussed earlier, there would be no fresh acquisition or direct purchase of land under the proposed project. All encroachers and squatters having shops, hutments, semi-permanent dwelling units within the RoW will be compensated under “GITANJALI” Housing Scheme of the State Government, where the

present rate is Rs. 1,20,000 which is equal to the financial provision made under Pradhan Mantri Awas Yojana, Gramin (PMAY, G). In terms of Memorandum No.382-HI/HG/P/1B-5/2013 dated 29th May 2014, category of beneficiaries under "GITANJALI" Scheme also include Poor People affected by Government Projects (as part of rehabilitation measures). However, the scheme would require minor improvisation to expedite the resettlement process, which has been detailed in the Entitlement Matrix.

In accordance with the principles of this resettlement policy framework, all affected families / persons will be entitled to compensation depending upon the nature of ownership rights on affected assets. The affected persons, individual or community, will be entitled to the following types of compensation / assistance under the project:

1. Compensation for the loss of crops / trees at their replacement cost;
2. Compensation for structures (residential / commercial) and other immovable assets at their replacement cost as per the GITANJALI scheme of the Govt. of West Bengal;
3. Rebuilding and / or restoration of community resources / facilities, in case these structures are affected due to execution of works;
4. Compensatory afforestation for the trees that are uprooted / cut due to project activities

An Entitlement Matrix has been prepared, that summarizes the types of losses and the corresponding nature and scope of entitlements which is following the provision of Gitanjali Scheme of Govt. of West Bengal and World Bank OP. If the GoWB adopts any higher provisions for compensation and assistances then such higher provisions will apply. The entitlement matrix presents the entitlements corresponding to the project affected families which comprises encroachers and squatters (Non-title holders).

6.9.1 Compensation for Community Structures

The Embankment/s and its nearby area which is proposed for stabilization and flood wall construction is having a number of community structures and service structures such as electric / light pole, cremation ground, pump house, sluice gate, temple, platforms for religious rituals etc. These structures may be affected due to the construction work and hence project will have provision of compensation where ever such structures are to be demolished or to be affected partially and relocated to other place.

1. For structures like electric / light pole, pump house etc., project will bear all the cost of shifting these facility points to other suitable location in consultation with concerned Govt. Department. The project is having the plan to repair / replace the defunct sluice gates to minimize the water loss and improve irrigation efficiency.

2. Some of the cultural properties and community facilities like temple, cremation grounds etc. will not require demolition / shifting. The project will take all possible measures to ensure that such cultural resources are not affected due to construction works. However, in exigencies when it is not avoidable, in-spite of all measures, compensation for the structures like temples, Mandaps and similar other structures, will be paid by the project to the local GP or to the management committee of the structure, as per the suitability and based on the consultations, if such structures will be affected. The market value of the asset will be assessed following the provisions of the PWD prescribed price or as per the norm of the Govt. of West Bengal.

3. Structures like drinking water source (tube well / well), toilets, Anganwadi centers etc. will be established in other suitable location after due discussion with the local GP, if such structures are to be demolished fully or affected partially.

6.9.2 Compensation for Private Structures

Since,the project working locations are defined and limited to the specific areas, impacts are limited in nature in significant number of structures and a significant number of structures are temporary in nature which can be relocated easily, relocation would not require much time and the provision of 'GITANJALI' scheme would be adopted for building a new unit as well as to arrange for subsistence during the construction period, and also for managing the cost involved in demolition / shifting. Accordingly, no other allowance on these accounts are proposed to be paid. It needs to be stated here that so long as there is no acquisition of land in the project area, the encroachers and squatters are not strictly qualified under the definition of "affected family" as defined in LARR Act, 2013 and accordingly, all the provisions of the rehabilitation packages stated in the Act may not be mandatorily applicable in case of WBMIFMP. In case any private land is impacted, it will be directly purchased as per the prevailing GO of government of West Bengal.

6.9.3 Compensation for Trees

As the tress are not under the private possession in the demarcated areas and in case of non-title holders, compensation for the trees will not be paid. However, clearance from the forest department would be required and compensatory afforestation / plantation will be done by the project. Trees standing on the land owned by the government will be disposed-off through open auction by the concerned Revenue Department / Forest Department.

6.9.4 Right to Salvage Affected Materials

Even after payment of compensation for structures, the PAFs / PAPs would be allowed to take away the materials salvaged from their dismantled houses and shops and no charges will be levied upon them for the same. A notice to this effect will be issued intimating that the PAFs / PAPs can take away the materials so salvaged within 15 days of their demolition; otherwise, the same will be disposed-off by the project authority without giving any further notice.

6.9.5 Compensation Disbursement

All the compensation related to property / infrastructure should be made transparent for which a suitable mechanism will be worked out in consultation with the District Magistrate and local BDO and preferably all the payments should be made through bank transfer or account payee cheque or through bank drafts. Of the total compensation package of 1.2 lakh, 50.0 percent of the compensation will be paid before the demolition of the structure and remaining 50.0 percent after the demolition of the structure. However, compensation in full will be disbursed before the commencement of the work.

6.9.6 Temporary Relocation

Temporary relocation refers to relocation to another site by the encroacher / squatter for a specific period of time, especially during the construction period. Temporary relocation does not require any demolition of structures (permanent / semi-permanent) but the space would be vacated for a specific period of time. In certain cases, small shops can be shifted to other places as protective measure and the encroacher / squatter can operate the shop from temporarily relocated place. In case of temporary relocation of families residing near the embankment / public sites identified for construction / rehabilitation, the project will adopt multiple strategies for the families to be relocated. Temporary relocation would also permit temporary vacating or even dismantling of shops and other structures.

Table 82: Entitlement Matrix

Sl. No.	Type of loss	Application	Definition of Entitled Persons / Families	Description of Entitlement to the Project Affected Families (PAF)	Implementing Authority & Period	Remarks includes suggestions on improvisations
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Loss of residential or business structure.	Small temporary hutments, movable / immovable shops for residential and/or commercial purpose, built on government land.	Squatters / encroachers occupying government land without valid legal rights, till prescribed cut-off date	Compensation as per "GITANJALI" Housing Scheme of Govt. of West Bengal to each PAF, irrespective of the size of the residential / commercial structures, on submission of written undertaking towards demolition of structure and vacation of land, on receipt of the grant.	District Magistrates, using the District level Project Officials of the IWD and other Departments, and also the Block Administration. RAP to be implemented before the inception of the works.	Transferring the fund to the beneficiary's account by the District Magistrate in two instalments, i.e. 50% on receipt of undertaking from the beneficiary, and balance 50% after demolition of the structure and vacation of worksite/s. Funds will be transferred by the IWD, directly to the District Magistrates to expedite the process.
2	Loss of crop during project activity, due to temporary storage of materials or using the land as a part of haul road, but never permanent loss of land.	Agriculture land or vacant land near countryside or riverside slope of embankments or river banks.	Legal title holder, family with traditional land right, patta holders, leaseholders, share croppers.	Compensation for standing crops including prospective crops, for the duration and crop season of occupation of such lands, and compensation for timber value of the trees, at market rate to be determined by the District Magistrate in consultation with and as per recommendation of Agriculture / Horticulture / Forest Department, as the case might be, plus deemed rent of land as may be fixed by the District Land & Land Reforms Wing; In case of lease holder and	RAP to be implemented by the working agencies before starting field activities.	The land has to be restored to previous or better condition, failing which, 25% of the total compensation amount as fixed initially, would have to be provided, subject to verification and certification of Experts on change of characteristics of land.

				registered share croppers, the original owner of land not get any compensation; In case of unregistered share croppers, the compensation package will be restricted to 75% value of the total compensation package in (a) above, while the original land owner will get the balance 25%.		
3	Common Property Resources	Service and community structures requiring shifting, such as electric / light posts / pumphouses / outlet structures / drinking water sources (tube-wells or wells), Anganwadi Centers.	Concerned service provider (State Govt. Dept. or Panchayats / State owned / Private Companies, responsible for maintenance of the assets.	Compensation as per vetted estimates to be submitted by the service providers, in case of Government Departments, or as per agreed rate for different type of structures to be determined by the District Magistrate in all other cases, to be disbursed as prescribed modalities.	RAP to be implemented by district level project officials of the IWD in association with the Block Administration set up, before commencement of field works; Partly by working contractors during execution period, as per provision of the Contract and also guidance / advice of the Project Officials of the IWD.	-
4	Temporary impact due to some or other project activities, during construction period.	Private properties, community properties.	Legal title holder, family with traditional land right, ROR (*patta*) holders, leaseholders or concerned service provider or community preserving the	The project shall either bear the cost of any damage / other impact on structures or lands or other movable and immovable assets, due to movement of machinery, transport of materials, etc. or due to any other activities during construction or establishment of construction	RAP to be implemented by the working agencies, as per provision of the Contract and also guidance / advice of the Project Officials of the IWD.	-

			assets.	plant, as per mutual agreement between the impacted entity and the agency, or at such rates as may be decided by the Project Implementing Authority or the District Magistrate, as the case might be, or make good such demands at his own cost, up to the full satisfaction of the owner of the asset.		

Chapter 7: Institutional Arrangement and Implementation Structure

7.1 Introduction

Detailed discussion has already been made on the socio-economic profile of the area, the affected families and also the impacts along with perceptions and attitude of the people towards the proposed WBMIFM Project. This chapter outlines the institutional and implementation structure for the project as per consultations with the IWD Department of Government of West Bengal.

7.2 Institutions for Policy, Planning, Implementation, Monitoring and Evaluation

The project being bi-lateral in nature, involves IWD Department of Government of West Bengal and the World Bank along with the association of Government of India in terms of providing legal sanction and clearance. The institutions which are very much related to policy, planning, implementation, monitoring and evaluation are mentioned below.

Policy Level Institutions:There are different policy level institutions who may be associated in different stages of the project, such as;

1. Ministry of Water Resources, Govt. of India;
2. Central Water Commission, Govt. of India
3. Central / State Ground Water Board
4. Ministry of Forest and Environment, Government of India;
5. Dept. of Forest, Govt. of West Bengal;
6. IWD Department, Govt. of West Bengal
7. SPMU and Office of the Chief Engineer, IWD Department, Govt. of West Bengal
8. Water Supply and Sanitation Department, Govt. of West Bengal;
9. Tribal Development Department, Govt. of West Bengal;
10. Panchayat and Rural Development Department, Govt. of West Bengal;
11. State / Central Pollution Control Board;
12. Housing Department, Govt. of West Bengal;
13. Labour Department, Govt. of West Bengal;
14. Forest Department, Govt. of West Bengal;
15. Environment Department, Govt. of West Bengal
16. Office of the Dam Safety, Government of West Bengal;
17. Damodar Valley Corporation;

Planning Level Intuitions: The planning level institutions are;

1. IWD Department, Govt. of West Bengal;
2. Office of the Chief Engineer, IWD Department, Govt. of West Bengal;
3. Collector and District Magistrate of project districts;
4. Agriculture Department, Govt. of West Bengal;
5. Agri-Marketing Department, Govt. of West Bengal;
6. Fisheries Department, Govt. of West Bengal;
7. Power and non-Conventional Energy Department, Govt. of West Bengal;
8. State Ground Water Board;

9. River Research Institute, Govt. of West Bengal;
10. Damodar Valley Corporation;

Implementation level Institutions: The institutions that will be associated in the implementation of the project activities are;

1. Office of the Superintending Engineer / Executive Engineer, Project Districts
2. Agriculture Department, Govt. of West Bengal;
3. Agri-Marketing Department, Govt. of West Bengal;
4. Fisheries Department, Govt. of West Bengal;
5. Food Processing, Industries and Horticulture Dept., Govt. of West Bengal;
6. Panchayat and Rural Development Department, Govt. of West Bengal;
7. Land & Land Reforms &Refugee Relief and Rehabilitation Department, Govt. of West Bengal;

Monitoring and Evaluation Intuitions: The institutions that will be associated in monitoring and evaluation of the project are;

1. IWD Department, Govt. of West Bengal (association of PMC);
2. The World Bank;
3. Office of the Superintendent / Executive Engineer, project districts (DPMUs / DPIUs);
4. Agriculture Department, Govt. of West Bengal;
5. Agri-Marketing Department, Govt. of West Bengal;
6. Food Processing, Industries and Horticulture Dept., Govt. of West Bengal;
7. Fisheries Department, Govt. of West Bengal;
8. Forest Department, Govt. of West Bengal;
9. State Pollution Control Board.

7.3 RAP Implementation Organization

The Resettlement Action Plan (RAP) will be implemented by a joint team of project officials of the IWD and other Departments, and Block Administration, under the overall leadership of the District Magistrate of the concerned project district (s). Engagement of Self-Help Groups, Support Organization and NGOs will be permitted for effective implementation of the RAP, if felt necessary by the District Magistrate. Local Bodies (Panchayat) may also be involved in this process, to the extent required.

7.3.1 Formation of District Level Committee:

In order to make the public land in the identified work sites free from encroachers and squatters and to address their entitlement as a PAF / PAP, there will be a committee at the project level in each project district where such eviction is required. The District Level Committee (DLC) would be headed by the Collector and District Magistrate as chairperson with APD, DPMU as the convener of the committee. The committee will comprise of other members, i.e., DL&LRO of the district, SDL&LROs, concerned DPD of the DPIUs, assistant PDs under the DPD, concerned BDOs and person/s nominated by the Collector and DM. The committees will have following role and responsibilities.

Role and Function of DLC

1. Review and verification of list of encroachers and squatters by project site;
2. Discussing with the encroachers / squatters from time to time and facilitate clearance of the site;
3. Taking final decision on awards to be paid for temporary and permanent relocation;
4. Reviewing the progress in eviction status in the project sites;
5. Redressal of grievances, if any;

6. Other related matters as find necessary by the committee

7.3.2 Formation of Block Level Committee:

There will also be a Block Level Committees (BLC), at each project block level (blocks where land clearance and eviction is required for project activities), headed by the BDO of the concerned block and will comprise concerned BL&LROs and Assistant PDs to monitor and supervise the process at the field level. The BDO may nominate other representatives from local NGOs / civil society organizations to be the member of the committee. The committees will have following role and responsibilities.

Role and Function of BLC

1. Prepare list of affected persons by project location;
2. Physical verification of the identified claimant and sites;
3. Taking measurement of the area / habitation / shop, if so required;
4. Discussion with the claimant before awarding the compensation;
5. Finding alternative of eviction / displacement;
6. Examining possibilities of temporary relocation / shifting;
7. Preparing chart for awarding compensation;
8. Discussing with the DLC and finalizing the compensation;
9. Disbursement of awards, as per the finalized package;
10. Monitoring and supervision of the process.

7.3.3 Association of BDO for Land Clearance and Eviction:

The overall responsibility of making work site area free from encroachments / unauthorized use, will rest upon the BDO based on the land related inputs (records on land ownership etc.) from BL&LRO of the respective project blocks. The Government of West Bengal will issue an Order (GO) in this regard, mentioning the responsibility of the BDO to ensure clearance of the work site areas from encroachment / other unauthorized use. Once the identified area is made free from encroachers / squatters, with award of compensation where ever applicable, the land will be handed over to IWD to start construction work.

7.3.4 Role and Responsibilities:

Officers	Roles and Powers
Project Director, WBMIFMP, IWD, Govt. of West Bengal	▪ Overall in charge of operation for land clearance and disbursement of resettlement awards ▪ Reporting to World Bank on progress and submission of half yearly progress report ▪ According financial approval for all payments pertaining to R&R assistance ▪ Obtaining necessary budgetary allocation from GoWB; ▪ Recommend / Approval for placing of funds with Collector and DM for compensation disbursement; ▪ Decision on the report of the Collector & DM of claims for inclusion as PAF / PAP ▪ Approve payment to NGO / external monitoring agency (if engaged)
District Collector and Magistrate	▪ Chairperson of the DLC; ▪ Approve the entitlement holders list in consultation with the DLC and pass for payment; ▪ Addition / deletion of entitlement holder as per the review and suggestions; ▪ Overall Guidance and Oversee the land eviction and compensation payment; ▪ District level grievance redressal
District Land and Land Reform Officer	▪ Review and update land records in case of necessity; ▪ Support to DLC / BLC / BDO in providing land records and verification of

(DL&LRO)	ownership.
Additional Project Director (APD-DPMU)	▪ Coordinate with Collector and District Magistrate, DLC, BDO and BLC from time to time and on regular basis to ensure that land is cleared from unauthorized use / encroachments etc.; ▪ Extend all supports that are required to Collector and DM / BDO / DLC / BLC in terms of identification of sites, area to be required for clearance, site specific maps etc.; ▪ Monitoring the progress of land clearance and assistance disbursement; ▪ Monthly reporting to Project Director, WBMIFMP, IWD, Govt. of West Bengal; ▪ Appraise to the Collector from time to time on the progress;
Block Development Officer (BDO)	▪ Competent authority for clearing encroachment / squatting and awarding compensations; ▪ Approve valuation of structure as per State Rule; ▪ Hear objections, determine compensation amount in agreement with the cost norms and finalize assistance package, refer disagreement on compensation to DLC and APD-DPMU for decision; ▪ Pronounce award of compensation as per Gitanjali Scheme; ▪ Co-ordinate the implementation of resettlement (temporary / permanent) activities in consultation with DPMU, forest, agricultural department and horticulture department; ▪ Preparation of Individual Entitlement Plan for implementing RAP and its due approval from DLC; ▪ Certify work of NGO (if engagement) for payment (payment by IWD); ▪ Hold fortnightly meetings on RAP implementation and report to the DLC and APD-DPMU on monthly basis; ▪ Participate in community level meetings to facilitate resettlement activities; ▪ Having financial power for disbursement of compensation as entrusted by the Collector and District Magistrate / DLC.
Block Land and Land Reform Officer (BL&LRO)	▪ Review and update land records in case of necessity; ▪ Support to BDO in providing land records and verification of ownership.

7.3.5 Competent Authorities

Disbursement of compensation awards and implementation of RAP will require approvals and clearance at various stages. The following officers will act as competent authorities for key activities.

Table 83: Competent Authorities for Approvals

Approvals Required	**Competent Authority**
Resettlement Action Plan with Budget Details	PD-WBMIFMP, IWD, Govt. of West Bengal
Approval of entitlement holders for compensation	Collector & District Magistrate
Finalization of list of entitlement holders for compensation	District Level Committee (DLC)
Approval for Awards / Disbursement of Compensations	Collector & District Magistrate
Changes in Policy Provisions and Entitlements	State Level Technical Steering Committee, WBMIFMP
Approval for inclusion of left out persons / households	District Level Committee (DLC)
Disbursement of Compensation	BDO
Approval for shifting and relocation of community assets	BDO
Resolution of disputes (at State level)	Grievance Redressal Committee (GRC)

7.4 Implementation Schedule for RAP

Table 84: Implementation Schedule for RAP

SN	Activities	Responsibility	Support Agency	Months																	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A	**Preparation of RAP**																				
A.1	Preparation of RAP	ESIA Agency	IWD Dept.																		
A.2	Review & Validation of RAP	SPMU / DPMU	IWD Dept.																		
B	**RAP Approval & Disclosure**																				
B.1	Approval of RAP by IWD & Sending to World Bank	SPMU	IWD Dept.																		
B.2	Disclosure on website of IWD and Bank's Portal	SPMU / WB	IWD Dept.																		
C	**Training and Capacity Building**																				
C.1	Training Scheduling	SPMU	IWD Dept.																		
C.2	Organising Training	SPMU	IWD Dept.																		
C.3	Refresher Training	SPMU	IWD Dept.																		
D	**Institutional Arrangement**																				
D.1	Formation of District Level Committee	Collector & DM	IWD Dept.																		
D.2	Formation of Block Level Committee	BDO	IWD Dept.																		
D.3	Constitution of GRC	SPMU	IWD Dept.																		
D.4	Orientation of GRC Members	SPMU	IWD Dept.																		
E	**Plan and Disbursement**																				
E.1	Site Specific Assessment and Structural Re-Assessment	BDO / BLC	DLC																		
E.2	Consultation with the Local Community / People	BDO / BLC	DLC																		
E.3	Area Photography / PAP Photography	BDO / BLC	DLC																		
E.4	Collection of Bank Details of PAPs / PAFs	BDO / BLC	DLC																		
E.5	Finalising List of Entitlement Holders	BDO / BLC	DLC																		
E.6	Meeting of the BLC and DLC	BDO / BLC	DPMU/DPIU																		
E.7	Approval of Entitlement Holders	Collector & DM	IWD Dept.																		
E.8	First Instalment Disbursement to Holders	BDO / BLC	DLC/DPMU																		
E.9	Land Eviction and taking Possession of Public Land	BDO / BLC	DLC/DPMU																		
E.10	Releasing Second Instalment to Title Holder	BDO / BLC	DLC/DPMU																		
E.11	Shifting of the Facilities to Identified Locations	Line Dept.	DPMU/DPIU																		
E.12	Structural Rehabilitation and Restoration Measures	Line Dept.	DPMU/DPIU																		
F	**Monitoring / Supervision**																				
F.1	List of Entitle Holders																				
F.2	Disbursement of the Compensation	BDO	DLC/DPMU																		
F.3	Possession of Working Sites	BDO	Collector & DM																		
F.4	Shifting of Facilities / Services	DPMU / DPIU	SPMU/IWD																		
F.5	Restoration of Community Facility (affected Structures)	DPMU / DPIU	SPMU/IWD																		
F.6	Annual Review	PMC (SPMU)	SPMU/IWD																		
F.7	Half Yearly Review	PMC (SPMU)	SPMU/IWD																		
G	**Reporting**																				

G.1	Monthly Progress Report	DPIU/DPMU	SPMU/IWD																				
G.2	Quarterly Progress Report	DPIU/DPMU	SPMU/IWD																				
G.3	Half Yearly Assessment Report	SPMU/IWD	World Bank																				
G.4	Annual Report	SPMU/IWD	World Bank																				

Note:
A. 1 Refers to Month 1
B. Site Specific Deviations may occur due to unforeseen exogenous factors
C. Site Specific Assessment and Compensation Distribution in a Phased Manner

Chapter 8: Monitoring and Evaluation

8.1 Introduction

To monitor the effectiveness of the RAP implementation, there will be both internal and external monitoring mechanism. The internal monitoring will be conducted by DPMU along with DLC members from time to time to assess the progress in addressing the issues. The committee at the district level, headed by the Collector and District Magistrate will review the progress from time to time and BDO will monitor the activities at the field level. The APD-DPMU will also conduct periodic monitoring to ascertain that progress is as per the plan and framed benefits are accessed by the affected families in the prescribed manner. The Social Expert at the SPMU level will also monitor the relocation, clearance of site and delivery of the awards. The project will have following monitoring and evaluation system.

8.2 Concurrent Monitoring

Along with internal monitoring mechanism, there will be concurrent monitoring by the Project Management Consultant (PMC), to be engaged by the project as an independent agency. The agency will depute person/s who have experience in land acquisition, R&R and community development to monitor the activities. The PMC will assess the progress in distribution of compensation, relocation aspects, livelihood impact on affected people etc. from time to time. Based on the assessment and field findings, PMC will submit quarterly report to PD-WBMIFMP. Key indicators to be monitored during concurrent monitoring are;

1. Progress in census survey and identification of encroachers / squatters in sub-project locations;
2. No. of affected persons identified in different sub-project locations by their category;
3. No. of consultations took place in each such locations / sites with PAFs / PAPs;
4. No. of meeting conducted at the committee level to finalise the list of encroachers / squatters and awards by category of encroacher / squatter;
5. No. of PAFs / PAPs provided with compensation assistance;
6. No. of encroachers / squatters cleared the ground for implementation of project works.

8.3 Mid-Term Review and Impact Evaluation

The PMC will conduct mid-term review (mid of the project period after 2 years of execution) of the planned activities under RAP and assess the overall output and outcome of the measures taken under the project to ensure effective implementation of RAP. The PMC will submit a mid-term review report to the SPMU based on the field findings. At the end of the project, PMC will conduct impact evaluation of the implementation of RAP and its different dimensions. The key outcome and impact indicators to be looked in to during mid-term review and impact evaluation area;

1. Households reported restoration / improvement in their livelihood;
2. Household reported effective utilization of compensation for managing the impact;
3. Total area cleared and made available for construction work on timely basis;
4. Persons / families timely availed compensation benefits;
5. Effectiveness of grievance redressal mechanism in dealing with grievances;

8.4 Monitoring and Evaluation Frame:

Table 85: Monitoring and Evaluation

Components	Key Indicators	M&E Responsibility	
		Primary	**Secondary**
Community Consultations	1. No. of locations where consultation meetings organized 2. Project sites covered under community consultations 3. Key responses of the local community	DPMU	SPMU (IWD)
Finalization of Entitle Holders / Structures to be Affected	1. No. of persons / households finalized as per location specific survey; 2. Approved list of persons / households to be compensated for structures; 3. No. of times BLC and DLC meetings organized and issues discussed and resolved	DPMU	SPMU (IWD)
Compensation Provisions	1. No. of persons / families received compensation 2. No. of persons / families yet to receive compensation 3. No. of installments released (1st and 2nd)	DPMU	SPMU (IWD)
Displacement / Eviction	1. Total area cleared from encroacher / squatters 2. Total persons / families displaced / evicted 3. Persons / families resettled elsewhere	BDO/BLC	DLC/DPMU
Relocation of Community Utilities / Facilities / Structures	1. No. and type of community utilities / facilities affected 2. No. and type of such utilities / facilities restored	DPMU	SPMU (IWD)
Grievance Redressal	1. No. and type of grievances registered 2. No. of grievances addressed and its timeliness 3. No. of grievances pending for redressal	DPMU	GRC

Note: The table highlights the M&E Responsibility which is different from execution responsibility. Association of Collector and other district and block level institutions are primarily for the execution of the RAP which will be monitored by the DPMU and SPMU from time to time.

8.5 Institutional Strengthening and Monitoring Support

During implementation of RAP, different steps to be taken up are as below

1. Conducting project location specific meetings to aware about project benefits, to address related issues, to appraise the compensation benefits and to motivate the persons / families for quick shifting so that works can be commenced;
2. Monitoringtransparency and fairness in disbursement of permissible compensation package to the rightful displaced / relocated families;
3. Accessing the site-specific land use pattern, available public amenities / infrastructural facilities etc. and measures for its restoration in consultation with the local GP / people / concerned Dept.;
4. Accessing and adopting best alternatives which have no or less impact on people and need of relocation;
5. Establishing proper coordination among different departments and RAP implementation committee and institutions associated in RAP implementation;
6. Review and follow-up evacuation and relocation as well as construction activities for quick and timely completion of the project works;

7. Taking up appropriate institutional strengthening measure for RAP implementation, monitoring &required other supports. If so required, the IWD will assess the requirement of human resources and will take appropriate measures to ensure that RAP is implemented as per the plan.

Chapter 9: Grievance Redressal Mechanism

The Grievance Redressal Mechanism of the project will address all the grievance related to clearance of the land, eviction of encroachers and squatters and payment of awards. As per the grievance redressal mechanism, local GP will be the basic grievance redressal unit and SPMU-IWD will be the apex unit at the project level. In case of RAP related issues, Collector and District Magistrate and concerned BDO will act as the part of the grievance redressal system at the district and block level. Peron/s not satisfied with the addressed grievance, may also approach the court of law.

Web based grievance mechanism[2]: In case of grievances received through toll free number or web-based system, a person will be made in-charge of screening and resolution of the same/communicating with the concerned divisions for resolution of the same. The person in-charge based on nature of complaint, will forward the same to the concerned official. A receipt or a unique number will be generated for all such complaints. The complainant will follow up based on that unique number. All calls and messages will be responded within two weeks. If response is not received within 15 days, the complaint will be escalated to project head.

Tier I: Under this project, the local Gram Panchayat and Community level organizations will serve as the first-tier mechanism to handle complaints and grievances. The local Sarpanch of the Gram panchayat will be the focal point who will receive, address, and keep record of the complaints and feedbacks. The grievance focal point will first review the grievances submitted. If grievances or disputes cannot be solved at the GP level within 30 days of the submission of the grievances, the issue will be brought to DPMU level for mediation. DPMU is expected to inform aggrieved persons or parties to disputes of the resolution in 30 days.

Tier II: If the aggrieved person is not satisfied with the verdict of site level grievance cell, he or she can escalate the grievance to state level grievance cell. The tier II cell will be under the Chairmanship of Secretary, Department of Water Resources. The other members will include Chief Engineer; Project Director and Environmental and Social Officer of the Project. The second level of grievance cell will provide its view within 30 days of receiving the grievance.

Tier III: The aggrieved person if not satisfied with the verdict given by State level grievance cell, will have the right to approach the Judiciary. Project will help the aggrieved person in all respect if person wants to approach the judiciary.

Table 86: Grievance Redressal

SN	Grievance Redressal Measures	Duration (D)	Action Authority
A	**Web Based Grievance Redressal**		
A.1	Receipt of grievance (Recording as per Code)	D1	Designated Person, SPMU
A.2	Scrutiny of grievance for action in terms of available Law/Act	D1+3	Designated Person, SPMU
A.3	Forwarding the grievance to appropriate section for action	D1+4	Designated Person, SPMU
A.4	Examination of grievance by the section	D1+7	Designated Person, SPMU
A.5	Discussion with DPIU / DPMU / Contractor on grievance	D1+9	Designated Person,

[2] IWD website will include a link where affected person(s) can register their complaints online. A telephone number will also be on the website of IWD and the project sites, so that the general public can register their complaint with the SPMU office.

			SPMU
A.6	Verification of authenticity of complaint by site visits and discussion with the person concerned.	D1+14	Designated Person, SPMU
A.7	Address the grievance with an intimation to the compliant	D1+15	Designated Person, SPMU
B	**General Grievance Redressal Route**		
B.1	Receipt of grievance (GP Level)	D1	Sarpanch, GP Level
B.2	Discussion of the Sarpanch with the complaint	D1+2	Sarpanch, GP Level
B.3	Submission of grievance to Contractor for solution	D1+3	Contractor
B.4	Contractor resolves the issue if within its reach	D1+5	Contractor
B.5	Contractor forward the grievance to DPIU for Examination	D1+6	In-Charge, DPIU
B.6	DPIU examines the issue as per the applicable Law / Act	D1+9	In-Charge, DPIU
B.7	Verification of authenticity of complaint by site visits and discussion with the person concerned.	D1+12	In-Charge, DPIU
B.8	Address the grievance with an intimation to the compliant	D1+14	In-Charge, DPIU
B.9	DPIU Forward the grievance to DPMU if out of reach	D1+15	APD-DPMU
B.10	DPMU examines the issue as per the applicable Law / Act	D1+18	APD-DPMU
B.11	Verification of authenticity of complaint by site visits and discussion with the person concerned.	D1+22	APD-DPMU
B.12	Address the grievance with an intimation to the compliant	D1+23	APD-DPMU
B.13	DPMU Forward the grievance to SPMU if out of reach	D1+24	PD-SPMU
B.14	SPMU examines the issue as per the applicable Law / Act	D1+27	PD-SPMU
B.15	Verification of authenticity of complaint by site visits and discussion with the person concerned.	D1+34	PD-SPMU
B.2	Address the grievance with an intimation to the compliant	D1+35	PD-SPMU

Chapter 10: RAP Budget

The RAP budget consists of cost of compensation for the structures likely to be affected, cost of RAP implementation, restoration of common property resources etc.

Table 87: RAP Budget

SN	Budget Heads	Unit	Qt.	Unit Cost	Total Cost
A	**Compensation for Private Structures**				
A.1	Residential Structures	No.	1076	1,20,000.00	12,91,20,000.00
A.2	Residential Cum Business Structures	No.	78	1,20,000.00	93,60,000.00
A.3	Boundary Wall of Existing Structures	No.	61	1,20,000.00	73,20,000.00
A.4	Toilets (Unit cost as per Govt. Norm)	No.	158	12,000.00	18,96,000.00
A.5	Cattlesheds	No.	328	1,20,000.00	3,93,60,000.00
A.6	Shops / Business Units	No.	694	1,20,000.00	8,32,80,000.00
A.7	Sheds	No.	169	1,20,000.00	2,02,80,000.00
A.8	Private Bedi	No.	13	1,20,000.00	15,60,000.00
A.9	Other Structures	No.	60	1,20,000.00	72,00,000.00
	Sub-Total				**29,93,76,000.00**
B	**Community Utilities / Facilities (Repair/Relocation)**				
B.1	School	No.	1	1,50,000.00	1,50,000.00
B.2	Anganwadi	No.	1	75,000.00	75,000.00
B.3	Club	No.	19	3,00,000.00	57,00,000.00
B.4	Office of Political Parties	No.	4	3,00,000.00	12,00,000.00
B.5	Temple	No.	31	3,00,000.00	93,00,000.00
B.6	Bedi	No.	46	1,50,000.00	69,00,000.00
B.7	Burning Ghat	No.	3	1,50,000.00	4,50,000.00
B.8	Bus Stop	No.	4	1,50,000.00	6,00,000.00
B.9	Bridge	No.	6	5,00,000.00	30,00,000.00
B.10	Transformer	No.	9	50,000.00	4,50,000.00
B.11	Tube well	No.	12	1,50,000.00	18,00,000.00
B.12	Electric Pole/EP	No.	396	10,000.00	39,60,000.00
B.13	Light Post	No.	1	10,000.00	10,000.00
B.14	RLI (Pump house)	No.	9	25,000.00	2,25,000.00
B.15	Pond	No.	38	75,000.00	28,50,000.00
	Sub-Total				**3,66,70,000.00**
	Sub-Total (A+B)				**33,60,46,000.00**
C	**Monitoring and Evaluation**				
C.1	Concurrent Monitoring	No.	10	25,000.00	2,50,000.00
C.2	Mid-Term Review	No.	1	7,00,000.00	7,00,000.00
C.3	End-Line Assessment	No.	1	10,00,000.00	10,00,000.00
C.4	Documentation / Publication / IEC materials etc.	Copies	10000	5.00	50,000.00
C.5	DLC and BLC Quarterly Review of RAP	No.	368	2,000.00	7,36,000.00
C.6	Consultation Visits	No.	72	15,000.00	10,80,000.00
C.7	Quarterly Review Meetings (DPMU & IWD Level)	No.	32	10,000.00	3,20,000.00
C.8	Contingencies & Allied Expenses	Project Dist.	4	5,00,000.00	20,00,000.00
	Sub-Total				**61,36,000.00**
	Sub-Total (A+B+C)				**34,21,82,000.00**
D	Administrative and Allied Expenses	Project Dist.	4	15,00,000.00	60,00,000.00
	Total (A+B+C+D)				**34,81,82,000.00**