Government of the People's Republic of Bangladesh
Ministry of Water Resources

Bangladesh
Water Development
Board

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RIVER MANAGEMENT IMPROVEMENT PROJECT

ANNEX C VOL 3

Social Development Plan

Feasibility Study and Detailed Design Priority Reach

Revised Draft, March 2015

Project Management Office

RIVER MANAGEMENT IMPROVEMENT PROJECT

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EXECUTIVE SUMMARY

RMIPProject Context and Overview

Ongoing river erosion and major flooding of the Brahmaputra-Jamuna has been a history of human suffering for people living along the river causing an increasing number of internally displaced 'refugees' and a continuous set back on many human development indicators. The very high population density of over 1,300 people per square kilometer exacerbates these impacts on many levels.

BWDB seeks financing from the WB for the River Management Improvement Program (RMIP) which encompasses a total of 147 km of the Central Jamuna Right Embankment (formerly known as BRE) covering3 administrative districts (Gaibandha, Bogra, Sirajganj) over an area of 2,750 km^2 and approximately 4.8 million people. This stretch It startsnorth of Jamuma Bridge and reaches up to the confluence of the Teesta river upstream. The Program will be implemented in three phases.

Phase 1 of the Program includes the reconstruction of the Central JRE (Jamuna Right Embankment) in the 50-km Priority reach from Simla to Hasnapara, bankline protection and relocation of the affected households in the right of way for construction. This RMIP Phase 1 will be referred to as the Project and is the focus of this report.

SDP Objective

The overall two objectives of the SDP are to (i) Mitigate any negative social impacts related to the implementation of RMIP Phase I – Priority reachandto (ii) Support the overall development of the population in the Project area that lives a precarious life along the eroding river in respect to their livelihood, gender and public health status. The SDP is a 5-year program that encompasses a livelihood restoration and development, a gender mainstreaming as well as public health action plan for project-affected people and beneficiary communities.

This Social Development Plan (SDP) is Volume 3 of the Social Action Plan (SAP) that contains further Volume 1 Project Context, Socio-Economic Baseline, Consultations and Communication Strategy and Volume 2 Resettlement Action Plan (RAP).

Affected Populations and Beneficiaries

Key project-affected persons and communities include:

i. **To be relocated households and units:**3,639 households (2,256 residential HH), small businesses (148), joint residential-shop units (84) and 78 CPRs representing 15,558 persons that will either "self-relocate" and/or resettle in project-sponsored resettlement sites along the project alignment.
ii. **Economically affected without being displaced:**1,437 households lose agricultural plots (< 50 decimal land) and 612 household or small businesses temporarily lose incomewithin the Priority area.

Project beneficiaries include:

i. **Neighbouring communities/households remaining on the old embankment and or living in 2km proximity of the embankment**: These communities are mostly poor can benefit from social development interventions. These households and communities live in close proximity to the project-affected household may otherwise feel 'left out' from the Project.
ii. **Host villages/communities:** The smaller of the 15 resettlement sites rely on neighbouring villages for some of the services such as schooling and religious services. Communities that receive self-relocated resettlers that exceed 10% of their current household number are eligible to receive support with civic amenities.

Structure of the SDP Report

The SDP consists of four parts: I) Overview II) Assessment, impact and interventions related to income and livelihood restoration and development, gender mainstreaming, and public health, III) Implementation framework, costs and budget, and IV) Monitoring and evaluation.

Assessment, Impact and Interventions

Livelihood Restoration and Development

The livelihood situation for the population at risk is relatively homogenous in the Project area due to the similarities in the socio-demographics (inherent high poverty levels),river-influenced ecology and communication as well as poor civic infrastructure.

The potential adverse impacts of RMIP on livelihood for the project-affected population are temporary and limited as there is a relatively small loss of productive assets as most people are squatters with very limited and mostly no productive assets. Therefore, the potential negative impacts are temporary and limited to i) A short-term loss of income, ii) A disruption of livelihood and social capital**.**

The population in the Project area has a low development status on human (low education and skill levels), financial (circa 48% of population below poverty level) and physical capital (basic housing, little or no land). Given the large need for social development in the Project area due to continuous bankline erosion and regular flooding as well as forced migration due to land and homestead loss, the focus will be on livelihood development. Potential positive impacts that aim to cover the project-affected population and beneficiaries are i) Enhanced employment opportunities as part of the civil works of the Project but also project supporting works, ii) Capacity development to improve productivity of existing crops and livestock, iii) Better marketing and linkage of products to markets, and iv) Skill building to diversify livelihoods.

Based on the objectives of the livelihood plan as well as the livelihood and impact assessment, two major strategies will be pursued: 1) To restore income and livelihood of the directly project-affected population in short-term, and 2) To ensure sustainability mid- and long-term livelihood improvements. A number of interventions have been planned to support each strategy: i) Cash assistance to support lost income, ii) Assistance to re-establish businesses, employment in construction site and construction-supported sector as well as iii) Special assistance for vulnerable groups are planned to support strategy 1.

To support strategy 2, the sustainability of the ILRP and long-term livelihood improvement, the following interventions have been designed: i) Community participation in tree, medicinal plantation and social forestry on embankment sides, ii) Fostering the cultivation of high value vegetables, iii) Improving the productivity of livestock sector, iv) Improving productivity of poultry sector, v) Improving the productivity of fisheries, vi) Training of skilled labor, vii) Installation of solar home systems and viii) Grants to support livelihood enhancing projects.

Gender Mainstreaming

Men and women are relatively evenly distributed in the Project area. Of the 3,639 project-affected households along the embankment, 466 or 12% are female-headed households (FHH). They are considered as socially and economically disadvantaged HHs. Majority of them have less earnings than the male-headed HHs. Furthermore, there are 213 disabled persons along the surveyed population. Seventy-four of them are female and 139 are male.

The conducted gender analysis for the project area indicates a number of potential positive and negative impacts of RMIP. The potential positive influences on gender equality that need to be fostered are: i) Enhanced employment opportunity for women, ii) Active participation and decision making of women, iii) An increase of skills and knowledge of women as well as iv) Gender mainstreaming overall and within BWDB. The potential negative impacts of RMIP that will particularly affect women and need to be mitigated at any costs are: i) The loss of land and properties, ii) The disruption of livelihoods and living, iii) The change in social and cultural support mechanisms as well as iv) The increased risk of sexual assault, violence, HIV/AIDS and STD.

Five strategies have been derived from the gender analysis and impact assessment which will each be supported by a number of interventions. The strategies are as follows: i) Promote women's participation in design and implementation, ii) Enhance employment opportunities for women, iii) Ensure gender responsible resettlement measures, iv) Provide services and safeguards against social and health vulnerabilities, v) Enhance capacity on gender mainstreaming within BWDB.

Key interventions are to i) Involve women in all important project committees for RMIP, ii) Give preference to women interested to seek employment as part of the RMIP including social forestry as part of the embankment maintenance, iii) Provide special assistance to FHH during resettlement, iv) Raise awareness on health issues and human trafficking, v) Provide skill training for birth attendants/community health workers and vi) Capacity building on gender mainstreaming for BWDB.

Public Health

Water-born diseases are the major public health concern for the population in the Project area, especially for flood and erosion victims living on and around the embankment. This is mainly due to their basic living conditions and limited access to clean water and sanitation, especially during flood season from June to October. Bacterial infections such as diarrhea, dysentery, typhoid and possibly cholera are likely to be prevalent. However, much of the disease burden goes unreported as patients in the project area seek mostly care in the informal private sector.

While the MDG 4 on child mortality is not met, the MDG 5 on maternal death is likely to be met by 2015 on a national level with 143 deaths per 100,000 life birth. Nevertheless, most deliveries are still done at home assisted by unskilled birth attendants –70% of all deliveries according to the survey in the Priority area. HIV/AIDS and malaria are currently not prevalent in the project area. Tuberculosis exists in Bangladesh and likely also in the Project area. But no local data was available for the RMIP area. Targeted activities focusing on the prevention of HIV/AIDS, malaria, and Tb mainly through IEC initiatives have been planned, building upon the measures of the national control programs.

The immunization coverage in the affected districts of Bogra and Sirajganj reaches, according to national sources, between 81% and 100% for all required vaccines.

Access and quality of health services were assessed by treatment received during illness, satisfaction with services, and distance to the next health services. While the population's perception on the above indicators is relatively positive, it needs tobe noted that it does not necessarily reflect the real quality of services impacting health outcomes as people mostly seek care in the informal sector with village doctors and medicine shop owners who lack proper skills and training.

Potential positive RMIPimpacts that can be achieved for affected people but also beneficiaries in regards to public health are: i) Increased health awareness, knowledge and information,ii) Improvedhealth services and iii) Improved health conditions for households. Potential adverse impacts that need to be mitigated at all costs are: i) Resettlement-related public health risks such as ensuring good health standard in the resettlement villages and ii) Health risks related to construction such as increased risk of infections, road accidents and occupational health.

Taking into account the public health assessment and the two objectives of the public health plan, which are to i) Mitigate possible public health and safety hazards and to ii) Improve the public health situation, a number of targeted programs have been developed. The key interventions will encompass i) IEC programs on HIV/AIDS, Tb, STD, assault, pollution, noise, road traffic and hand-washing, nutrition, 5 danger-signs of pregnancy, ii) Capacity development for public health staff on RMIP related risks/diseases, iii)Construction traffic safety measures, iv) Water-sealed slap latrines in resettlements sites and old embankment, v) Clean cooking stoves in resettlements sites and old embankment, vi) Safe tube wells in resettlements sites and, as required, on old embankment, vii) Skill training including health workers/birth attendants, viii) Prevention and management of pesticide poisoning as well as x) Women-friendly health services.

Implementation, Cost and Budget

The SDP involving livelihoods, gender and public health will be implemented over a period of 5 years. BWDB will engage an experienced and nationally reputed SONGO to implement the SDP programs in partnership with local NGOs in the Project area. The SONGO will update and refine all three programs based on thorough needs assessment surveys in close collaboration with the beneficiary communities before implementation and prepare a detailed annual work plan for each sector- livelihood, gender

and public health. The total budget for the SDP for 5 years accumulates to USD 7.79 million (BDT 602.6 million).

Monitoring and Evaluation

SDP implementation will be monitored both internally and externally. For internal monitoring, a Director-ESDU will set up the monitoring arrangements with the SONGO. An independent external M&E specialist/agencywill be hired to bi-annually monitor the overall implementation of the SAP including the SDP.

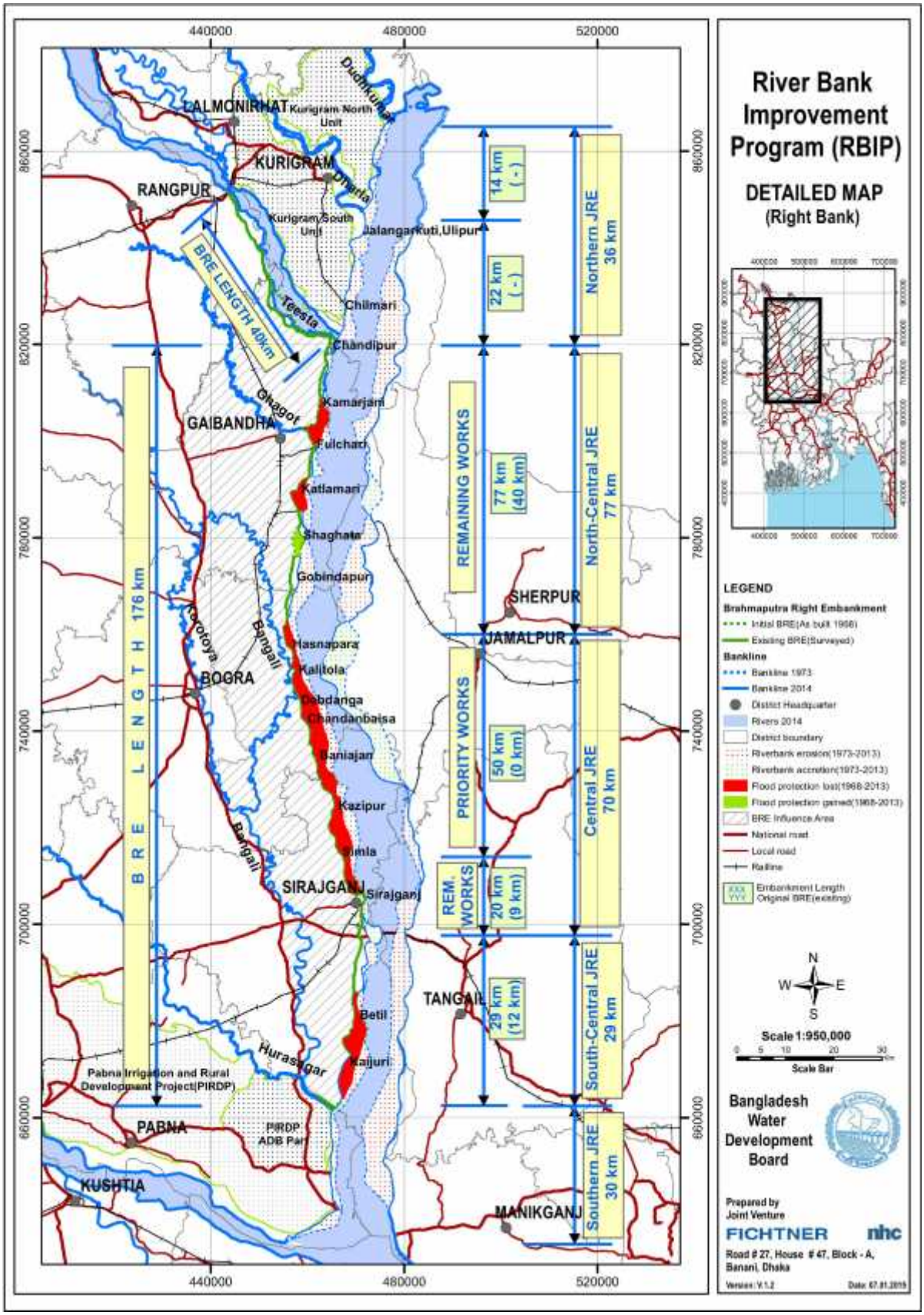

Figure 1: RMIP Location Map including 50 km Priority Reach (Project 1 area)

ABBREVIATIONS

ADB	Asian Development Bank
ADB FRERMIP	Asian Development Bank Flood and Riverbank Erosion Risk Management Investment Project
AI	Artificial Insemination
ASA	Association for Social Advancement- Bangladeshi NGO
BADC	Bangladesh Agricultural Development Corporation
BAN	Bangladesh
BARI	Bangladesh Agricultural Research Institute
BAU	Bangladesh Agricultural University
BBS	Bangladesh Bureau Of Statistics
BDHS	Bangladesh Demographic Health Survey
BRAC	Bangladesh Rural Advancement Committee-Bangladeshi NGO
BWDB	Bangladesh Water Development Board
BRE	Brahmaputra Right Embankment
CEGIS	Centre For Environmental And Geographical Information Systems
COPD	Chronic Obstructive Pulmonary Disease
DAE	Department Of Agricultural Extension
DLS	Department Of Livestock Services
DOF	Department Of Fisheries
EMB	Embankment
EMP	Environmental Management Plan
FGD	Focused Group Discussion
FHH	Female Headed Household
HH	Households
HIES	Household Income And Expenditure Survey
FWV/FWC	Family Welfare Volunteer /Family Welfare Counselor
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immuno-Deficiency Syndrome
IEC	Information, Education And Communication
IDU	Injectable Drug Users
JRE	Jamuna Right Embankment – historically called BRE
GOB	Government Of Bangladesh
GUK	GunoUnnayanKarmo
KMC	Knowledge Management Centre
KPI	Key Performance Indicator
MDG 4	Millennium Development Goal 4: Reduce Child Mortality
MDG 5	Millennium Development Goal 5: Improve Maternal Health
MDG 6	Millennium Development Goal 6: Combat HIV/AIDS, Malaria and Tuberculosis
MHH	Male Headed Household
NDP	National Development Program
NGO	Non Government Organization
PAP	Project-affected Population
RMIP	River Bank Improvement Project
SA	Social Assessment
SDP	Social Development Plan
SONGO	Social Non-Government Organization – also referred to as Coordinating NGO (CNGO)
STD/STI	Sexual Transmitted Disease/ Infection
SVRS	Sample Vital Registration System

TB	Tuberculosis
TTBA	Trained Or Skilled Traditional Birth Attendant
TBA	Traditional Birth Attendant (Unskilled Or Without Formal Training)
VCT	Voluntary Counseling and Testing (for HIV/AIDS)
WHO	World Health Organization

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PART IBACKGROUND AND OVERVIEW

1. Introduction

1.1 Program Area

Bangladesh is a riverine country with more than 750 rivers of different sizes. The 1,200km long braided Brahmaputra Systems is the largest braided sand-bed river in the world starting from the southern Himalayas in the plains of Assam, India through the course of the Jamuna[1] in Bangladesh and further downstream Padma and Lower Meghna. It has widened by around 50% since the 1950s and 60s mainly caused by the Great Assam Earthquake in 1950 and by the soft soils that make up the riverbed and riverbank.

The Government of Bangladesh (GOB) built the 220 kilometers so-called Brahmaputra Right Embankment (BRE) in the 1960s to prevent regular flooding causing damage to an area of about 240,000 ha and therewith providing more stability to the area along the right bank of the now generally referred to Jamuna river. Therefore, the term Central Jamuna Right Embankment (Central JRE) will be used throughout the report. At the time it was build, it was about 1.5 km away from the bank line. During the period of rapid widening, the Brahmaputra-Jamuna eroded the Central JRE with increasing frequency and breached at several places. Nearly 21,000 ha of flood-protected land had to be given up as a result of the consistently retreating embankment line. In some places the Central JRE was retired up to 7 times from the original bankline. Today, only 61 km of the original Central JRE exists along the Brahmaputra-Jamuna. See Figure 1-1.

The high risk of riverbank erosion and flooding poses a substantial impact on the flood plain dwellers and other people living in proximity of the river. Firstly, the loss of land – homestead and agriculture- is accompanied by a loss of infrastructure, such as homes, flood embankments, schools, mosques and a loss of livelihood and kinship. Secondly, tens of thousands of people are displaced annually by river erosion in Bangladesh. Given the high population density of more then 1,300 people per square kilometer, the only options for most displaced people are to squat on nearby flood embankments or to move to slums in bigger cities like Dhaka where in both cases they often lack minimum living standards and access to basic services such as drinking water, schooling for children, health facilities, and attention of the local government.

In summary, the ongoing river erosion and major flooding of the Brahmaputra-Jamuna has been a history of human suffering for people living along the river causing an increasing number of internally displaced 'refugees' and continuous set backs on many human development indicators.

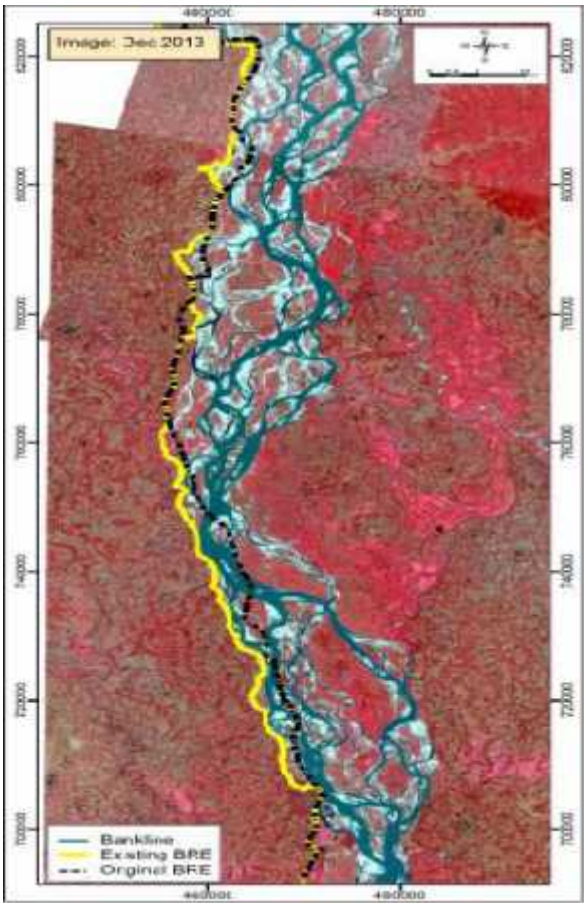

Figure 1-1:Original and existing Central JRE

Overview of River Management Improvement Program

[1]The Brahmaputra is called Jamuna within Bangladesh beforeit converges with the Ganges. The name Jamuna or Brahmaputra-Jamuna is used interchangeably in this report.

Given the magnitude of the issues, the GOB seeks funding from the World Bank for bankline protection and the reconstruction of the Central JRE with the River Management Improvement Program (RMIP), which will be implemented in three phases. The primary objective of RMIP is to reduce the incidence and severity of flooding and erosion along selected sections of the Brahmaputra-Jamuna River. The secondary objectives are to improve access to socio-economic services for affected communities in the project area and to build BWDB's capacity to undertake effective operations and maintenance.

The Bangladesh Water Development Board (BWDB) is the executing agency (EA) of the Program. The Program includes:

Phase 1 (RMIP-1): Flood and erosion control measures along the 50 km Priority reach from Simla to Hasnapara affecting four upazilas (sub districts) in two zilas (districts).

Phase 2 (RMIP-2): Flood and erosion control measures as outlined in Phase 1 for the 17 km stretch closing the gap between Simla and West Guide Band of the Jamuna Bridge and another 70 km from Hasnapara to the confluence with the Teesta river.

Phase 3 (RMIP-3): The development of a road on top of the embankment. Based on the outcomes of a road feasibility study from Phase 1, a road along the new or rehabilitated embankment may be developed.

The overall Program consists of a total of 147 km covering 3administrative districts (Gaibandha, Bogra, Sirajganj) over an area of 2,750 km^2 and approximately 4.8 million people.

The Asian Development Bank Flood and Riverbank Erosion Risk Management Investment Project (ADB FRERMIP) with a similar scope will complement the RMIP downstream, south of the Jamuna Bridge (see Figure 1).

The primary objective of RMIP is to reduce the incidence and severity of flooding and erosion along selected sections of the Brahmaputra/Jamuna River. The secondary objectives are to improve access to socio-economic services for affected communities in the project area and to build BWDB's capacity to undertake effective operations and maintenance.

The Social Action Plan

The Social Action Plan (SAP) for the Project consists of three volumes:

- Volume 1: Socio-EconomicBaseline, Consultation and Communication Strategy
- Volume 2: Resettlement Action Plan
- Volume 3: Social Development Plan.

These three volumes together present the project impacts and the mitigations as well as enhancement measures adopted by the Project to comply with GOB laws and WB safeguards and operational requirements.

Objectives of SDP and Purpose of Specific Components

The overarching two objectives of the SDP are to(i) Mitigate any negative impacts related to the implementation of Phase I – Priority reach area, and (ii) Support the overall development of the population in the project area related to their income and livelihood, gender and public health status. The SDP is a 5-year development program to support the local communities as project beneficiaries and improve their standards of living in post-project period. The specific objectives for each of the three components are discussed briefly in the following sections.

Income and Livelihood Restoration

The Income and Livelihood Restoration Plan (ILRP) describes the design of the income and livelihood plan for the directly affected populations along the 50 km embankment and some79 adjacent villages (within 2-km from the embankment to the countryside) as beneficiary groups. The overall objectives of the ILRP are to:

i. Restore income and livelihood of the directly project affected population
ii. Enhance the present income and livelihood situation of the directly and indirectly affected population, which also includes people remaining on the old embankment, living along the embankment, as well as the host communities.

Besides mitigating the short-term loss of the directly affected populations, the livelihood and income restoration plan takes a systematic approachto identify long-term investment opportunities to enhance sources of income opportunities in various subsectors along the value chain to support additional income.

Gender Mainstreaming

The gender component of SDPrecognizes that men and women of the project area have different needs, aspirations and barriers due to their social position. These need to be addressed during the project design, implementation and monitoring in order to maximize women's access to the project benefits and mitigate harmful gender-related impact on affected male and female population. The GAP has three specific objectives to achieve in this project. These are to:

i. Maximize women's access to the RMIP project benefits including employment;
ii. Mitigate harmful gendered impacts on affected male and female population, especially health and safety;
iii. Build capacity of BWDB in gender mainstreaming in the remaining phases of the Program as well as in future project operations.

Public Health Action Plan

The public health plan provides an account of the current health situation in the Project area and its contributing factors. It acknowledges the importance of health as a critical factor for well-being, livelihood and social development of people. It provides a list of targeted interventions to improve the overall health conditions focusing on prevention.

The objectivesof the public health action plan (PHAP) are:

i. Tomitigate possible adverse impacts on public health due to the construction of the embankment for the project-affected populations and
ii. To improve the public health situation related to key health development indicators such as a reduction or prevention in disease burden, maternal and neonatal health, HIV/AIDS and STDs for the project beneficiaries living along the bank line and embankment.

Affected Populations and Beneficiaries

The primary focus of the SDP will be given to the Project-affected populations in order to foster any possible positive and mitigate any possible negative impact for them. The **Project-affected persons and population** include:

i. **To be relocated households and units:** The Priority reach will affect 3,639 households and units (15,558 persons) including households, businesses and community infrastructures that will either "self-relocate" and/or resettle in project-sponsored resettlement sites along the project alignment.
ii. **Economically affected without being displaced:**Individuals, households and businesses, who will not need to relocate but loose productive assets temporarily or permanently. This will affect an estimated612 household within the Priority area.
iii. **Construction workforce:** The construction force will mainly be drawn from local communities with a preference to project affected persons willing to work on the construction site. There will be a very limited number of workers from outside the region. Of the estimated 350 total workforces, 100 workers are likely to be non-local.
iv. **In-migrant populations:** These refer to individuals who are attracted by commercial opportunity and interact with local residents during the construction. Their number is expected to be limited as the project is linear along the bankline and will move with the progress of the construction.

Given the long-term impacts of erosion and poverty conditions on large segments of the population living along the river and embankment, the SDP will also expand to local communities and host villages through targeted interventions.Those **Project beneficiaries** include:

i. **Households remaining on the old embankment:** Although, these householdsare not affected by the new alignment and don't need to resettle, they perceive themselves rather 'left out' from the Program. As many of them are very poor

and vulnerable, the SDPwill be extended to eligible and vulnerable households remaining on the old embankment.

ii. **Host villages/communities:**The smaller of the 15 resettlement sites rely on neighbouring villages for some of the services such as schooling and religious services. Communities that receive self-
relocated resettlers that exceed 10% of their current household number are eligible to receive support with civic amenities.

Structure of theReport

The main text of the SDP is made up of four parts broken into six chapters. Part I provides on overview with the introduction to the overall RMIP, objectives and target populations for the SDP. Part II assesses the livelihood, gender and public health situation in the Project area, estimates the possible positive and negative impacts, and describes the planned interventions for each sub component in an individual chapter. Part III discusses the implementation framework, costs and timeline for SDP implementation.Part IVbriefly outlines the monitoring and evaluation parameters, the frequency and ownership of the M&E to ensure effective supervision and implementation of the programs.

In addition, the report contains a set of appendices, which provide detailed assessments and analysis, based on field–level surveys and studies on livelihoods, gender and public health, as well as TORs and budget details. The proposed interventions and programs are based on the analyses provided in the appendices.

PART II: ASSESSMENT, IMPACT AND INTERVENTIONS

This Part II providessummaryassessments, potential impacts as well as suggested interventions and programs for each of the three social development components-Livelihood (Chapter 2), Gender Mainstreaming (Chapter 3) and Public Health (Chapter 4)- for the project-affected population and beneficiaries described in the previous subchapter 1.5.

The programs described under this Part II are based oninitial assessments and will be further developedin terms of program scope, content, targets and beneficiaries.Prior to implementation a thorough needs assessment will be conducted to further develop the suggested programsin close consultation with targeted beneficiary communities. The SDP will take adynamic approach over the planned 5-year implementation period. Detailed tasks are included in the ToR for the SONGO that will be hired as a next step and further discussed in chapter 5 Implementation Framework and Appendix 4.The supporting data for Part II can be found in the respective appendices for income and livelihood, gender, and public health at the end of this report.

2. Livelihood Restoration and Development

2.1 Program Rational and Scope

Livelihood restoration for project-affected households and people is the primary mandate for this major infrastructure program. The Project will have a limited and temporary impact on income and livelihood on the overall impoverished project-affected population (42% of households below poverty level).

Given the large need for social development in the Project area due to continuous bankline erosion and regular flooding as well as forced migration due to land and homestead loss, a livelihood enhancement and development approach will be taken.

Such a planned livelihood development program will expandits **coverage beyond project-affected households to include also vulnerable households in close proximity to the Project including households remaining on the old embankment and living within 2km of the embankment as well as host communities**. The planned livelihood assistance for these beneficiary communities aims to contribute to poverty alleviation mid- and long-term in a sustainable manner as part of this five-year Social Development Plan.

2.2 Livelihood Assessment

2.2.1 Assessment of Project Impacts on Income

The adverse impact on income and livelihood will minor due to the fact that most of the 370 ha land to be acquired will be in a linear manner using 74% agricultural and 17% homestead land. Only 12 km of the existing Central JRE, mainly populated by squatters,will be in the right of way for the Project.

98% of affected HH (total 1,437) losing agricultural plots will only give up a maximum of 50 decimal of land and 94% of the agricultural plot owners will lose less than 10% of their income due to loss of agricultural income.To put it in perspective, HH with less than fifty decimal of land are considered ‘landless’ in Bangladesh.

Furthermore, 52% of the 3,639 physically displaced households living in the right of way on the old embankment are squatters without a land title. They will therefore not lose any income generating assets.

25% of title holders will lose their entire homestead land and the remaining 23% of title households will lose their homestead only partially.

The project will affect 3,480 residential, 148 shops and tea stalls as well 84 joint residential/business structures. 95% of these small businesses are squatters. The vast majority of the residential and businesses structures that consist of tea stalls and small shops are in form of low-value kutcha structure and most of them are easily shiftable. They can be easily re-established nearby or in the resettlement sites.

Out of 5,751 affected HHs only 200 HHs will lose more than 10% of their income. The major livelihood impact is the relocation itself.

Only 3.5% HHs income will be severely affected as they are losing more than 10% of their income. 128 labors will lose their job for the time being and most of them are unskilled.

Overall, there is a minimum and temporary impact on income generating assets and livelihood through this Project. It will, however, not remove the basis of livelihood for most households, as the majority of them do not own any agricultural land and live as squatters on the embankment.

All physical and income losses will be duly compensated as per the GOB laws and the project entitlement policies, which comply with WB policy guidelines (see Vol. 2 RAP).

2.2.2 Assessment of Community Livelihood Needs

An initial assessment of livelihood development needs along the five livelihood asset dimensions – human, natural, financial, social and physical assets – has been done for the beneficiary communities.

It is important to note, that the livelihood needs of the population in the Project area is very common due to the similarities in theirsocio-demographics, the ecology, theriver communication as well as poor infrastructure.

More details can be found in Appendix 1 of this report.

Human Capital

An estimated 15,558 people represented by 3,639 physically displaced households and other units such as businesses and community structures live in the right of way of the new embankment along the 50km priority stretch and will need to be resettled. The vast majority of household heads are between 35-44years or 45-60 years old. About 80% of households have 1 to 4 members in the household.

A total of 2,762 of the affected households are considered vulnerable. Of this, 466 of them are female-headed, 33 are headed by a disabled person, 773 landless or ‘squatters’, 1,303 poor and another 187 households are headed by elderly. 200 hhs will be severely affected as they are losing more than 10%

of their incomes due to project intervention. They will receive additional compensation and benefits from the social development program.

The vast majority of the affected population has a minimum level of education and mostly lacks any vocational training. About 45% of the male household heads are illiterate while 75% of the female household heads are illiterate.

About 30% of all affected individuals are involved in income generation of which 26% are men and about 4 % are female. Most income generating individuals work in the agricultural sector (68%), mostly as day laborers. But their day labour jobs will not be affected due to project interventions as agricultural landowners losing their land partially. Moreover there is a shortage of day labourers in these area as people are taking jobs to the garment sectors. Only 10% each work in the service sector or run a business. The remaining types of income generation extend across rickshaw pulling, selling agricultural products, remittances and crafts. (See Table 2-1)

The overall low level of human capital indicates a need for development. Targeted skill training and capacity building will be required to promote livelihood improvements

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Photo 2-1: River fishing

Table 2-1: Primary occupation of affected population in number and percentage

Occupation	Sirajganj Sadar		Kazipur		Sariakandi		Dhunat		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Small Business	14	8	48	13	54	8	21	9	137	10
Agriculture	128	75	248	67	429	66	178	72	983	68
Service	15	9	39	11	86	12	8	3	148	10
Others	14	8	34	9	79	14	39	16	166	12
Total	171	100	369	100	648	100	246	100	1,434	100

Source: RMIP Land User Survey, 2014

Natural Capital

The natural capital plays an important role for these rural communities that depend to a large degree on agricultural products, fruit trees, backyard poultry, and livestock. These are mostly grown or raised for own sustenance and only to a small degree for commercial purposes. The top three sources of livelihood for the project-affected population are based on natural resources:

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Photo 2-2: Men carrying bundles of jute

- Livestock, backyard poultry, pond and open water fishing;
- Field crops (*boro* rice, maize, wheat, sugar cane, chili and pulses), onion, ginger, turmeric, winter and summer vegetables, fruits, medicinal fruits and plants;
- Agricultural labor
- Skilled labor (carpenters, masons, electricians, rickshaw/van puller, Tailoring, cobbler, Barber, Sweet maker, Chatai (by bamboo) maker, driving etc.)
- Trading (petty trade, shop keeping, Bepari)
- Wage employment in GoB, NGO and private sector (garments).

There are opportunities to improve livelihoodmid- and long-term through increasing the commercialization of agricultural products and the productivity of agricultural inputs as well as diversifying the livelihoods from natural resources.

Financial Capital

Nearly half of the households in the Project area have an income below the Bangladesh poverty level of 7,000 BDT per month. Thirty one percent of households live of an income between 6,368 and 10,000 BDT. Only about a fifth of the households make more than 10,000 BDT per month.

A small percentage of households (6%) hold a bank account. Twelve percent of women in the project area have taken out a loan from a formal or informal institution while only 2% of men indicate to serve a loan.

Providing access to capital through MFIs and some livelihood assistance grants to those households aiming to start or improve small businesses will need

to be key elements of the planned livelihood development interventions.

Social Capital

The social capital plays a very critical factor in poor and vulnerable communities that often operate to a large degree in the informal sector. Households and individuals are very much dependent on their extended family network, kinship and *samaj* group for survival. Therefore, affected households indicated early on during the consultation meetings that they have a strong interest to resettle in close proximity to their current location (80%) and with their current neighbor (71%).In addition to the planned benefits, mutual interdependence and support will still play an important role in the transition to resettlement and economic development.Given the importance of social capital, the resettlement sites have been selected in close proximity to allow the affected families and extended kin to resettle in groups or as close as possible to their current home to support the existing socio-cultural and political contexts. When designing livelihood development interventions the existing social structures and networks will need to be taken into account for all prospective beneficiary communities.

Physical Capital

A total of 3,480 residential hhs will be affected whereas 1,539 hhs residential structures are on their own land. Out of 1539 hh, a total of 396 hhs will lose their homestead land completely due to project intervention and rest will partially. Squatters own the residential structures and these structures are shiftable. Most of the structures in the project influenced area are kutchas, mainly tin and bamboo made. Most of the hhs own atleast one mobile but few of the hhs own a television. They normally rely on the radio. But for those people living in the country side, the picture is different. These people never faced erosion nor had to shift their homestead. For that reason, their hh assets are higher than those of erosion victims living on the embankment. Country side households structures are mostly pucca (brick made). They are more solvent than the people living on the embankment. Therefore, only households living on the embankment and towards the riverside will require any development measures.

The affected area is not connected to the power grid, so that 75% of households have no electricity. Only 7% of household use solar panels. These areas will not be connected to the national electricity grid in the near- or mid-term future. However, solar systems will be considered after doing a feasibility study for households remaining on the old embankment as well as the resettlement villages that are not connected to the national grid.

2.2.3 Opportunities and Challenges of Specific Economic Sub Sector for Mid- and Long-Term Income and Livelihood Development

An initial assessment of various economic subsectors based on community surveys and consultations with the beneficiary communities have been conducted in order to design effective and sustainable livelihood development interventions in a next stage and discussed in subchapter 2.4.

High Value Small Fruit Orchards

Opportunities:

i. Large demand for high-value fruit such as mango, litchi, baukool, and guava
ii. High value fruit require little land to be profitable
iii. Increase of production and income over time with growing size of trees
iv. Establishment of linkage with buyers of fruit for marketing locally and regionally.

Challenges:

i. Lack of ecosystem for commercial fruit production
ii. Limited knowledge about farming, production and marketing of high value fruit
iii. Access to financing is crucial but often limited

High Value Medicinal Plants/Tree Plantation

Opportunities:

i. Rural and urban demand for medicinal fruit and plants like wood-apple, *basak* leaf, *amloki,* tamarind, ginger for private use
ii. Large demand by Ayurvedic (locally called Kabiraji) manufacturers as Hamdard, SadanaOsadalaya and pharmaceutical

manufacturers such as Square and ACME as well as cosmetic and food processing companies (currently 30% of total demand covered by national supplies)

iii. Grow plants and trees not only at homesteads but also on slopes of the embankment to keep new squatters away from settling on new embankment

Challenges:

i. Lack of knowledge about production techniques
ii. Lack of readily available seeds and sapling in local nurseries and markets
iii. Weak extension and support services
iv. Little knowledge about marketing and distribution channels
v. Access to financing is crucial but often limited

High Value Vegetables

Opportunities:

i. A well-developed ecosystem for the production, distribution and sales for vegetables exists

Challenges:

i. Quality issues with some seeds from commercial sources
ii. Inappropriate storing of seeds by farmers to avoid dependency from commercial source and saving costs
iii. High usage of pesticides, especially in brinjal and cucurbits threaten public health, but also increase costs of cultivation
iv. Lack of knowledge about Integrated Pest Management (IPM)
v. Lack of distributors and retailers of pheromone traps or other alternative organic pesticides
vi. Weekly loan collection by MFIs does not fit the seasonal cash flow for agricultural products

Fisheries

Opportunities:

i. High demand but only small share of ponds (less than 5%) and *khas* (especially WAPDA) are under commercial fish farming
ii. Pond and flood plain fisheries during rainy season currently underutilized
iii. Introduction of high-value fish besides current breeding of carp

Challenges:

i. Lack of knowledge about production practices such as overstocking fingerlings, inappropriate pond preparation
ii. Quality of feed for fish not always know to farmer
iii. Lack of quality of fingerlings

Livestock

Opportunities:

i. Raise cattle for commercial purposes also
ii. Expand variety to goats and sheep

Challenges:

i. Lack of knowledge and interest in raising livestock commercially
ii. Breeding of local varieties with low productivity
iii. Absence of reliable veterinary care including preventative vaccinations
iv. Lack of livestock insurance products

Poultry

Opportunities:

i. Expansion of variety from backyard poultry to broiler, sonali and duck
ii. Market well established and easily accessible
iii. Low investments required that can mostly covered from own funds

Challenges:

i. Lack of knowledge and interest in raising poultry commercially
ii. Lack of production techniques
iii. Supply of ducklings limited
iv. Absence of reliable veterinary care including preventative vaccinations

2.3 Summary of PotentialImpacts on Livelihood

Based on the assessment of the income and livelihoods of the project-affected households and the beneficiary communities, the Projectrepresents an immense development opportunity for livelihood improvement to this poverty-ridden region.Only temporary and limited adverse impacts on livelihood and income can be expected. See a summary as follows:

Potential Positive Impacts onIncome and Livelihoods

Enhanced employment opportunities: The project will generate substantial short- and long-term employment opportunities especially for young people, who are currently unemployed, and women who are willing to work. These employment opportunities lay within the civil works for the Project and beyond.

Capacity development to improve productivity of existing crops and livestock: The project will provide opportunities for capacity building for the local farmers to better manage their agricultural inputs such as seeds, fertilizers, irrigation and pesticides.

Better marketing and linkage of products to markets: A better marketing and distribution of local products to serve not only the local but also regional or national customers can be achieved through capacity building and better road connectivity.

New skill development to diversify livelihoods: The Project will introduce new types of crops like medicinal plants, fruit trees in form of social forestry on the embankment slopes. Furthermore, new types of livestock such as goats and ducks and commercial fisheries will be encouraged toexpand the portfolio of livelihoods. In addition, women will be trained as birth attendants and community health workers to better serve the community with health services.

Potential Adverse Impactson Income and Livelihood

Limited loss of productive assets:As most land required for the Project is on and around the embankment and the affected households are squatters on the government-owned embankment, the loss of agricultural and residential land is limited.(SeeTable 2-2).

Short-term loss of income: Lack of daily income for a month during relocation and resettlement can be expected. As resettlers are mostly squatters without agricultural land and earn their income through day labor, no long-term loss of income is anticipated for the majority of the affected population.

Disruption of livelihood and social capital: TheProject will have a temporary but limited impact on the livelihood and social capital of households that will be resettled. They may loose fruit trees around their home. However, the access tocommonresources such as water, forest, grazing, and fishingmay less likely to change due to short-distance relocation. Similarly, existing relationships with neighbors and their community may be temporarily disrupted.

Table 2-2: Project impact on livelihood assets for Project-affected population

Impact/Types of losses	Sirajganj		Bogra		Total
	Sirajganj Sadar	Kazipur	Dhunat	Sariakandi	
Number of physically affected HHs requiring relocation[2]	266	1,125	718	1,530	3,639
Affected Residential& Agricultural Land only by HH	0	2	2	15	19
Number of persons requiring relocation	1,264	5,006	3,116	6,172	15,558
Number of wage laborers affected	27	57	75	77	128
Number of HH's losing agricultural plots only[3]	171	369	648	249	1,437
Affected residential HHs only	164	812	424	856	2,256
Affected business	4	60	29	55	148
Severely affected HH loosing >10% of their income due to loss of productive lands	12	58	19	111	200

[2] Refers to affected HHs and Businesses to be relocated
[3] No relocation required

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Photo 2-3:Women showing freshly caught fish, which is a critical source of protein for people living along the river

2.4 Interventions for Livelihood Restoration and Development

The Project has adopted a two-fold approach for livelihood restoration and development derived from the assessments and impact analysis that has been conducted based on household and community surveys and in consultation with the beneficiary communities. The first strategy will be short-term and in line with the mandate for ILRP to mitigate any adverse impacts by the Project that will be limited and temporary for this Project, as discussed earlier. The second strategy focuses on increasing income and livelihoods mid- and long-term in a sustainable manner through wage and self-employment integrated with human resource development, and exploring local, regional and national resources and linkages. A summary of interventions by objective is presented in Figure 2.1.

2.4.1 Restore Income and Livelihood of the Directly Project-Affected Population in Short-Term

Cash Assistance to Support Lost Income

PAPs, including those experiencing indirect impacts, will be eligible for assistance for loss of employment/work days (wage earners) due to dislocation and relocation. One-time cash grant for a fixed number of days will be paid to all such eligible PAPs. It is expected that the PAPs would be able to recover their losses and/or find alternative employment within this period.

Targeted beneficiaries:5,751 households/units representing 23,584 people who are in the right of way of the new embankment.

Assistance to Re-Establish Small Businesses

All owners of affected shops, tea stalls and other small business owners will receive cash compensation and cash grant for loss of business income premises plus shifting or moving allowance. This assistance is intended to help them re-establish their small business in new locations. All PAPs are likely to continue their previous occupations and commercial activities in the new relocated site. In addition, commercial plots will be allotted to deserving business-losers in project sponsored resettlement sites on lease basis to re-establish affected businesses.

Target groups: Small business owners (148 shops/tea stalls and small businesses and 84joint shop/residential structures) in the right of way of new embankment

Employment in Construction Site and Construction-Supported Sector

Temporary or short-term employment for non-skilled labor in construction or construction-related support activities (surveying, work in office setting, etc.) at the resettlement or project construction sites will be available. Local people whose livelihood is impacted by the project will get preference in jobs associated with the project construction. Semi- und un-skilled jobs will be offered to the PAPs with ID numbers on a preferential basis.

Target groups:PAPs andbeneficiary communities living on the old embankment and within 2km of embankment

Special Assistance for Vulnerable Groups in Short-Term

Special attention will be paid to vulnerable groups (female-headed, elderly-headed, disabled-headed and poor households) in the form of additional assistance (see Entitlement Matrix Vol. 2 RAP) during the implementation of the resettlement program, as they are at particular risk of becoming disadvantaged as a consequence of the resettlement. This Project, in particular the SDP, shall represent an opportunity for vulnerable people to improve their socio-economic status.

Target groups:Project-affected vulnerable households (Female-, elderly-, disabled-headed HHs and poor HHs)

2.4.2 To Improve Income and Livelihood Long-Term in a Sustainable Manner

The interventions that aim to enhance the socio-economic status of people in the Priority area are either targeting an increase in productivity of the existing occupations/income sources and or a diversification of existing income sources taking into account the sub-sector analysis presented earlier (see sub chapter 2.2).

Community Participation in Social Forestry (Tree, Medicinal Plantation) on Embankment Slopes

Organized social forestry with high value fruit trees ormedicinal plantswill not only increase and diversify the income source but will also prevent squatters, new and old ones, to re-settle on the new embankment in the future. To ensure the sustainability of the intervention the following number of activities are planned along the value chain:

Organize farmers within affected people: Organize 20-55 people (including 40% women) who are willing to plant and maintain trees/social forestry or medicinal plants on the village side and or on the crest of the new embankment. Each of them represents equal number of interested households living permanently alongside the embankment.

Provide long-term leases: Each of such small groups is given a long-term lease (not less than 15 years) free of cost by BWDB to plant and grow suitable trees or plants all through the new embankment on several segmented sections, each with appropriate length.

Training and technical assistance: Provide orientation on planting, growing, maintaining and harvesting of suitable trees and or plants. The choice of appropriate species of the trees will lie with BWDB and the saplings will be planted as per the guideline of the forest department to be sure about maintaining embankment integrity.

Cost sharing and responsibilities: The beneficiary groups will bear all associated costs for such a plantation program as they will benefit from earning money from the total sale proceedsof the treesor plants after maturity. BWDB will have no claim on such proceeds. However, BWDB field staff must supervise the plantations to ensure that no damage is inflicted on the embankment during the cutting of the trees or plants. A possible re-plantation of suitable trees or plants must again follow the same proper guidelines. In return of the above benefits, each plantation group will agree, as per the condition of the lease agreement with BWDB, to undertake all preventive maintenance of the specific embankment section basedon the BWDB guidelines and also strictly ensure 'no entry' for squatters to settle on the embankment.

Establish linkage with potential buyers*:* Potential buyers will be formally contacted and invited to farmer groups to speak directly about their needs and demands of potential suppliers. Besides, local traders will also be contacted.

Supporting services: Work with BARI, DAE and Agricultural Universities to provide good quality of sapling to farmers and assist nursery owners to produce reliable and good quality saplings; and ii) develop local training providers, especially individuals and local partner NGOs. Clearly, the social forestry program is also part of the environmental enhancement/greening program in this project.

Target groups: Project-affected households and people remaining on and around the old embankment

Improve Productivity of Existing and Diversify in New Agricultural Sub Sectors Through

Natural Pest Control for High Value Vegetables

The vegetable sector is fairly well established but a number of activities will be implemented to improve the productivity of high value vegetables and reduce the use of pesticides. See the Pesticide Control Program discussed at the Environmental Management Plan (EMP) for more detail.

Target groups:Farmers in the Project area and project-affected households growing vegetables and using pesticides.

Vet Services and New Variety of Livestock

The livestock sector is fairly well established but a number of activities will be implemented to improve the productivity of raising cows, also for commercial use, diversify into other livestock and introduce preventive vet services.

Organize farmers: The first step will be to organize interested farmers (form Common Interest Groups) who are willing to receive training. For a cow/bull a package of 4 de-worming tablets, and vaccines for Anthrax, BQ and FMD (7 strains) will cost about BDT 350, which will include travel expense and fee for the vaccinator. However, a detail financial model needs to be developed by the implementing agency, most likely by NGO-MFIs currently offering microfinance in the proposed project areas.

Introduce new breeds: Encourage farmers and households to further diversify into goats, sheep, if not done so yet

Training and technical assistance: Provide improved farm management training for one day. Issues to be covered will be breed selection, feed, housing, disease control and AI. Training courses must be practical and hands-on, preferably in successful dairy projects so that trainees can observe and learn from training. Classroom/lecture type training must be avoided. NGO vet and vaccinators will provide curative services and if necessary develop a referral service with local DLS.

Develop alternative veterinary health services: Local NGOs in the Project area will do the following: i) Organize farmers through their contracted trained persons (vaccinators/trainers); ii) Set up refrigerators in two locations in each part/sector of project areas, iii) Store vaccines and de-worming tablets/injections from good sources; iv) Sign a deal with each family for delivering health services, v) Ensure vaccines at designated time and date; and vi) Work with vaccine and medicine suppliers to ensure supply and get wholesale reduced price for medicine and vaccines.

Connect with MFIs*:* Provide a link to micro-loans if desired by farmers to finance new livestock or vaccinations

Supporting services:i) Train 15 vaccinators/trainers from good training centers; ii) Develop three dealers of feed and medicine sellers by contacting feed and medicine producers.

Target groups: Vulnerable project-affected households and farmers who resettled and those who remain on and around the old embankment.

Commercial Rearing and New Variety of Poultry

Rearing poultry for commercial purposes and diversifying the breeds is expected to increase the source of income but also provide higher and more diverse nutritional value for the households. The following activities will be undertaken:

Organize farmers: The first step will be to organize all village households who are willing to practice new farming techniques and more importantly accept preventive veterinary health services for full-cost, which will include travel expense and fee for the vaccinator.

Introduce new varieties: Encourage farmers or households to try ducks, sonali variety and broiler.

Training and technical assistance: Provide orientation on improved farm management training for half-a-day. Issues to be covered will be breed selection, feed, housing, and disease control. NGO vet and vaccinators will provide curative services.

Develop alternative veterinary health services: Partner NGOsthroughout the Project area will do the following: i) Organize farmers through their contracted trained persons (vaccinators/trainers); ii) Use the same solar-powered refrigerators store vaccines; iii) Sign a deal with each family for delivering veterinary health services for full-cost with the help of vaccinators; iv) Ensure vaccines at designated time and date.

Supporting services: In addition to existing vaccinators, about 100 suitable poultry farmers will be trained to vaccinate poultry within the project villages so that they themselves can vaccinate the poultry.

Target groups: Vulnerable project-affected households and farmers who resettled and those who remain on and around the old embankment.

Commercial Rearing and New Variety of Fish

Activities for the fishery sector include both an increase in productivity and a diversification of fish breeding. They will be supplemented and coordinated with the Fisheries Development Program discussed in the Environmental Management Plan (EMP) Tasks include:

Organizing the fishermen/villagers: The first step will be to organize interested fishermen/farmers into two categories fish producers and fingerlings producers.

The selection criteria for fish producerswill be as follows: i) Pond owners or long-term leaseholders; ii) Interested to participate in commercial fish production; iii) Willing and able to invest in commercial fish production after receiving training; iv) Some previous experience will be preferable but not required; v) Willing to receive hands-on training, if necessary at distant venues.

The selection criteria for fingerling producers will be as follows: i) Already successful fish producers; ii) Willing and able to invest in commercial fingerling production after receiving training; iii) Some previous experience in fingerling production will be preferable but not required; iv) Willing to receive hands-on training, if necessary at distant venues.

New types of fish breeds: Five types of fisheries will be tried: i) Seasonal pond fisheries where water is available for 8-10 months and high growth seasonal varieties such as puthi, tilapia and carps (silver carps) and larger size fingerlings will be stocked; ii) Round the year ponds where carps will be stocked along with high-value indigenous fish; iii) Pond culture during rainy season; iv) Flood plain fisheries (mix culture) in selected areas; and v) Fingerling production.

Training and technical assistance: Organize production-related technological and farm management training to farmers. Provide direct hands-on and problem solving technical assistance initially by project technical staff and if available, by

DOF experts. Training courses must be practical and hands-on, preferably in successful fisheries projects so that trainees can observe and work there for few days. Gradually local private trainers should be developed for sustainable services.

Develop local services providers:i) develop local trainers from within expert farmers, persons trained by Department of Youth, fingerlings producers, and hatchery owners; ii) develop or establish dealers of feed sellers by contacting feed producers; iii) establish linkage of farmers with banks and MFIs to ensure finance.

Target groups: Vulnerable project-affected fishermen/villagersand beneficiaries in the Project area who are willing to produce culture fish on a commercial basis.

Training of Skilled Labor

A selected number of vocational trainings will be provided, especially to younger men and women, in services needed in the community such as driving, car mechanics, security guarding, technical maintenance for solar panels as well as health services. The following activities will be planned:

Identify and prioritize vocational training needs: Identify top two or three vocational training needs beyond agriculture and farming in the vulnerable project-affected population

Design and implement vocational training: Run two vocational training courses based on the prioritization exercise plus a course for skilled births attendants for women, further discussed in the following two chapters on gender mainstreaming and public health.

Target groups: Project-affected vulnerable households and people, especially young persons, who remain on and around the old embankment

Installation of Solar Home Systems

The installation of solar systems in the resettlement sites as well as in households remaining on the old embankment who are interested and have currently no access to the nationalgrid will contribute to a better livelihood by allowing for longer working hours and reduction of indoor pollution through kerosene lamps, where used.

Target groups: Project-affected households and people remaining on and around the old embankment

Grants for Livelihood Enhancement

A selected numberof cash grants (4,000 x BDT 25,000)will be made available to affected or beneficiary households that plan for a livelihood enhancing project or initiative. The applicants will need to submit a detailed business plan that will be reviewed by the SONGO. In case of approval, a close monitoring of the implementation and outcome of the initiative by the SONGO will be done.

Target groups: Project- affected and beneficiary households with the intention to start or enhance existing livelihood supporting initiatives and projects.

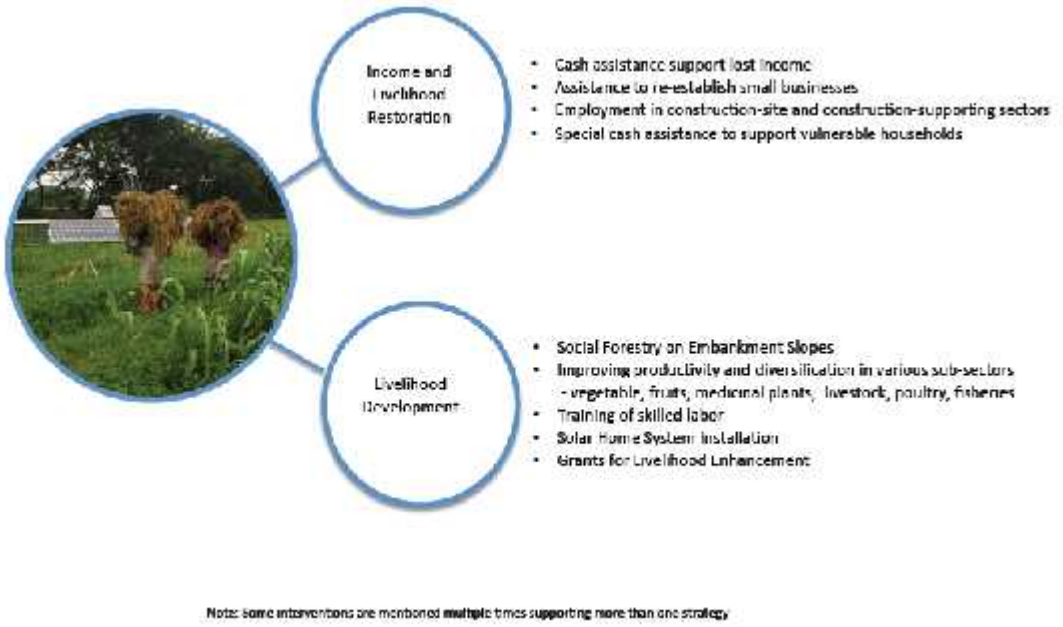

Figure 2.1. Livelihood Restoration and Development Programs by Objective

2.5 Implementation Planning

In a next step, a Social NGO (hereafter SONGO) will be engaged to implement the Social Development Plan and an Implementing NGO (hereafter INGO) for the implementation of the Resettlement Action Plan.

The limited and short-term livelihood restoration interventions will be implemented by the INGO according to the compensation matrix and guidelines discussed in Vol. 2 RAP.

The SONGO will conduct further household- and community-level needs assessment surveys at the beneficiary communities to design and refine the most appropriate and impactful livelihood assistanceprograms prior to implementation. Every year, it will assess and prioritize the livelihood needs in close collaboration with the beneficiaries and translate those agreed livelihood schemes into an annual implementation plan. The implementation plans for each beneficiary community will include the appropriate budget allocations, staffing, management operations and monitoring mechanism to ensure an effective implementation of the livelihood assistance programs over the five-year program period. See also Chapter 5 Implementation Framework.

3. Gender Mainstreaming

3.1 Demographic Gender Overview of RMIP and Project Area

The socio-economic survey for the Project area over 50km carried out in fall 2014 relatively even distribution of man and women of the affected population.

As elsewhere in Bangladesh, the majority of the HHs is male-headed. Of the 3,639 project-affected households along the embankment that require relocation, 466 or 12% are female-headed households (FHH) as indicated in Table 3-1. They are considered socially and economically disadvantaged HHs as the majority ofthem have fewer earnings than the male-headed HHs and less opportunities.

Furthermore, there aredisabled persons along the surveyed population. Seventy-fourof them are female and 139 are male. Three of the 74 disabled females are heads of households.

3.2 Potential Impact on Gender

The potential impacts, both positive and negative, have been identified based on the gender analysis taking into account the overall context of women in Bangladesh society, as well as the primary sources of data collected specifically for the population, in particular women, affected by the Project. Details of the impact assessments are available in the APPENDIX 2.

Table 3-1:Gender distribution of Project-affected population and FHHs in the Priority area

Area	HH	Population		
		Male	Female	Total
Sirajganj Sadar	266	641	623	1,264
Kazipur	1,125	2,540	2,466	5,006
Dhunat	718	1,581	1,535	3,116
Sariakandi	1,530	3,132	3,040	6,172
Total HH	3,639	7,894	7,664	15,558
FHH	466	–	–	–

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Photo 3-1: Women living on riverbank

Positive Impacts on Women

Enhanced employment opportunity for women: The project will generate substantial direct short and long-term employment opportunities in the construction and/or strengthening of the embankment. These jobs during the construction as well as for the embankment maintenancewill bring gains in terms of incomes, skill development and empowerment.

Active participation and decision-making: The Project has promoted an inclusive process through consultation and FGDs and therewith fostered the active participation of women in the design phase of the project. This will continue through the implementation phases, as well, to keep building confidence amongst women.

Increase of skills and knowledge*:* The Project has the opportunity to build skills for women either for jobs directly related to construction works or through targeted livelihood building measures such as training of skilled birth attendants. Health and safety awareness programs allow women to gain knowledge to improve their health status and avoid risks.

Gender mainstreaming*:* In the context of gender roles, women may rise in status due to earning an income and more active participation in decision-making. On an administrative level, gender mainstreaming within the BWDB will be promoted.

Potential Negative Impacts

Loss of land and properties: Less than 5% of the women in the project affected area will loose land properties due to the construction of the new embankment. However, as part of male headed household women are more worried about possible displacement than men as it often affects them more emotionally, physically and psychologically than men. Due to low access to resources and opportunities, women in the Project area may undergo disproportionate impact in the process of land acquisition, resettlement and project construction.

Disruption of livelihoods and living: Displacement and relocation will have direct adverse impacts on household income and on women in the family. Affected women will lose their "customary" way of living and will require time to adjust to the new relocated place. The project may also have an impact on the livelihood, especially of marginalized women, due to a possible loss of access to common resources – namely, water, forest, grazing, fishing – resulting in major erosion in their incomes and livelihood means.

Change in social and cultural support mechanisms: Women have a social support system in the villages. No matter how strict the setup is within their villages, they support each other and share in times of need. In the village women largely can depend on kinship support. With displacement this system may disintegrate, at least temporarily.

Increased risk of sexual assault and violence: The survey conducted indicates prevalence of physical/domestic violence against women in the project area, particularly women living on the embankment. With the imminentpsychosocial pressure of resettlement and impending uncertainties, the risk of domestic violence against women may raise further. In addition, external labor workforce or migrants attracted by commercial opportunities may increase the risk of sexual assault and violation.

Increased risk of HIV/AIDS and STD: Despite limited in-migrants and "outside" workers, therisk for HIV/AIDS and STD due to extra marital sex, and multiple sex partners may increase.

3.3 Strategies and Interventions Supporting Gender Mainstreaming

Based on the gender analysis and in view of the objectives outlined in 1.4.2, the planned interventions are grouped in five different strategies reflecting the needs and priorities of the women in the Project area. These strategies are:

i. Promote women's participation in design and implementation
ii. Enhance employment opportunities for women
iii. Ensure gender responsible resettlement measures
iv. Provide services and safeguards against social and health vulnerabilities

v. Enhance capacity on gender mainstreaming within BWDB.

Each strategy is supported by a list of interventions or activities outlined in this sub chapter.

Find a summary in Figure 3-1.

3.3.1 Women's Participation in Design and Implementation Phase

Activities during design phase

Participation and inclusion of women in all project committees and community meetings related to design, resettlement and embankment maintenance plan have and will be ensured. For this study, women were consulted separately in focus group discussions to learn their preferences and needs, particularly related to resettlement site screenings and the resettlement process. They were also asked about the perceived benefits of the Project. Women from different socio-economic backgrounds and different communities were included in the FGDs. Thus, the Project has explicitly taken into account social and gender concerns into the project design phase and will continue to do so. The women's areas of input and participation will include road and embankment design, preparation and review of resettlement plans, site selection, site and housing design, provision of civic infrastructure, access to services, provision of land and housing titles, payment of compensation, income restoration and monitoring progress of the Project.

Target groups: Women, particularly those who are poor and interested to work in the project construction site, who run small shops/businesses from home, young entrepreneurial women at project resettlement sites and other places where resettlers moved on a self-managed resettlement basis.

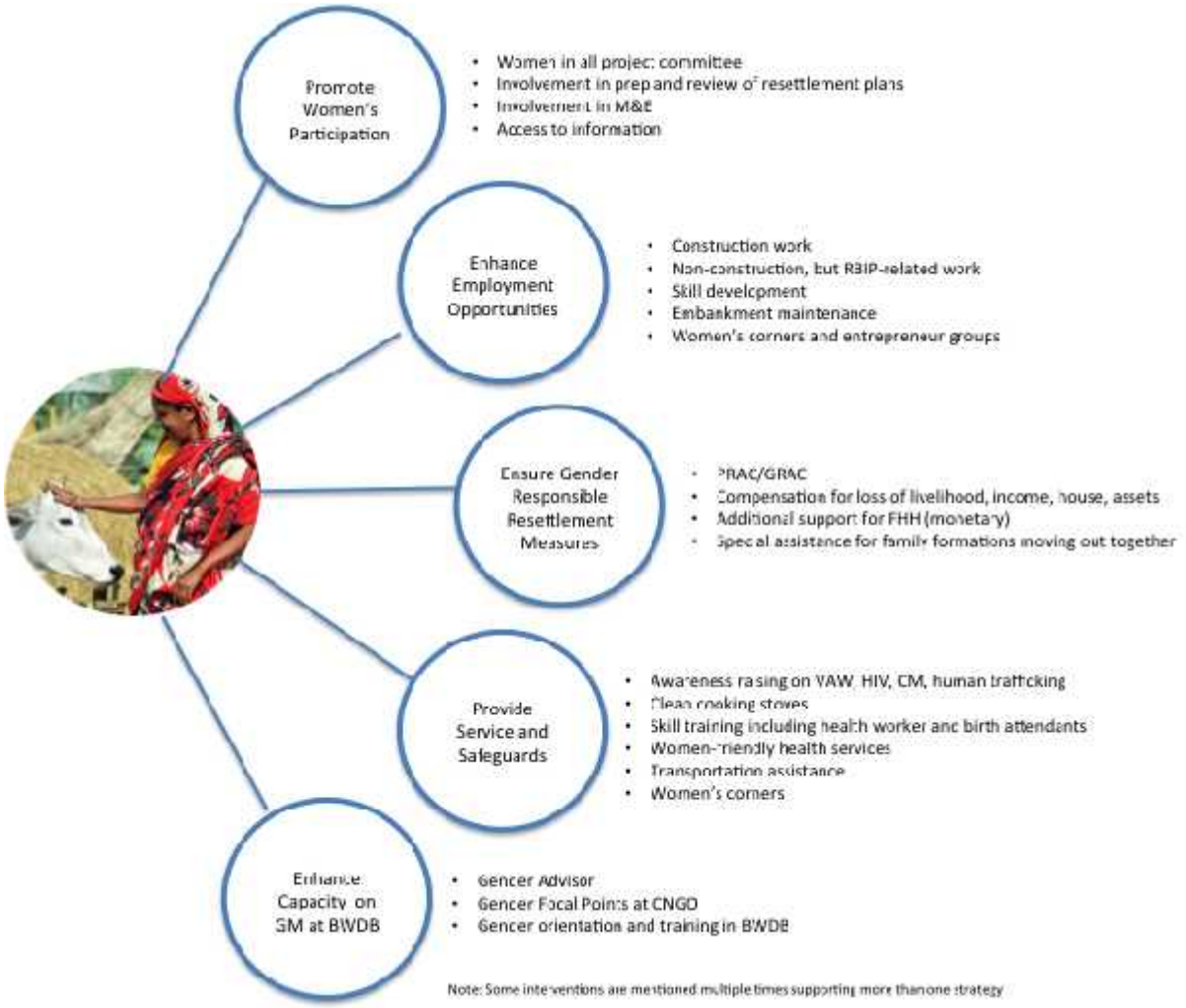

Figure 3-1: Gender Action Plan Strategies and Actions

Activities during construction phase

Participation and inclusion of women

During the construction phase, women will be encouraged to participate in all community meetings and decision-making related to the implementation of RAP in order to safeguard themselves from health and social vulnerabilities. Women will be part of the following committees: RAP Implementation Committee, Grievances Redress committees, SDP Implementation Committee and others.

Target groups: Women in the various committees, local women leaders (e.g., elected women members/vice-chairman of union Parishad, upazila), local activist women, female schoolteachers and representatives of the affected women as well as women from host areas.

3.3.2 Employment Opportunities for Women

During construction phase

Activities to increase access to project construction employment

Women will be encouraged to take up construction employment such as filling geo bags for the river revetment. This will be done through raising awareness about the types of jobs available, time frames and pay rates, way of applying for work, and issue of ID cards to directly or indirectly affected people which will give them preference for project work. Employment opportunity will be created following established BWDB practices, through Labor Contracting Societies (LCS) for equitable physical works in the construction works and routine maintenance of embankment. Women will be encouraged to take up work through LCS, which will be monitored through BWDB. The contractor will be responsible to monitor and report gender status, equal pay and prohibition of child labor.

Target groups: Given that the women's level of interest during the project gender analysis was low and only very poor women (widows, those living on the river side) were actively interested, the target is deliberately set low at 10% female construction employment.

Activities to increase access to non-construction project employment

Raise awareness amongst women in the project affected area for non-construction related work to boost their own incomes and ensure preferred hiring of women from affected populations. These types of jobs include the provision of services to the project (catering, laundry, provision of fresh produce and other consumables, office services, managing accommodation), as well as working for local NGOs (implementation, project monitoring and evaluation, community mobilization focal points, women's enterprise leaders) hired by the project for project implementation.

Target groups: Women in the project area (Resettlement sites, host areas, etc.) who are willing to work in the project sites and project setting with NGOs in the office and in field as support staff, community mobilizers, health workers, small business and other income earning opportunities.

Post-construction phase

Activities to increase skills and livelihood for women in resettlements sites and those remaining on the old retired embankment

Skill training:The project will contribute to improve the capability of vulnerable women to cope with the change. Women will develop skills which they can leverage in direct employment opportunities of the project, such as setting up nurseries to provide plants for embankment/ river connecting road side environmental planting, training female drain laying and grouting teams or to foster social development in their communities such as community health workers and skilled birth attendant (also, see public health section in SDP). Cash for training (CFT) will be provided to the women. The type and duration of training will be determined during SDP implementation by the SONGO in consultation with the households, particularly women.

Embankment maintenance: After construction of the embankment groups of women will be deployed as Surveillance Team (ST) for slope turfing, tree

plantation/social forestry and road maintenance. One

ST may be assigned for maintenance of 5 km embankment. Tree plantation increased considerably on roadsides, homestead, and on the embankments at post project periods. However, for increased efforts on Social Forestry (large scale tree plantation) in these places, there is a need for launching long -term program by BWDB and DOF. The SONGO will assist BWDB to develop the modalities and logistic for this program. Further, this will provide a specific long-term employment opportunity for disadvantaged women, following established BWDB practices, through Labor Contracting Societies (LCS) for equitable physical works. The SONGO will be tasked to do some grouping of LCS and will ensure that the civil work contractor has an appropriate clause in its contracts.

Women's corners: Establish women's corners with business/employment opportunities, IEC materials /messages targeting women and girls in large resettlement sites (>100 HHs). These sites will serve as physical space where women can network, learn, support each other, and undertake individual or group earning activities. Additionally, information about the activities of local organizations providing relevant services, such as Upazila MohilaAdhidoptar, Upazila Social Welfare and Upazila Youth Department will be provided in order to improve women's access to existing services. Ensure that each woman's corner/section will be managed by a local female volunteer (i.e., manager) from the resettlement village or the old embankment village. The manager will be selected and after training, employed by local NGO partners as mobiliser and motivator of the village women's group. Furthermore, the partner NGOs will use the women corners as training locations for income generating activities, as appropriate. Women's corners will include at least 40% of all women in the resettlement villages.

Village women's entrepreneur groups*:* Conduct community building exercises and support initial establishment of village women's entrepreneur's groups. It may branch out from the skill building and women's group activities depending on the women's interest and identification of market niches. Provision for micro-credit assistance linked to MFI/NGOs to receive credit and start business.

Target groups*:* Affected women, women in resettlement sites and women remaining on old embankment.

3.3.3 Gender Responsible Resettlement Measures

RAP Implementation Committee (RAP-IC) will be formed for each union parishad under the leadership of the elected representatives from concerned union parishads, village leaders, representatives from the affected persons, embankment and road management organizations, women and BWDB representations. The executive engineer/PMO, field office, will head RAP-IC.

Grievance Redress Committee (GRC) at local level will be formed for each union with union level representation to ensure easy accessibility by the project affected men and women and communities. This local GRC and the process for resolving land acquisition grievances will be the local focal points of the project grievance redress mechanism (for further details, see Vol. 2 RAP). The GRC sets out the information and communications strategy to ensure women and men's rights to offer suggestions and make complaints, and the different mechanisms through which they can do so, including grievances related to the land acquisition process. All grievances received through the GRC process will be resolved local GRC or by the Project level GRC. Membership of GRC will include representative from local women's group.

Compensation for loss of livelihood, income, house and properties: This will include measures related to compensation for land/structure/trees/crop to women, compensation for loss of income/employment to FHH.

Additional support to FHH: The project will provide additional assistance to FHH in house construction in new resettlement sites, registration/stamp duty on purchase of replacement land with compensation for FHH**,** transfer/shifting assistance for houses, commercial/business enterprises (CBEs), and community facilities to FHH.

Additional grant to match market/replacement value for lost assets: House re-construction grant, re-

establish the women's SMEs affected under the Project. Vulnerable FHH will be provided a grant of BDT 10,000.

Equal share of land title registration between husband and wife: Landless households that will receive land through the Project in the resettlement sites will have the land title registered in the husband's and the wife's name to equal parts following the khas land ordinance regulation.

Target groups: Affected women, women in resettlement sites and women remaining on old embankment.

3.3.4 Services and Safeguards against Social and Health Vulnerabilities

Activities to mitigate construction-related impacts

IEC: The Social Development Programs will ensure health awareness related HIV/AIDS and STD, dowry, reproductive health, CM, violence against women. It will furthermore create awareness about risk of trafficking in women and children and implement a zero tolerance policy against sexual harassment at the work place.

Occupational health and safety: Implement occupational health and safety measures tailored to women (for details see, EIA – Health and Safety).

Access to information: Provide women information on entitlements, timetable for compensation, relocation, livelihood issues and services of local organizations for women's empowerment and safeguarding. Women will be informed through advocacy materials, mobile phone, milking and UP information center. The project will sign a MOU with Grameen Phone to send project-related messages in Bangla to the women.

Target groups: Women in the project area, resettlement sites/host villages.

Activities to mitigate overall risk related to the Project

Women-friendly hospital facilities: Conduct orientation on gender issues to two public upazila hospitals and to public health servicesproviders

serving the resettlement sites and communities remaining on old embankment like doctor, nurse, and general staff.

Women-friendly portable cooking stove: All affected female-headed household would be provided with a portable cooking stove in order use during disaster situation and use health friendly cooking facilities.

Girl-friendly facilities at school:30 local schools will be provided with facilities to build washroom facilities for girls and sports related materials.

Self-help group for credit, business and savings*:* Implementing NGOs will support to form self-help group for women of MHH and FHH for their empowerment. This group will be mobilized for obtaining credit and undertake joint business.

Awareness raising and monitoring of risk of human trafficking: Conduct awareness sessions with women on risk of human trafficking, monitor the actual risk and design appropriate interventions, as necessary, working with local law enforcement.

Target groups: Women and girls who live in the project area, resettlement sites and host villages.

3.3.5 Capacity Building for Gender Mainstreaming within BWDB and Project-Related Organizations

Staff training: All project-related staff of the Project PMO/BWDB will attend a Gender Orientation Staff Training on gender awareness and mainstreaming mechanisms as well as project planning and implementation of the gender action plan. This will be done over the Project period in groups, as available.

Gender advisor:A gender advisor will be hired for three years in order to provide leadership in capacity building and gender mainstreaming activities.

Gender focal points in SONGOs: The SONGO will recruit gender focal persons to support the day-to-day gender-specific activities.

Community facilitator: Eightfemale community facilitators will be recruited by the SONGOs to support group formation, overall management and other activities.

Gender integration in BWDB training institutions:BWDB has three training institutions that provide regular training to BWDB officials. The BWDB/PMO officials are mandated to receive training courses on gender mainstreaming. The gender advisor will provide support all training institutions to incorporate gender-specific issues in their curricula.

Target groups: Project PMO staff/BWDB officials, project-associated organizations like NGOs

3.4 Implementation Planning

In a next step, a Social NGO (hereafter SONGO) will be engaged to implement the Social Development Plan and an Implementing NGO (hereafter INGO) for implementation of the Resettlement Action Plan.

The measures outlined under the Gender-Responsible Resettlement will be the responsibility of the INGO and be included in its TORs, see Vol2. RAP.

The SONGO will conduct further focus group discussions and consultation with project-affected women as well as with women in the beneficiary communities to refine the most appropriate gender mainstreaming measures. Every year, it will assess and prioritize the gender mainstreaming needs in close collaboration with the women and translate those agreed measures into an annual implementation plan. The implementation plans for each PAP and beneficiary community will include the appropriate budget allocations, staffing, management operations and monitoring mechanism to ensure an effective implementation of the gender mainstreaming interventions over the five-year program period. See also Chapter 5 Implementation Framework.

4. Public Health

4.1 Overview of Determinants of Public Health

This section provides a summary assessment of the determinants that affect the public health situation in the Project area. More details can be found APPENDIX 3.

Disease Profile

Water-born diseases are the major public health concern for the population in the Project area, especially for flood and erosion victims living on and around the embankment. This is mainly due to their overall low living standards including the limited access to clean water and sanitation, especially during flood season from June to October, as shown in Photo 4-1.

Bacterial infections such as diarrhea, dysentery, typhoid and possibly cholera are likely to be prevalent. However, much of the disease burden goes unreported as patients in the Project area seek mostly care in the informal private sector.

No official prevalence data was available for the Project area only. But is can be assumed that many of the self-reported symptoms gathered during the household survey such as fever (82%), cold (52%) headache (36%), and colic pain (10%) are caused by infections, in particular water-born infections such as typhoid fever and diarrhea. (See Figure 4-1.)

Figure 4-1: Top 10 Self-reported symptoms by respondents in RMIP Priority area. Size of font is displayed in proportion of the frequency mentioned.

These finding are also supported by the data provided by the general surgeon in the districts of Bogra and Sirajganj as part of the top 10 reasons for hospital admissions. In Bogra district, diarrhea andgastritis of presumed infectious origin is reported with nearly 18% of all hospital admissions and another 3.5% for typhoid fever. In Sirajganj, 12.25% of all hospital admissions were due to diarrhea. The prevention of water-born diseases such as improvement of sanitation and hygiene will therefore be the primary focus of the developmental interventions in the PHAP.

Table 4-1:Mortality Rates for Different Subgroups, BDHS, 2011

	National*	MDG	Sirajganj			Bogra	
			Zila	Sadar upazila	Kazipur upazila	Zila	Sariakandi upazila
National*	5.66	Na	5.25**	-	-	5.56**	-
Neonatal (# of deaths)	32	Na	32.97**	-	-	49.42	-
Infant mortality (# of deaths/1.000 Life birth)	43	31	32.97	-	-	49.42	-
Under five Mortality (# of/1.000 life birth)	53	48	-	76**	76	-	19**
Maternal mortality Rate (# of deaths/ 100.000 life births)	194****	143	-	-	-	-	-

*** SVRS (Sample Vital Registration System), 2010 *** MICS 2009 **** BMMS 2010, na= non-applicable, - = non available*

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Photo 4-1: Flooding of homesteads including tube well

Mortality Including Status of MDG 4, 5, 6

The national crude death rate has been reported as 5.66 per 1,000 mid-year total populations during 2011. The numbers are slightly lower for the relevant districts with 5.25 and 5.56 per 1,000 mid-year total populations for Sirajganj and Bogra, respectively, as shown in Table 4-1.

It is noteworthy, that the infant mortality rate for Bogra district is slightly higher (49.42) than the national average of 43 deaths per 1.000 life births. Both districts do currently not meet the MDG 4 on child mortality of 31 deaths per 1.000 life births.

According to ICDDR,B, a leading research hospital in Dhaka, the major cause of death for children between 1 and 4 years in Bangladesh is drowning- accounting for 12,000 deaths or 43% of all deaths in this age group. This finding could not be confirmed by the RMIP survey but it is likely to be relevant for the Project area as the affected households live and will continue to live along the river.

The maternal death rate in Bangladesh overall was reduced significantly over the last 20 years. The SVRS data from 2011 show that on a national level there were 209 maternal deaths per 100,000 life births versus 473 maternal deaths in 1990. There was a minor difference between urban and rural areas, 196 deaths in urban areas versus 215 deaths in rural areas in 2011. [1] The MDG 5 target of 143 deaths per 100,000 life births is likely to be met by 2015. No local data was available. See also table 2.1 for an overview of mortality rates for different sub groups.

According to the RMIP survey, the vast majority of deliveries (70%) in the Priority area were assisted by a traditional birth attendant at home and only about 10% by a trained one. Although, the self-reported survey conducted amongst the project-affected population did not show any maternal or child death within the last six months, training and attendance of skilled birth attendants as well as preventive measures to reduce drowning of children need to be included in the Public Health Action Plan to reduce the risk for child and maternal deaths.

The MDGs 6 relate to the combat against HIV/AIDS, Malaria and Tuberculosis. HIV in Bangladesh remains at very low levels with an estimated 0.1 % prevalence nationwide in 2011 and a concentration

within IDU in Dhaka according to the 9th serological survey.

Malaria is not a public health issue in the Project area. Accordingto the Bangladesh's National MalariaControl Program, malaria is endemic in Sylhet, Chittagong and the northeastern part of the Dhaka division where 98% of all reported cases come from.[4]

Tuberculosis is prevalent in Bangladesh and likely in the Project area, although no local data was available. According to the MDG status report for Bangladesh, the 2015 target of 320 cases of Tb or 38 deaths per 100,000 people can still be met. This is likely due to the high Tb detection rate of 70% through Directly Observed Treatment, Short-Course (DOTS), which already met its 2015 target.

Targeted activities focusing on the prevention of HIV/AIDS, malaria, and Tb mainly through IEC initiatives have been planned building upon the measures of the national control programs. Special attention has been given to the incoming but limited construction workforce (about 100) focusing also on IEC initiatives plus VCT and condom distribution to prevent HIV/AIDS and STDs. It is covered in more detail in the health and safety plan for the construction workforce.

Poverty

People living on and along the embankment area are mostly flood and erosion victims of the Brahmaputra-Jamuna who lost their land and often also their house and belongings to the river. They are mostly squatters seeking refuge on the elevated embankment owned by the BWDB or *khas* (government) land.

Between 39 to 49 % of the population in the project districts of Sirajganj and Bogra fall under the Upper Poverty level[5], which is 8- to 19 percent higher compared to the national average. Given the immense impact of river erosion and flooding on people's life, the Project including the social development activities represents an immense opportunity to improve the overall living conditions of the PAP and to reduce their poverty overall.

Literacy and Health Education

The illiteracy rate in the suggested priority area is relatively low; only 13.6% of men and 10.09 % of women in Sirajganj district and 13.9% or 12.2% in Bogra district, respectively, are illiterate. More than 50% of the population surveyed completed levels 1-4, 5-7 or 8-9. The education and literacy level in the area can therefore be rated as moderate and will allow for possible dissemination of written information and education materials. The health awareness is expected to be moderate to low, as national public health education programs often do not reach a wide rural audience. Hand washing, for example, is only practiced before eating (92% of respondents) but not for preparing food, feeding children or eating fruit (all 16% or less). Therefore, IEC interventions have been planned.

Water Supply

Nearly 100% of the surveyed population indicated that tube wells are their major source of water supply. An example is shown on photo 6. 97% of households living on the embankment indicated that they have access to a tube well within a 150m distance. Furthermore, 50% of respondents living on the embankment indicated in the RMIP household survey that their tube well water is contaminated. These

[4]Bangladesh National Malaria ControlProgram, www.nmcp.info
[5]World Bank, PovertyMaps Bangladesch 2010

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Photo 4-2: Tube well used

numbers could not be confirmed by secondary data prepared by research institutes, the government or NGOs.

The collected data related to arsenic contamination of tube wells is contradictory and requires further investigation through testing.

Latrines

The majority of households (53.56%) indicated to use a pit latrine. Those as well as hanging or open toilets are not meeting the hygienic standard, as they are more likely to be a source of infectious diseases. Water-sealed slap latrines, the minimum recommended standard, is currently only met by 31.34% households, shown in Photo 4-3. A very small minority of 3.28% households owns a modern toilet or septic tank.

An upgrade to water-sealed slap latrines is therefore required. However, it will need to be ensured that a water source for flushing the water-sealed toilet is close by to ensure its proper usage. As observed in the field, most people remove the water seal as they do not see the benefit of it, but only perceive is as an extra hassle that the water seal requires more water to remove faeces in comparison to a pit toilet. Therefore, many households remove the water seal.

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Photo 4-3: Slab latrine

Indoor Pollution

The population in rural areas including the RMIP priority reach uses traditional fuels such as cow dunk, jutes sticks or other agricultural waste for cooking. The poorly ventilated inefficient stoves that are mostly set up indoors produce smoke, carbon monoxide and carcinogens, as shown in photo 8. Women and children are exposed to the toxic pollution leading to about 46,000 deaths of women and children per year in Bangladesh according to the WHO. 70% of the victims are children under 5. Many more millions suffer from respiratory disease, asthma, chronic obstructive pulmonary disease (COPD), eye problems and lung cancer as a direct result from indoor pollution. Although there are no exact numbers for the Priority reach, the negative health impact can be expected to be high. An intervention is strongly recommended.

Pesticide Poisoning

Overutilization and improper usageof pesticides, especially carbonates, organochlorides and organophosphates has become an increasing concern in Bangladesh [6] . Poisoning including biological substances is in the top 10 reasons of death in Sirajganj district (see Table 2.4 in the Appendix). The risk is likely to increase with an expected improvement in agricultural productivity in

[6]Dasgupta, S, Meisner C., Huq, M., HealthEffectsandPresticidePerceptionasdeterminantofpesticideuseevidence in Bangladesh, World Bank Policy Research Working Paper 3776, November 2005

the Project area. The direct exposure of farmworkers to pesticides as well as the indirect exposure by people consuming agricultural products and or water with toxic pesticide levels can lead to severe health effects such as cancer and neurological disorders, especially in children who are more vulnerable to toxic exposures. Only a multi-layered approach spanning from strict environmental regulations, awareness and education as well as management of individuals or natural assets exposed to toxic levels of pesticides will be effective. Appropriate health-related interventions on the community level are discussed under interventions.

Nutritional Status

A considerable share of children in the program area is malnourished.

The proportion of underweight children is highest (41.7%) among children aged 24-35 months and lowest (31.0%) among children aged 6-11 months. Furthermore, children living on the old embankment not in the right of way of the new embankment show a higher degree of underweight (41.5%) compared with children living on the embankment areas within the proposed plan (38.0%) or children living between the embankment and the riverside (36.0%). The proportion of underweight children is lowest (22.7%) within households living towards the village side.

An intervention supporting the improvement of the nutritional status of children will be considered.

Family Planning

Bangladesh has made major strides in reducing the fertility rate from 6.96 children per woman down to 2.2 in 2012. This is thanks to strong family planning efforts including free provision of contraceptives and awareness campaigns carried out by the Ministry of Health and Family Welfare.

According to the conducted survey, around 100% of respondents in the Priority area indicated to use family planning methods, independent if they live on, inside or outside the embankment. Therefore, no project interventions have been set up. The PHAP is counting on the existing programs by the Ministry of Health and Family Welfare.

Photo: GIZ

Photo 4-4: Women being exposed to indoor pollution

Immunization

The immunization coverage in the affected districts of Bogra and Sirajganj reaches, according to national sources, between 81% and 100% for all required vaccines. The numbers are similar for the Project area. Therefore, no project interventions have been planned. The PHAP is counting on existing programs by the Ministry of Health and Family Welfare.

Gender Aspects

Sexual assault and violence have been identified as issues, particularly for the project-affected population. This is further discussed and addressed in the previous chapter on Gender Mainstreaming.

Health Infrastructure, Services and Health Seeking Behavior in Project Affected Area

For this study, three indicators were chosen to determine access and quality of health services: treatment received during illness, satisfaction with services, and distance to the next health services. It is important to note, that while these indicators may reflect the population's perception of health services, it is not necessarily reflecting the real quality impacting health outcomes as most individuals seek care in the informal sector at untrained village doctors or medicine shop owners (see photo 9).

Ninety-eight percent of the respondents in the household survey indicated that they received treatment in case of an illness. These very positive findings do, however, not take into account the level

of qualification of the health care providers. Regarding the quality of services, 72% of respondents in the project area rated the quality as 'good' and another 17% as 'satisfactory'.

These numbers can be misleading as discussed in the first paragraph. Independent international health specialists rate the service quality in the public health facilities as substandard, even compared with other least developed countries. The main reasons for poor health care delivery in public facilities are the discrepancy between the facilities' capacity and their catchment population size, the shortage of qualified staff, equipment, medicines, and a lack of effective management and absenteeism.

Across the RMIP survey respondents in all four districts, most of them indicated that their closest health facility is less than 2km or between 2-10km away taking into account formal and informal providers. While these numbers contribute to a very good accessibility, the qualification of these health care providers is mostly substandard, as mentioned above. Informal health service providers are most easily accessible within RMIP accounting for 43 in total – 22 medicine shops clustered around the bazaar area and 21 village doctors (see Table 4-2and Figure) on the next page. Their lack of training and education and a lack of diagnostics lead to a high degree of misdiagnosis and mistreatment including over-prescription of antibiotics being a major issue.

The health seeking behaviors indicates that almost half of the respondents visit the public upazila health complex. But informal private providers such as village doctors and pharmacy shops (see Table 4-2)account for more then half of the options mentioned with 36% and 23 %, respectively. Multiple mentioningwas possible. Although, these findings would support capacity development and training of informal providers, the limited short-term capacity building which could be in scope of this SDP is likely to give informal providers more credibility after receiving a certificate for the course. However, it will have a small likelihood of changing their prescription pattern and will not allow them provide adequate medical care.

Table 4-2: Public and private informal health facilities providers in priority area[7]

Type of Facility/Provider	Number
Community clinic	30
Satellite clinic	16
Medicine shop	22
Family Welfare Centre	2
Village doctor	21
SBA	11
TBA	7
TTBA	7
Medicine shop owner	2
Union Health Complex	2
Estimated Total	120

[7] It represents more than 80% of all health care providers (100% of public providers) in the area. Kutubpur and Chondonbaishaunion in ShariakandiUpazilla were not accessible due to flood and breach of embankment. Some of the health care facilities are washed away or temporarily closed at that area.

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Photo 4-5: Village pharmacist /medicine shop

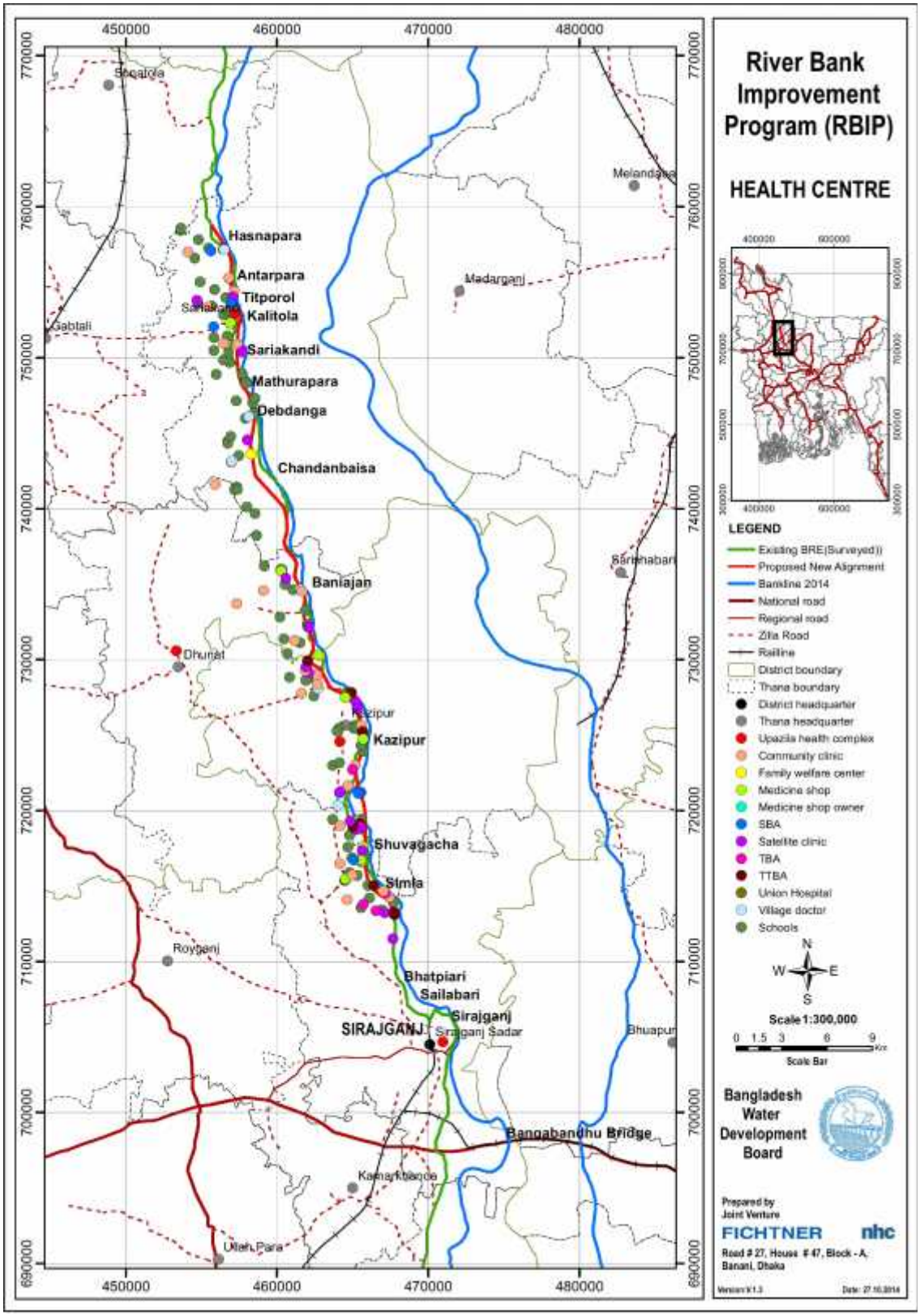


Figure 4-2: Health Service Providers (Public and Informal Private) in Priority Area[8] 4.2.

[8]It represents more than 80% of all health care providers (100% of public providers) in the area. Kutubpur and ChondonbaishaunioninShariakandiUpazilla were not accessible due to flood and breach of embankment. Some of the health care facilities were washed away or temporarily closed at that area.

4.2 Potential Public Health Impacts

Positive Impacts

Increased Awareness, Knowledge and Information: ExtensiveIEC programs on relevant health promoting topics to all different types of community members play a critical role to ideally prevent or better manage diseases in the future.

Improved Health Services: The project can support capacity building through continuous medical education for existing public health staff or vocational training for community-based health care workers and skilled birth attendants, which will improve the quality of health care services leading ultimately to better health outcomes for the project affected communities.

Improved Health Conditions for Households: The project can be used to improve basic amenities for households opting to move to the resettlement village or those remaining on the old embankment. Selected amenities that improve hygiene, provide safe drinking water and reduce pollution will contribute to healthier living conditions for people in the project area.

Negative Impacts

Resettlement-Related Public Health Aspects:A large number of households (3,639) will be resettled during the Project. According to an initial survey/census estimate, about 55 percent of affected household indicated that they will do their own resettlement, also referred to as 'self-managed resettlement'. Many prefer this option as it provides choices and personal options in decision-making. However, others with limited options or choices will be resettled in sites to be designed and constructed by the Project. Currently, 1,594 households opt to move into resettlement sites. An estimated 15 sites of various sizes (from 50 to 300 plots) are being planned. Depending on the size of the specific site, civic amenities such as water, access roads and others will be provided (see Vol. 2 RAP for more details). In addition, those opting for self-managed resettlement will also be covered under the health action plan. Self-managed resettlements will likely have less environmental and health risks as those for large resettlement sites. The health plan will monitor those moving on their own choice to places and locations due to factors such as availability of residual land for housing and support from kin/relatives. It is expected that these resettlers will be well integrated with the local and host communities. These resettlers will have better access to existing health facilities. In sum, those resettled on their own will experience minimal disruption with many of the civic and health amenities still accessible.

Thus, the public health action plan will focus more on the Project-sponsored resettlement sites due to density of settlement and lack of health amenities on site. The resettlement sites will typically have basic public health-related amenities such as tube-wells for safe drinking water (1 tube well per5 families on site); water-sealed slap latrine for each family; clean cooking stoves, provisions for solid waste management; and additional support (for example, site-specific Village Health Worker/VHW) to provide access to health benefits and facilities. See also the sub chapter 4.3 on interventions below.

Health Risks During Construction Period: No apparent pre-construction health hazards are expected due to the type of planned construction activities in RMIP I (priority stretch), which will include bankline protection and revetment works as well as reconstruction and/or strengthening of the existing embankment.

During the construction phase, the population living in close proximity of the construction area, people living in and around the potential resettlement sites, the construction workforce and individuals drawn to the area in search of income opportunities will be exposed to a number of temporary risks such as exposure to dust, noise, pollution, infectious disease, and various hazards, including potential conflict with "outsiders" to the project area about employment and income. The environmental management plan (EMP) has addressed these temporary risks with appropriate mitigation measures.

The construction phase will be of limited duration, only during the dry seasons (December to May). The effects, however, can last much beyond. The presence of labor from outside of the community poses a critical risk factor. Targeted interventions

related to the risk of infectious diseases such as HIV/AIDS and STDs will be in the IEC materials for dissemination among the local villagers. In addition, the Environmental Management Plan will cover HIV/AIDs and STDs.

4.3 Interventions for Public Health

This section presents the planned interventions that have been derived from the overall objectives of the public health component and the health assessment discussed in the previous sub chapters.They are organized by the two overarching objectives for the public health plan and summarized in Figure 5.

4.3.1.To Mitigate Possible Public Health and Safety Hazards Related to the Construction of RMIPand Associated Resettlement

As the primary objective of the PHAP is to prevent or manage health and safety hazards related to the Project, the following interventions are designated as of high priority.

Pre-construction period

Information, Education and Communication Programs (IEC)

Objective: Ensure awareness and knowledge about health hazards related to RMIP such as increased road traffic, noise, pollution, increased risk for HIV/AIDS and STD, Tb, sexual assault (for women).

Activities:

- Conduct awareness and education sessions on RMIP-related risks with children in schools, women groups, and men
- Distribute flyers and briefly inform informal health care providers on RMIP-related health risks
- Put up information board on central sites close to construction site

Target group: Communities on and around the embankment and neighboring village to construction

Targets:

- Reach at least 60% of target population
  Set up one information board on potential health hazards and how to prevent them on each major intersection/bazar close to the construction site (total of 12).

Public Health Staff Capacity Development

Objective:Ensure knowledge and skills about diseases and injuries related to construction of RMIP such as dust, combustion gas, emissions to soil and water, inadequately managed waste including biological waste, noise as well as HIV/AIDS, Tb and emergency health care, traumatology, stabilization and referral.

Activity:

- Conduct training sessions about how to manage possible project-related health hazards.

Target group: Health staff at public upazila and zila health complex

Targets:

- All health staff at public health facilities in community (30 union health centers) and upazila health complexes (2) along the embankment
- Key personnel at district level hospital in Bogra and Sirajganj

Resettlement Sites and Housing

Objective: Ensure improved living conditions at new resettlement sites improving public health standard

Activities:
All households in all resettlement sites will have

i. Access to health care facilities within 10km
ii. Minimum of swamp and standing water to reduce risk of malaria breeding ground
iii. Well-ventilated houses (to be constructed by the resettlers on assigned plots)
iv. One well-ventilated efficient cooking stoves per household (ideally outside but covered)
v. Easy to maintain drainage system
vi. Guarded off solid waste disposal sites
vii. One water-sealed slap latrine per household
viii. One manual tube well with safe drinking water (arsenic free) per 5 households
ix. Minimum 30 feet distance between latrine and tube well
x. Provision of solar home systems or nano-grids

Target group: Households that will move to resettlement sites.

During construction

Occupational Health

A comprehensive health, safety and environmental plan will be developed that includes activities such as:

- Wearing of safety gear
- Hearing protection for workforce operating noisy equipment
- Respiratory protective equipment, as needed, for workers exposed to high dust, especially during dry season
- Limitation of working hours from 7am-7pm
- Wearing of seat belts in cars
- Washing off tires of vehicles with large amounts of sludge to prevent heavy dirt on roads
- Adequate supply of water for washing and drinking
- Proper waste water management
- IEC campaign on prevention of HIV/AIDS, Tb, STD

Target group: Local and non-local construction work force

Public latrines

Objective: Ensure sufficient latrines for men and women due to potential temporary increase of population attracted by commercial activity.

Activity:

- Place temporary public latrines for men and women in areas that may attract additional vendors due to the construction site

Target group:Migrants attracted by commercial opportunities such as shop owners and host population.

Construction Traffic Control

Objective:Ensure mechanisms to voice traffic violations for pass-through construction traffic i.e. complain toll-free hotline with contractor and to promote road safety.

Activities:

- Set up road signs on accident-prone areas due to increased construction traffic
- Set up a complain line for community to report reckless driving and traffic violations caused by contractors

Target group: Communities living along the construction sites or along the access road to the site

4.3.2. ToImprove the Overall Public Health Situation in Project Area

Information, Education and Communication Programs (IEC)

Objective:Ensure awareness and knowledge about health-related issues to prevent diseases including HIV/AIDS and STDs, Tb, reproductive health, 5 danger signs of risk pregnancy, hand washing, proper sanitation, safe drinking water, variety of nutrition, importance of clean drainage and hygiene in community.

Activities:

- Conduct interactive health awareness and education sessions with women, men and children, i.e. in form of plays
- Launch a hand-wash initiative in schools that teaches children to promote hand washing with their peers but also their families

Target group: Households that will move to resettlement sites, those relocated on their own choices and those remaining on old embankment.

Targets:

- Reach 60% of population in Project area

Water and Sanitation Infrastructure

Objective:Ensure minimum hygiene standard and safety for latrines and drinking water to reduce the risk for water-born diseases. Making water source available in proximity to water-sealed latrines for flushing, otherwise households will not use water-seal.

Activities:

- Install a water-sealed slap latrines
- Test water safety of existing non-tested tube wells
- Install arsenic-free tube wells, where needed

Target group: Households remaining on the old embankment.

Targets:

- Test for arsenic contamination of existing tube wells accessed by households remaining on the old embankment
- Build one safe tube well in proximity (max 100 meters) to max 5 households, if necessary
- Install one water-sealed slap toilet per household as minimum standard ensuring 100% coverage (some may have it already). The toilet should be in close proximity to water source for flushingbut not to be mixed or used for drinking water (min 10m distance).
- Each household is aware of the health benefits of using the water-sealed latrines and keeping the water-seal on the toilet

Clean Cooking Stoves

Objective: Promote well-ventilated and efficient cooking stoves to prevent the risk of asthma and COPD caused by indoor pollution by giving subsidies of 50% for households interested to buy.

Activities:

- Promote and make clean cooking stove technology available for an affordable subsidized price.
- Further feasibility assessments will be required

Target group: Households remaining on the old embankment

Targets:

- Cover about 50% of population who purchase and install one efficient and safe cooking stove per household ('Bondhu Chula' model)

Community Health Worker Training

Objective: Improve maternal and child health status, in particular neonatal health, and build income opportunities for women within the community.

Activity:

- Train skilled birth attendants and later build upon their initial delivery training to become health care worker, serving especially women and children in the

Target group: Women from resettlement sites and living on old embankment.

Targets:

- Train a minimum of 1 woman per km on the old embankment and 1 per women per resettlement site,
- Increase rate of attended deliveries by women in affected communities by skilled birth attendant by 50% by the end of 5 years

Road Safety

Objective: Ensure improved road safety with the construction of a 2- or 4-way highway.

Activities:

- Set up road signs on accident-prone areas
- Build speed reduction bumpers, if appropriate, at schools, mosques or bazars with high frequency of passenger crossing
- Education about road safety in schools

Target group: Communities living along the highway.

Targets:

- Install road signs at each major crossing
- Conduct road safety training in all schools along the priority area

Pesticide Poisoning

Objective: Prevent and reduce the health affects of poisoning through exposure to toxic levels of pesticides (see for further details also Environmental Management Plan – EMP)

Activities:

- Awareness raising about proper storage, use of pesticides as well as health consequences for farmers and pesticide retailers
- Education on prevention and early recognition of symptoms of poisoning for children and women
- Training of public health staff to diagnose and treat poisoning by pesticide

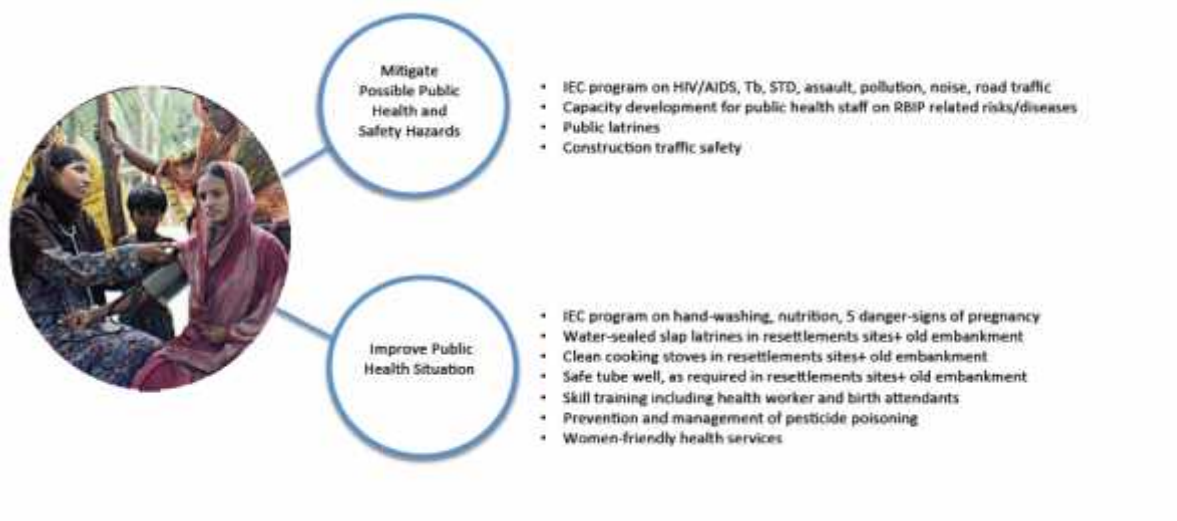


Figure 4-3: Summary of health interventions by objective

Target groups: Farmers, women, school children, and health staff at public health facilities in priority reach area.

Targets:

- Train x% of the pesticide retailers on proper pesticide use, storage and health consequences
- Conduct two community sessions per mouza in schools and women's groups along the embankment on the impact, prevention, early symptoms and first aid of poisoning through pesticides.
- All health staff at public health facilities in community (30 union health centers) and upazila health complexes (2) along the embankment should be covered to raise awareness on pesticides poisoning.

4.4 Implementation Planning

In a next step, a Social NGO (hereafter SONGO) will be engaged to implement the Social Development Plan and an Implementing NGO (hereafter INGO) for implementation of the Resettlement Action Plan.

As a priority, the SONGO will further assess and refine the discussed interventions that are set up to mitigate public health and safety risks in close collaboration with all relevant stakeholders (public health administrators, schools, mosques, directly and indirectly project-affected households and communities, contractor,etc.)

The SONGO lead health specialist will work closely with the supervision consultant, engineers and INGO to ensure that the health-promoting standards for the resettlement sites are successfully implemented.

Prior to implementation of the overall public health promoting measures, the SONGO will conduct further household and community surveys and consultations with the project-affected households as well as with beneficiary communities to further develop and refine the most appropriate and needed health promoting programs for the community and individual households. Every year, it will re-assess and prioritize the health promoting interventions in close collaboration with the communities and translate those agreed measures into an annual implementation plan. The implementation plans for each PAP and beneficiary community will include the appropriate budget allocations, staffing, management operations and monitoring mechanism to ensure an effective implementation of the public health programs over the five-year program period. See also Chapter 5 Implementation Framework.

PART III: IMPLEMENTATION FRAMEWORK, COST AND BUDGET

The SDP involving livelihoods, gender and public health will be implemented over a period of 5 years. BWDB will engage an experienced and nationally reputed SONGO to implement SDP programs in partnership with local NGOs in the Project area. The SONGO will update all three programs based on needs assessment surveys and prepare a work plan prior to implementation. The institutional framework for implementation is discussed in this next section. The SDP program and implementation cost and budget will also be presented.

5. Implementation Framework

5.1 Role of Project Director - PMO

BWDB, in particular the Project Management Office (PMO) headed by the Project Director (PD), will be responsible for the implementation and monitoring of all interventions under SDP dedicated to overall improvements in income and health of the affected and beneficiary groups in the project area. The PD will be assisted by the Director of Environmental and Social Development Unit (ESDU) of the Project in matters related to the appropriate and timely implementation of this plan.

5.2 ESDU and Field Staff

A Superintendent Engineer (SE) of BWDB will be appointed as Director–ESDU with the following field staff. Two Executive Engineers (ExEn) will be posted in Sirajganj and Bogra Districts as Deputy Director (DD)–ESDU to guide and supervise the SONGO activities in their respective district. At the field level, two Sub-Divisional Engineers (SDE) as Assistant Directors (ADs) for Resettlement/SDP will assist the DDs in day-to-day operational activities.

5.3 SONGO – Team and Staffing

The Director PMO will engage an experienced and nationally recognized organization as Social NGO (SONGO) that will lead the implementation of the social development plan. The TOR and staffing of the SONGO is available in APPENDIX 4. Key staff in the SONGO include a Team Leader, three Lead Specialists (Livelihood, Gender and Public Health) to head their respective work streams working with local partner NGOs to implement, monitor and report progress of the programs. (See APPENDIX 5 for TOR of livelihood, gender and health specialist) The SONGO will be required to align with all relevant stakeholders of the project- PMO, the field offices, and other parties as relevant across the livelihood, gender and health work stream. The PMO office will provide guidance and support to the SONGO and the local partner NGOs, as necessary. The Social Development Specialist (International) of the Construction Supervision Consultants (CSC) will provide further technical guidance and assistance.

The SONGO will coordinate with the management of all relevant institutional and administrative stakeholders at the upazila and zila levels and in particular with the responsible line ministry i.e. Ministry of Agricultural for Livelihood, the Ministry of Health and Family Welfare (MoHFW) and the General Surgeon's Office for health- and gender-related issues, as appropriate. This will ensure that the programs will align with existing institutional structures to facilitate the effective implementation of the SDP. The interventions are planned as time-based project activities for improved income and well-being of the population in the Project area. However, the experience of the first 50 km Priority reach will influence the design of the social development plan for the remainder of the Program (RMIP-II). The SONGO will be encouraged to harness local entrepreneurs for the implementation of the programs, where possible and find a mechanism to involve and/or hire local people as health workers, program facilitator, paid workers to develop local ownership of the programs.

5.4 Role of Local Partner NGO

The Social NGO will engage local partner NGOs that ideally work with vulnerable communities for livelihood improvements, gender and health in the project area. There are many experienced local NGOs

working in these fields. The local NGOs will have orientation and training by the SONGO and project staff prior to SDP implementation.

Each of the local partners NGO (6) will have dedicated and locally hired staff and workers for each component in each district that will be skilled to work with the communities and perform responsible 'social mobilization' as needed. The SONGO Team Leaders and respective Program Specialist for livelihood, gender and public health will engage and work with affected/beneficiary communities to mobilize necessary support for the program planning and implementation.

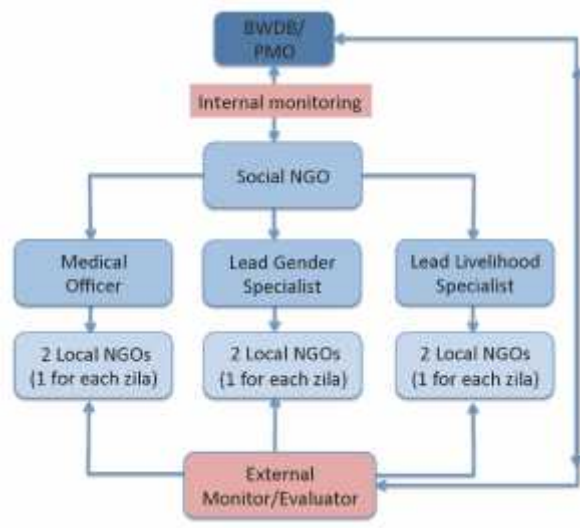


Figure 5-1:Governance structure for implementation, monitoring and evaluation of the Social Development Plan

5.5 Local Capacity Building

The SONGO and local NGOs will ensure that local capacitywill be built through the implementation of the SDP that will allow the communities to benefit from beyond the 5-year time frame. This will include skill development, training, work experience and project managements.

5.6 Implementation Planning

In a next step, a Social NGO (hereafter SONGO) will be engaged to refine and implement the Social Development Plan.

In general, the SONGO will first prioritize all activities related to the mitigation of project-related impacts, such as mitigating public health risks related to construction and planning for gender- responsible resettlement as well as income restoration.

Before implementing the suggested developmental programs presented in the previous chapters, the SONGO will further assess and refine the discussed interventions through further households and community surveys as well as consultations with the project-affected people as well as the beneficiary communities. See each individual chapter for livelihood, gender and health for more details.

Overall, the SONGOwill for each of the three dimensions- livelihood, genderand health- re-assess and prioritize the development programs every year. It will do this in close collaboration and negotiation with the affected and beneficiaries individual and groups and translate those agreed measures into an annual implementation plan. Each implementation planwill include the appropriate budget allocations, staffing, management operations and monitoring mechanism to ensure the effective implementation of the programs over the five-year program period and allow for adjustment on the way.

5.7 Cost and Budget Summary

A summary table of the estimated cost and budget for SDP is presented in table 6 below. A detailed break down by program for the livelihood, gender and health component as well as the SONGO implementation costs can be found in APPENDIX 6.

Table 5-1: Budget summary by subcomponent

Sub Component	Total in BDT (million)	Total in USD (million)	Annual Break Down in BDT (million)				
			1	2	3	4	5
Income and Livelihood	203.6	2.63	20.5	40.5	60.8	60.8	21.0
Gender Mainstreaming	50.1	0.65	5.1	10.0	15.0	15.0	5.0
Public Health	215.4	2.80	21.6	43.1	64.6	64.6	21.5
SDP/SONGO Implementation costs	133.5	1.71	25.0	28.0	28.0	28.0	24.5
Total SDP	**602.6**	**7.79**	**72.2**	**121.6**	**168.4**	**168.4**	**72.0**

PART IV: MONITORING AND EVALUATION

6. Monitoring and Reporting Arrangements

6.1 Internal Monitoring

The SDP implementation will be monitored both internally and externally. For internal monitoring, the Director-ESDU will set up monitoring arrangements with the SONGO. A list of multiple indicators across the three SDP Programs – livelihood, gender and public health – has been designed for monitoring purpose (see Table 7). TheSONGO will be responsible to provide monthly, quarterly and annual progress reports (MPR) on the status of the implementation of the SDP to the PMO including budget updates.

6.2 External Monitoring

The independent external M&E specialist/agency to be hired for SAP activities (i.e. resettlement, stakeholders participation, communication and SDP) will evaluate the SDP implementation bi-annually. The TOR for external M&E is available in Volume 3 RAP. The regular status reports by the external specialist/agency will be available to all stakeholders and posted in the Project's website.

6.3 Complaint Monitoring

Complaints and grievances will be handled through the established GRC systems in the Project. Any complaints related to SP programs must be first submitted to the Local GRC for review and deliberations. Unresolved cases will be forwarded to Project-level GRC (see Vo. 2 –RAP). All complaints andresolution will be reported in the MPR.The external monitoring agency /specialist will also review the complaints/grievances and the grievance process on a bi-annual basis.

6.4 Methodology and Indicators

6.4.1 Methodology

Both internal and external monitoring will involve qualitative and quantitative methods. Therefore, the progress reports must reflect results from Participatory Rapid Appraisal (PRA); community based consultation meetings, interviews, case studies of project-affected people and beneficiaries as well as others, as appropriate. The monitoring reports will contain progress of all three social development programs.

6.4.2 Key Indicators

Table 6.1.provides a list of suggested key indicators for all programs by subcomponent.

Table 6-1: Overview of Indicators and Targets for SDP

Key Activity/Intervention	Indicators/Targets
Overall budget and timing	All activities have been implemented according to plan within the given budget and timeframe
ILRP	
Cash Assistance to Support Lost Income and Livelihood	• List and file, as well as provide documents, to x number of people receiving cash assistance • Number of qualified people receiving appropriate amount according to resettlement matrix
Assistance to re-establish small businesses Employment in Construction Site and	• Support all small businesses such as tea stalls and small shops that need to be re-settled to re-establish their business in the resettlement site or somewhere close by including finding appropriate location • Ensure that all individuals with an ID that identifies them as project-affected and that are interested and suitable to work in the construction

Key Activity/Intervention	Indicators/Targets
Construction-Supporting Sector	site will be hired • All individuals with an ID that identifies them as project-affected and that have the same qualification as somebody without an ID will be given preference in hiring for project-supporting work such as surveys.
Special cash assistance to support vulnerable households	• All individuals that are considered vulnerable (FHH, poverty, disabled HH) will receive additional cash assistance as outlined in the entitlement matrix
Social Forestry on Embankment Slopes	• X kilometers of embankment well maintained through social forestry along the slopes
Improving productivity and diversification	• Growth in production, sales and profit of subsectors businesses (vegetables fruit, medicinal plants, livestock, poultry, fisheries)as agreed with each community (% increase compared to baseline figure)
Capacity and skill training	• Training of x individuals in each community as per agreement with each community focusing on the vulnerable and un-employed youth
Solar Home System installation	• Install solar home systems in each resettlement site to supply each HH
Grants for Livelihood Enhancement	• Disburse x grants per community to individuals that are eligible for the livelihood enhancement grant after the submission and review of their convincing business plan

Key Activity/Intervention	Indicators/Targets
`GAP	
Promote Women's Participation	• At least one women in each relevant committee (resettlement committee, GRC) • All relevant information to the project will be disclosed also through women-relevant channels such as gathering specific women gatherings in each community • Hire at least one women per monitoring team to assess and monitoring progress on activities
Employment Opportunities for Women	• X% female construction employment for those interested to work in the construction site • X% women employed with project NGOs in the office and in field as support staff, community mobilizers, health workers, small business and other income earning opportunities. • x women drawn from resettlement sites and from old embankment to be trained as skilled birth attendants/ community health worker • X% involvement in embankment maintenance
Gender-Responsible Resettlement Measures	• X% women to be part of RAP- IC • One member of Local Women's Group to be at GRC • All compensation processed as outlined in RAP • X% of HH get shared landowner title for newly acquired land in resettlement site
Provide Services and Safeguards	• Conduct at least one awareness raising and training session for women in each community in the project- area on VAW, HIV, CM, human trafficking • Ensure that FHH or women receive transportation assistance, if required, during the resettlement process and to implement the SDP activities • Establish a women's corner in each community if agreed with community
Enhance Capacity on Gender Mainstreaming within BWDB	BWDB to hire a gender advisor to counsel on GM BWDB will conduct at least one gender orientation and training on the central (Dhaka) and the regional level (Bogra and Sirajganj)
PHAP	
IEC Programs	• Reach at least x% of target population to inform about RMIP related health and safety hazards • Set up at one information boards on health hazards and how to prevent on each major intersection • X% increase in hand washing practice in adult and child population • Reach at least x% of resettlement site HH, host populations and HH on old embankment with general health information (nutrition, pesticide, 5-pregnancy danger signs) • Set up one information board on health promotion per resettlement site (approximately 10-15)
Capacity development public health staff	• Conduct one training session on project-related hazards and risk for all public health staff at all community health centers, upazila health complexes and the zila hospitals in the project area •
Public latrines	• Set up temporary public latrines at all bazar area that attract more than x number of new business due to construction site

Key Activity/Intervention	Indicators/Targets
Construction Safety	• Set up x number of information boards/traffic sign on places with increased traffic and high population such as schools, bazars, crossings • Install one free of charge complaint line for individuals to voice traffic violations or increased risks caused by construction traffic
Occupational Health and Safety	• Availability of approved Health Safety and Environmental Plan (HSE) • Number of HSE trainings conducted • Availability of trained HSE staff with the contractors • Number of accidents • Number of near misses • Number of non-compliances identified by Construction -Supervision Consultants • Number of related public complaints (grievances)
Improved public-health standards in resettlement households and for HH remaining on old embankment	• Resettlement sites: Installing safe tube well per 5 HH, water-sealed slap latrine in each HH, clean efficient cooking stove in each HH and solar home systems in each resettlement site, as needed • Old embankment: Conduct tube well testing, Install safe tube wells, as necessary and agreed with community • One water-sealed slap latrines per HH, reach x% of HH with clean cooking stoves in beneficiary communities as agreed with communities
SBA/ Community health worker capacity development	• Train a minimum of x women per affected mouza and resettlement site as skilled birth attendant • Increase rate of attended deliveries by women in affected communities by skilled birth attendant by x% by the end of year 5 • % Increase of service quality by providing women-friendly health services

APPENDIX 1

Income and Livelihood Supporting Data, Assessment and Methodology

Income and Livelihood Supporting Data, Assessment and Methodology

ILRP 1.1. Sustainable Livelihood Analysis for RMIP Priority Area (RMIP-1)

A livelihood analysis guided by the sustainable livelihood framework developed by DFID has been performed (see ILRP Figure 1) with particular focus on the livelihood asset analysis. This analysis will guide to design the strategies and programs to improve livelihood outcome for the directly and indirectly affected populations.

Livelihood data used in for the assessment come from multiple sources, for example the household census for first 50km, the livelihood survey conducted by the livelihood specialist, the loss of income survey for the project-affected populations as well as information collected during consultations with affected and beneficiary groups.

ILRIP 1.2. Review of Livelihood Assets in Project Area (RMIP-1)

Summary

The affected population consists of about 3,639 households or 15,558 people along the Project area (50km priority stretch) that live in the 'right of way' of the new embankment and need to be resettled. Most of them are environmental refugees who lost land and or house to the river and had to move up to seven times seeking refuge on the elevated embankment.

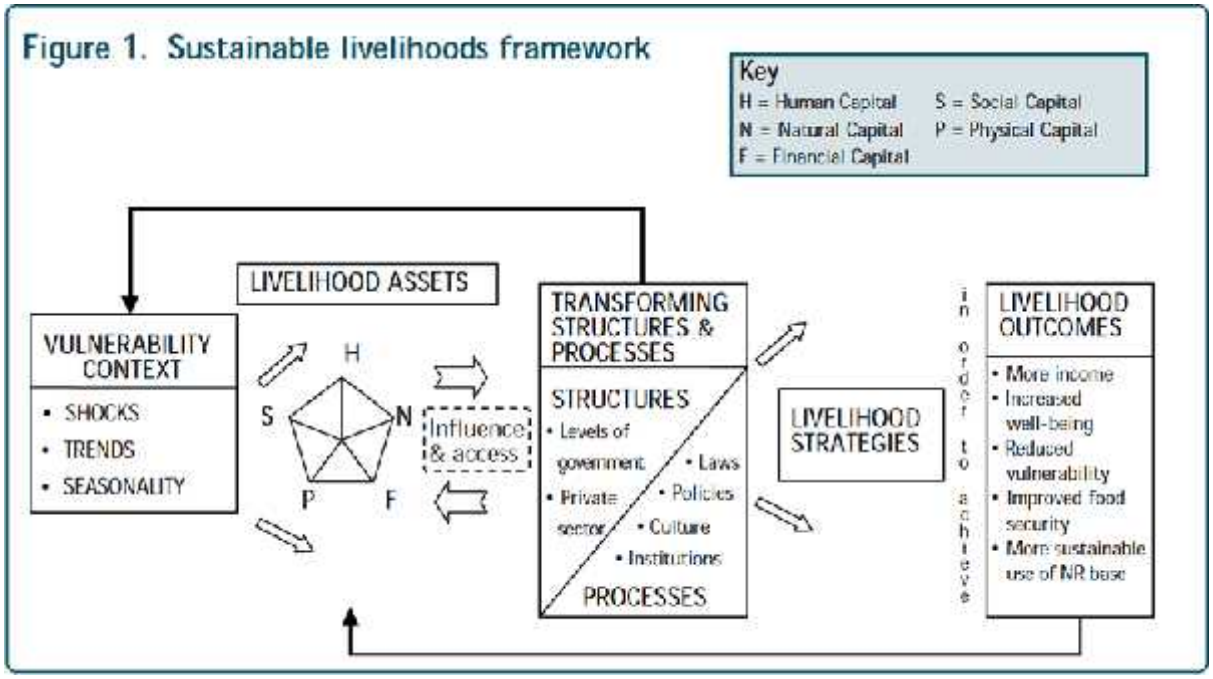
The population overall has a low education and skills level with most household heads being illiterate and working as day laborers in agriculture or non-agriculture.

The area is relatively rich in natural assets such as fruit and banana trees and most households breed livestock or poultry for home use. Also pond fishing is common but not for commercial use.

Nearly half of all household (48%) live below the poverty line with a monthly income of 7,000 BDT or less. Only a small percentage of households have a bank account or have debts.

Given the vulnerability of the households, their social capital is critical for their livelihood and therefore households prefer to be resettled in the nearby locality together with their current neighbors.

Nearly half of the households own land, but mostly only the plot they build their house on (88%). The villages are not connected to the electricity grid and only 7% own solar panels to generate electricity.



Source: Sustainable livelihood guidance sheets, 2.1., DFID, Oct 2001

ILRP Figure 1 Sustainable livelihoods framework

While affected households will loose their home structure, in very few cases some land, and a limited number of fruit and banana trees as well as some backyard poultry and livestock, which they will all be duly compensated for, the project will not take away their livelihood. In fact, besides the compensating foraffected loss of income or assets, the project has an opportunity to deliver improved livelihood outcomes through targeted livelihood building interventions such as skill training and capacity development for a population with a currently low overall living standard.

Human Capital

Socio-Economic Profile

The population living in the RMIP area is to a large degree made up by climate refugees who moved up to seven times driven be the continued erosion of the Brahmaputra-Jamuna river. They sought refuge at the nearby elevated embankment (CENTRAL JRE) that belongs to the government.

According to the Socio-Economic Survey of the Project area, of a total of 3,639 households interviewed 2,924 are male and 171 are female-headed households (see ILRP Table 1).

The vast majority of household heads are as expected between 35-44 years or 45-60 years old. About 80% of households have 1 to 4 members in the household (see ILRP Table 2) cumulating to a total of 13,724 affected persons.

The household heads have had nearly no formal education. About 45% of the male household heads are illiterate while 75% of the female household heads are illiterate (see ILRP Table 3).

208 of the affected 13,774 persons are disabled or long-term sick of which 132 are male and 76 are female (see ILRP Table 4).

Occupation and Skills

About 30% of all affected individuals are involved in income generation of which 26% are men and about 4% are female (see ILRP Table 5). Most income generating individuals, about 28% of people, are day laborer in the agricultural or non-agricultural sector. 10% of people are farmers, 15% work in the service sector and 15% run a business. The rest distributes across rickshaw pulling, selling agricultural products, remittances and crafts (see ILRP table 6)

This small percentage of skilled laborers stretches across a variety of skills such as persons trained in handicrafts (cap, bamboo) and tailoring, carpenter, cobbler, and garment workers. They produce for local needs but are challenged by a lack of market linkage, advanced fashion or newer tailoring techniques and capital shortage.

Besides many seasonal agriculture laborers, there is a large proportion of unemployed educated (V-XII passed) young individuals that are living in the project area. Capacity building and training for these individuals such as working as security guards, mobile and automobile maker, and driver for men and beauty parlor worker, skilled birth attendant, community health worker and vaccinator for women become viable employment options, that will be taken up as interventions.

ILRP Table 1 (Q1.2 & Q1.3): Distribution of households by sex and age of household heads

Age group	Male household heads		Female household heads		Total	
	No.	%	No.	%	No.	%
15 to 24	95	3.2	2	0.4	97	2.9
25 to 34	525	18	38	8.5	563	16.7
35 to 44	815	27.9	69	15.5	884	26.2
45 to 60	987	33.8	165	37.1	1,152	34.2
Above 60	502	17.2	171	38.4	673	20
Total	2924	100	445	100	3,369	100

Source: RMIP SES, 2014

ILRP Table 2 (Q1.1): Number of Persons in HH (HH size)

Relationships	Total	
	No.	%
<2	127	18.7
2	153	22.5
3	192	28.3
4	115	16.9
5	55	8.1
6	21	3.1
>6	16	2.4
Total	**679**	**100**

Source: RMIP SES, 2014

ILRP Table 3 (Q1.5): Distribution of household heads by educational level

Education level	Male		Female		Total	
	Number	%	Number	%	Number	%
Illiterate (none)	1343	45.9	330	74.2	1673	49.7
Primary (i-v)	830	28.4	80	18	910	27
Secondary/vocational (vi-x)	341	11.7	21	4.7	362	10.7
SSC or equivalent	186	6.4	7	1.6	193	5.7
HSC or equivalent	132	4.5	4	0.9	136	4
Tertiary (BS/MS or equivalent)	92	3.1	3	0.7	95	2.8
Total	**2924**	**100**	**445**	**100**	**3369**	**100**

Source: RMIP Household Census, 2014

ILRP Table 4 (Q1.15): Number of disabled, invalids or long-term sick person in the HH

Male		Female		Total (n=13724)	
No.	%	No.	%	No.	%
132	1.0	76	0.6	208	1.5

Source: RMIP Household Census, 2014

ILRP Table 5 (Q1.16): Number of HH members engaged in income generation

Male		Female		Total (n=13724)	
No.	%	No.	%	No.	%
3,609	26.3	516	3.8	4,125	30.1

Source: RMIP Household Census, 2014

Occupation	Male		Female		Total	
	No.	%	No.	%	No.	%
Day laborer (agril./non-agril.)	850	29.1	104	23.4	954	28.3
Agriculture	347	11.9	13	2.9	360	10.7
Renting-out house/land	1	0.0	1	0.2	2	0.1
Crop selling (paddy, potato, etc.)	6	0.2	0	0.0	6	0.2
Livestock selling	12	0.4	17	3.8	29	0.9
Poultry bird selling	1	0.0	2	0.4	3	0.1
Fodder (grass) selling	2	0.1	1	0.2	3	0.1
Milk selling	3	0.1	2	0.4	5	0.1
Service	481	16.5	41	9.2	522	15.5
Handloom owner	3	0.1	0	0.0	3	0.1
Handloom laborer	11	0.4	1	0.2	12	0.4
Rickshaw-van puller	233	8.0	5	1.1	238	7.1
Housewife/unemployed	2	0.1	45	10.1	47	1.4
Old/retired	132	4.5	88	19.8	220	6.5
Student	0	0.0	0	0.0	0	0.0
Business	481	16.5	9	2.0	490	14.5
Carpenter	142	4.9	7	1.6	149	4.4
Blacksmith	4	0.1	0	0.0	4	0.1
Tailor	15	0.5	12	2.7	27	0.8
Fisherman	52	1.8	2	0.4	54	1.6
Remittance	19	0.6	40	9.0	59	1.8
Teacher	26	0.9	0	0.0	26	0.8
Driver	8	0.3	0	0.0	8	0.2
Mason	15	0.5	1	0.2	16	0.5
Physician	2	0.1	0	0.0	2	0.1
Kabiraj/Traditional healer	6	0.2	0	0.0	6	0.2
Boatman	15	0.5	0	0.0	15	0.4
Others	55	1.9	54	12.1	109	3.3
Total	**2,924**	**100.0**	**445**	**100.0**	**3,369**	**100.00**

ILRP Table 6 (Q1.17): Occupation of the heads of households

Source: RMIP SES, 2014

Natural Capital

The natural capital plays an important role for these rural project-affected households who depend to a large degree on natural resources, mostly fruit trees, for their own sustenance.

Field Crops and Fruit Trees

The cropping season in the RMIP priority area is similar to other parts of the country with three distinct cropping seasons: Rabi (November to February), Kharif-1 (March to June) and Kharif-2 (July to October). Several weeks of variations are observed in

plantation and harvest due to variations in timing and quantity of rain, access to irrigation, land and crop type, and availability of seedlings.

The farmers produce rice, jute and various types of vegetables in karif -1 and karif -2 along with the seasonality. While during kharif-1 (summer season) boro rice, jute, chili, and summer vegetables such as

okra*, jail gourd*, snake gourd, bitter gourd, spinach, sweet gourd, cucumber and bottle gourd are grown in the field and around homesteads, aman rice and various types of cucurbits, okra and jail gourd are planted in kharif-2.Duringrabiseason, rice, wheat, maize, potato, mustard, groundnuts, spices (ginger, chili, and turmeric, onion, garlic), pulses and variety of winter vegetables (tomato, radish, carrots, beans, cabbage, cauliflower) are grown.

About 80% of the affected households are expected to loose one or more tree by the Project (see ILRP Table 7). About 60,000 trees of which about 65% are fruit trees and about 34% are banana trees will be affected on private land (see ILRP table 8).

Agricultural Inputs

The main sources of agricultural inputs (seeds, fertilizer, pesticides) come from local or upazila market dealers or open market sellers. The seeds for local rice and vegetables are kept from last year's production, bought or borrowed from neighbors or friends or bought from the market. Hybrid seeds (local or imported) come from BADC or local private companies. Farmers reported quality problems with the available in seeds. All common fertilizer and pesticides (local and foreign) are used by farmers. As of now, there is no interest to use organic fertilizer. Pesticides are used in huge quantities. They are either sprayed by the farmers themselves or by hired persons. Very few farmers have used pheromone traps instead of pesticides. Furthermore, farmers reported that pesticides recommended by dealers sometimes do not work. However, pesticides and fungicides recommended by DAE are not available in local smaller markets but that they need to travel several kilometers to the main market to get them. Most of the farmers also reported that they could not get any training or any other support from DAE for preventing and or treating diseases and pest attack. Capacity building for farmers on better management of agricultural input is needed.

Livestock

Beef fattening is normally not done commercially, but only for family consumption. With Eid season in mind, families keep 1 to 5 cattle per family by feeding them free grass and fodder. Artificial insemination has become popular in the RMIP Project area in recent years. Families buy small cattle from the cattle market that is local or near the upazila markets and raise them. Other livestock such as goat and sheep are currently raised in small numbers.

Raising of goat and sheep represent an excellent opportunity to the affected populations and project beneficiaries to expand their livelihoods.

IRLP Table 7 (Q 4.1): Distribution of HHs whether affected due to losing trees by the Project

Whether trees affected	MHH		FHH		Total	
	No.	%	No.	%	No.	%
Yes	2398	82.0	350	78.7	2748	81.6
No	525	18.0	95	21.3	620	18.4
Total	**2923**	**100**	**445**	**100**	**3368**	**100**

Source: Inventory of Loss Survey, 2014

ILRP Table 8 (Q 4.1): Number of fruit bearing trees on private land affected by the Project

Type of trees	Big		Medium		Small		Sapling		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Fruit	4385	39.5	11541	61.5	11372	67.3	11919	87.2	39217	64.9
Medicinal	17	0.2	218	1.2	196	1.2	13	0.1	444	0.7
Banana	6705	60.4	7006	37.3	5320	31.5	1739	12.7	20770	34.4
Total	**11107**	**100.0**	**18765**	**100.0**	**16888**	**100.0**	**13671**	**100.0**	**60431**	**100.0**

Source: Inventory of Loss Survey, 2014

Poultry/Duck

While every household is rearing poultry in their backyard, commercial poultry firms are not common in the Project area. Ducks are popular in selected households. Sonali variety is not common. But it can be introduced where there is no supply of electricity, if coupled with production of day-old-chicks. There is no local firm produce local variety of chickens. Indigenous poultry and duck mainly feed on free aquatic plants/snail and insects etc. In local and upazila markets have got agents, who supply day-old-chicks, and sell feed and medicines but villagers complain about high cost and irregular supply of day-old-chicks and mortality rate is high because of proper management and lack of vaccination. The ILRP offers an excellent opportunity to expand the variety of poultry production to broiler, layer and Sonali.

Open Water and Pond Fisheries

Open water fisheries are the main occupation for some poor families during rainy season.

None of ponds is professionally managed or cultivates fish commercially. The current practice is to produce carps-type of fish in mixed culture by following traditional methods. No production of high-value indigenous fish has been observed. Also, pan and flood plain fisheries are absent. Fingerlingsare not

produced locally, but are all bought from hatcheries and fingerlings producers in Bogra, Pabna and Shirajganj-Pabna border, from where they are not regularly available. Ponds are not re-excavated which is critical for productivity gain. Capital shortage is a hurdle for some of them, especially since some of the ponds are leased for a high price. Local bazaar sells different fish medicine.

Households are not loosing fish farms through the project (see IRLP Table 10), but as indicated in focus groups, do some fishing in ponds in a non-commercial manner.

Financial Capital

Income

Nearly half of the households in the Project area have an income below the Bangladesh poverty level of 6,367 BDT per month, which is significantly more than the national average of 31.5%. [9]31% live of an income between 6,368 and 10,000 BDT. Only about a fifth of the households make more than 10,000 BDT per month (see ILRP Table 12). The top five sources of household incomes are agricultural labor (about 20% of total HH income), own agriculture (15%), construction (14%), transportation (10%), and salaried work (about 10%). See also ILRP Table 13.

[9]BBS, 2010

ILRP Table 10 (Q 5.1): Distribution of HHs whether affected due to losing fish farm by the Project

Whether fish farm affected	MHH		FHH		Total	
	No.	%	No.	%	No.	%
Yes	18	0.6	0	0	18	0.5
No	2905	99.4	445	100	3350	99.5
Total	**2923**	**100.0**	**445**	**100**	**3368**	**100.0**

Source: Inventory of Loss Survey, 2014

ILRP Table 11 (Q7) Types of Cooking fuel in the HHs

Devices	No.	%
Gas	0	0.0
Wood/Leaf	665	97.99
Kerosene	1	0.1
Cow-dung	13	1.9
Total	**679**	**100.0**

Source: RMIP SES, 2014

About 62% of the household heads earn only up to 6,367 BDT per month, which is the poverty line in Bangladesh. This means that in most households more than one person is responsible for generating the household's income.

Access to Financial Sector

Only 6% of the households hold a bank account (see IRLP Table 15). 12 % of women in the project area have taken out a loan from a formal or informal institution while only 2% of men indicate to serve a loan (IRLP Table 16).

National and regional/local NGO-MFIs are actively serving the project areas although the intensity of coverage depends on communication. All national MFIs such as Grameen Bank, ASA, and BRAC serve partly or fully all project areas but may not be all villages.

Besides medium size NGO-MFIs and local/regional NGO-MFIs such as NDP, TMSS, Arches, SKS, GUK, and smaller NGO-MFIs are present in project areas. These NGO-MFIs not only offer microfinance but also provide training on agriculture, education, water and sanitation, primary health care etc. although the outreach may not be big, always subject to donor funds.

We have found some local NGO_MFIs such as NDP, GUK and ARCHES that have lot of experience working riverside areas especially char areas. These were also partner organizations of CLP.

Although loans from MFIs are easily accessible but main demand from farming community is the seasonal agricultural loan, which is offered by some NGO-MFIs.

ILRP Table 12 (Q1.20): HH income per month (all members including HH heads)

Income/month	MHH		FHH		Total	
	No.	%	No.	%	No.	%
Up to 6367 (poverty level)	1289	44.1	334	75.1	1623	48.2
6368-10000	991	33.9	70	15.7	1061	31.5
10,001-15,000	396	13.5	21	4.7	417	12.4
15,001-20,000	147	5.0	16	3.6	163	4.8
Above 20,000	101	3.5	4	0.9	105	3.1
Total	**2924**	**100**	**445**	**100**	**3369**	**100**

Source: RMIP Household Census, 2014

ILRP Table 13 Percentage of contribution to the total household income (for all surveyed households)

Income Source	Percentage of contribution to the total household income (for all surveyed households)			
	On the Embankment	Inside the Embankment	Outside the Embankment	**Total**
Agriculture	9.51	21.76	18.99	**15.53**
Agricultural Labor	25.20	11.57	17.81	**19.51**
Agriculture rent recipient	0.56	0.43	0.19	**0.41**
Other rent recipient	0.00	0.05	0.00	**0.01**
Construction	16.59	12.83	14.00	**14.85**
Transport	14.11	5.83	7.75	**10.06**
Industry Self Employed	1.67	1.08	1.34	**1.42**
Industry worker	9.45	11.24	9.59	**9.93**
Trade (business owner)	7.05	6.52	6.75	**6.82**
Business Employee	1.77	1.31	1.24	**1.48**

Income Source	Percentage of contribution to the total household income (for all surveyed households)			
	On the Embankment	Inside the Embankment	Outside the Embankment	**Total**
Salaried Services	5.52	17.25	11.46	**10.28**
Household Services	1.29	0.20	0.45	**0.76**
Political	0.18	0.44	0.51	**0.35**
Priest/ Imam/ Moazzen	0.02	0.23	0.22	**0.14**
Artisan/ artists	0.25	0.44	0.19	**0.28**
Self employed in business and profession	2.33	2.69	3.02	**2.64**
Dependent on son/ daughter/ relatives remittance beneficiary (in country)	0.00	0.00	0.02	**0.01**
SSN Beneficiary (VGD/ VGF/ Old age/ Freedom fighter allowance)	0.06	0.04	0.11	**0.07**
Beggar/ dependent on charity	0.65	0.18	0.09	**0.36**
Collector of waste materials/ leftover crops/ free goods from nature	0.00	0.00	0.02	**0.01**
Student	0.83	1.36	0.71	**0.92**
Overseas Remittance Beneficiary	0.75	2.08	3.30	**1.89**
Child/ Old/ Unemployed	0.79	1.23	0.72	**0.88**
all other codes	0.45	0.34	0.33	**0.38**
House Wife	0.97	0.91	1.19	**1.03**
Total	**100.00**	**100.00**	**100.00**	**100.00**

Source: RMIP Household Census, 2014

ILRP Table 14 (Q1.18): Income of household heads per month

Income/month in BDT	MHH		FHH		Total	
	No.	%	No.	%	No.`	%
Up to 6367 (poverty level)	1692	57.9	406	91.2	2098	62.3
6,368-10000	920	31.5	30	6.7	950	28.2
10,001-15,000	207	7.1	7	1.6	214	6.4
15,001-20,000	75	2.6	2	0.4	77	2.3
Above 20,000	30	1.0	0	0.0	30	0.9
Total	**2924**	**100**	**445**	**100**	**3369**	**100**

Source: RMIP Household Census, 2014

ILRP Table 15 (Q 9.1): Status of Bank Account Holder by HH Head or Any Family member

Bank Account Holding	Male		Female	
	No.	%	No.	%
Yes	23	3.4	40	5.9
No	656	96.6	639	94.1
Total	**679**	**100.0**	**679**	**100.0**

Source: RMIP SES, 2014

ILRP Table 16 (Q 9.4): State of Loan Taken from any Institutional/Non-institutional Source

Loan Taken	Male		Female	
	No.	%	No.	%
Yes	14	2.1	83	12.2
No	665	97.9	596	87.8
Total	**679**	**100.0**	**679**	**100.0**

Source: RMIP SES, 2014

Social Capital

The social capital plays a very critical factor in disadvantaged communities that often operate in the informal sector. Households and individuals are very much dependent on their extended family network and kinship for survival. Therefore, affected households indicated early on during consultation meeting that they have a strong interest to resettle in close proximity to their current location. A vastmajority of households (80%) wish to stay in the same locality (see IRLP Table 17) and 71% of these households prefer to also be relocated with their current neighbor (see ILRP Table 18).

Given the importance of social capital, the resettlement sites should be as closely as possible to the existing social structures and allow for neighbors or extended families to resettle jointly.

IRLP Table 17: Distribution of HHs by most acceptable resettlement site

Resettlement options	MHH		FHH		Total	
	No.	%	No.	%	No.	%
Same locality	2371	81.1	337	75.7	2708	80.4
Place with work/market/road	552	18.9	108	24.3	660	19.6
Total	**2923**	**100**	**445**	**100**	**3368**	**100**

Source: Inventory of Loss Survey, 2014

ILRP Table 18: Distribution of HHs by most acceptable relocation option

Resettlement options	MHH		FHH		Total	
	No.	%	No.	%	No.	%
Relocate with your village neighbors	2102	71.9	301	67.6	2402	71.3
Relocate alone (with help from project)	409	14.0	78	17.5	487	14.5
Free choice (just cash compensation)	413	14.1	66	14.8	479	14.2
Total	**2923**	**100**	**445**	**100**	**3368**	**100**

Source: Inventory of Loss Survey, 2014

Physical Capital

House and Land

The most critical physical asset for the affected population is land. While 46% of households indicate to own land (see ILRP Table 19), the majority (89 %) of the households own just land for their dwelling (see ILRP Table 20). About 23% of households have some cultivable land and about 21% own a bamboo grove. The total affected land for dwellings accumulated to 13,760 decimal and 33, 415 decimal for cultivable land (see ILRP Table 21).

The physical losses will be duly compensated for according to WB and national guidelines. See resettlement action plan volume 2 for further details. The project will, however, not remove the basis of livelihood for households as most of them do not own any agricultural land that they live of.

Electricity and Fuels

The affected area is not connected to the power grid, so that 75% of households have no electricity (see ILRP Table 23). Only 7% of household use solar panels (see IRLP Table 24).

These areas will not be connected to the national electricity grid in the near- or mid-term future. Solar systems will be considered after doing a feasibility study for households in villages including resettlement villages that are not connected to the national grid.

An extension of solar energy will be explored for the resettlement sites but also households remaining on the old embankment.

Nearly all affected households (98%) use wood and leaf as cooking fuel (see ILRP Table 11).

Most of them use inefficient and poorly ventilated clay stoves that produce smoke, carbon, monoxide, and carcinogens. The particulate pollution levels may be 30-35 times higher than accepted guidelines. Women, who cook over these stoves, and their small children are exposed to these high levels of toxin for between three and seven hours a day. Most of them suffer from respiratory disease, tuberculosis, asthma, cardiovascular disease, eye problem and lung cancer (for more information also refer to the Public Health Action Plan). Improved cooking stoves that burn biomass much more efficiently and creating a safer environment for women and children will be a necessary intervention.

ILRP Table 19 (Q1.21): Land ownership of the household

Whether own land	MHH		FHH		Total	
	No.	%	No.	%	No.	%
Yes	1378	47.1	169	38.0	1547	45.9
No	1546	52.9	276	62.0	1822	54.1
Total	**2924**	**100**	**445**	**100**	**3369**	**100**

Source: RMIP Household Census, 2014

ILRP Table 20 (Q 2.1): Distribution of the HHs by total own land only (continues on next page)

Land use	Affected HHs					
	MHH (n=1378)		FHH (n=169)		Total (n=1547)	
	No.	%	No.	%	No.	%
Dwelling land/Vita/high land	1332	96.7	39	23.1	1371	88.6
Commercial Land	9	0.7	0	0.0	9	0.6
Cultivable land	335	24.3	18	10.7	353	22.8
Orchard	88	6.4	1	0.6	89	5.8
Bamboo groves	330	23.9	4	2.4	334	21.6
Pond	54	3.9	1	0.6	55	3.6
Wet land/ditch	8	0.6	2	1.2	10	0.6
Fallow land	7	0.5	0	0.0	7	0.5

Source: Inventory of Loss Survey, 2014

ILRP Table 21 (Q 2.1): Size of total own land only

Land use	MHH (n=1378)	FHH (n=169)	Total (n=1547)
	Sum of area (in decimal)	Sum of area (in decimal)	Sum of area (in decimal)
Dwelling land/Vita/high land	12464.5	1296	13760.5
Commercial Land	63	5	68
Cultivable land	30961.5	2454	33415.5
Orchard	1127.5	66	1193.5
Bamboo groves	1041.9	116	1157.9
Pond	1336.5	12	1348.5
Wet land/ditch	27	1	28
Fallow land	559.5	0	559.5

Source: Inventory of Loss Survey, 2014

ILRP Table 22 (Q 3.1): Distribution of HHs whether affected due to losing structures by the Project

Whether structures affected	MHH `		FHH		Total	
	No.	%	No.	%	No.	%
Yes	2915	99.7	443	99.6	3358	99.7
No	8	0.3	2	0.4	10	0.3
Total	**2923**	**100**	**445**	**100**	**3368**	**100**

Source: Inventory of Loss Survey, 2014

ILRP Table 23 (Q4.1): Availability of Electricity Connection of HHs

Availability of electricity	Male Headed HHs		Female Headed HHs		Total	
	No.	%	No.	%	No.	%
Yes	148	25.3	19	20.2	167	24.6
No	436	74.7	75	79.8	511	75.4
Total	**584**	**100.0**	**94**	**100.0**	**678**	**100.0**

Source: RMIP SES, 2014

ILRP Table 24 (Q 4.2): Availability of Solar Panels in the HHs

Availability of Solar Panels	Male Headed HHs		Female Headed HHs		Total	
	No.	%	No.	%	No.	%
Yes	46	7.9	3	3.2	49	7.2
No	538	92.1	91	96.8	629	92.8
Total	**584**	**100.0**	**94**	**100.0**	**678**	**100.0**

Source: RMIP SES, 2014

IRLP 1.2. Ten Village Profiles in Detail

Objective: The objective of this survey is to get a qualitative understanding of the livelihood of the project affected population, how to project may affect their livelihood and options to mitigate possible impacts but also identify development opportunities**.**

Methodology: Livelihood-related information has been gathered from 10 embankment adjacent villages through FGDs. They were mostly attended by farmers and traders who make up the majority of people living on both sides of embankment and by UP members. Furthermore, KII were conducted with the representatives from four line agencies such DLS, DoF, DAE, the women welfare department, selected NGOs and private sector stakeholders. Geographical diversity has been ensured by choosing villages from all four upazilas from the CEGIS' mouza database of the 50 km project areas.

Surveyed Villages:

Land Ownership Status HHs Along the Embankment

Given that the project affected population living along the embankment is made up of more than 90% of squatters who sought refuge on and along the embankment as a result of their homestead being washed away by the river, the majority of them do not own homestead land. The exceptions are the twovillages of Kamalpur andIchamarawhere households along the embankment have 10 to 40 decimal of land to grow trees, vegetables or plants and keep livestock. Less than 50% of households own agricultural land ranging from 10% to nearly 50% depending on the village. See ILRP table 26.The population along these 10 sample villages living on the embankment is overall very homogenous and the findings are in line with the data other survey data (full household survey and sample household survey for project area) collected.

Patterns of Income and Occupation

The vast majority of people earn their income as agricultural laborers, followed by garment and tailoring work (in the city), crafts, trading and driving. Households that own agricultural land (<50%) use it to provide for their livelihoods. Furthermore, keep almost all households livestock around their house. There are 37 poultry firms in the sample villages. 55 ponds and 22 khats, that are mostly not commercially managed, are being used for fishing. 300 households, especially very poor ones, engage in open water fishing. ILRP Table 27 shows a numeric break down of the livelihoods in 10 sample villages in the Project area.

The population along these 10 sample villages living on the embankment is overall very homogenous and the findings are in line with the data other survey data (full household survey and sample household survey for project area) collected.

ILRP Table 25 In-Depth Surveyed Villages

Village	Union	Upazila (Sub district)	Zila (District)
Pachtakuri	Changacha	Sirajganj Sadar	Sirajganj
Italy	Changacha	Sirajganj Sadar	Sirajganj
Bahuka	Ratonkandi	Sirajganj Sadar	Sirajganj
Maijbari	Maijbari	Kazipur	Sirajganj
Meghai	Meghai	Kazipur	Sirajganj
Kaiagari	Bhanderbari	Dhunat	Bogra
Baniajan	Bhanderbari	Dhunat	Bogra
Bhutbari	Bhanderbari	Dhunat	Bogra
Kamalpur	Kamalpur	Sariakandi	Bogra
Ichamara	Kamalpur	Sariakandi	Bogra

ILRP Table 26 Overview of size and land ownership of 10 sample villages

Village	Land Lost to River	Total HH on and Along Embankment	Total Population On and Along Embankment	Homestead Owners Amongst HH	Agricultural Landowners Amongst HHs
Pachtakuri	No information	1,156	Approx. 7,000	Majority of HHs own no homestead land as they migrated to embankment from the riverside due to river erosions. It applies for all 10 sample villages. Except Kamalpur and Ichamara where most HH own 10 to 40 decimal land for homestead	Approx.100
Italy	No information	859	Approx. 3,500		Approx. 400
Bahuka	No information	2,263	8,348		na
Maijbari	2/3 of village area	456	Approx. 2,100		Approx. 150
Meghai	½ of village area	594	Approx. 3,000		Approx. 150
Kaiagari	½ of village area	350	Approx. 3,000		Approx. 100
Baniajan	More then ½ of village area and now expected other ½ for LA for RMIP	400	4,000		Approx. 100
Bhutbari	No information	2,000	10,000		Approx. 150
Kamalpur	No information	380	3,500		15-20
Ichamara	No information	328	2,500		Approx. 40

ILRP Table 27: Livelihood in 10 sample villages in Project area

Types of Livelihoods	Total
Agriculture Land for livelihoods around the year (HHS)	1,295
Agriculture Labor (# persons)	6,400
Livestock	Almost all HHS
Backyard Poultry/Duck	Almost all HHS
Poultry Firm (# firms)	37
Pond and Khat (#)	Pond -55, Khat-22 (191 bighas)
Open water Fishing (HHS)	300
Trading (petty trade) # of Persons	545
Rickshaw/Van/CNG Puller(# persons)	530
Carpenter, handicrafts, cobbler(# persons)	925
Garments Worker/Tailoring (# Persons)	3,300
Other services (# Persons)	965

Although, there is overall a limited number of households that still own agricultural land the remaining agricultural land is therefore extremely scarce. The RAP and this livelihood plan will ensure that households loosing productive land will be fairly compensated. Agricultural laborers, as well as business owners affected by the project will be compensated for the loss of income if affected by construction. Overall, there is an opportunity to improve the productivity of the current sub sectors but also diversify the current income sources through the ILRP.

IRLP 1.3. Constraint Analysis and Mitigation for Specific Sub-Sectors

The selection criteria for the possible sub sectors chosen to improve livelihood need to ensure easy measurement and be limited in number not to cloud the decision making. With this in mind, the following indicators have been used to select products or subsectors for livelihoods subcomponent:

Profitable products: Since only profitable products will enhance income this indicator is an obvious choice, that is, the product must be inherently profitable for the farmers to encourage them either to introduce or expand production.

Potential for increasing sales and employment (i.e. large number of farmers can be included): The product or subsector either presently involve large number of producers or has the potential to engage large number of them so that project interventions can increase sales and create self-employment for large number of households but in this project it would not be possible because of limited scale households involved.

Opportunities for strategic interventions: In many subsectors constraints are found to be numerous, and consequently, interventions needed become also numerous but that makes it difficult to manage project activities and produce results. That means selected product/subsector should present opportunity to make1-3 strategic interventions to create significant benefits.

Potential for visible results: Sometimes projects cannot show results even after many years of support; therefore, subsector and interventions should lead to visible results appreciated by participants and encourage others to join in. The tactic is to pick subsectors at their early stage of development and devise interventions for growth.

Potential products

Taking into the account the above selection criteria, the following list of potential products or subsectors suitable for promotion under livelihoods subcomponent was chosen:

- Tree plantation in homestead as well as in embankment sides (Fruits and medicinal plants and fruits);
- Homestead based high value vegetables;
- Livestock (Cow/bull/heifer, goats, sheep): Animal health care and development;
- Poultry: Local poultry birds (backyard poultry) and introduce Sonali variety;
- Fisheries in ponds as well as in WAPDA khats (dug areas by WAPDA for preparation embankment; its becomes water body in rainy season and water remains 6-7 months in a year)
- Creation and Development of skilled labor/person
- Restoration issues of livelihood during Resettlement (Improve stoves, solar electricity, dropping income during resettlement etc.)

High Value Fruit Orchards

Opportunities: The subsector has potential in all project areas of high-value summer fruits such as mango, litchi, baukool and guava are consumed as fresh fruits. We have found that farmers are slowly moving into small high-value fruits orchards in and around homestead, but present acreage is very small compared to potential. Now-a- days a small quantity of these fruits, especially mango (Rajshahi and amrapali), litchi (Dinajpur variety), baukool and guava (Narshingdi/ Gazipur variety) are produced in these areas for local consumption. Farmers find it profitable to establish small orchards in homestead. The size of the tree, production and income increases with time. Although good potential exists but no organized efforts are seen to promote high-value fruits.

Plantation of high-value fruits trees in project areas is precondition of commercial production of high-value fruits. Therefore, the focus of the analysis is on orchard subsector than fruits. Since this subsector is yet to fully develop the sector map is very rudimentary in nature: i) Producers sell directly to local markets; ii) local traders buy, mainly baukool to supply to upazila markets. Other fruits mango, litchi, guava are produced small in quantities for family consumption. Present supply situation offers good opportunities to introduce homestead fruits orchard in project areas including both sides of embankment, which will also help protection to damage embankment and will help developing the livelihoods.

Constraints and solution: Since this subsector is still at early stage of development the overall objective is

to develop and make high-value fruits orchards subsector an important source of family nutrition and

household income. ILRP Table 28 summarizes constraints and possible solutions to remove them in the following five areas:

Product and market: A large market within project areas exists for high-value fruits and project areas can be a source of meeting a significant part of local demand and need to establish direct linkage with buyers of fruits i.e. networks of traders/beparis.

Human resources: Knowledge of production and markets is yet to be fully disseminated.

Finance: Capital will be important for setting up orchards; loan from financial institutions will be important.

Support services: Production related training can be available from DAE, BARI, NGOs and Agricultural University. Seeds and saplings will be needed from other parts of the country as well as from within local areas.

Implementation Strategy: The objective for homestead-based high-value fruits orchards subsector is to develop sustainable fruits production to diversify and enhance household income. ILRP Table 29 summarizes activities along with corresponding physical targets for various proposed activities. The main implementation strategy will be as follows:

- **Organize farmers within affected people:** Organize village households who are willing to setting small fruits orchards in and around homestead and other available high-land currently not used for any agricultural production. Some of the leading farmers will be developed as nursery owners; existing nurseries will also be organized to supply saplings.
- **Training and technical assistance:** Provide orientation on i) production system of fruits orchards; and ii) sapling selection techniques; and iii) follow-up problem solving type technical assistance.
- **Pilot phase:** In project areas: i) engage some farmers in setting up of orchards in 3-4 places. Efforts will be to develop fruits villages for drawing attention to a large number of households in project area; and ii) engage another some lead farmers (20-25) in different places to become nursery owners of fruits plants saplings.

Support services: i) Work with BARI, DAE and Agricultural Universities to provide good quality of sapling to farmers and assist nursery owners to produce reliable and good quality saplings; and ii) develop local training providers, especially individuals and NGOs.

High Value Medicinal Plants for Leaves, Fruits and Roots

The objective for medicinal plants subsector is to develop sustainable (commercial) plants/fruits production to diversify and enhance household income.

Opportunity or Demand for medicinal plants and fruits

This subsector has potential in all project areas especially in homestead and embankment sides. The demand for medical plants and fruits comes from number of sources:

i. Many rural/urban households traditionally prepare and consume 'medicine' (sometimes drinks) made from different types of medicinal plants, fruits and seeds (examples of such fruits and leaves are wood-apple, basak leaf, amloki, tamarind, zinger etc.)
ii. Traditional Ayurvedic medicine (herbal medicines or locally called as Kabiraji medicine) are produced in Bangladesh by many companies such as Hamdard, SadanaOsadalaya etc. and many small outfits.
iii. In addition to medicine, Hamdard has moved into production of drinks and some food items that also use such plants and fruits;
iv. Recently two of the country's largest pharmaceutical companies – Square Pharmaceutical and Acme Laboratories, have entered into herbal medicine segment. Square needs about 100 tons of dried *Basak* leaf per month for its very popular cough syrup 'Adovas'. It has plan to move into other items that will require different types of medicinal plants and fruits;

v. Some food processing and herbal cosmetic companies also use some vegetables, fruits and seeds and their extracts for various products.

ILRP Table 28: Constraints analysis for homestead-based high-value fruits orchards subsector

Main Areas	Constraints and Challenges	Proposed Solutions	Activities to implement the solutions
Entrepreneurship	• Limited scale commercial production of high-value fruits, and therefore, fruits orchards are still small in numbers but can be expanded if properly promoted.	• Create enthusiasm for investments in high-value fruits orchards through exchange visits	• Organize exchange visits to BARI, plant nurseries, successful orchards/farms • Invite successful farmers in training courses
Product and markets	• No major problem reported in product and marketing areas. New fruits can be sold to present fruits traders. Profitable business and easy access to Bangladesh market. • Exact demand information is not available but since the fruits are known demand will come from within project areas and neighboring areas.	• Establish linkage with fruits traders.	• Establish contacts with traders.
Technology and production	• Presently good quality saplings are not locally available. • Farmers do not have the knowledge about production techniques	• Establish contacts with good sources and disseminate information about good sources of saplings • Develop local nurseries by introducing high-value fruits sapling production to current nursery owners and assisting new nursery owners. • Disseminate production practices	• Contact sellers of saplings in Rajshahi and other parts of the country • Organize training on production system for nursery owners and farmers.
Human resources	Knowledge regarding commercial production is absent	Disseminate knowledge of production	Organize training on farm management
Support services	Local trainers on management of nurseries and orchards are	Develop local trainers from within the area	Train successful farmers as

Main Areas	Constraints and Challenges	Proposed Solutions	Activities to implement the solutions
	not available		trainers

ILRP Table 29: Activities and targets for one segment (example for 15 villages) of the project area for homestead-based high-value fruit orchards

Main Areas	Activities to implement the solutions	Targets (4 years)	Gender and other relevant targets
Organizing farmers in selected villages	• Organize farmers in selected villages to establish high-value fruits orchards and 'fruits villages'. • Organize farmers to become nursery owners • Organize informal farmers' groups (CIGs)	• 150 farmers per project part area at the rate of 10 farmers per village • 02 farmers (nursery owners) per project part • One per village	More farmers per village may join the project but: 1. At least 30% o f CIG members should be women 2. At least 40% of CIG members should be men since in most cases men are involved in this profession
Product and markets	• Exchange visits of lead farmers to successful farmers' gardens within or outside project areas • Form nursery owners' association and establish linkage with BARI, BAU, and other sources of technology, seeds, saplings etc.	• Exchange visits of 30 (2 farmers per village) farmers to successful fruit orchards • One informal association	
Technology and production	• Organize training half-day training on production system of selected high-value fruits orchards and fruits • Advance training for nursery owners on production and management of • Meetings/visits suppliers of seeds and sapling • Organize demonstration or pilot application of pheromone traps (block/cluster demonstration) in mango orchards	• 150-200 persons in 4 years • 10 persons • 10 sources in different parts of the country • 100 farmers	RMIP will organize this training .
Human resources	Same as above		
Support services	Develop local trainers	10 lead farmers as source of local expert knowledge	

A list of present demand of leaf, fruits, and skin extracts commonly demanded by Ayurvedic medicine companies is given in ILRP Table 30. Sources from imports and locally procured (30% of total demand). But many of the locally procured items are grown in the jungles, hills and homestead,

and collected through networks of rural traders/beparies but not commercially produced and sold. One exception is in Natore (near Sirajganj districts) where a number of villages are committed to produce medicinal plants, gained the reputation of Medicinal Plant Villages. An expansion production of medicinal plants has been noticed due to continuous expansion of herbal medicines and cosmetics.

Currently the main demands are for the following items:

i. Basak leaf (approximate 100 tons per month) by Square pharmaceutical
ii. Four other itemschirata (sold as dried leaf), amlaki (sold as dried fruit), neem sapling, and Ashwagandha (roots) are of big demand by Ayurvedic companies

But not all of these items can be produced and marketed immediately. Basak leaf can be produced within months and so are chirata and ashwagandha but amloki and neem tree may need 3-5 years to get harvest. RMIP needs to encourage both short and long-term plants.

In addition to income from these products farmers can earn additional income by producing complementary commodities in early years when plants such as amloki and neem do not create *shade*. Even in shaded area zinger can be profitably produced. However, as a strategy medicinal plants will be cultivated on homestead, slopes, road sides and fellow lands not on prime agricultural lands.

Constraints and solution*:* This subsector will be somewhat different than the rest because the idea is to develop a whole new subsector from undeveloped stage. The overall objective is to develop and make medicinal plants subsector an important source of household income. ILRP Table 31 summarizes constraints and possible solutions to remove them in the following five areas:

- **Product and market:** As we have explained a large market within the country exists which is met by imports and only 30% of total demand is met from other parts of the country. The immediate demand is for basak leaf, chirata leaf, amlaki sapling (for plantation) and ashwagandha (roots), which can be met by producing plants that can be harvested within months (less than a year). The strategy would be to establish direct linkage with large buyers (companies) and other networks of buyers (traders/beparis).
- **Technology and production**: Although the fruits and plants are familiar to the farmers but the following production challenges exist: i) knowledge of production techniques is not readily available; ii) seeds and sapling are not readily available as local nurseries focus mainly in common fruits, trees and flowers; iii) extension services is weak.
- **Human resources**: Knowledge of production and markets is yet to be disseminated.
- **Finance:** Large sums of money will not be needed for production of medicinal plants and fruits.

Support services:i) Production related training can be available from Neem Foundation, DAE, BARI, Natore association, and Agricultural University ii) Seeds and saplings will be needed from other parts of the country especially nature district as well as from within local areas.

Implementation Strategy for Medicinal plants Sub-sector

Table 32 summarizes activities along with corresponding physical targets for various proposed activities for medicinal plants subsector:

Organize farmers: The first step will be to organize all village households who are willing to produce medicinal plants for fruits, leaves and roots in homestead, road side or fallow land, and participate in pilot activities with limited number of plants. Some of the more leading farmers will be developed as nursery owners; existing nurseries will also be organized to supply seedlings and saplings.

ILRP Table 30 Common locally procured medicinal plants, fruits, roots and leaves

Names	Names	Names	Names
Amlaki	Basak leaf	Ashwagandha	Cardemum
Wood apple	Chirata	ShimulMul	Turmeric
Bayhera	Neem	Shatamuli	Zinger
Betel nut	Aloe	Ghritokanchan	Garlic

	vera		
Haritaki	Tulushi leaf		Pepper
			Tamarind

- **Establish linkage with potential buyers:** Potential buyers will be formally contacted and invited to farmers groups to speak directly about their demand. Besides, local traders will also be contacted.
- **Training and technical assistance:** Provide orientation on i) production system of medicinal plants, and ii) seed selection and seed preservation techniques, and iii) follow-up problem solving type technical assistance.
- **Pilot phase:** In each project part area: i) engage 500 farmers in production of selected plants. Efforts will be to develop 'medicinal plants/fruits' villages for effectiveness and for drawing attention to all farmers in an area; and ii) engage 25 lead farmers to become nursery owners of medicinal plants, fruits seedlings and saplings.

Supp1ort services: i) Work with BARI, other research agencies and NGOs to bring selected processing technologies in project areas; and ii) develop local training providers, especially individuals and NGOs.

Components, Activities and Locations

This subsector is suitable for all areas in the project. The activities mentioned here are assumed for one typical part (assumed 15 villages) of the project. The project will continue its support for each subsector for five years and then the project period is expected to develop a sustainable production and marketing system.

ILRP Table 31: Constraints analysis for homestead/embankment-based medicinal plants subsector

Main Areas	Constraints and Challenges	Proposed Solutions	Activities to implement the solutions
Entrepreneurship	Medicinal plants and fruits are not commercially produced but can be produced if access to market is assured.	• Create enthusiasm for investments in medicinal plants and fruits through exchange visits	• Organize exchange visits to BARI, nurseries, NF village and Natore medicinal plant villages • Invite buyers to speak to farmers • Invite successful farmers in training courses
Product and markets	• No major problem reported in product and marketing areas. Profitable business and easy access to Bangladesh market. • But exact demand information regarding items and seasonality needs to be collected • Buyers are not aware of potential of these areas.	• Establish linkage with buyers	• Establish contacts with selected major buyers of medicinal plants and fruits • Establish contacts with traders.

Main Areas	Constraints and Challenges	Proposed Solutions	Activities to implement the solutions
Technology and production	• Presently all types of seeds and saplings are not locally available. • Farmers do not have the knowledge about production techniques	• Establish contacts with good sources and disseminate information about good sources of seeds and sapling • Develop local seed producers and nurseries. Introduce medicinal plants to current nursery owners • Disseminate production practices'	• Contact sellers of seeds and saplings • Organize training on production system for nursery owners and farmers.
Human resources	Knowledge regarding commercial production is absent	• Disseminate knowledge of production	• Organize training on farm management
Support services	Limited number of farmers produce plants and fruits but processing technologies are not available	• Develop or collect selected processing technologies of selected items	

ILRP Table 32: Activities and targets for one segment (example for 15 villages) of the project area for homestead- and embankment-based medicinal plants trees, fruit

Main Areas	Activities to implement the solutions	Targets (5 years)	Gender and other relevant targets
Organizing farmers in selected villages	• Organize farmers in selected villages to establish medicinal plants and fruits villages and farmers. • Organize farmers to become nursery owners • Organize informal farmers' groups (CIGs)	• 200 farmers per project part area at the rate of 15 farmers per village • 03 farmers (nursery owners) per project part • One per village	More farmers per village may join the project but: • At least 30% o f CIG members should be women • At least 40% of CIG members should be men since in most cases men are involved in this profession
Product and markets	• Exchange visits of farmers to successful farmers' gardens within project areas. • Exchange visit of Lead farmers to 'Natore medicinal plants village' • Establish contact with medicinal plants and fruits buyers	• Exchange visits of 200 farmers to local successful farmers' gardens. • Exchange visits of Lead Farmers (One from each village) to 'Natore medicinal	• Contacts with buyers will mean: • Establish formal contacts • Develop formal buying/selling contracts (verbal or written)

Main Areas	Activities to implement the solutions	Targets (5 years)	Gender and other relevant targets
	especially pharmaceutical and Ayurvedic companies. • Meetings with buyers at farmers groups • Form nursery owners' association and establish linkage with BARI, BAU, Neem Foundation and other sources of technology, seeds, saplings etc. • Organize medicinal plants and fruits tree exhibition by farmers and nursery owners every year	plants village' • At least 2-3 companies • One meeting per 100 farmers at the selected areas • One informal association • One exhibition in total project areas every year	• Meetings of buyers reps with farmers • Note: The gender and ethnic proportions mentioned above should also apply to exchange visits of farmers.
Technology and production	• Organize training (3-day) training on production system of selected medicinal plants and fruits • Advance training for nursery owners on production and management of • Meetings/visits suppliers of seeds and sapling	• 200 persons in 5 years • 25 persons • 15 sources in different parts of the country	• RMIP will organize this training • Note: The gender and ethnic proportions mentioned above should also apply to exchange visits of farmers.
Human resources	Same as above		
Support services	Transfer processing technologies	At least two processing techniques are replicated	

High Value Vegetables

Constraints and solutions:ILRP Table 33 summarizes constraints and possible solutions to remove them for vegetable subsector. The overall objective is to improve profitability of vegetables production in project areas, especially in homestead, small pieces of land and enhance household income. We have divided the issues in the following five areas:

- Product and market: As such no major problem is reported by the farmers and traders regarding product and markets: summer and winter vegetables have good and increasing demand and price in local markets; access to markets is not also a problem- farmers can directly sell to consumers or traders in the local markets; price and profit are good.
- **Technology and production**: Farmers in project areas are producing similar types of vegetables and following similar production technology and farm practices as in other parts of the country. But two issues can be considered as challenges: i) quality of seeds of some vegetables may not be good as farmers sometimes keep their own seed where preservation techniques may not be appropriate. Sometimes seeds from commercial sources may not also be of good quality; and ii) More acute problem is application of alarming levels of pesticides in brinjal and cucurbits that not only possess danger to public health but also expensive. An estimation shows that Taka 50-60,000 is spent for pesticides for one hectare of brinjal, i.e. Taka 20,000 to 24,000 per acre. The alternative, which has been successful in other parts of the country, is to use pheromone traps, and release *tricogama and bricon* at a cost of Taka 5,500 per acre. The application of pheromone traps have been found effective in other parts of the country but known in project areas. Only handful farmers who have access to DAE have received some such traps to be applied in mango orchards. A major campaign along with commercial promotion of this approach can

reduce cost and increase farm income and reduce public health risks.

- **Human resources:** Knowledge of IPM (Integrated Pest Management), specifically pheromone trap, and knowledge of seed selection can easily be improved through training and information of good seed sources.
- **Finance:** Households use own money for vegetable cultivation and MFIs also provide loan for vegetable production. But the present weekly system of loan collection is not suitable whereas more appropriate would be to introduce seasonal loan. PKSF-partner MFIs, provides such loans to its members.
- **Support services:** Agriculture related training is often provided by DAE but the scope is limited. Some NGOs have agriculture programs, which also provide common production training. Input sellers such as seeds and pesticides sellers are also sources of information for the farmers but the accuracy and appropriateness of that information remains a suspect.

Overall opportunity

More than 70% of households produce vegetables, which represents total potential for pheromone trap application. But it will need major campaign and demonstration to develop sustainable application of such less expensive and safe alternative.

Implementation Strategy for Vegetable Sub-sector

ILRP Table 34 summarizes activities along with corresponding physical targets for various proposed activities for high-value vegetable subsector by gathering similar activities:

- **Locations:** All plain, low, middle and fellow land are suitable for vegetable production and consequently, suitable for application of pheromone traps and improvements farming practices.
- **Organize farmers:** The first step will be to organize all village households who are willing to practice alternative pest control (pheromone trap and other biological agents), and participate initially in demonstration of such farming practices. Farmers who produce brinjal and cucurbits will be the main targets.
- **Training and technical assistance:** Provide orientation on i) IPM and pheromone trap applications in collaboration with pheromone trap manufacturers, and ii) seed selection and seed preservation techniques.
- **Demonstration:** In each project sector, pilot demonstration on pheromone traps will be organized in the fields of 200 farmers (brinjal) and 400 farmers who produce cucurbits. 'Block demonstration', i.e. all farmers in a field/block will be encouraged to try this technology to show effectiveness and to draw attention to all farmers in an area.
- **Support services:** i) Work pheromone with trap manufacturer to establish appropriate number of dealers in the project area; ii) work with plastic bottle/container producers to produce low-cost plastic pots for pheromone traps, once demand for such tarps increases.

Components, Activities and Locations

This subsector is suitable for all areas in the project. The activities mentioned here are assumed for one typical part (assumed 15 villages) of the project. We assume that the project will continue itssupport for each subsector for five years and then the project period is expected to develop a sustainable production and marketing system.

ILRP Table 33: Constraints analysis for high value vegetable subsector

Main Areas	Constraints and Challenges	Proposed Solutions	Activities to implement the solutions
Entrepreneurship	Vegetables are commercially produced. No major problem regarding business attitude.	--	--
Product and markets	• No major problem reported in product and marketing areas. Profitable business and easy access to Bangladesh market. • Farmers do not try new types of vegetables	• Pilot demonstration of new vegetables at farmers' field.	--
Technology and production	• Seed quality is not always good • Farmers seed selection and preservation may be faulty • Excessive amount of pesticides are applied in brinjal and cucurbits; Successful IPM practices are not known	• Disseminate information about good sources of seeds • Train farmers on seed selection and preservation • Familiarize successful IPM practices through demonstration in collaboration with pheromone trap manufacturers.	• Organize orientation training on seed sources, seed processing and preservation. • Demonstrate (block demonstration) effectiveness of pheromone trap in collaboration with manufacturers.
Human resources	Knowledge regarding IPM is absent	Disseminate knowledge of IPM and production of safe vegetables.	Organize training on improved farm management and application of IPM
Support services	Pheromone trap sellers/dealers are absent	Develop new dealers or work with existing dealers to market pheromone trap	Work with manufacturers to establish appropriate number dealers in project areas

ILRP Table 34: Activities and targets for one segment (example for 15 villages) of the project area for high value vegetables

Main Areas	Activities to implement the solutions	Targets (5 years)	Gender and other relevant targets
Organizing farmers in selected villages	• Organize vegetable farmers in selected villages to organize block demonstrations for 1st season who will later buy pheromone traps for application in the fields.	• 200 farmers per selected project areas on brinjal and 400 farmers on cucurbits	More farmers per village may join the project but: i. At least 30% of CIG members should be women ii. At least 40% of CIG members should be men since in most cases men are involved in this profession
Product and markets	i. Introduce new vegetables.	• 50 farmers	
Technology and production	• Organize (half-day) training on seed selection and perseveration • Organize orientation training on pheromone trap application in collaboration with manufacturers. • Organize actual demonstration or pilot application of pheromone traps (block or cluster demonstration)	• 500 persons in 5 years • 500 persons within 5 years. • Pilot application in 500 (250 in brinjal and 250 in cucurbits) farmers' fields in 5 years.	RMIP will organize this training Note: The gender and ethnic proportions mentioned above should also apply to exchange visits of farmers.
Human resources	Same as above		
Support services	• Develop new dealers or work with existing dealers to store and sell pheromone traps and other IPM items • When pheromone trap becomes popular work with manufacturers to locally produce appropriate low-cost boxes	• 1-2 dealers per selected area or as appropriate • 1-2 plastic box producers	

Fisheries

Constraints analysis:ILRP Table 35summarizes constraints and possible solutions to remove them. The overall objective is to expand pond/khat (a large number of areas dug by WAPDA for embankment preparation), pan and flood plain fisheries in low areas. We have divided the issues in the following five areas:

- **Product and market:** A very small percent (less than 5%) of ponds and khats are under commercial fish farming. Pond owners, who are mostly busy with producing rice and vegetables. Although a large proportion of ponds are under cultivation but professional commercial approach is missing. Farmers stock fish but may not give proper feed. Farmers mainly stock fish for family consumption. It seems that lack of proper production techniques (see below) and information are not known. Besides, even the limited number of farmers who are currently engaged in fish production focus on relatively low value fish not the other high-value indigenous fish such as *Pabda, Tengra, Shing, Magur (local cat fish)* etc.
- **Production and technology:** Aside from limited entrepreneurial initiative improved production practices are not known or practiced. Main challenges are:
  i) Overstocking of fingerlings by farmers;
  ii) Inappropriate pond preparation such as shallow ponds; many year of accumulation of clay, leaves and other dirt have raised pond bed reducing total water boy.
  iii) Often no extra feed is given;
  iv) Testing of water quality is not done;
  v) Reliable and sustained technical assistance is not available
  vi) Quality of fingerling is often a suspect;
  vii) Because fingerlings are sometimes transported from long distance they become weak, and when stocked leads to high mortality; and
  viii) Bank of khats are not prepared or organized for production.
- **Human Resources Issues:** Farmers have very limited production related knowledge. DoF is the main source of training, which has very limited outreach. Farmers just follow traditional practices and often follow the advice from seasonal retail fingerling sellers (*Patilwalas*). Besides no good quality of training are offered from non-governmental and private sources.
- **Finance issues:** Finance is a critical issue since commercial farming needs capital for pond preparation, fingerling and feed.
- **Support institutions:** The main support institutions in this sector are input sellers (most critical is hatchery owners and feed sellers), research and extension service providers, and training providers. Not all project areas have fingerling producers. The result is that farmers depend on private hatcheries and fingerling producers from far from project areas and may deliver poor quality fingerlings. Therefore, identification of a good source is often a challenge. DoF and NGOs deliver some training often classroom-based and supply-driven, which are found not effective. Private training and technical assistance services is non-existent but may emerge with increased demand for such services.

Overall Opportunities

Although small number of ponds in project areas but has lot of opportunity in WAPDA Khats and also have the opportunity of introducing pan and flood plain fisheries in rainy season. Besides mix culture of carps and high-value fish can also bring additional productivity and income.

Implementation Strategy for Pond Fisheries Sub-sector

ILRP Table 35 summarizes constraints, and corresponding broad proposed solutions and activities are further discussed in ILRP Table 36.

ILRP Table 35: Constraints analysis for pond and flood plain fisheries subsector

Main Areas	Constraints and Challenges	Proposed Solutions	Activities to implement the solutions
Product and markets	• Ponds are either not used for fish production or productivity is low. • Suitable flood plains are not used for fish production.	• Introduce commercial aquaculture of mix culture of fish • Introduce flood plain fisheries	• Selected farmers are trained on mix fish culture and assisted to begin fish culture
	Even when ponds are used for fish production only carps are cultivated; High-value fish such as Pabda, Tengra or indigenous cat fish varieties are not cultivated	• Introduce indigenous varieties fish culture on pilot basis side by side with carps.	• Selected farmers are trained on indigenous fish culture and assisted to begin mixed-culture
Technology and production	Over stocking of fingerlings; sometimes no feed given; water quality not maintained; lacks proper supervision from the owner	• Train farmers on commercial fish production • Provide proper technical assistance and regular monitoring services	• Selected farmers are trained on farm management • Project provides hands on technical assistance and supervision services
	Often poor quality of fingerlings or weak fingerlings are stocked due to not knowing the sources, transportation method or small size fingerlings are stocked	• Provide information of good sources of fingerlings (nurseries and hatcheries) to farmers. • Develop local pond fish nurseries (private entrepreneurs) with proper technical assistance and access to good quality *renupona*(post larva)	• Project establishes linkage of farmers with good sources of *renupona* and fingerlings. • Assist selected farmers to set up pond nurseries through training and technical assistance
	Adequate and proper mix of feed is not applied	• Introduce proper feed application practices	• Proper feed mixing technique is taught • Assist local input sellers to stock fish feed and become agents of feed processors

Main Areas	Constraints and Challenges	Proposed Solutions	Activities to implement the solutions
Human resources	Some of the constraints are due to lack of knowledge of commercial aquaculture	• Transfer knowledge of commercial fish farming	• Organize hands-on training on commercial aquaculture in established farms (if possible, arrange short-time apprenticeship in fish farms).
Finance	Sometimes limited access to finance prohibits commercial aqua-culture	• Establish linkage with MFIs with qualified farmers;	• Project staff members assist farmers to receive loans from MFIs
Support services	Limited technical assistance from DoF	• Develop technical capacity within NGO and private sector	• During project period fisheries expert within Partner NGO will provide assistance • Develop a cadre of trainers from within farming communities, fingerling producers, feed sellers, and hatcheries • Develop networks of such technical assistance providers
	Information about source and quality of hatcheries to is limited	• Establish contacts of farmers with good quality hatcheries	• Provide contact information of good hatcheries • Assist/encourage hatcheries to engage local dealers
	Quality of feed is not always known to farmers	• `Provide information on sources of good quality feeds • Train farmers on how to select good quality feed	• Develop training courses and provide training courses on feed preparation and selection

ILRP Table 36: Activities and targets for one segment (example for 15 villages) of the project area for pond and flood plain fisheries

Main Areas	Activities to implement the solutions	Targets (5 years)	Gender and other relevant targets
Organizing the pond owners or fisheries in selected	• Organize fish pond owners or fish farmers (carps fish and mono-sex Tilapia) as project participants per project sector • Form informal groups of fish	• 100 fish farmers in one part/sector (90 seasonal and year round ponds, 10 pan culture). In case of	• More farmers per village may join the project but: • At least 20% o f CIG members should be

Main Areas	Activities to implement the solutions	Targets (5 years)	Gender and other relevant targets
villages	farmers (carps and tilapia) (Common Interest Groups) to facilitate project activities • Organize fingerling producers • Form CIGs of fingering producers • Organize farmers for production of high-value local fish (*pabda, tengra, cat fish etc.*)	flood plains organize 05 groups of farmers to do flood plain fisheries in 05 locations). • 10 CIGs of fish farmers organized • Organize 05 fingerling producers • Form 01 CIGs of fingerling producers • 10 farmers of high-value local fish producers	women • At least 50% of CIG members should be men since in most cases men are involved in this profession
Product and markets	• Form association of producers • Organize exchange visits for fingerling producers • Form association of fingerling sellers • Establish fingerling selling corner in main markets • Establish contacts with traders from Dhaka and other districts	• One producers' association per project sector • 05 fingerling producers participate in exchange visit • Form one association per project sector of fingerling producers • Organize one fingerling selling corner in main project sector market • Develop contacts of fish traders (name, address and contact phone)	
Technology and production	• Train on pond fisheries- hands on training (farm management and feed production, supervision, water testing) • Training on fingerling production • Establish linkage with good quality GoB and private hatcheries and fingerling nurseries to ensure good quality • Encourage re-excavation of ponds	• Organize hands-on training (1 days for each batch) for 100 farmers, preferably in successful fisheries projects venue • Organize hands-on training for 05 fingerling producers (one week training) • Prepare and distribute list of contacts of good private and GoB hatcheries and	• RMIP will organize this training and re-excavated. • Note: The gender and ethnic proportions mentioned above should also apply to exchange visits of farmers.

Main Areas	Activities to implement the solutions	Targets (5 years)	Gender and other relevant targets
		fingerling suppliers • 20 ponds, All WAPDA khats and one canal are re-excavated and developed the banks.	
Finance	• Linkage with banks and MFIs- contacts and gathering	• Facilitate loans from MFIs for 50 farmers (selected should provide loans only very large loans should be referred to banks) • Fingerlings and fish feed can be supported for first time for selected khats.	• RMIP will support finance for fingerlings and fish feed.
Support services	• Provide supervision and technical assistance • Develop local private trainers from among DoY trained youths and successful fish farmers	• Project staff supervise fisheries projects and establish linkage with DoF • Train 25 persons on advance fish production technologies from successful farmers and others (source of training: DoY, DoF, BAU)	

Poultry (Broiler, Sonali chicken, Local chicken and Duck)

Constraints and Solutions analysis

ILRP Table 37 summarizes constraints and possible solutions to remove them for backyard poultry subsector. We have divided the issues in the following five areas:

- **Product and market:** As such no major problem is reported by the farmers/traders regarding product and markets. Poultry birds have good increasing demand and price in local markets; access to markets is not also a problem- farmers can directly sell to consumers or traders in the local markets; price and profit are good; opportunities exist to expand i) backyard scavenging type chicken ii) broiler, iii) Sonali chicken and iv) duck production.
- **Technology and production:** Backyard poultry birds are raised traditionally. Current practices of incubation and rearing give low yields of eggs and birds per year which can be changed as follows to substantially increase production and yield: i) currently farmers do not give any feed to the mother chicken during incubation that reduces body weight and delays another round of egg production. If some feed (poor quality rice and wheat) and water is given during incubation number of batches of eggs and consequently chicks can be produced 5-6 times per year compared to 2-3 batch now; ii) in addition to feed mother hen has to be removed from the newly hatched chicks within three days that encourages another cycle of egg production within days. For

broiler main problems are irregular supply of day-old-chicks, high cost of feed and chicks. Sonali birds will somewhat new to the project areas, which will need local production of day-old-chicks to be supplied to the rearers. Duck farms can be expanded with expanding duckling production farms.

- Second critical issue is lack of vaccination services for chicks, adult hen/cock and ducks. The most common disease is Ranikhet, which can be prevented by vaccines, which are available cheaply from DLS and from private sources. Presently mortality is high since access to vaccination is low. This because of distance between DLS and villages and there is no alternative NGO/private vaccination services. Duck vaccine is not always available.

Human resources: Knowledge of vaccination is the common limitation found among the farming community. Besides, knowledge of advance production practices of backyard poultry, broiler and Sonali chicken are limited.

Finance: Usually own money is used for poultry production and in some cases loan from MFIs.

Support services: DLS vaccination services are limited. At the same time no reliable private animal health services is available. Villagers normally go without any preventive services. Similarly, due to lack of demand animal medicines are not available in rural areas. It is critical to maintain cool chain for vaccines, which is only available with DLS. Any alternative system will have to develop such infrastructure for offering vaccination services to the farmers.

Implementation Strategy: The overall objective is to expand poultry production (scavenging, broiler, Sonali and duck in project areas and make this subsector as a significant source of income. The interventions are summarized in ILRP Table 38. The main implementation strategy will be as follows:

- **Organize farmers:** The first step will be to organize all village households who are willing to practice new farming techniques and more importantly accept preventive health services for full-cost, which will include travel expense and fee for the vaccinator.
- **Training and technical assistance:** Provide orientation on improved farm management training for half-a-day. Issues to be covered will be breed selection, feed, housing, and disease control. NGO vet and vaccinators will provide curative services.
- **Develop alternative health services:** Partner NGO in each project part will do the following: i) Organize farmers through their contracted trained persons (vaccinators/trainers); ii) use the same solar-powered refrigerators store vaccines; iv) sign a deal with each family for delivering health services for full-cost with the help of vaccinators; v) ensure vaccines at designated time and date.
- **Support services:** i) In addition to vaccinators, about 100 good poultry farmers will be trained to vaccinate poultry within project villages so that they themselves vaccinate poultry birds;

ILRP Table 37: Constraints analysis for poultry subsector

Main Areas	Constraints and Challenges	Proposed Solutions	Activities to implement the solutions
Entrepreneurship	Farmers take traditional outlook not so much commercial consideration in rearing backyard poultry birds. More opportunities exist to expand broiler, Sonali and duck production.	Motivational campaign and training about commercial considerations regarding local poultry production	Include commercial issues in training courses
Product and markets	No major problem reported in marketing areas. Profitable business and easy access to market. Sonali birds and min-hatcheries need to be promoted.	--	--
Technology and production	• Backyard poultry: Farmers follow traditional farming techniques, does not provide feed during incubation period; Hens are allowed to roam with chicks for more than a month. • Sonali variety is not raised and production techniques need to be taught. Local day-old-chicks to be produced • Broiler: production knowledge and disease control knowledge is limited • Supply of duckling is limited • Reliable preventive health care system absent • Vaccine cool chain facilities are not available in rural areas	• Disseminate information about improved farming techniques for all types of chickens and duck. • Develop alternative health care system • Develop cool chain infrastructure	• Organize orientation training on improve poultry bird farming management • Develop alternative care system through NGOs that would provide services and recover full cost • As part of vaccine services, use the same [large animal] solar powered refrigeration system.
Human resources	Knowledge regarding improved poultry management and disease control is absent	• Disseminate knowledge of improved management, especially to the women	Organize training on improved farm management
Support services	• No alternative vaccinators available • No alternative private trainers are available	• Develop alternative NGO/private vaccinators and trainers	Develop a cadre of vaccinators and trainers from within the communities.

ILRP Table 38: Activities and targets for one sector (example for 15 villages) of the project area for the poultry subsector

Main Areas	Activities to implement the solutions	Targets (5 years)	Gender and other relevant targets
Organizing the poultry farmers or entrepreneurs	Organize poultry farmers or form poultry villages as clusters who are ready to accept health services at full-cost and expand poultry production.	All villages in the project for backyard poultry; 10 farms each for broiler, duckery and Sonali production	–
Product and markets	Introduce Sonali production and chick production	–	–
Technology and production	• Organize (half-day) training on improved farm management that includes incubation, feed and disease control. • NGOs offer vaccination services • Use solar powered refrigerators to maintain cool chain for vaccines.	• 500 persons for backyard poultry; 300 for other three varieties; and 25 breeders • All poultry birds in a village are covered under this health • Use solar-refrigerators and required number of thermo-flux to carry vaccines	–
Finance	–	• Backyard poultry can be supported for direct 700-800 affected families who are rearing in each part of the project.	RMIP will support finance for poultry to direct affected families.
Support services	Train about 100 persons as poultry vaccinators for each part/sector of the project areas from successful farmers who will be contracted by the NGOs to do the vaccinations. These skilled persons can also be used as trainers	• 100 persons in each part/sector of the project (Persons with DoY training will also be accepted; educated and successful farmers and village vets may also be accepted for this program)	–
–	Develop new dealers or work with existing dealers to store and sell poultry feed and medicines	• 2-3 dealers per project part.	–

Livestock (Beef fattening, dairy and sheep rearing)

Challenges:ILRP Table 39summarizes constraints and possible solutions to remove them for livestock subsector and ILRP Table 40 presents activities. Briefly the constraints are as follows:

- **Product and market:** In project areas all cows and sheep are of local varieties and more adaptive to the areas. Local varieties are expected continue. DLS promotes artificial insemination (AI) but in most of the project areas is not popular due to communication problems. Most of the time farmers who live near respective DLS offices may find it easy to opt for AI for dairy cows.
- **Technology and production:** Cattle and sheep are raised traditionally where the farmers depend on natural grass. During rainy season fodder shortage is very common. But the most critical problem for livestock rearing is the lack of preventive and curative health care services. Only about 5% animals are de-wormed and about10% may have preventive vaccination whereas if only de-worming is done (4 tablets per year) 70-80% of animal health problem can be prevented. For cattle the common diseases, which can be prevented by vaccines, are Anthrax, BQ and FMD. Lack of awareness, limited supply of services from DLS, distance and expenses are the main reasons. Farmers reported death of animals and major loss of productive asset and income due to disease. Even when vaccinated for FMD by DLS, spread of disease was reported. According to DLS, it has been due to vaccine supplied by DLS. FMD can be caused by 7 stains of virus whereas DLS supplied vaccines can protect against two strains. Privately produced vaccines can protect against all strains. A number of farmers reported heavy expenses for curative health services, which could have been prevented at a lot lower cost if reliable health services were available. **Recent spread of anthrax in cows and then to human in several districts has become a national crisis**. In addition to vaccination, it will be important to develop local breading farms where sheep are properly vaccinated and then sold to buyers that would protect from spread of disease. Discussions with farmers reveal that they are ready to pay for reliable preventive health care services.

Human resources: Knowledge of vaccination is the common limitations found among the farming community.

Finance: Usually own money and in some cases loan from MFIs are the main sources of finance for livestock business.

Support services: Vaccination from DLS is limited and not reliable. At the same time no reliable private animal health services is available. Villagers normally go without any preventive services but often depend of village vets (unskilled herbal healers). Similarly, due to lack of demand animal medicines are not available in rural areas. It is critical to maintain cool chain for vaccines, which is only available with DLS. Any alternative system will have to develop such infrastructure for offering vaccination services to the farmers.

Implementation Strategy for Livestock Sub-sector: The objective for livestock subsector is to develop sustainable alternative animal health services to promote livestock as important source of income for affected households of RMIP. The main implementation strategy will be as follows:

- **Organize farmers:** The first step will be to organize interested farmers (form Common Interest Groups) who are willing to receive training. For a cow/bull a package of 4 de-worming tablets, and vaccines for Anthrax, BQ and FMD (7 strains) will cost about Taka 350, which will include travel expense and fee for the vaccinator. However, a detail financial model needs to be developed by the implementing agency, most likely by NGO-MFIs currently offering microfinance in the proposed project areas.
- **Training and technical assistance:** Provide improved farm management training for one day. Issues to be covered will be breed selection, feed, housing, disease control and AI. Training courses must be practical and hands-on, preferably in successful dairy projects so that trainees can observe and learn from training. **Classroom/lecture type training must be avoided.** NGO vet and vaccinators will provide curative services and if necessary develop a referral services with local DLS.

- **Develop alternative health services:** Partner NGO-MFI in each Project areas will do the following: i) Organize farmers through their contracted trained persons (vaccinators/trainers); ii) set up refrigerators in two locations in each part/sector of project areas, iii) store vaccines and de-worming tablets/injections from good sources; iv) sign a deal with each family for delivering health services, v) ensure vaccines at designated time and date; and vi) work with vaccine and medicine suppliers to ensure supply and get wholesale reduced prices for medicine and vaccines.
- **Support services:** i) Train 15 vaccinators/trainers from good training centers; ii) Develop 03 dealers of feed and medicine sellers by contacting feed and medicine producers.

ILRP Table 39: Constraints analysis for Livestock subsector

Main Areas	Constraints and Challenges	Proposed Solutions	Activities to implement the solutions
Entrepreneurship	Farmers take traditional outlook not so much commercial consideration in raising livestock	Motivational campaign and training about commercial considerations regarding livestock rearing	Include commercial issues in training courses
Product and markets	Farmers mostly raise local varieties that produce small amount of milk and low value calves	Encourage artificial insemination to improve varieties, wherever applicable but breed change will not be the priority at the initial stage.	Promote AI through training and information dissemination Establish linkage between farmers and DLS, only provider of AI
Technology and production	• Farmers follow traditional farming techniques • Reliable preventive health care system absent • Vaccine cool chain facilities are not available in rural areas	• Disseminate information about improved farming techniques including animal health needs, and disease control. • Develop alternative health care system • Develop cool chain infrastructure	Organize orientation training on improve livestock management Develop alternative health care system through NGOs that would provide services and recover full cost As part of vaccine services set up refrigeration system in convenient locations in each project part/sector
Human resources	Knowledge regarding improved livestock management and disease control is absent	Disseminate knowledge of improved management, especially to the women	Organize training on improved farm management

Support services	No alternative vaccinators available No alternative private trainers are available No livestock insurance service available	Develop alternative NGO/private vaccinators and trainers	Develop a cadre of vaccinators and trainers

ILRP Table 40: Activities and targets for sector (example for 15 villages) of the project areas for livestock subsector

Main Areas	Activities to implement the solutions	Targets (5 years)	Remarks
Organizing the farmers or entrepreneurs	• Organize livestock farmers or try to develop each village as cluster for livestock farming who are ready to accept animal health services.	• At least 500 farmers in one project part/sector by the end of the project	The objective will be to organize all farmers in a village for vaccination.
Product and markets	• Organize campaign for adopting AI (include AI in training course) [but not a priority]	• 200 cows per year	This is to administered in collaboration with Upazila DLS offices
Technology and production	• Organize (one day) training on improved farm management that includes feed and disease control and AI issues.	• 1500 persons in 5 years	
Finance	• Advocacy with MFIs to offer seasonal loan for beef fattening • Asset Transfer can be promoted to direct affected families	• Livestock can be supported for direct 400-500 affected families who are rearing in each part of the project.	RMIP will support finance for poultry to direct affected families.
Support services	• Train animal vaccinators for each project areas that will be contracted by the NGOs to do the vaccinations and administer de-worming tablets and establish a referral services with qualified vet for curative services. These skilled persons can also be used as trainers. • NGOs offer vaccination and de-worming package for each livestock for full-cost. Develop management system where staff from NGOs will visit villages to administer de-worming and vaccinate animals at regular intervals • Set up refrigerators at least in	• 25 persons per part of project (Chittagong Vet University provides two weeks training course; persons with DoY training will also be accepted; educated and successful farmers and village vets may also be accepted for this program). • All animals of 500 HHs are covered under this health service • One set refrigerator	• Project will assist developing infrastructure for vaccination services • The objective will be target all livestock is a village and all villages in a project part areas. This will allow economies of scale and make the health services financially viable;

	two convenient locations in each part of project to easily reach the HHs	and required number of thermo-flux to carry vaccines	
_	• Develop new dealers or work with existing dealers to store and sell animal feed and medicines.	• 2-3 dealers per part of project areas.	_

ILRP 1.4. Methodology

The following steps have been undertaken to conduct livelihoods assessment:

- **Livelihood assets and baseline data:** Socio-economic data has been collected through a completed household survey of the 50km priority area with 3,346 households in the Project area, a sample survey covering 700 households and a sample survey covering over 4.000 households along 183 km including the Priority reach. Some of the numbers may slightly vary from the numbers presented in Volume 2 RAP that have been drawn from the two surveys specifically conducted for the RAP, the loss of Inventory and socio-economic survey.
- **Assessment of livelihoods options:** Further livelihoods related information have been gathered from 10 embankment adjacent villages, where mostly farmers and traders who are living in both sides of embankment, UP members are attended, meeting with offices of four line agencies such DLS, DoF, DAE and women welfare department, selected NGOs and private sector stakeholders.
- **Studying marketing system:** Simultaneously, marketing system in project areas has been studied by consulting with farmers, traders from project areas, retailers and various input sellers and suppliers. This step has also provided opportunities and challenges in production and marketing system in project areas.
- **Selection subsectors:** The study has led to identification of potential subsectors by completing the following steps: i) determine present demand and supply; ii) identify opportunities and challenges; iii) determine interventions for each subsector; v) determine cost/budget for implementation; and iv) devise monitoring and evaluation indicators.
- **Design Livelihoods Subcomponent:** The overall cost/budget for the subcomponent has been determined using information from sample studies. Besides, implementation and management system, MIS, risks and mitigation steps, and overall monitoring and evaluation have been determined and planned.

APPENDIX 2

Gender Impact Analysis, Supporting Data and Methodology

GAP 2.1. The National Context

Overview of Gender Status in Bangladesh

The life of women and men in Bangladesh is dominated by a patriarchal, patrilineal, and patrilocal social system. The family, which constitutes the basic unit of social control, sets the norm for male and female differently. Within this system, the father, or in his absence, the next male kin is the head of the household. Men own, manage and control over land, income and women's productive, reproductive labor and sexuality. The society maintains rigid division of labor that controls women's mobility, roles and responsibility, and sexuality. As a result, both decision-making powers and economic control are vested in the hands of men. Muslim women give up their right to fathers' property in favor of brothers or in the event of inheriting property, pass control to their husbands or sons. In both cases, the man gives protection to the woman in return for control over her property. As per patriarchal rules men also work as provider (bread winner). Without resources such as land, women have limited say in household decision-making, and no recourse to the assets during crises. Men are considered as the household head. However, number of female-headed households (FHH) is increasing. World Bank data shows that percentage of female-headed household was 13 % in 2011 from 9 % in 2009 (WB, 2013).

The social system has reflection in the area of women's mobility, women's engagement with cash work, marriage, health and entitlement to property. On the other hand, government, NGOs and civil society's intervention towards women's empowerment and gender equality has made substantial change in the life of women. Some of the key areas of achievements are summarized in the next section.

Key Areas of Progress

Women's Socio-Economic Political Progress

Bangladesh has already achieved the goal of gender parity in primary and secondary education at the national level. Primary School Completion Rate was 79.5 % in 2011 9 MDG progress report). Despite advancement significant challenges remain. The challenge of completing the full cycle of primary and secondary education includes poverty, violence against girls, restricted mobility, lack of separate toilet facilities for girls, lack of female teachers at secondary school level and lack of girls' hostel facilities and ensuring quality of education. As a result, there has been steady improvement in the social and political empowerment scenario of women. The current parliament has got 20 directly elected women parliamentarians and 50 reserved seats for women out of total 350 seats. The government has adopted the National Policy for Women's Advancement 2011 and a series of programs for empowerment of women. Women participation in the decision making process has also marked significant improvement in the country.

However, due to socio-cultural reason gender based occupational segregation still exists in Bangladesh. Gender differentials are prominent in terms of field of work, wage, time allocation and so on. Wage employment for women in Bangladesh is still low. Only one woman out of every five is engaged in wage employment in the non-agricultural sector (MDGs: Bangladesh Progress Report 2012, GOB 2013). FHH, separated, widow women constitute the majority of the hard-core poor who enter the labor market for survival, as heads of their households. Similarly women spent less time in market activities and men in non-market activities.

Marriage and Fertility

According to the Bangladesh Demographic Health Survey, 2007, fifty percent of the girls are married before the age of 16. This rate has remained the same in the last 35 years. A woman, on an average, is married before reaching the age of 20.6 years. Factors perpetuating early marriage include: poverty, parental desire to ensure sexual relations within marriage, a lack of educational or employment opportunities for girls and the sense that girls' main value is as wives and mothers and dowry system. On the average a Bangladeshi woman has three pregnancies in her lifetime. Some of the key marriage and fertility information are: (i) total fertility rate (births per woman) 2.2; (ii) women first married by age 18 (% of women ages 20–24) -66%; (iii) contraceptive prevalence (% of women ages 15–

49) -61%; (iv) unmet need for contraception (% of women ages 15–49) -17%; (v) births attended by skilled health staff (% of total) 32%; and (vi) maternal mortality ratio (per 100,000 live births) -240. (WB, 2013).

Violence Against Women

Women in Bangladesh traditionally suffer from a subordinate status in the family and subjected to discrimination in all spheres in life. Domestic violence, particularly physical violence committed by family members have long been considered a legitimate means to discipline women whose gender role in any manner did not conform to the expectations either of the parental family or of husband's family. Consequently family violence remained the most under reported crime of the society. According to a UN source forty seven per cent of women are physically abused by their intimate male partner in Bangladesh. Demographic surveillance data of ICDDR,B reveals that over 14% maternal deaths are associated with injuries caused by various forms of violence. Battering of women within the household appears to be the most wide spread form of domestic violence throughout Bangladesh, although there is a strong social trend of not recognizing it as violence – even police often refuse to file a case of domestic violence.

Migration

Internal migration involves men, women and children, and includes rural to rural, urban to rural, urban to urban and rural to urban flows. Even prior to the establishment of garment factories, poorer women, compelled by poverty and lack of social security arrangements, migrated to towns and cities in search of improved livelihood to work as construction labor or domestic help. With the advent of the RMG sector mainly in Dhaka city, the migration of young women experienced strong growth leading to some notable changes in women's mobility and occupations due to their entry into the formal sector.

Gender, Health and Nutrition

Women are more disadvantaged than men in terms of access to health care. Trained personnel attend only one third of births in Bangladesh. Women suffer from malnutrition more than men. The nutritional status of girls is also worse than that of boys. Bangladesh is one of the few countries in the world where males outnumber females. Women in the reproductive age group are more prone to sickness. Males suffer from acute and chronic conditions in lower proportions than females.

Abortion except to save the life of the mother is illegal. Legal abortions must be performed by a qualified physician in a hospital. The severity of punishment for illegal abortion under the penalty code depends upon whether the woman consented to the abortion and the stage of her pregnancy at which the procedure is performed. A sentence of up to three years' imprisonment, fines or both may be imposed for causing an abortion with the woman's consent. The sentence increases to up to seven years, if the woman is 'quick with child' meaning past the fourth or fifth month of pregnancy. Despite the illegality of abortion, official government policy allows for menstrual regulations as means of ensuring that a woman at risk of pregnancy is not actually pregnant. Because the procedure is considered as a method establishing non-pregnancy, as opposed to terminating pregnancy, it is unaffected by laws restricting abortion and is thereby removed from the purview of the penalty code. According to official policy, menstrual regulation is allowed up to eight weeks from the last menstrual period by a trained family welfare visitor under the supervision of a physician, and up to tenth week by a licensed medical practitioner trained in the procedure. Menstrual regulation cannot provide services to unmarried women requesting the procedure.

Agriculture

In Bangladesh, rural women play a major role in agricultural production. Especially women are extensively involved in pre and post-harvest activities. A widow receives one-eighth of her husband's property if they have children and one-fourth if they do not. On the contrary, men are basically involved in harvest activities. However, women are not recognized as farmer and experience deprivation in owning and controlling of land. Moreover they face wage discrimination. Generally, agriculture extension services, do not reach to

women. They suffer from lack of training, marketing facilities, credit and subsidy. This phenomenon leads to further deprivation in their lives and treat women as burden and problem. The Islamic laws of inheritance are based on the local school of sharia, wherein a daughter is bequeathed only half what her brother inherits. Hindu and Buddhist women inherit nothing. Often women do not claim any of their inheritance, leaving it in their brothers' possession. Activists in Bangladesh call it the "good-sister syndrome": hoping that the brother will look after his sister's rights. In their experience, more often than not "the good brother does not reciprocate in the way the good sister anticipated". A significant proportion of Bangladeshi women involve themselves in the wage labor market hugely occupied and dominated by their male counterparts. Abdullah (1983) claimed that except for the field-level activities of the agricultural sector, all activities generally related to agriculture are operated by women. In fact, female members of a family spend at least 10-14 hours a day in doing homestead agriculture, post-harvesting activities, childcare, household maintenance, handicraft production, etc. at the homestead level either for their own consumption or for market sale (Abdullah and Zeidenstein 1976; Hye 1984).

GAP 2.2 Gender Analysis Introduction

Objectives

The gender analysis will be used to identify and mitigate adverse impacts that the project might cause on men and women concerning their loss of livelihood activities, and health risk. The analysis will look into, within the context of GOB national policies and gender mainstreaming guidelines of the World Bank, how best to identify gender actions in respect of project interventions – for instance, (i) how to ensure women's inputs and participation in project planning; (ii) how to identify needs and expectation as well as potential adverse impacts on women and other groups; (iii) how to identify and integrate appropriate actions to ensure and maximize project benefits for women and other vulnerable groups.

Gender Analysis

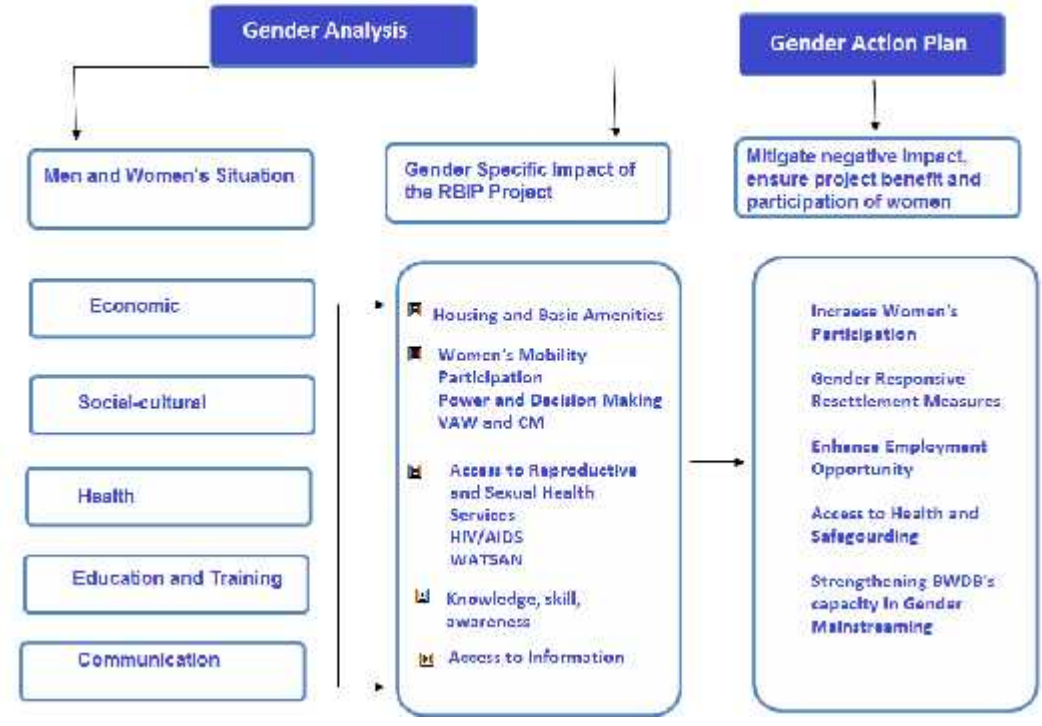
The project in each phase will include gender analysis for gender inclusive design, implementation and operation including beneficiary participation. GA will find out the conditions, needs, participation rates, access to resources and development, control of assets, decision making powers, etc., between women and men in their assigned gender roles. Following key questions were asked and data collected to facilitate the gender analysis.

Four key areas were considered in developing questions. These include

i. Roles and responsibility – for example, what do men and women do – where (location, pattern, mobility) and when (daily, seasonal pattern)?
ii. Ownership of assets – for instance, what livelihood assets/opportunities do men and women have access to and control over and what constraints do they face?
iii. Power ad decision-making: what decision-making do men and/or women participate in and who makes decisions and how?, and
iv. Needs, priorities and perspectives such as what are women's and men's needs and priorities and what perspectives do they have on appropriate and sustainable ways of addressing their needs?

Conceptual Framework

The following framework (GAP Figure 1) guided the analysis in an integrated fashion covering nearly all socio-cultural aspects and likely impacts of the proposed interventions



GAP Figure 1: Conceptual Framework for Gender Analysis

GAP 2.3. Gender Status in the Project Area

Male and Female Population and Sex Ratio

The social survey shows that among the all sample HHs the number of women were less than men. However, on the embankment the demographic scenario was opposite. The following table (Table 1) depicted that Sex ratio is 95 on the embankment, against national average of 99.68 (BBS, population survey 2011). On the contrary, average sex ratio is 102 among the sample households. Further analysis of population age structure reveals that women's number is significantly lower between 10-19 age group, which is 130 at this group and 150 for 15-19 age group. This represents imbalance at this category. On the other hand sex ration is 89 % between 20-39 age group. About 13.43 % of the female population are widowed, divorced or separated (against Bangladesh rural 8.8%, BBS Labor Force Survey 2010 p 20). As a whole, more women are widowed, separated or divorced on the embankment dwellers than in other two areas. The sample households have a total of 213 disabled persons of them 74 are female and 139 are male. Of the total, 71 are household heads including 3 female household heads.

Economic Status

A study conducted by Nirapad at Kazipur, Sariakandi and Gaibanda shows that women living on the embankments and on other's land have lost everything due to river erosion and flooding. They are on constant threat of eviction. Most of them had to shift their temporary houses multiple times due to riverbank erosion. They don't own lands, living in very limited space and are always facing crisis due to lack of work opportunities for their livelihood. They seek attention of government and NGO programs to help uplift their condition. These affected families have become extreme poor losing their assets and land properties. Most families are temporarily separated because of the facts that a large number of the males left the family searching for works elsewhere. On the other hand, the families of the existing non-eroded villages have also faced serious problems due to overburdened pressure of higher population density, although the demand for employments (mostly agriculture related) remains the same as before. The social assessments (see Vol. 2 Social Assessments) and other available literature echoed similar findings. In sum, the quality of their living and habitat is deteriorated as the displacees are surrounded with enduring physical hardship, shared poverty and immense economic adversity caused by the riverbank erosion displacement.

GAP Table 2: Sex ratio in the RMIP area (183 km)

Area	Population			Sex Ratio
	Male	Female	Total	
On the Embankment	4,050	4,273	8,323	95
In the village	1,956	1,759	3,715	111
Riverside	2,807	2,601	5,408	108
All Sample HH	8,813	8,633	17,846	102

Housing and Basic Amenities

Majority of the sample households do not own any homestead land, most have built own house of their own. Both the male and female-headed households have experienced riverbank erosion displacement many times. After displacement, many poor households without any options took shelter under the shade of their relatives or neighbors, locally called uthulis (persons sheltered by others). Some of them built their huts on the side of road or flood preventing embankment.

Food Security

The social survey shows that on the whole 76% of the sample households were able to afford two meals daily for all household members on a regular basis, which is perceived as borderline for the lower poor. This indicates that about 24% of the households are extreme poor, which was 30% for the embankment dwellers, 15% for the insider villagers and 20% for the riverside households. Women sacrificed meals more frequently than men seemingly to give preference to children. About 17% women in the embankment and 6.5% in the Countryside villages had less than 3 meals, which was 14 and 5 percent for the males.

Following key skills: Katha sewing, homestead gardening, processing, cattle rearing, earth work

(FHH), pita making. The women shared that they require training assistance to improve their livelihood

options. Nearly 76% of the respondents wanted training on embroidery, tailoring, cattle and poultry farm and cow fattening.

Food Security

The social survey shows that on the whole 76% of the sample households were able to afford two meals daily for all household members on a regular basis, which is perceived as borderline for the lower poor. This indicates that about 24% of the households are extreme poor, which was 30% for the embankment dwellers, 15% for the insider villagers and 20% for the riverside households. Women sacrificed meals more frequently than men seemingly to give preference to children. About 17% women in the embankment and 6.5% in the countryside villages had less than 3 meals, which was 14 and 5 percent for the males.

Income and Livelihood

The gender survey reveal that out of the total women of the 702 respondent HHs, 38% on the embankment, 47 % on the embankment but outside the proposed alignment, 46 % at the village side and 20% at the riverside do some kind of income earning activities. This data shows that only a fifth of the riverside women are engaged in income activities. It shows higher income earning engagement than the previous reviews conducted by Nirapod on the right bank of Jamuna, which shows that in the project area 75% of women were not engaged in any income-generating activities. 19% were engaged in irregular economic activities such as domestic bird rearing, cow or goat rearing, homestead vegetable cultivation and agricultural labor. The remaining 6% were engaged in regular employment, 5% in the garment industry in Dhaka city and 1% in services such as teachers, NGO workers or other community services. It seems that women are engaged in more income activities than before. See GAP Table 2.

Apart from the livelihood activities in the project area, many of the families survived on the remittance they received from the family members working outside. A total of 642 respondent households reported receipt of income transfer or remittance from family members/kin. Around 16% of the HHs received remittance from outside the locality. Many families received remittance from their daughters working in the garments industry at Dhaka. The uncertain and irregular income of the displacee households of study villages pushed the female displacees into the operation of economic activities by themselves. As a matter of fact, the female displacees are driven to engage themselves as supplementary means of earning in various economic activities. The female displacees employ themselves to earn something for maintaining their familial survival and/or to assist their male household heads in this regard. Although the operation of economic activities outside the homestead premises by female members is culturally restricted and treated as humiliating one for the familial status in social arena, their prodigious needs compelled them to do the same in the desolate state of their livelihood after displacement. The female displacees formulate and undertake other than usual initiatives in their own ways to supplement their irregular and contemptible familial income.

According to the social survey data, the majority of the earning women are engaged in poultry, egg selling, and tailoring and animal husbandry. This is also supported by the findings of the gender survey conducted by the project. Young women work at garments industries in Dhaka, women of FHH are engaged as maid, earthwork in the locality. It was found from the RMIP consultation with women that many of the families survive on the remittance daughters send to the families from Dhaka city. On an average they send BDT 6000-8000 per month. Nearly 46 percent displacee women in total reared cattle for supplementing their familial survival. Another popular economic activities done by the displacee women is poultry raising. They raise poultry in order to supplement their family income. Some of the displacee women sharecrop in chicken and ducks from their neighbors and relatives. They do it on fifty-fifty share arrangement. Consultations and FGDs reveal that female displacees are also engaged themselves in homestead agriculture, handicrafts, needlework, bamboo work, indigenous mat of date-leaf and kantha sewing (which is one kind of bed-cover specially designed with indigenous

needlework and also it is used to wrap the body), produce winnowing fan, baskets, khalpa (used as wall material and fence material), khalsun (means of trapping fish), etc. Female displacees run some sort of small business for maintaining their familial subsistence. Only a few are engaged in construction work. Char Livelihood Programme review shows that poor and extreme poor women (Jamuna river poor char land) of Sariakandi upazila (Sadar and Narshi unions) under Bogra district and Kazipur upazila (Sadar and Maizbari unions) under Sirajganj district engaged in homestead raising, flood shelter construction, water and sanitation, road, market, graveyard, etc. raising tree plantation, rescue boat, tree plantation, road improvement, shelter construction, training, food for work, relief package distribution, school renovation, sapling distribution, housing with steel frame. RMIP qualitative findings show that women have preferred livelihood activities: tailoring, embroidery, cattle rearing, poultry, computer (young educated women).

GAP Table 2: Overview of Activities reported by Female Respondents in Priority Area

Reported Activities	Number of women
Homestead gardening	3
Poultry	42
Cattle Farming	5
Cleaning	2
Beef Fattening	6
Milk Selling	1
Egg Sales	50
Private Tuition	2
Embroidery	3
Tailoring	17
Bamboo work	1
Katha Sewing for cash	3
Animal husbandry	16
Katha Sewing	1
Total	152

Source: Gender Survey, RMIP 2014, multiple responses possible

Women's average income is only BDT 1068 per month (less than half a $ a day). Majority of them earn less than this amount. Women spend their earning on basic items such as food, education, clothing and soap/oil. The pattern is similar for all areas. Out of 348 only 71 women (20%) shared that they can keep their money in their hand.

Restriction Working Outside

66% of the sample households mentioned that they would have no restriction working outside home, which is 64 % for the embankment dwellers (see GAP Table 3). 59% of the sample households mentioned that they would have no restriction on participating at the social committees for riverbank protection. Only 37% of the women expressed their willingness to participate in the project related activities. Nearly 42% of the respondents stated that they go to the market places. However, the percentage is nearly 50% on the embankment.

GAP Table 3: Restriction for Women to Work Outside, 50 km Priority stretch

Restriction on working outside	Yes	No
Female	118	230

Source: Gender Survey, RMIP 2014, multiple responses possible

Education and Skills

Among the embankment dwellers, 17.2% of the women are illiterate. Only 16 % of them studied up to grade 6. There are 11 women among the respondents on the embankment who have bachelor and above qualification. 32% men and 36% women have grade 1 to 4 level of education. Women are however behind men in education above SSC. Literacy rate is higher in the villages and lower among the embankment dwellers and lowest among the charlanders.

The gender survey reveals that only 13% of the respondent women received training from non-government organizations, whereas men's participation was nearly zero. More than 86% of the female training recipients mentioned that they were benefited from the training course. 72% of the trainees received training from the NGOs. Majority of them received training on poultry, tailoring, seed management, and cattle farming. Qualitative findings shows that women have following key skills: Katha sewing, homestead gardening, processing, cattle rearing, earth work (FHH), pita making (see GAP Table 5) The women shared that they require training assistance to improve their livelihood options (see GAP Table 4). Nearly 76 % of the

respondents wanted training on embroidery, tailoring, cattle and poultry farm and cow fattening.

Social–Cultural Aspects

As elsewhere in a male dominated society women are not recognized as the household head despite their major contribution in a family. They have limited or no entitlement to property, work and choices. RMIP gender survey shows that Women have limited mobility to hospitals, schools and relatives house. However, now a significant number of women also visit market. The social survey data reported that out of 318 respondents 130 women go to the market. Women go to hospitals more than men (see upazila data under health).

Women are engage with number of NGOs working in the area. In all the two upazilas there are a large number of NGOs (32 at Sariakandi and about 25 at Kazipur) working with local poor women and men (http://www.nirapad.org.bd).

Training Assistance Needed As Per People Living in RMIP Priority Area

GAP Table 4: Trainings as per Female Respondents in Priority Area

Training assistance required area	Number=348
Job Training	1
Small trade	1
Product Development	2
Savings Group	4
Connecting to buyers	7
Food Processing	1
Weaving industry	1
Embroidery	38
Tailoring	103
Boutique shop management	1
Computer training	2
Homestead gardening	5
Keeping poultry and cattle farm	105
Cow fattening	19
Contact with buyers for the sale of products	2
Training is intended to	41
Job manage	2
River erosion work	2

Social –Cultural Aspects

As elsewhere in a male dominated society women are not recognized as the household head despite their major contribution in a family. They have limited or no entitlement to property, work and choices. RMIP gender survey shows that Women have limited mobility to hospitals, schools and relatives house. However, now a significant number of women also visit market. The social survey data reported that out of 318 respondents 130 women go to the market. Women go to hospitals more than men (see upazila data under health).

Training Status As Per People Living in RMIP Priority Area

GAP Table 5: Trainings Received

Training	Number of women
Seed Management	5
Fertilizer management	1
Cattle Farming	4
Financial Management	1
Tailoring	10
Marketing	1
Poultry	17
Small trade	2
Food Processing	2
Embroidery	1
Total	44

Source: Multiple Response, Gender Survey, RMIP 2014

Women are engage with number of NGOs working in the area. In all the two upazilas there are a large number of NGOs (32 at Sariakandi and about 25 at Kazipur) working with local poor women and men (http://www.nirapad.org.bd).

Violence Against Women

In the consultation meetings, people mentioned eve teasing, dowry, early marriage are common in the area. 62% of the respondents shared that dowry is the biggest form of violence against women. However, only 14% of the respondents accepted that daughters are married early. Around 8% mentioned multiple marriages as the reason of violence. Husband's addiction to drugs is the reason of violence for more than 17%, which is around 13% on the embankment. Around 10 % of the respondents' husband left home, which is slightly more for the embankment dwellers. Nearly 38 %

mentioned that HH matters such as women could not cook on time were the reason of violence.

Nearly 74% of the respondents shared about incidence of physical violence. 8% women and more than 10% men reported about sexual violence. 16% women and 8 % of the men reported about economic violence. 88% of the women identified husband as the perpetrators while 89% of the men identified husband as the key perpetrators. All identified mother in law as the second perpetrators. However, considering the composition of the household structure it appears that % of mother-in-law, as abuser is very high. Women reported 7 cases of rape and abduction in last one year in the 50 km priority area, whereas men reported 4 cases of incidence on the embankment. Only two women reported about eve teasing. 62% women and 75% of men go to UP Chairman or member to report on VAW. 8 % of the female respondent and only 1% of the male respondent go to female UP member also. 22% of the women and 1 % of the men also go to the neighbors. 9% of the female respondents and 1% of the male respondents shared that they go to the police, as well.

Women and Health Seeking Behavior and Access

RMIP gender survey shows that majority of the respondents go to upazila health complex, union health center, community clinic, village doctor and pharmacy (see GAP Table 6). It was found that more women than men go to health facilities. Nearly 35% go to upazila health complex and 23% to the village doctor. The respondents share that they go there to treat from the diseases they suffer most such as that fever, cold, headache, diarrhea, colic pain. Majority of them suffered from fever. Hospitals also provide them only two/three medicines like paracatamole. Around 76% shared that they use family planning method, which is high in comparison to national scenario. RMIP qualitative findings show that young women use contraceptive, access to health facilities. As per Health bulletin 2014, Kazipur Upazila Health Complex MMR is low (only 12.48 per 100,000 live births). Only 8 (slightly more than 2%) reported about reproductive health related problems. However, there are no MCWCs at Kazipur. Nearly 88% of all last deliveries took place at home.

RMIP qualitative findings shows that young women use contraceptive, access to health facilities, health

worker go less to river eroded area; there is no MCWCs at Kazipur nearly 88 % of all last deliveries took place at home.

RMIP qualitative findings show that young women use contraceptive and access to health facilities. However, health worker go less to river-eroded areas. There are no MCWCs at Kazipur.

Women and Risk for HIV/AIDS and STD

16 % of the female and male respondents shared that they will accept marriage proposal with the outsiders came in the locality for work. Majority of them mentioned that they will accept marriage proposal if the bridegroom earn well and from a solvent family. Nearly 39% of the male respondents go outside the locality in search of work. All respondents did not respond about their sexual relations outside home. Those who responded, 21% of the embankment dwellers shared that they had sexual relations outside marriage. They had sex with sex workers and female co-workers.

Communication

The social survey and consultation findings show that majority of women lack control over communication channel; both male and female respondents preferred TV, mobile and mike as their preferred channel of communication. Most of women preferred TV. On the other hand men preferred TV and mobile equally. 38% of the men and 39% of the female respondents shared that they can read SMS in Bangla. Only a few preferred community radio, newspaper and other channel of communication. 17% of the male and 9% of the female respondents preferred collecting information from the UP.

GAP Table 6: Utilization of formal health facilities in Kazipur sub district

Type of Facility	Total OPD	Male	Female	Total Emergency	Male	Female

Upazila Health Complex	42,196	18,190	24,006	727	523	204
Union-Sub Centres	70,389	31,818	38,571			
Union Health and Family Welfare Centre (under DGHS)	94,280	8,978	85,302			
Private clinics	1,784	289	1,495			
NGO Clinics/Facilities	18,575	5,895	12,680			

Source: Health Bulletin, 2014

GAP 2.4. Women Living on Embankment – Overview of Challenges

Consultations, case studies and interviews reveal following gender specific challenges with women and men in the project area (see GAP Table 7).

GAP Table 7: Challenges of Living on the Embankment

Areas	Challenges for Women, Men, Girls and Boys
Housing and basic amenities	River erosion displace both MHH and FHH, FHH have no land
Education	School/Madrasa eroded, distance to schools increases: primary/high school-3 miles, college- 5 miles, girls suffer eve teasing, lack of separate/functional washroom facilities
Livelihood	Lack of work opportunity, skill development training, lack of space to homestead gardening, rear poultry, cattle on the embankment
Health	Health worker visits rarely in the river eroded area, lack of contraception, most delivery takes place at home, lack of awareness on Reproductive Health
Mobility	Many face restriction to work outside and will face restriction in participating project activities
Sanitation	Women who live on the embankment suffer most, Ring slap latrine, use a piece of cloth on the mouth during latrine use;
Nutrition	Women and children cannot maintain nutritional status due to lack of work, more food insecurity for women
Water	Arsenic problems in all upazilas
VAW	Early marriage (girls get married by 13-16), dowry, physical and psychological violence, more violence
Poverty	Perception: all poor
Marriage	Bad/no marriage proposal for daughters who live on the embankment, parents are desperate to marry of daughters, consider any proposal

GAP 2.5 Gender Mainstreaming in BWDB Projects

BWDB has a Gender Equity Strategy and Action Plan (2006-2011) formulated under IPSWAM project funded by the Netherlands. After phasing out of the project the activities did not take place for nearly two years. The second phase as The Blue Gold Project has undertaken an initiative to review the Gender Equity Strategy and Action Plan. The project also recommended reconstructing the previous Gender Equality Committee formulated in 27 February of 2007. The committee has suggested mainstreaming gender in planning, design, research, operation and preservation activities and monitoring, administration, finance, accounts and audit management. A new committee was formulated in 20.8.2014 (DP 3/606/71) with specific TORs.

In real practice, BWDB has no track record in gender mainstreaming in project operations. There is need for more in-house training and orientation to develop awareness and know-how for gender strategy and capacity building. Particularly incorporating gender-mainstreaming issues within the curriculum of BWDB Training Institutions is a priority. This should be made mandatory within the 100 hrs.mandatory course items of the BWDB training institution.

GAP 2.6Methodology

This section presents a discussion on the methodology adopted for conducting the gender analysis in Project area. In addition to available secondary data sources used to develop the national context, primary data – both qualitative and quantitative – were collected using a variety of field data collection techniques and methods. Quantitative data was collected on major gender issues, such as resource profile of men and women, women's participation to livelihood, income, skills, communication and health services. The data collection techniques and methods used are discussed below.

GAP Survey

A survey with 702 HHs along the 50km priority stretch (RMIP phase 1) was conducted to capture these issues. On the other hand qualitative data collection methods includes FGDs, community consultation, in-depth interview and data analysis from gender perspective. Sample distribution among the geographic location was 50% from embankment, 30% riverside and 20% countryside. As regards the sex 50% of the respondents were female. Simple random sampling technique was followed to select the respondents of quantitative survey. A questionnaire was used as a tool for conducting semi-structured interviews with women and men of the affected areas. The questionnaire included three sections: Background information, Health, Livelihood and Communication. VAW and HIV/AIDs were included under health. Gender was integrated under all components. However, there was scope with the questionnaire to separate gender related data during data analysis. A great deal of useful information was obtained by those well-designed women questionnaires consisting of quantitative and qualitative investigation. The questionnaire included following issues in order to find a complete gender picture in the locality:

- Resource profile: women's ownership/access/control over land, pond, trees, business, and savings.
- Livelihood: Women and men's access to work and income, employment/jobscenarioincluding landless and any excluded groups, wage, access to credit, education, skill development training and other assistance and challenges.
- Health: demographics, disease profile of men and women, morbidity (incidence, prevalence by men and women) & mortality (MMR), poverty, food and nutrition, water and sanitation, access and affordability to quality health services for women, KAP and health seeking behavior of women and men, women's access to health information, Violence Against Women (VAW) including trafficking issues, Sexuality (condom use, multiple partners in sex life, marriage aspect of young girls during construction phase, information and decision making, STIs and HIV/AIDS risk, challenges in accessing health care services.
- Communication: Women's Access to project related Information.
- Mobility and participation: Mobility to work, market, health facilities and social network/committees, women's ability to participate in resettlement related planning, decisions over household relocation options and resettlement related committees, social networks (including self-help groups), possible restrictions in participation including project related committees, family decision making, livelihood activities and information dissemination mechanism
- Decision making/choice: Access to livelihood, health services, information, leadership, and perception about the project, RH, marriage, contraception, family planning.

Apart from the gender questionnaire findings of the SA was also utilized to find out wider gender perspective in the project area.

Baseline HH Data for 183 km

In addition to the in-depth baseline study for the priority stretch over 50km, a sample survey was conducted along the 183 km for social assessment of the entire reach to be covered in three project phases. The gender analysis also benefitted from the sample household data.

Community Consultation, FGDs and In-depth Interviews

Extensive consultation meetings were held with the affected populations, particularly those on the embankments (for details, see VOL 3 Public Consultation and Participation Plan). A total of 5 FGDs were conducted with the directly and indirectly affected women of MHH and FHH at the project area to understand qualitative aspects of livelihood, health, VAW, communication related issues and Project's Impact analysis on the directly program affected female populations (MHH and FHH). In addition, Women Affairs Officer (Project Area), UP VIEC Chairperson/Up member (Female), ADB Gender Officer, UNWOMEN, Women Organization and NGO personnel, and community leaders were consulted to understand existing support mechanism to women of the project areas as well as understand possible impact of the project on them. All Consultations ensured women's active participation.

Data Quality Control and Analysis

Quality control was ensured at two levels. The field enumerators checked and edited the filled in questionnaire immediately after completing the field investigations as a team. Later, the questionnaires were also reviewed and checked by the supervisors. Data sets were processed and information relating to gender assessment was analyzed after completion of the field survey. Analysis of this diversified data and preparation of conclusions in the minimum possible time was achieved using statistical techniques of data analysis. Statistical software SPSS was used to record and analyze data.

GAP 2.7 References

i. Nirapod - A Review of Disaster and Livelihood Related Projects In GaibandhaSadar, Sariakandi and KazipurUpazilas And Existing Government Policies on Disaster Management).
ii. BBS, Government of Bangladesh. POPULATION AND HOUSING CENSUS 2011,
iii. Dr M Zulfiquar Ali Islam -Survival Strategies of the Female Displacees in Rural Bangladesh: A Study of Two Riparian Villages on the Right Bank of Jamuna
iv. The Little Data Book On Gender, 2013, The World

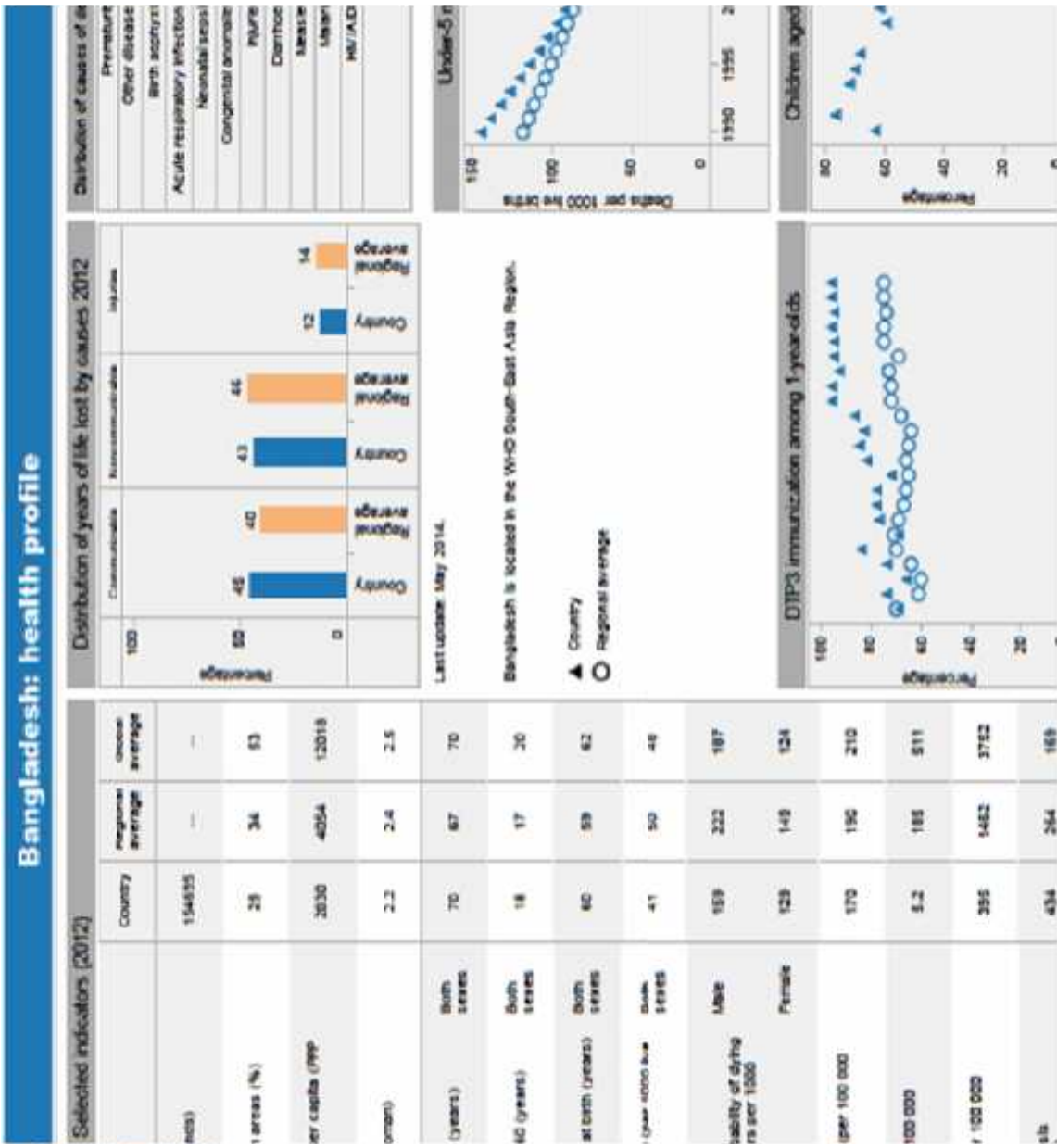
APPENDIX 3

Public Health Impact Analysis, Supporting Data and Methodology

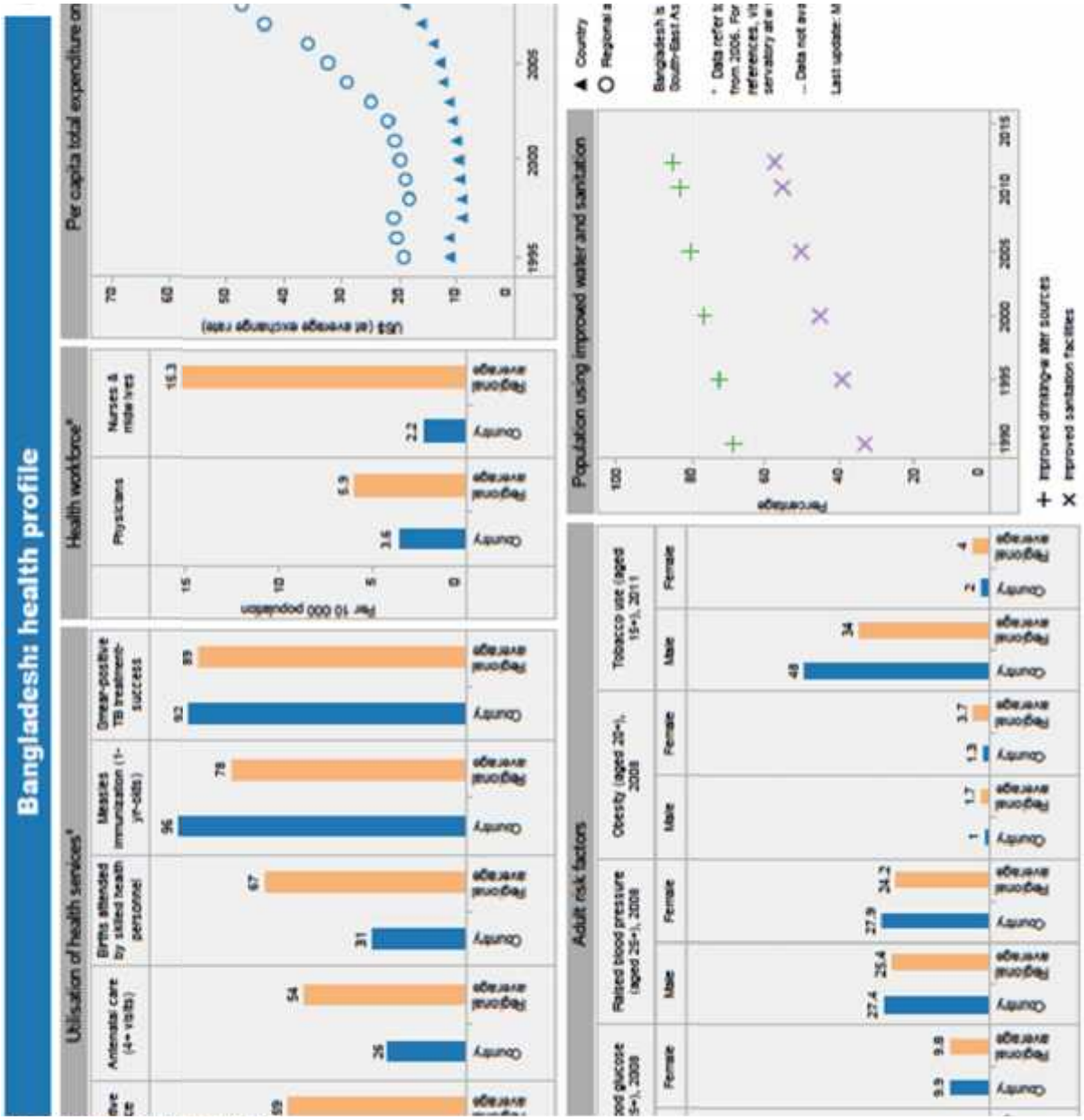
Public Health Impact Analysis, Supporting Data and Methodology

This appendix presents the data that support the assessment of the health situation and the determinants of health discussed in the main report. It provides an overview of the national context of health in Bangladesh, the burden of disease as well as a range of specific determinants of health for the project area, for the sub district or district level depending on availability of data. The data has been drawn from secondary as well as primary sources discussed in the methodology section at the end of this appendix.

PHAP 3.1 WHO Health Profile Bangladesh



PHAP Figure 1: WHO country profile Bangladesh (1of 2)



PHAP Figure 2: WHO country profile Bangladesh (2 of 2)

PHAP 3.1 Disease Burden in RMIP Priority Area Districts

Morbidity

Morbidity in Sirajganj District

PHAP Table 1 Top 10 Diseases according to number of patients admitted to public health facilities for Sirajganj district

No.	ICD-10 Code with Disease Name	No. of Cases	%
1	Y09 Assault by unspecified means	9874	24.09
2	A09 Diarrhoea and gastroenteritis of presumed infectious origin	5019	12.25
3	V99 Unspecified transport accident	4686	11.43

4	J18 Pneumonia, organism unspecified	3527	8.61
5	167.9 Code either does not match or written incorrectly. Correct Example: A09.0 or A09 without space or hyphen or comma	3097	7.56
6	J029 Acute pharyngitis, unspecified	2496	6.09
7	J45 Asthma	1212	2.96
8	T50 Poisoning by diuretics and other and unspecified drugs, medicaments and biological substances	315	0.77
9	0.04 Code either does not match or written incorrectly. Correct Example: A09.0 or A09 without space or hyphen or comma	236	0.58
10	A93 Other arthropod-borne viral fevers, NEC	105	0.26

Source: Sirajganj Civil Surgeon Office, Health Bulletin 2013, page 6

Morbidity in Bogra District

Appendix Table 2:Top 10 diseases according to number of patients admitted to public health facilities for Bogra district

No.	ICD-10 Code with Disease Name	No. of Cases	%
1	A09 Diarrhoea and gastroenteritis of presumed infectious origin	13,684	18.84
2	Y09 Assault by unspecified means	5,417	7.46
3	J45 Asthma	3,020	4.16
4	J18 Pneumonia, organism unspecified	2,944	4.05
5	K27 Peptic ulcer, site unspecified	2,673	3.68
6	A01 Typhoid and paratyphoid fevers	2,552	3.51
7	V89 Motor or non-motor vehicle accident, type of vehicle unspecified	2,336	3.22
8	J44 Other chronic obstructive pulmonary disease	1,445	1.99
9	I10 Essential (primary) hypertension	1,136	1.56
10	X68 Intentional self-poisoning by and exposure to pesticides	1,081	1.49

Source: Bogra Civil Surgeon Office, Health Bulletin 2013, Page 6

Self-Reported Symptoms by People Living in RMIP Area

PHAP Table 2: Top 10 Self-reported symptoms or diseases in RMIP Priority area in %, multiple responses possible

n=641	**Bogra District**		**Sirajganj District**		**Total**
Sub district (upazila)	Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	%
	n=275	n=101	n=226	n=39	
Fever	74.18	91.09	87.17	87.18	82.22
Cold	46.55	61.39	64.60	71.79	56.79
Headache	31.64	52.48	34.51	33.33	36.04

Gastric Ulcer	6.18	5.94	16.37	7.69	9.83
Colic pain	9.82	8.91	10.18	10.26	9.83
Diarrhea	8.36	1.98	7.96	7.69	7.18
Anemia	2.91	3.96	4.42	0.00	3.43
Eye problem	3.27	0.99	4.42	0.00	3.12
Pneumonia	3.27	1.98	2.65	0.00	2.65
Jaundice	2.91	1.98	1.33	7.69	2.50

Source: RMIP Household Survey, 2014

Mortality

Mortality in Sirajganj District

PHAP Table 3: Top 10 diseases according to the number of deaths among admitted patients in Sirajganj district

No.	ICD-10 Code with Disease Name	No. of Cases	%
1	Birth Asphyxia Code either does not match or written incorrectly. Correct Example: A09.0 or A09 without space or hyphen or comma	89	30.80
2	I21 Acute myocardial infarction	36	12.46
3	J449 Chronic obstructive pulmonary disease, unspecified	35	12.11
4	J18 Pneumonia, organism unspecified	32	11.07
5	LBW Code either does not match or written incorrectly. Correct Example: A09.0 or A09 without space or hyphen or comma	27	9.34
6	V99 Unspecified transport accident	25	8.65
7	Code either does not match or written incorrectly. Correct Example: A09.0 or A09 without space or hyphen or comma	21	7.27
8	J45 Asthma	14	4.84
9	T50 Poisoning by diuretics and other and unspecified drugs, medicaments and biological substances	7	2.42
10	Go3.9 Code either does not match or written incorrectly. Correct Example: A09.0 or A09 without space or hyphen or comma	3	1.04

Source: Sirajganj Civil Surgeon Office, Health Bulletin 2013, page 7

Mortality in Bogra District

PHAP Table 4: Top 10 Diseases according to the number of deaths among admitted patients in Bogra district

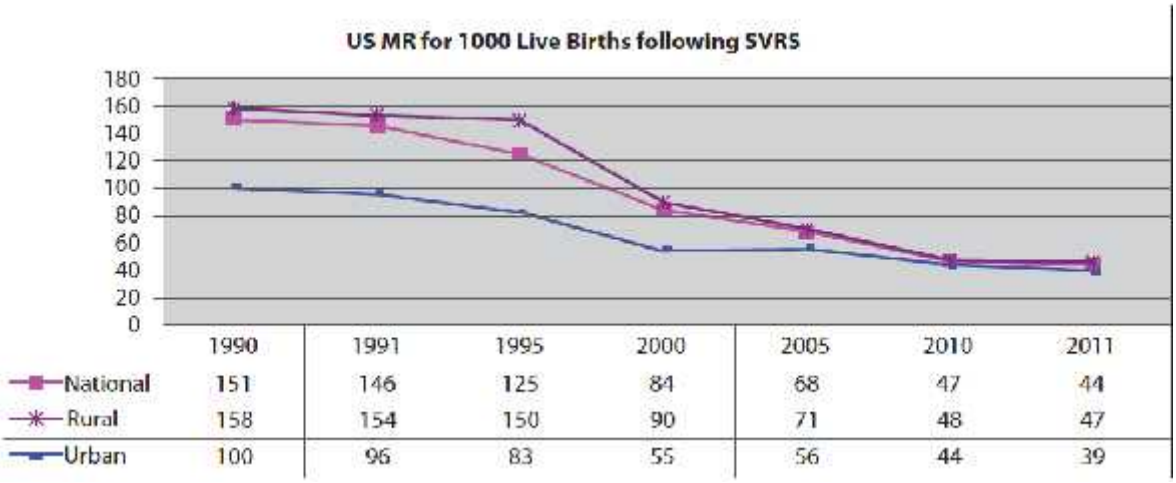
No.	ICD-10 Code with Disease Name	No. of cases	%
1	J45 Asthma	23	13.86
2	A35 Other tetanus	16	9.64
3	J18 Pneumonia, organism unspecified	11	6.63
4	I21 Acute myocardial infarction	11	6.63
5	V89 Motor or non-motor-vehicle accident, type of vehicle unspecified	10	6.02
6	E14 Unspecified diabetes mellitus	9	5.42
7	J35 Chronic diseases of tonsils and adenoids	8	4.82
8	A15 Respiratory tuberculosis, bacteriologically and histologically confirmed	7	4.22
9	I50 Heart failure	6	3.61
10	E87 Other disorders of fluid, electrolyte and acid-base balance	4	2.41

Source: Bogra Civil Surgeon Office, Health Bulletin 2013, page 7

PHAP 3.3 Status on Health-Related Millennium Development Goals

MDG 4 REDUCE CHILD MORTALITY

PHAP Table 6: Trends of under-five mortality rate, 1990-2011

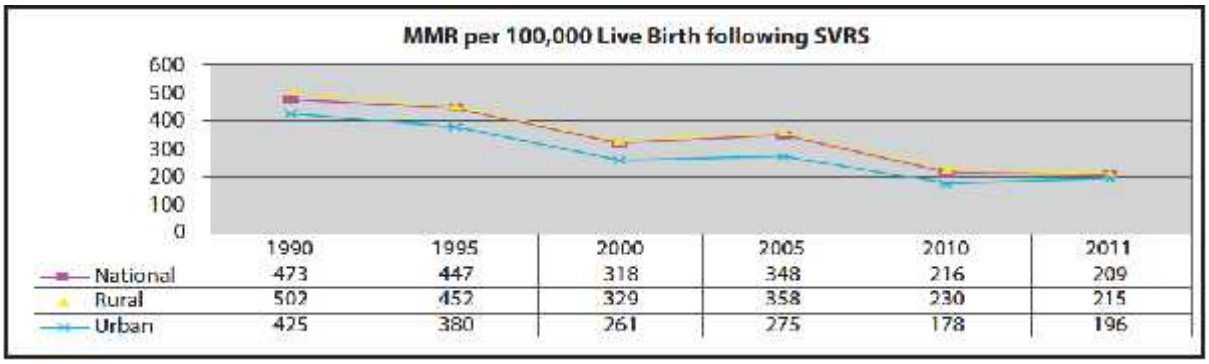


	1990	1991	1995	2000	2005	2010	2011
National	151	146	125	84	68	47	44
Rural	158	154	150	90	71	48	47
Urban	100	96	83	55	56	44	39

Source: SVRS, Millennium Development Goals, Bangladesh Progress Report 2012, page 53

MDG 5 IMPROVE MATERNAL HEALTH

PHAP Table 7: Trends of maternal mortality rate, 1990-2011



	1990	1995	2000	2005	2010	2011
National	473	447	318	348	216	209
Rural	502	452	329	358	230	215
Urban	425	380	261	275	178	196

Source: SVRS, Millennium Development Goals, Bangladesh Progress Report 2012, page 61

Delivery with Skilled Birth Attendant

The proportion of skilled birth attendants assisting the delivery has increased from 5% in 1990 to 31.7% in 2011 in Bangladesh overall, but is still away from the 50% target to be reached by 2015. The numbers according to the conducted survey for the RMIP priority area indicate that about 70% of all deliveries were attended by a traditional birth attendant and only about 10% by a trained traditional birth attendant.

Family Planning

In respect to family planning, the contraceptive coverage rate could be increased from 39.7% in 1990 to 61.2% in 2011 with the likely goal to be met of 72% of coverage by 2015[10]. According to the conducted household survey, nearly 100% of women in the priority area are taking or have been taking family planning measures.

Ante-Natal Care (ANC)

Although progress has been made on antenatal care (ANC) coverage, there is still a major deficit that will most likely not allow for meeting the target numbers by 2015. Mothers who attended one ANC visit were 67.7% according to BDHS in 2011 with the goal of 100% coverage by 2015. Only 25.5% of pregnant mothers went for a minimum of 4 ANC visits in 2011 aiming for 50% coverage by 2015. [11]

Data for the district and sub-district level was not available

[10] Millenium Development Goals Bangladesh Progress Report 2012, page 63

Type of Assistance with Last Delivery in RMIP Priority Area

PHAP Table 8: Assistance with last delivery in %

n=640	Bogra district		Sirajganj district		Total for respondents within RMIP priority area
Sub district (upazila)	Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	
	n=293	n=96	n=210	n=41	n=640
Government doctor	9.56	9.38	4.09	4.88	7.50
Private doctor	4.78	2.08	4.55	0.00	4.06
Government health workers	1.71	3.13	3.64	2.44	2.66
NGO	0.34	0.00	0.00	0.00	0.16
FWV/FWC	0.00	0.00	1.36	0.00	0.47
Trained traditional birth attendant (TTBA)	12.63	2.08	9.55	4.88	9.69
Traditional birth attendant (TBA)	63.48	82.29	69.55	87.80	70.94
Village doctor	1.37	0.00	0.45	0.00	0.78
Others	6.14	1.04	2.27	0.00	3.75

Source: RMIP Household Survey, 2014

Place of Last Delivery for Women in RMIP Priority Area

PHAP Table 9: Location of delivery of last child in numbers

n= 702	Bogra district		Sirajganj district		Total for Respondents within RMIP Priority area
Sub district (upazila)	Sariakandi	Dhunat	Kazipur	Sirajganj	
Home	245	184	90	39	558
Health center/hospital	48	26	6	2	82
Not applicable	24	29	9	0	62

Source: RMIP Household Survey, 2014

PHAP Table 10: Self-reported usage of family planning methods in number and percentage

n=702		Bogra District		Sirajganj district		Total Respondents in priority area
Sub district (upazila)		Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	
Yes	no	246	83	168	25	522
	%	77.60	79.05	70.29	60.98	74.36
No	No	67	22	69	16	174
	%	21.14	20.95	28.87	39.02	24.79

Don’t know	No	4	0	2	0	6
	%	1.26	0	0.84	0.00	0.85

Source: RMIP Household Survey, 2014

MDG 6 Combat HIV/AIDS, Malaria and Tuberculosis

HIV in Bangladesh remains at low levels with an estimated 0.1% prevalence nationwide in 2011 according to the 9th serological survey. A cluster of HIV positive individuals is made of male injectable drug users (IDUs) in Dhaka, where prevalence is about 5.3% in 2010. 100% of the infected individuals have access to HIV/AIDS treatment[12]. Condom use in high-risk populations remains, however, relatively low with 44% to 67% according UNGASS data.[13]

The prevalence of malaria was at 287 cases per 100,000 people in 2012 according to MIS NMCP with 0.101 deaths per 100,000 in the same year. On a positive note, the target of 310 cases of malaria or 0.6 deaths per 100,000 people hasalready been achieved. [14]

Malaria is not a public health issue in the RMIP area over the 183km. According to the Bangladesh's National Malaria Control Program, malaria is endemic in Sylhet, Chittagong and the Northeastern part of Dhaka division from where 98% of all reported cases come.[15]

411 cases of tuberculosis per 100,000 people, or about 600,000 people in total, were reported in 2011 through GTBR WHO of which 43 people per 100,000 died of Tb. The 2015 target of 320 cases or 38 deaths per 100,000 people can still be met. This is especially likely due to the high Tb detection rate of 70% through Directly Observed Treatment, Short-Course (DOTS), which already met its 2015 target.

[12] Millenium Development Goals Bangladesh Progress Report 2012, page 69

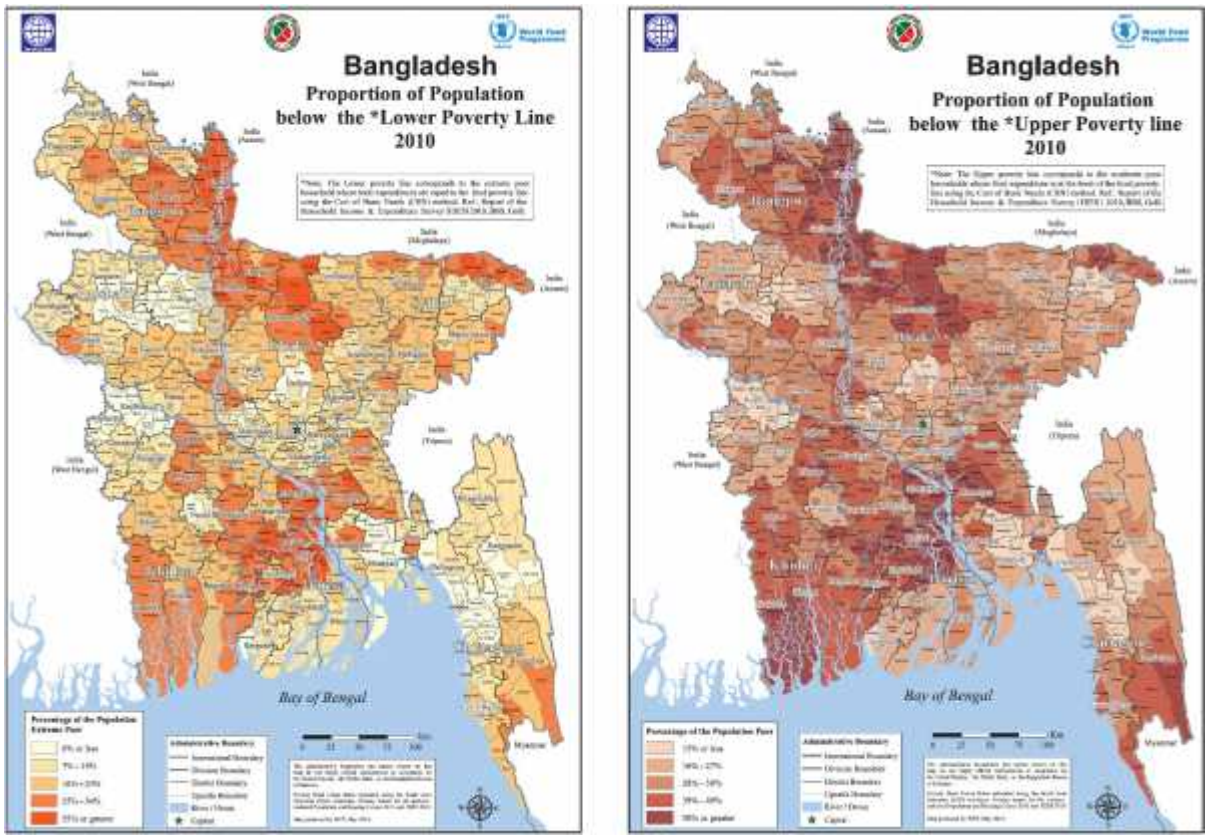
[13] ibid.

[14] ibid.

[15] Ibid.

PHAP 3.4. Determinants of Health in RMIP Priority Area

Poverty



PHAP Figure 2: Poverty maps for Bangladesh

Literacy and Education

The national adult literacy rate (> 15 years old) for Bangladesh reaches 57.7% overall; divided into 62% for man and 55% for women[16].

Education Level in RMIP Priority Area

PHAP Table 12: Level of education in Priority districts divided by sub population

District	Education Level	Sub Population						Total	
		On embankment		Inside Embankment		Outside Embankment			
		Male %	Female %	Male %	Female %	Male %	Female %	Male %	Female %
Sirajganj	Level 1-4	26.1	24.97	23.88	19.95	20.97	24.24	24.06	23.75
	Level 5-7	17.4	19.85	21.28	21.86	17.80	21.57	18.35	20.77
	Level 8-9	8.7	6.11	9.46	13.66	11.31	7.66	9.66	8.08
	SSC or equal	4.82	3.27	6.86	4.92	5.32	5.17	5.41	4.18
	H.S.C or equal	2.31	0.87	5.44	3.01	5.16	2.14	3.84	1.68
	B.A/B.com/ B.sc or equal	0.63	0.33	3.31	0.82	2.00	0.53	1.62	0.49
	M.A/M.com/M.sc or equal	0.52	0.11	0.47	0	0.83	0.53	0.61	0.22
	Diploma/Vocational	0.52	0	0.24	0.27	0.67	0.18	0.51	0.11
	Ph.D	0	0	0	0	0	0	0	0
	Hafez	0.63	0	1.18	0	1.33	0	0.96	0
	Illiterate	15.51	10.8	10.87	10.11	12.48	8.91	13.60	10.09
	Age Less or equal 7	3.67	2.62	2.36	1.37	3.16	1.96	3.24	2.17
	Can Sign Only	19.18	31.08	14.66	24.04	18.97	27.09	18.15	28.47
	All locations	100	100	100	100	100	100	100	100
Bogra	Level 1-4	22.55	22.82	21.03	24.63	20.50	20.17	21.62	22.40
	Level 5-7	16.75	18.22	14.49	21.22	16.46	22.18	16.20	20.03
	Level 8-9	10.75	9.52	15.42	11.46	12.27	11.09	12.15	10.39
	S.S.C or equal	7.9	4.2	12.85	7.32	10.87	5.71	9.80	5.30
	H.S.C or equal	3.71	1.43	7.71	3.66	7.14	2.86	5.56	2.32
	B.A/B.com/ B.sc or equal	1.14	0.2	3.04	1.46	1.55	0.34	1.65	0.50

[16] CIA World Fact Book, 2011

District	Education Level	Sub Population						Total	
		On embankment		Inside Embankment		Outside Embankment			
		Male %	Female %	Male %	Female %	Male %	Female %	Male %	Female %
	M.A/M.com/M.sc or equal	0.19	0.1	0.93	0	0.47	0.17	0.42	0.10
	Diploma/Vocational	0.1	0	0.47	0	0.16	0	0.19	0
	Ph.D.	0	0	0	0.24	0	0	0	0.05
	Hafez	0.29	0	0.23	0	0.16	0	0.24	0
	Illiterate	15.51	13.1	9.35	9.02	14.29	12.94	13.90	12.21
	Age Less or equal 7	2.66	2.46	1.4	1.95	1.40	2.02	2.03	2.22
	Can Sign Only	18.46	27.94	13.08	19.02	14.75	22.52	16.25	24.47
	All locations	100	100	100	100	100	100	100	100

Source: RMIP Household Survey, 2014

Water Supply for Households

Bangladesh is covered with a wide area of rivers and water bodies. However, many households lack access to clean and safe water. In rural areas, underground water hand tube wells and surface are the most common sources of water supply.

The survey population has been broken down into four sub population in order clarify if further investigations and more targeted interventions are necessary. The data has been broken down into

A: Households who live on the embankment in the right of way and will be resettled

B: Households who live on the embankment but will not be resettled

C: Households who live along the embankment on the village side

D: Households who along the embankment towards the river side

The data shows that nearly 100% of the surveyed population indicated that their major source of water supply is a tube well. There is no difference in responses between the different sub groups – people living inside, outside or on the embankment. Furthermore, 97% of households living remaining on the embankment indicated that the well is within 150m distance.

PHAP Table 13: Type of main water supply for households in %

N=702	Bogra District								Sirajganj District								Total			
	Sariakandi				Dhunat				Kazipur				Sirajganj Sadar							
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
N	57	98	31	31	55	29	10	11	121	64	26	28	29	11	0	1	362	202	67	71
Tube well	97	99	100	97	100	100	100	100	100	100	100	100	100	100	0	100	99	99.50	100	99
Deep tube well	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.50	0	0
Pond	1	0.00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Source: RMIP Household Survey, 2014

Distance of Main Water Supply from Home

PHAP Table 14: Mean distance to water supply for households remaining on the embankment in %

n= 362	Bogra district		Sirajganj district		Total respondents remaining on embankment within RMIP priority area
Sub district (upazila)	Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	
	n= 157	n= 55	n= 121	n= 29	n= 362
Within 150 meters	96.82	94.55	99.17	100	97.51
Above 150 meters	3.18	5.45	0.83	0	2.49

Source: RMIP Household Survey, 2014

Contamination of Water Supply

PHAP Table 15: Households remaining on the embankment indicating arsenic contamination in %

n= 362	Bogra district		Sirajganj district		Total respondents remaining on embankment within RMIP priority area
Sub district (upazila)	Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	
	n=157	n=55	n=121	n=29	n=362
Yes	55.41	40	54.55	27.59	50.55
No	10.83	32.73	35.54	44.83	25.14
Don't know	33.76	27.27	9.92	27.59	24.31

Source: RMIP Household Survey, 2014

The Government of Bangladesh and NGOs have been investing in deep tube wells in the country to reduce the risk of arsenic water which is more common in upper earth layers and marking wells after testing in 'safe' and 'unsafe' tube wells depending on the concentration of arsene.

The contradicting data arises from the fact that the tube well water appears not be tested for toxic arsenic levels in the project affected area along the embankment. Further investigation is needed

Latrines in Households

As households on and along the embankment had to resettle themselves from the riverbank or flood plane to mostly poor housing and sanitation condition, often as squatters on government land, their access to toilet facilities has been affected. Out of 702 respondents, the majority indicated to use a pit latrine with 53.56%. Pit latrines and other cited options including hanging or open toilets are not meeting the hygienic standard, as they can be a source of infectious diseases, especially when getting flooded. See boxes underlined in red in table below. Water sealed slap latrines are the minimum recommended standard, which currently only 31.34% households have. A neglectable proportion of 3.28% households own a modern toilet or septic tank. See the acceptable standard marked in green. Unhygienic latrines and lack of access to clean non-contaminated tube well water are the key drivers for water-born diseases such as a diarrhea, dysentery, typhoid, fever. In addition, studies in BRAC WASH program also found that the combined effect of safe water, sanitation and hygiene practices reduced the prevalence of waterborne diseases nearly by 30%, after 2 years of interventions.

Food and Nutritional Status

Due to the loss of homestead, the erosion victims living along the embankment have limited or no opportunity to keep animals or grow vegetables and rice. Most food needs to be purchased. A shortage of food overall or balanced nutritious food leads to underweight or even stunting especially in women

and children. The effects of malnutrition are often worsened through the high prevalence of helminthic infections, especially in children. The prevalence of moderate and severe underweight reaches on a national level 31.9 per hundred children and 8.8 per hundred children, respectively. These numbers are even higher for Sirajganj district – 34.6 per hundred children and 12.3. Stunting to a moderate and sever degree is even more prevalent with 51.9 per hundred children to a moderate and 20.3 per hundred children to a severe degree in Sirajganj district.

The numbers from conducted household survey shown below indicate that 37.6% of children 6 months to below 5 years are underweight and 8.6% are severely underweight. The proportion of underweight children is highest (41.7%) among children age 24-35 months and lowest (31.0%) among children age 6-11 months. Male children are more likely to be underweight (38.6%) than female children (36.3%). Children in Bogra district are more likely to be underweight (38.6%) than the children in Sirajganj district (36.6%). Among the upazilas, Dhunat upazila has the highest proportion (46.5%) and Sariakandi upazila has the lowest proportion (34.8%) of underweight children, while Kazipur upazila and Sirajganj Sadar upazila have the proportion of underweight children are 35.1% and 43.5% respectively.

Children in the embankment areas outside the proposed alignment are more likely to be underweight (41.5%) compared with the embankment areas inside the proposed plan (38.0%), outside the embankment of the riverside (36.0%). The proportion of underweight children is lowest (22.7%) outside the embankment (village side) areas.

Type of Latrines in Households in RMIP Priority Area

PHAP Table 16: Type of toilet facility by district in percentage

n= 702	**Bogra district**		**Sirajganj district**		**Total for respondents within priority area**
Sub district (upazila)	Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	
	n=317	n=105	n=239	n=41	n=702
Septic tank/ modern toilet	2.21	2.86	4.60	4.88	3.28
Water sealed/ slab latrine	40.06	27.62	26.36	2.44	31.34
Pit latrine	47.32	54.29	60.25	60.98	53.56
Open toilet	4.73	2.86	5.44	14.63	5.27
Hanging latrine	1.89	1.90	1.26	7.32	1.99
No facilities/ bush/field	3.79	9.52	0.84	9.76	3.99
Don’t have any specific location	0.00	0.95	1.26	0.00	0.57

Source: RMIP Household Survey, 2014

Nutritional Status of Children in RMIP Priority Area

PHAP Table 17: Nutritional status of children (weight-for-age) by different sub populations

Weight-for-age				
Background characteristics	Percentage below -3 SD	Percentage below -2 SD	Mean Z-score (SD)	Number of children
Age in months				
6-11	6.9	31.0	-1.25	29
12-23	8.6	37.1	-1.68	70
24-35	11.1	41.7	-1.73	72
36-47	10.2	36.7	-1.66	49
48-59	4.3	37.0	-1.61	46
Sex				
Male	7.8	38.6	-1.67	153
Female	9.7	36.3	-1.57	113
District				
Sirajganj	9.7	36.6	-1.67	134
Bogra	7.6	38.6	-1.59	132
Upazila				
Sariakandi	3.4	34.8	-1.41	89
Kazipur	9.9	35.1	-1.6	111
Dhunat	16.3	46.5	-1.95	43
Sirajganj Sadar	8.7	43.5	-1.99	23
Area type				
On the embankment (inside the proposed alignment)	8.8	38.0	-1.61	137
On the embankment (outside the proposed alignment)	12.2	41.5	-1.83	82
Outside the embankment (village-side)	4.5	22.7	-1.51	22
Outside the embankment (river-side)	0	36.0	-1.21	25
Total	8.6	37.6	-1.63	266

Source: RMIP Household Survey 2014

Immunization

Child Immunization Coverage in Bangladesh and RMIP-affected Districts

PHAP Table 15: Child immunization coverage in Bangladesh and RMIP by government

	National	Sirajganj district	Bogra district
BCG	99.3	100	100
Pentavalent 3	92.0	98.2	91.3
Measles	85.5	88.0	84.7
DPT 1	99.0		
Polio3	96.0		
MCV (Meningococcal Vaccine)	96.0		
Hep B3	96.0		
Full Vaccination Coverage (FVC)	80.7	82.7	81.4

Received all the antigen within 1 year of birth following exact EPI schedule
Source: BCG, Pentavalent 3, FVC from Bangladesh National EPI Coverage Evaluation Survey 2013; other data from UNIECF, http://www.unIECf.org/infobycountry/bangladesh_bangladesh_statistics as accessed on July 22,2014

Self-reported Vaccination Coverage of Children in RMIP Priority Area

PHAP Table 19: Child vaccination coverage for RMIP Priority area in % from survey

Type of Vaccination	**N=126**	**Bogra District**		**Sirajganj District**		**Total**
	Sub district	Sariakandi	Dhunat	Kazipur	Sirajganj	
		N=42	N=25	N=52	N=7	N=126
Has the child received BCG?	Yes	100	100	98.08	85.71	98.41
	No	0	0	1.92	14.29	1.59
	Total	100	100	100	100	100
Has the child received Pentavalent 3?	Yes	92.86	100	100	85.71	96.83
	No	7.14	0	0	14.29	3.17
	Total	100	100	100	100	100
Has the child received measle vaccine?	Yes	90.48	88.00	98.08	57.14	91.27
	No	9.52	12	1.92	42.86	8.73

Source: RMIP Household Survey, 2014

PHAP 3.5. Health Infrastructure and Services in RMIP Priority Area

Access and Quality to Treatment

Self-Reported Access to Treatment by People in RMIP Priority Area

PHAP Table 20: Population that Received Treatment and Share that did not in Numbers and Percentage

Sub district (upazila)		Bogra district		Sirajganj district		Total respondents in priority area
		Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	
		n=275	n=101	n=226	n=39	n=641
Number (%) of respondents receiving treatment	no.	269	99	225	39	632
	%	97.82	98.02	99.56	100.00	98.60
Number (%) of respondents not receiving treatment	no.	6	2	1	0	9
	%	2.18	1.98	0.44	0.00	1.40

Source: RMIP Household Survey, 2014

Self-Reported Quality of Health Services By People in RMIP Priority Area

PHAP Table 21: Satisfaction with quality of services in numbers and percentage

Sub district (upazila)		Bogra district		Sirajganj district		Total for respondents within RMIP priority area n=632
		Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	
Very good	no.	19	3	22	1	45
	%	7.06	3.03	9.78	2.56	7.12
Good	no.	201	65	163	27	456
	%	74.72	65.66	72.44	69.23	72.15
Satisfactory	no.	38	27	31	10	106
	%	14.13	27.27	13.78	25.64	16.77
Not satisfactory	no.	11	4	9	1	25
	%	4.09	4.04	4.00	2.56	3.96

Source: RMIP Household Survey, 2014

Self-Reported Distance to Next Health Facility By People in RMIP Area

PHAP Table 22: Distance to next health facility in percentage of respondents

Sub district (upazila)	Bogra district		Sirajganj district	
	Sariakandi	Dhunat	Kazipur	Sirajganj Sadar
	n=207	n=52	n=148	n=19
< 2km	26.08	55.76	31.75	73.68
2-10km	68.11	38.46	62.83	26.31
>10 km	5.79	5.76	5.40	0

Source: RMIP Household Survey, 2014

Public Health Sector Infrastructure

In Bangladesh, the delivery of public health services is the responsibility of two ministries. The Ministry of Local Government Rural Development and Cooperatives (MLGRD&C) is predominantly responsible for Primary Health Care, whereas the Ministry of Health and Family Welfare (MoHFW) ensures health services provision through hospital care and is also in charge of health educational institutions.[17]

The Ministry of Health and Family Welfare is divided into health services and family welfare with separate lines of management, decision-making, reporting and supply from the national to the local level.

This set up and a lack of effective governance often leads to fragmentation, duplication, and inefficiency in the public health sector.

There are three types of public facilities providing primary health care – starting from the smallest unit:

Community Clinics

- Catchment area: 6,000 people
- Services provided: Preventive outreach work and basic clinical: work
- Type of staff: Community Health Care
- Provider (CHCP)

Union Health Centers

- Catchment area: 30,000-35,000 people
- Services provided: Basic clinical work and uncomplicated deliveries (not in all centers)
- Type of staff: Sub-assistant community, medical officer, family welfare visitor, and pharmacist.

Upazila Health Complex

- Catchment area: 200,000-250,000 people
- Services provided: Moderate clinical work and deliveries
- Type of staff: UH&FPO, regional medical officer, medical officer, consultant, nurse
- No of beds: 31-50

[17]Adressing Bangladesh's Demographic Challenge Factsheet, GIZ

Type of Public Health Facilities in SirajganjSadar Sub District

PHAP Table 23: Public health facility types and number for Sirajganj Sadar sub district

Facility Type	Total	No. of Beds
Upazila Health Complex	0	0
No. of Union Sub-Centres	7	0
No. of Union Health and Family Welfare Centres	0	0
No. of Rural Dispensaries	0	0
No. of Community Clinics	41	0
No of Trauma Centres	0	0
No. of MCWC	1	20
No. of Chest Disease Clinic (TB clinic)	1	0
No. of Private Clinics	25	390
No. of NGO Clinics	5	15

Source: Sirajganj (Sadar) Upazila Health Office, Health Bulletin 2013

Human Resource Status in Public Health Facilities in Sirajganj Sadar Sub District

PHAP Table 24: Status of human resources in Sirajganj Sadar sub district

Manpower	Community Clinic		USC/UHFWC/RD		UHC		Others		IMCI trained	Basic EOC trained
	Sanctioned	Filled-up	Sanctioned	Filled-up	Sanctioned	Filled-up	Sanctioned	Filled-up		
Physician	0	0	9	7	3	3	0	0	0	0
Nurse	0	0	0	0	0	0	0	0	0	0
Medical Assistant	0	0	10	8	0	0	0	0	0	0
Medical Technologist	0	0	0	0	1	1	0	0	0	0
CHCP	45	42	0	0	0	0	0	0	0	0
HI	0	0	0	0	5	5	0	0	0	0
AHI	0	0	0	0	15	15	0	0	0	0
HA	0	0	0	0	75	61	0	0	0	0
CSBA trained***	0	0	0	0	0	23	0	0	0	0

Source: Sirajganj (Sadar) Upazila Health Office, Health Bulletin 2013

Private Health Sector

The private health sector in Bangladesh consists of the formal and informal sector.

The formal profit generating private sector is nearly non-existent in rural areas and out of reach- financially and geographically- for most people living in the rural RMIP program area. NGOs offering health services, which can be considered as non-profit private sector or make up its own category, are popular with low income populations but are rare in the RMIP priority stretch.

Informal providers such as village doctors and pharmacists, who were trained within the family or had a few weeks (< 2 months) of formal education, provide the majority of health care service's in rural low-income areas and enjoy high trust among the community. Their lack of training and education and a lack of diagnostics lead to many misdiagnosis and mistreatment with the over-prescription of

antibiotics being a major issue. See also figure 2.7 in main report with map of all health care providers in RMIP priority area.

Type of Public Health Facilities in Sariakandi Sub District

PHAP Table 25: Public health facility types and number for Sariakandi sub district

Facility Type	Total (No.)	No. of Beds
No. of Upazila Health Complex	1	50
No. of Union Sub-Centres	12	0
No. of Union Health and Family Welfare Centres	9	0
No. of Rural/Urban/Thana Dispensaries	0	0
No. of Community Clinics	29	0
No of Trauma Centres	0	0
No. of MCWCs	0	0
No. of Chest Disease Clinics (TB clinics)	0	0
No. of Private Clinics/Facilities	0	0
No. of NGO Clinics/Facilities	0	0

Source: Sariakandi Upazila Health Office, Health Bulletin 2013

Human Resource Status in Public Health Facilities in Sariakandi Sub District

PHAP Table 26: Status of human resources in Sariakandi sub district

Manpower	Community Clinic		USC/UHFWC/RD		UHC		Others		IMCI trained	Basic EOC trained
	Sanctione d	Filled -up	Sanctioned	Filled up	Sanctioned	Filled -up	Sanctioned	Filled -up		
Physician	0	0	12	60	22	6	0	0	1	0
Nurse	0	0	0	0	18	16	0	0	0	0
Medical Assistant	0	0	8	8	2	2	0	0	5	0
Medical Technologist	0	0	0	0	6	5	0	0	0	0
CHCP	29	28	0	0	0	0	0	0	0	0
HI	0	0	0	0	3	3	0	0	0	0
AHI	0	0	0	0	10	10	0	0	0	0
HA	0	0	0	0	49	41	0	0	0	0
CSBA trained***	0	0	0	0	2	2	0	0	0	0

Source: Sariakandi Upazila Health Office, Health Bulletin 2013

Type of Public Health Facilities in Kazipur District

PHAP Table 27: Public health facility types and number for Kazipur sub district

Facility Type	Total (No.)	No. of Beds
No. of Upazila Health Complex	1	31
No. of Union Sub-Centres	12	0
No. of Union Health and Family Welfare Centres	10	0
No. of Rural/Urban/Thana Dispensaries	0	0
No. of Community Clinics	35	0
No of Trauma Centres	0	0

No. of MCWCs	0	0
No. of Chest Disease Clinics (TB clinics)	0	0
No. of Private Clinics/Facilities	1	0
No. of NGO Clinics/Facilities	1	0

Source: Kazipur Upazila Health Complex, Health Bulletin 2013

Human Resource Status in Public Health Facilities in Kazipur Sub District

PHAP Table 28: Status of human resources in Kazipur sub district

Manpower	Community Clinic		USC/UHFWC/RD		UHC		Others		IMCI trained	Basic EOC trained
	Sanctioned	Filled-up	Sanctioned	Filled-upz`	Sanctioned	Filled-up	Sanctioned	Filled-up		
Physician	0	0	12	5	9	6	0	0	0	0
Nurse	0	0	0	0	11	10	0	0	3	3
Medical Assistant	0	0	12	12	2	2	0	0	8	0
Medical Technologist	0	0	4	4	8	8	0	0	0	0
CHCP	40	40	0	0	0	0	0	0	0	0
HI	0	0	0	0	0	0	4	4	0	0
AHI	0	0	0	0	0	0	13	13	0	0
HA	0	0	0	0	0	0	64	52	0	0
CSBA trained***	0	0	0	8	0	0	13	13	0	0

Source: Kazipur Upazila Health Complex, Health Bulletin 2013

Private Health Sector

The private health sector in Bangladesh consists of the formal and informal sector.

The formal profit generating private sector is nearly non-existent in rural areas and out of reach- financially and geographically- for most people living in the rural RMIP program area. NGOs offering health services, which can be considered as non-profit private sector or make up its own category, are popular with low income populations but are rare in the RMIP priority stretch.

Informal providers such as village doctors and pharmacists, who were trained within the family or had a few weeks (< 2 months) of formal education, provide the majority of health care service's in rural low-income areas and enjoy high trust among the community. Their lack of training and education and a lack of diagnostics lead to many misdiagnosis and mistreatment with the over-prescription of antibiotics being a major issue. See also figure 2.7 in main report with map of all health care providers in RMIP priority area.

Type of Public Health Facilities in Sariakandi Sub District

PHAP Table 25: Public health facility types and number for Sariakandi sub district

Facility Type	Total (No.)	No. of Beds
No. of Upazila Health Complex	1	50
No. of Union Sub-Centres	12	0
No. of Union Health and Family Welfare Centres	9	0
No. of Rural/Urban/Thana Dispensaries	0	0
No. of Community Clinics	29	0
No of Trauma Centres	0	0
No. of MCWCs	0	0

No. of Chest Disease Clinics (TB clinics)	0	0
No. of Private Clinics/Facilities	0	0
No. of NGO Clinics/Facilities	0	0

Source: Sariakandi Upazila Health Office, Health Bulletin 2013

Human Resource Status in Public Health Facilities in Sariakandi Sub District

PHAP Table 26: Status of human resources in Sariakandi sub district

Manpower	Community Clinic		USC/UHFWC/RD		UHC		Others		IMCI trained	Basic EOC trained
	Sanctioned	Filled-up	Sanctioned	Filled-up	Sanctioned	Filled-up	Sanctioned	Filled-up		
Physician	0	0	12	60	22	6	0	0	1	0
Nurse	0	0	0	0	18	16	0	0	0	0
Medical Assistant	0	0	8	8	2	2	0	0	5	0
Medical Technologist	0	0	0	0	6	5	0	0	0	0
CHCP	29	28	0	0	0	0	0	0	0	0
HI	0	0	0	0	3	3	0	0	0	0
AHI	0	0	0	0	10	10	0	0	0	0
HA	0	0	0	0	49	41	0	0	0	0
CSBA trained***	0	0	0	0	2	2	0	0	0	0

Source: Sariakandi Upazila Health Office, Health Bulletin 2013

Type of Public Health Facilities in Kazipur District

PHAP Table 27: Public health facility types and number for Kazipur sub district

Facility Type	Total (No.)	No. of Beds
No. of Upazila Health Complex	1	31
No. of Union Sub-Centres	12	0
No. of Union Health and Family Welfare Centres	10	0
No. of Rural/Urban/Thana Dispensaries	0	0
No. of Community Clinics	35	0
No of Trauma Centres	0	0
No. of MCWCs	0	0
No. of Chest Disease Clinics (TB clinics)	0	0
No. of Private Clinics/Facilities	1	0
No. of NGO Clinics/Facilities	1	0

Source: Kazipur Upazila Health Complex, Health Bulletin 2013

Human Resource Status in Public Health Facilities in Kazipur Sub District

PHAP Table 28: Status of human resources in Kazipur sub district

Manpower	Community Clinic		USC/UHFWC/RD		UHC		Others		IMCI trained	Basic EOC trained
	Sanctioned	Filled-up	Sanctioned	Filled-up	Sanctioned	Filled-up	Sanctioned	Filled-up		

Physician	0	0	12	5	9	6	0	0	0	0
Nurse	0	0	0	0	11	10	0	0	3	3
Medical Assistant	0	0	12	12	2	2	0	0	8	0
Medical Technologist	0	0	4	4	8	8	0	0	0	0
CHCP	40	40	0	0	0	0	0	0	0	0
HI	0	0	0	0	0	0	4	4	0	0
AHI	0	0	0	0	0	0	13	13	0	0
HA	0	0	0	0	0	0	64	52	0	0
CSBA trained***	0	0	0	8	0	0	13	13	0	0

Source: Kazipur Upazila Health Complex, Health Bulletin 2013

PHAP 3.6. Key Observations on Health Seeking Behavior and Education

Health Seeking Behavior

Given the low quality of services in public facilities, only about 75-80% of the population seeks services in the public sector according the MoHFW. As the public sector has the lowest user fees (about 5-10 taka), most patients living in poverty rely on the public service for emergency care or free medicine. The majority of the rural poor seek health care from the informal private providers such as village doctors or pharmacy shops mostly owned by untrained staff. Thanks to their closeness to the community (village doctor at least every 2km or pharmacy shops at every bazar) and their long operating hours (9am-10pm), informal providers are for most patients the primary and often only source of health care and play therefore a very critical part in addressing public health issues. 'People still prefer to use pharmacies and local doctors which meet their needs better, less often use kobiraj (traditional healers)…'[18]

The survey conducted in the priority area of RMIP supports the national findings and indicates that almost half of the respondents visit the public upazila health complex. But local private providers such as village doctors and pharmacy shops account for more then half of the options mentioned with 36% and 23% respectively

Health Education and Promotion

The Bureau of Health Education (BHE) is responsible for health education activities under the Director General of Health Services. The current Health Population and Nutrition Sector Development Program (2011-2016) emphasize the importance of health education as a key public health measure, especially among the vulnerable and poor. The BHE is aiming to achieve behavioural change in a large number of health-related topics such as safe motherhood, breastfeeding, climate change, diarrhea, emerging and re-emerging diseases, food safety, vaccination, vitamin administration, road and

traffic safety, acute respiratory tract infections, violence against women, family norms, nutrition, and decrease in infant mortality and maternal mortality.

Objectives are to develop messages that relate to:

i. How the 10 most common infectious and five most common non-communicable diseases are transmitted and their reasons
ii. About their right to health, family planning and nutrition
iii. About hygienic living, e.g., hand washing, waste disposal, healthy housing
iv. Location and service provider-wise availability of contraceptives and on nutrition services.
v. Effects of different contraceptives and ten most commonly used medicines and nutrient value of cereals, vegetables, fruits, legumes and nuts
vi. Small family norm, increase use of FP methods, especially more effective long-term and permanent methods.
vii. Danger signs of pregnancy, diarrhea, pneumonia, most common five types of malnutrition
viii. Strengthen IEC and BCC activities to combat the health impact of climate change and to protect human health from current and projected risks due to climate change[19]

According to the household survey, almost all the households know about and are practising hand washing before eating, 92%. Only a small percentage of the respondents wash their hands before preparing food (16%), before serving food 15%, or before feeding children, only 8%. See table 8.2. on the next page.

[18]Reality Check Bangladesh, Listening to Poor People's Realities about Primary Healthcare and Primary Education – Year 5, SIDA, 2012

[19]MoHSFW, Health Population and Nutrition Sector Strategic Plan, 2011-2016, September 2010

Self-Reported Health Facilities Visited in Case of Illness by People In RMIP Priority Area

PHAP Table 29: Most common choice(s) of health facility during illness in percentage (%), multiple answers allowed

Sub district (upazila)	Bogra district		Sirajganj district		Total
	Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	
	n= 317	n= 105	n= 239	n= 41	n= 702
Union health Center	16.72	21.90	13.81	12.20	16.24
Community clinic	14.51	4.76	14.23	7.32	12.54
Upazila health complex	65.93	27.62	35.98	2.44	46.30
District hospital	23.66	8.57	12.97	19.51	17.52
NGO clinic/hospital	2.21	0.95	5.86	0.00	3.13
Pharmacy	10.09	34.29	33.89	34.15	23.22
Homeopathy	0.00	0.95	1.67	0.00	0.71
Village doctor	40.69	28.57	30.54	51.22	36.04

Source: RMIP Household Survey, 2014

Self-Reported Hand Washing Practice by People in RMIP Priority Area

PHAP Table 30:Hand washing practices (indicator for health awareness and practice) in %

Sub district (upazila)	Bogra district		Sirajganj district		Total
	Sariakandi	Dhunat	Kazipur	Sirajganj Sadar	
	n=303	n=103	n=233	n=38	n=677
Before preparing food	18.15	18.45	14.16	2.63	15.95
Before serving food	25.08	7.77	6.44	5.26	14.92
Before eating	90.43	94.17	93.56	97.37	92.47
Before feeding children	6.60	5.83	10.73	0.00	7.53
Before eating fruits	2.31	0.00	1.29	0.00	1.48

Source: RMIP Household Survey, 2014

PHAP 3.7. Methodology

Data Collection

A mix of qualitative and quantitative data collection methods from both, primary and secondary source has been used. The primary data was collected from directly and indirectly affected stakeholder.

Primary data collection

Quantitative: Household survey with a total of 700 male and female community members from the 50 kilometers priority batch area was conducted between July 7 and 22, 2014.

Taking into account the program's target populations, 50% of the total sample will be drawn from the households that will be relocated, 30% from squatters remaining on the old embankment, 20% from the communities that live within a 2km strip from the new embankment.

Assessing gender specific issues, 50% of the respondents were female within each sub sample.

A simple random sampling technique was followed to select the respondents of quantitative survey.

Data has been collected on health seeking behavior, health awareness and education, health infrastructure and quality, disease profile, reproductive health, child health and immunization, nutrition, water and sanitation.

Qualitative: 4FGD, and22 IDI/KII were conducted for the primary batch area between Simla and Hasnapara. Participants were selected by gender and sub population based on the availability and willingness to interview.

FGD guideline and checklist were used for FGD and IDI. (See next page for interview partners).

Secondary data collection

Available reports such as BDHS, MICS, indoor and outdoor registered and MIS data were used to provide health-related background information on health infrastructure, specific disease profiles such as HIV/AIDS, malaria and to put the program areas' health situation into perspective with the overall situation in Bangladesh.

Data analysis

The following analyses have been conducted based on the collected data

i. Impact analysis on health and safety for directly by the program affected populations
ii. Indirectly affected populations: gap analysis of general health indicators
iii. Institutional capacity analysis of BWDB related to health and safety

Interventions and implementation

Based on the above-mentioned analysis, a list of tailored interventions driven by the suggested impact and gap analyses has been developed for the directly and indirectly by the project affected populations to address the overall and specific objectives of the PHAP. It is important to note that the intervention will ensure key health and safety measures which can reasonably relate to effects of the construction without replicating or reducing the responsibilities of the line ministries.

Each intervention outlines the objective, the rationale, and target group. The implementation section will outline the required tasks, the suggested timing, responsibilities and required resources, to the extent possible.

The interventions are aligned with relevant national and international policy and strategic issues for the provision of safeguarding health services. The implementation aims to rely as much as possible on existing structures within the area.

Furthermore, synergies were sought with other social safeguard components of the River Bank Improvement Project such as RAP and GAP. Finally, a special emphasis has been made on the sustainability of interventions, which have or should have an impact beyond the construction period and may require an exit strategy.

Monitoring and evaluation

Processes and tools are designed to ensure the implementation and measure the impact of suggested interventions.

Limitations

A comprehensive primary data research has been conducted. As answers are self-reported by the affected project population, some questions related to health or tube well water status would require a diagnosis by a professional and reliable testing and may therefore be inaccurate.

Available secondary data by the government, international organizations and NGOs for the area hat were taken into account, as well, but were often only available for the overall district and not specifically for the project area.

There is often conflicting data between international and national sources on certain health indicators. For the purpose of this report the most recent data have been used.

The self-reported primary data collected for this study may sometimes contradict with other sources. However, the primary data should be given high relevance as this has been collected specifically for this study and includes the most relevant sample population.

While data on the public health infrastructure is mostly available and relatively recent, there is little or no aggregated data available about the private health sector – formal and informal. Therefore, a basic mapping of the private health providers in the priority has been conducted.

Individuals Interviews for KII

Health Officials/Specialists

- Dr. Md. Shamsuddin, CS, Sirajganj
- Dr. Md. AfzalHossain, CS, Bogra
- Md. Amirul Islam, Junior Health Education Officer, Bogra
- Md. Oman Ali, Health Education Officer, Sirajganj
- Md. Abdus Salam, EPI Superindent, Sirajganj
- Begum LailaAkhter, UH&FPO, Sirajganj Sadar
- Dr. Bidhan Chandra Majumder, UH&FPO, Sariakandi
- Dr. Shusanta Kumar Das, UH&FPO, Kazipur
- Dr. RampodoSutrodhar, UH&FPO, Dhunat
- Md. Nazmul, MT EPI Kazipur
- Md. Solaiman, AHI, Kazipur
- Mr. GobinduSarkar, MT-EPI, Sariakandi
- Abdul Alim, MT- EPI, Dhunat
- Mr. Mojaffar, Statistician, Dhunat
- Utpal Kumar Das, Pharmacist TB Clinic
- Dr. Sushanta Kumar Das, TB Clinic
- Dr. Jahangir Hossein, Care Bangladesh
- Otto Gomm, GIZ
- Jan Söhlemann, GIZ

Community People

- Mr. Noor Mohammad Shaikh- PanchThakuria
- Mrs. GolamAzam-PanchThakuria
- Mrs. Hosnera-PanchThakuria
- Md. AbdurRazzaque-PanchThakuria
- Mrs. Sara Khatun- PanchThakuria
- Mrs. Jamela ,PanchThakuria
- Md. Abdus Salam- GaduChoowgacha, Guchha Gram
- Mrs. SakinaKhatun, Resettlement village Bera, Pabna
- Mr. Yusuf Ali, Resettlement Village, Jumana Bridge
- Mr. Ali Akbar Shaikh, Resettlement Village, Jumana Bridge
- Md. GolamMowla, Resettlement Village, Jumana Bridge
- Mr. Sohan, Village doctor

APPENDIX 4

Terms of Reference (TOR) for Social NGO (SONGOSONGO) Responsible for Planning and Implementation of Social Development Plan (SDP)

A. PURPOSE OF THE TOR

Bangladesh Water Development Board (BWDB) intends to hire an experienced NGO capable to coordinate the implementation of the social development plan (hereafter Social Social NGO or SONGO SONGO) to implement the Social Development Program (SDP) under the River Bank Improvement Project (RMIP). The SDP is an integrated program involving livelihoods, gender development and public health. The TOR includes a guideline to plan, implement and evaluate the activities contained in the SDP with the technical resources to be required for this purpose. The SDP is a five-year program. The SONGO will deliver the SDP through local partner NGOs in the specific fields.

To become eligible for this purpose, the SONGO must be strong in livelihood, gender and public health areas and duly registered with the NGO Bureau and Ministry of Social Welfare, Government of Bangladesh. Interested national NGOs having experience in (i) income and livelihood restoration studies in involuntary resettlement, (ii) preparing and implementing income and livelihood restoration plans successfully, especially focused on productive usage of embankment slopes and (iii) implementation of livelihood programs for destitute section of the society in rural Bangladesh, (iv) successful gender mainstreaming programs in rural communities (v) implementing impactful public health interventions in rural communities faced with regular flooding or erosion (vi) running successful training programs for skilled birth attendants ideally in partnership with the public sector are encouraged. Proposals will be invited from the short-listed NGOs with a brief statement of the approach, methodology, and relevant information concerning previous experience on monitoring of resettlement implementation and preparation of reports. The NGOs' organization along with full CVs of proposed key personnel must be submitted along with the proposal.

B. THE PROJECT AND IMPACTS

The objectives of RMIP are to reduce the adverse impacts of flood and erosion along the selected section of the Brahmaputra Rightbank Embankment (Central JRE), enhance it sustainable management and improve accessibilityin ruralareas. The Project includes a 50 km reach – called the "priority" reach – from Simla to Hasnapara. The Project area covers three sub-districts or *upazilas*: Kazipur (Sirajganj district), Dhunat and Sariakandi (Bogra district). The total The alignments, including 15-18 resettlement sites, will require acquisition of 330 to 340 ha of land for project construction. The World Bank (WB) and the Government of Bangladesh (GOB) will finance the project.

In addition to implementation of the Resettlement Action Plan (RAP), BWDB will undertake a 5-year SDP to restore income and livelihoods of the affected persons, implement gender and health programs. The SPD is primarily dedicated to the project affected persons; however, it also includes villages and local communities in host areas within 1 km range from the Central JRE to the countryside along the 50km reach. A particular focus of the SDP will be on the affected embankment settlers, who are poor and vulnerable.

An estimate 4000 households will require relocation. Nearly two-thirds of those affected are currently living on the embankment. About half of the resettlers expressed their desire in favor of self-managed relocation into the existing "host" villages and the rest will move to project-sponsored resettlement sites. Details of the project impacts are available in the Resettlement Action Plan (RAP) and SDP.

C. OBJECTIVES OF THE SDP

The two key objectives of the SDP are to (i) mitigate any negative impacts related to the RMIP, and (ii) support the overall development of the population in the project area related to their income and livelihood, gender and public health status. The specific objectives for each of the three-sub component are discussed in the following paragraphs.

Income and Livelihood Restoration: The overall objective of this study is to (i) restore income and livelihood of the directly project affected population, and (ii) enhance the present income and livelihood situation of the directly and indirectly affected population, which includes people remaining on the old embankment and living along the embankment.

Besides mitigating the short-term loss of the directly affected populations, this livelihood and income restoration plan takes a systematic approach

to identify long-term opportunities and constraints in a particular subsector along the value chain to support the second objective.

Gender Mainstreaming: The GAP has three specific objectives to achieve in this project. These are to (i) maximize women's access to the RMIP project benefits including employment; (ii) mitigate harmful gendered impacts on affected male and female population, especially health and safety; and (iii) build capacity of BWDB in gender mainstreaming in the remaining phases of the Program as well as in future project operations.

Public Health: Theoverarching and primary objective of the PHAP is to (i) mitigate possible impacts on public health due to the construction of the embankment for the project-affected populations (PAPs) and secondarily, to (ii) improve the public health situation related to key health development indicators such as reduction in disease burden, maternal and neonatal health, HIV/AIDS and STDs for the project beneficiaries living along the bank line and embankment, as needed.

D. AFFECTED POPULATIONS AND BENEFICIARIES

The primary focus of the SDP will be given to the project affected populations in order to foster any possible positive and mitigate any possible negative impact for them. The project-affected populations are:

i. Relocated and resettled households: The Priority reach will affect 4000 households who will either "self-relocate" and/or resettle in project-sponsored resettlement sites along the project alignment from Simla to Hasnapara stretching across four upazilas.
ii. Construction workforce: The construction force will mainly be drawn from local communities with a preference to project affected persons willing to work on the construction site. There will be a very limited number of workers from outside the region.
iii. Individuals and households who will experience temporary loss of income due to the civil works: Businesses and shop owners who will need to relocate or close down operations temporarily due to civil works.
iv. In-migrant populations: These refer to individuals who are attracted by commercial opportunity and interact with local residents. Their number is expected to be limited as the project is linear along the bank line and will move with the progress of the construction.

Given the suffering of the population living along the Brahmaputra-Jamuna river due to erosion and flooding over generations, the RMIP social development plan will take up selected developmental opportunities and encompass a number of targeted interventions for people living in the project area. Those project beneficiaries include:

i. Households remaining on old embankment: Although, they do not live in the right of way of the new proposed embankment and therefore do not qualify for resettlement benefit, they live in close vicinity to these households and require overall development support.
ii. Host villages/communities: Many of the resettlers will move on their own within the existing villages. Others will move to resettlement sites and live with the host communities. As such, villages and local communities within a 2-km strip from the eroding embankment are also included in the PHAP.

E. SCOPE OF WORK AND KEY ACTIVITIES

The SONGO to be engaged will responsible for planning and implementation of the SDP within the overall scope of work presented below under the three programs.

Income and Livelihood Restoration

- Cash Assistance to Support Lost Income
- Assistance to Re-Establish Business/Enterprises
- Employment in Construction Site and Construction-Supported Sector
- Community Participation in Tree and Medicinal Plant Plantation on Embankment Sides
- Capacity training in high-value vegetables, livestock, poultry and fisheries
- Training of Skilled labor

Gender Mainstreaming

- Women's Participation in Design and Implementation of RMIP
- Employment Opportunities for women
- Gender-Responsible Resettlement Measures
- Services and Safeguards Against Social and Health Vulnerabilities
- Capacity Building for Gender Mainstreaming in BWDB

Public Health

- IEC Program on RMIP-related health risks and overall health (e.g. improved hygiene, maternal health)
- Public health staff capacity development on RMIP-related health risks and casualties
- Ensure improved public-health standards in resettlement households (e.g. safe water, sanitation, solar energy supply and clean cooking stoves)
- Improved public-health standards for HHs remaining on old embankment (e.g. safe water, sanitation and clean cooking stoves)
- Pesticide poisoning prevention and management
- SBA/ Community health worker capacity development
- Road Safety

F. TARGET GROUPS AND TASKS

Target group beneficiaries (TGBs) of SDP will be selected from the target group families (TGFs) those are severely affected by RMIP due to temporary loss of income, displacement or other potential risks for the purpose of the project. They are indicated for each planned interventions in chapters 2 to 4. This represents a brief summary only (for further details, see Appendix in SDP).

The SONGO will carry out the intended tasks in two phases. The first phase will be to implement all activities related to mitigating any risk associated with the RMIP construction that will need to be implemented immediately before construction can begin such as resettlement (in close collaboration with the INGO), women's participation in important decisions related to RMIP and health awareness campaigns about RMIP risks. The second phase will include the implementation of overall social development measures that are unrelated to the civil works schedule and promote the overall social development in the Project area. The key tasks include:

i. The SONGO in close partnership with local NGOs, the SONGO will also identify capable local NGOs and the public and private sector to implement the SDP.
ii. It will guide and build the capacity of target group beneficiaries.
iii. Review the baseline data on existing livelihood pattern and opportunities, gender and health assessments.
iv. Together with local partner NGOs, conduct needs assessment and identify the potential members of affected families (TGBs) for bringing them under the SDP
v. Organize national and regional level workshop on livelihood, gender and health to explore wider linkages
vi. Disclosure campaign and information dissemination among the potential TGBs and their community on the SDPs in the operation area.
vii. Implement the outlined key activities for livelihood, gender mainstreaming and public health
viii. Monitor the implementation progress and the targets as outlined in the SDP Part IV.
ix. Align and be in close contact with all key stakeholders from PMO to INGO, local administration as well as local NGOs.

G. SONGO TEAM AND STAFFING

The following expert positions would be required for staffing the Team for implementing the SDP. The SONGO must bring together this multidisciplinary team with necessary expertise for the delivery of the programs. Table 1 provides the key staff positions while Table 2 presents man-month and inputs required.

Table 1: Professional Staff with Qualification and Experience

Position/expertise	Qualification and Experience	Major Responsibilities
A. Professional Staff		
Team Leader/ Social Development Specialist	Masters in management, economics or other social sciences with 10 years general experience including 5 years specific experience in similar fields. Experience in poverty interventions and livelihood development involuntary resettlement should be essential credential for the position.	Team management, administration, study design, scheme design, implementation planning and operation of livelihood programs. Effective coordination, planning and implementation of livelihoods activities. Management, monitoring and evaluation of livelihoods activities. Establishing and maintaining strategic partnerships and support the resource mobilization. Facilitation of knowledge-sharing and capacity building.
DTL/Lead Livelihood Development Specialist	Masters in economics or other social science with a minimum of 5 years practical experience in livelihood development field. Knowledge in micro entrepreneurship development, local resource management, human resource development, and social mobilization will be essential.	Design baseline survey and resource identification for exploring livelihood development schemes. Information disclosure and motivation of potential beneficiaries for brining them under self-employment schemes using local resources and linking with external buyers and markets. Identify training organizations and negotiate them for partnering in skill training of the TGBs and mobilize them in obtaining skill training on production businesses. Prepare business plan and mobilize trained TGBs on self-employment. Develop micro-enterprise for livelihood groups and individuals, mobilize them in operation, monitor and following up to ensure effective operation and profit making. Design and conduct orientation on mental and attitudinal preparedness on accepting a placement. Mobilize youths on job placements arranged by the Livelihood Promotion and Linkage Development Specialist. Following up performance and relationships of TGBs with employers and undertaken measures to improvement of job satisfaction by the TGBs.

Position/expertise	Qualification and Experience	Major Responsibilities
A. Professional Staff		
DTL/Lead Gender Development Specialist	Masters in social science with 10 years of practical experience as a gender specialist in development and livelihood projects.	Gender inclusive study design for baseline and resources identification surveys. Prepare gender strategy for the livelihood development plans and schemes. Ensure gender respect in LDS implementation.
DTL/Lead Public Health Specialist	Physician with MPH or equivalent degree with at least 5 years of work experience in the area of project implementation, coordination and monitoring in rural areas of Bangladesh Previous experience with resettlement and/or communities dealing with river erosion and flooding is preferred Working experience in successfully coordinating with multi-stakeholders and local NGOs Able to manage, organize and facilitate training to the local NGO staff to implement planned interventions Fluent in English with excellent writing and communication skills. Experienced in report writing.	The Lead Health Specialist at the SONGO will be responsible for the effective implementation, coordination and monitoring of the progress of the PHAP He/She will work closely with the local NGOs, the resettlement INGO, the PMO, local health officials, the other lead specialist for gender and livelihood, the design consultants and other relevant stakeholders. He/She will be responsible of transparent and efficient management of the budget allocated to the PHAP The effective and responsible implementation of planned key interventions as per PHAP: IEC program related to RMIP construction risks and general health including hand-washing program Provision or promotion of tube wells, water-sealed slap latrines, clean cooking stoves for the resettlement sites as well as households remaining on the old embankment Capacity building and training for selected public health staff on possible diseases and injuries related to RMIP construction Training of skilled birth attendants and community health workers within the resettlement sites and along the old embankment to better service health needs amongst women and children in the community

The number and overall input of SONGO staff resources are estimated as shown in Table 2. The SONGO will be employed for a period of 5 years, with intermittent inputs from the professional team, to synchronize project activities and ensure sustainable income restoration by the affected persons. There will be monitoring of the activities on a quarterly and yearly basis to see if the program is implemented as designed and the level of benefits accrued by the TGBs. A post evaluation will be carried out after one year of completion of the SDP in the field.

Table 2:SONGO Team Composition and Staff Inputs

Key Positions	No.	Duration (In years)	Total Input (man-month)
SDP Team Leader	1	5	30
DTL/Lead Livelihood Specialist	1	5	24
DTL/Lead Gender Development Specialist	1	5	24
DTL/Lead Public Health Specialist	1	5	24
Total	**4**		**102**

Other than the key staff positions for SONGO, there are provisions for hiring field level technical as well as support staff (e.g., Liaison Officer, Monitoring and documentation officer, Field Coordinator, Community mobilizer, field assistant/data collector) by the SONGO for SDP operations.

H. PROVISIONS FOR PARTNER NGOS FOR SDP DELIVERY

In addition, for local level partner NGOs, separate lump sum provisions have been made to hire specialists on an intermittent basis (for example, agricultural extension/development specialist, financial investment analyst, training specialists) as well as community level program facilitators/workers for the delivery of services and programs. These positions will be further firmed up after the mobilization of the SONGO staff and further needs assessment in view of the SDP programs.

The budget in the proposal to be submitted should include all expenses such as (i) staff salary, (ii) office accommodation, (iii) staff training, (iv) computer/software, (v) design, development and operation of automated MIS, (vi) transport and field expenses and (vii) other logistics staff resources for field operation, data collection, processing and analysis for monitoring and follow up work. The salary and remunerations rates for the professionals to be engaged for SDP should be at a standard attractive to good and qualified staff willing to stay at the project site for the delivery of services. Additional expense claims whatsoever outside the proposed and negotiated budget will not be entertained. VAT, Income Tax and other charges admissible will be deducted at source as per GOB laws.

APPENDIX 5

Budget

SDP/SONGO Implementation Costs

SL	Position	No. of staff	Imput (Staff-months)	Rate per month	Estimated Budget
A	Staff Remuneration				
1	Team Leader /Social Development Specialist	1	30	250,000	7,500,000
2	Deputy Team Leader/Public Health Specialist	1	24	160,000	3,840,000
3	Deputy Team Leader/ Gender Specialist	1	24	160,000	3,840,000
4	Deputy Teal Leader/ Livelihood and Income Restoration Specialist	1	24	160,000	3,840,000
5	Liaison Officer	1	36	100,000	3,600,000
6	Accounts Officer	1	48	50,000	2,400,000
7	Monitoring and documentation officer	1	30	100,000	3,000,000
8	Data Analyst	1	24	60,000	1,440,000
9	Office Assistant	1	60	35,000	2,100,000
10	**Sub Total of A**				**31,560,000**
B	Field Level Staff				
1	Field Coordinator	2	48	45,000	4,320,000
2	Supervisor	4	48	35,000	6,720,000
3	Community Mobilizer	4	36	30,000	4,320,000
4	Field Officer / Data Collector	10	12	30,000	3,600,000
	Sub total of B				18,960,000
	Tota(A+B)				**50,520,000**
C	Out of Pocket Expenses				
1	Hire Charge of four wheeler for TL and DTLs	1	36	60,000	2,160,000
2	Printing and Stationeries		60	4,000	240,000
3	Perdiem		60	10,000	600,000
4	Conveyance		60	10,000	600,000
5	Survey and consultation for need assessment		LS		200,000
6	Communications/ Liaison		LS		500,000
7	Computer Consumables	5	60	1,000	300,000
8	**Sub Total**				**4,600,000**
D	Operation cost for NGO/CBO				
1	Operation cost for Public Health NGO/CBO	LS			15,000,000

2	Operation cost for NGO/CBO Gender Action Plan implementation	LS			15,000,000
3	Operation cost for ILRP implementing NGO/CBO	LS			15,000,000
	Sub Total				**45,000,000**
	Total (A+B+C+D)				**100,120,000**
	VAT and IT on Grand Total @ 25%				**33,373,333**
	Grand Total				**133,493,333**
	USD (1 USD=78 BDT)				**1,711,453**

ILRP Program Budget

Interventions/Activities	**Total in BDT (million)**	**Comments**
# 1 Compensate for lost income and livelihood		
Business interruption (231 small units@BDT500x60days; 1 large business unit@BDT1,000 x 34)	6.96	
Short-term loss for wage laborers (139 person @BDT300 x 30 days)	1.25	
# 2 To Improve livelihood		
Needs assessment on livelihood development needs	2.0	
Pond/Khat Fisheries Subsector	4.43	
High-value Vegetable Subsector	12.73	
Medicinal Plants and Fruits Subsector	7.80	
High-value Fruits Subsector	4.04	
Poultry Subsector	17.63	
Livestock Subsector	26.52	
Skilled birth attendants	---	Covered under PHAP
Social forestry		Covered under EMP
Additional program support for self-managed resettlers and host communities	19.25	
Livelihood support grants (4,000 HH*BDT 25,000)	100,00	
Total: ILRP sub component in Taka	**203.61**	
Grand Total: ILRP Subcomponent in USD (1 USD=TK. 77)	2.63	

GAP Program Budget

Activities and Line Items	Unit	Number of Units	Unit Costs BDT in million	Total Costs BDT in million	Comments
#1 Enhance Women's Employment					
Pre-construction					
Information Sharing through mothers' mobilization at primary school		0	0	3	
MOU with Grameen Phone/Bangladesh Mobile Network to provide awareness, employment and Other Information to Women in Bangla		0	0	2.5	
Meeting with Labor Contracting Societies		0	0	0.1	
Training on Setting up nurseries (150 women, 5 days course, 3 course)	Lump sum	200	0.005	1	
Training on laying and grouting(150 women, 5 days course, 3 courses)	Lump sum	200	0.005	1	
Message Board Development: 100 3000 (HIV/AIDS and STD, Dowry, RH, CM, VAW)	Piece	150	0.003	6 0.6	
Meeting with women, men and children at mothers' meeting, bazar, Union Information Centre including leaflet	Lump sum	350	0.002	1.05	
Sub-total				**6.55**	
During Post-construction					
Community Social Worker Volunteer Training of 50 women, 5 days training	Person	50	0.12	6	Resettlement Budget
Skill Birth Attendant 150 women, 5 days course		0	0	0	PHAP Budget
10 Surveillance Team 36 months 50 women, 3,000 Tk per month	Lump sum	1800	0.003	5.4	
Women Corner -10 corner development = 200000	Lump sum	20	0.02	.4	
Entrepreneurship group, 20 groups, per group BDT 50000	Lump sum	25	0.05	1.25	
100 training course for 3000 women on 10 skills 3 days 100000 per course	Lump sum	100	0.1	10.0	
Sub-total				**23.05.**	
#2 Services and Safeguarding					
50 Van for women's transportation	Lump sum	50	0.015	.75	
Gender friendly facilities at school at 20 schools	Piece	20	0.2	4.0	
Women friendly facilities at 20 Hospital	Piece	20	0.2	4.0	
Sub-total				**8.75**	

#3 Capacity Building of BWDB and Project Staff					
Gender Training for project and BWDB Staff Training (2 days 20 Training course, per course 30 participant)	Lump Sum	25	0.1	2.5	
Gender Specialist for 36 months	Lump sum	36	0.1	3.6	
Gender Focal Points 3 30000	Lump sum	108	0.03	3.24	
Community Facilitator	Lump sum	15	0.1	1.5	Resettlement Budget
Gender Integration in BWDB curriculum (Outsource)	Day Rate	15000	0.00006	.9	
Sub-total				**11.74.**	
Subtotal in BDT (Lakh)				**50.09**	
Estimated total in USD (million)				**0.65**	**1 USD= 77 BDT**

Activities and Line Items	Unit	Number of Units	Unit Costs BDT in Lakh	Total Costs BDT in Lakh	Comments
#1 Enhance Women's Emplyment					
Pre-construction					
Information Sharing through mothers' mobilization at primary school		0	0	0	Staff cost
MOU with Grameen Phone/Bangladesh Mobile Network to provide awareness, employment and Other Information to Women in Bangla		0	0	0	Communication Budget
Meeting with Labour Contracting Societies		0	0	0	Resettlement Budget
Training on Setting up nurseries (150 women, 5 days course, 3 course)	Lump sum	150	0.05	7.5	
Training on laying and grouting(150 women, 5 days course, 3 course)	Lump sum	150	0.05	7.5	
Message Board Development: 100 ´ 3000 (HIV/AIDS and STD, Dowry, RH, CM, VAW)	Piece	100	0.03	3	

Meeting with women, men and children at mothers' meeting, bazar, Union Information Centre including leaflet	Lump sum	300	0.02	6	
Sub-total				**24**	
During Post-construction					
Community Social Worker Volunteer Training of 50 women, 5 dayas training		0	0	0	Resettlement Budget
Skill Birth Attendant 150 women, 5 days course		0	0	0	PHAP Budget
10 Surveillance Team ´ 36 months´50 women, 3,000 Tk per month	Lump sum	1800	0.03	54	
Women Corner -10 corner development = 200000	Lump sum	10	0.2	2	
Entrepreneurship group,20 groups, per group BDT 50000	Lump sum	20	0.5	10	
100 training course for 3000 women on 10 skills´ 3 days´ 100* 100000 per course	Lump sum	100	1	100	
Sub-total				**166**	
#2 Services and safegourding					
50 Van for women's transportation	Lump sum	50	0.15	7.5	
Gender friendly facilities at school at 20 schools	Piece	20	2	40	
Women friendly facilities at 20 Hospital	Piece	20	2	40	
Sub-total				87.5	
#3 Capacity Building of BWDB and Project staff					
Gender Training for project and BWDB Staff Training (2 days´ 20 Training course, per course 30 participant)	Lump Sum	20	1	20	
Gender Specialist for 36 months	Lump sum	36	0.9	32.4	
Gender Focal Points ´ 3 ´ 30000	Lump sum	108	0.3	32.4	
Community Facilitator	Lump	0	0	0	Resettlement Budget

	sum				
Gender Integration in BWDB curriculum (Outsource)	Day Rate	15000	0.0006	9	
Sub-total				**93.8**	
Subtotal in BDT				**371.3**	
Total in USD in (000)				**4.82**	**1 USD= 77 BDT**

PHAP Program Budget

Activities and Line Items	Unit	Number of Units	Unit Costs BDT in Lakh	Total Costs BDT in Lakh	Comments
x. #1 Mitigate Public Health and Safety Hazards					
Pre-construction					
IEC Program on RMIP related health and safety hazards					
Design of information boards	Lump sum			1	
Building& installation information boards	Piece	12	1	12	
Reprint education materials from Bureau of Health Education	Lump sum			5	
Distribution and meetings of materials	Lump sum			5	Informal health providers, schools, women groups, mosques
Transportation costs	Lump sum			3	
Local NGO staff fees	Day Rate	500	0.005	2.5	
Subtotal in BDT				**28.5**	
Public health staff capacity development					
Trainers	Day Rate	25	0.1	2.5	
Training materials	Lump sum			2	
Coordination of meetings	Lump sum			1	
Transportation costs	Lump sum			1	
Meeting costs	Lump sum			2	2 Zila, 4 Upazila, 30 Community Clinics, 16 satellites, 2 FWO
Subtotal in BDT				**8.5**	
During construction					
Public latrines					

Needs assessment and location	Lump sum			0.1	
Latrines (fixed or portable)	Piece	10	0.05	0.5	Pending on needs assessment every 10km
Installation	Lump sum	10	0.01	0.2	
Maintenance	Lump sum			5	
Transportation costs	Lump sum			0.5	
Subtotal in BDT				6.3	
Road safety control					
Traffic and Complain Number Signs & Installation	Piece	50	0.3	15	
Coordination and Set Up Complaint Line	Lump sum			0.2	
Subtotal in BDT				**15.2**	
xi. #2 Improve Public Health Situation					
Pre Construction					
Resettlement sites					
Tube wells	Piece	700	0.1	70	
Water-sealed slap latrines	Piece	3000	0.05	150	
Cooking stoves	Piece	3000	0.1	300	
Solar energy system	Unit per site	20	7.6	152	
Testing for water safety	Lump sum			1	
Drainage system	Piece			0	Included in Resettlement Site Development in RAP
Solid waste disposal site	Piece			0	Included in Resettlement Site Development in RAP
Maintenance& Operations	Lump sum		2	2	Incl training
Subtotal in BDT				**637**	

IEC Program on promoting health and hygiene in resettlement villages and HH remaining on old embankment					
Design of information boards	Lump sum			2	
Building& installation information boards	Piece	40	1	40	One per resettlement site and one per village along embankment
Reprint education materials from Bureau of Health Education	Lump sum			10	
Hand-wash initiative training children as champions	Cost per child training	500	0.5	250	
Transportation costs	Lump sum			10	
Local NGO staff fees for running IEC incl hand washing program	Day Rate	500	0.005	2.5	40 sites by 3 group meetings each for children, women, men run by two people incl prep
Subtotal in BDT				**314.5**	
During or post construction					
Water and sanitation infrastructure for HH remaining on old embankment					
Needs assessment and location incl water test	Lump sum			10	
Tube wells	Piece	1,000	0.1	100	
Water-sealed slap latrines	Piece	10,000	0.05	500	
Installation	Lump sum			20	
Maintenance Tube Well	Lump sum			20	
Subtotal in BDT				**650**	
Clean and efficient cooking stoves					
Needs assessment and location	Lump sum			0.2	

Cooking stoves	Piece	2500	0.1	250	Subsidize 50% (5000 BDT) per stove for people interested to get stove; assume 50% of hhs are interested to purchase
Maintenance	Lump sum			20	
Installation	Lump sum			20	
Subtotal in BDT				**290.2**	
SBA/ Nurse capacity development					
Promotion and recruitment	Lump sum			1	
Training costs	Per Nurse	80	2	160	
Meeting costs	Lump sum			1	
Transportation costs	Lump sum			1	
Nurse bags	Piece	100	0.005	0.5	
Safe delivery kit	Piece	100	0.002	0.2	
Uniforms	Piece	100	0.005	0.5	
Follow-up test	Lump sum			2	
Subtotal in BDT in Lakh				**166.2**	
Total in BDT in Lakh				**2154.4**	
Total in USD in million				**2.8**	**1 USD= 77 BDT**

GLOSSARY

Affirmative action	A policy or a program whose stated goal is to redress past or present discrimination through active measures to ensure equal opportunity
Adequate	Enough to satisfy a need or meet a requirement
Antenatal care	Pregnant women who make at least one antenatal care visit to either a public or private health practitioner following a prescribed checkup protocol
Appropriate	Suitable for identified needs or requirements.
Community	A group of individuals broader than the household, who identify themselves as a common unit due to recognized social, religious, economic and traditional ties or a shared locality.
Condition and position	Condition refers to the material state in which men and women live. Position refers to women's and men's political, social, economic and cultural standing in.
DOTS	Directly-observed treatment, short course is the recommended treatment for tuberculosis by WHO
Equality	In this case gender equality, means that both women and men enjoy the same status and have equal conditions for realizing their full potentials.
Equity	A concept of distributive justice, which is remedial, and is, intended to overcome inequalities.
Gender	Implies socially ascribed roles, relations and identity of male and female in human society.
Gender analysis	Analyzing information in order to ensure development benefits and resources are effectively and equitably targeted to both women and men.
Gender and Development (GAD)	An approach that was developed in the 1980s to overcome perceived weaknesses of the Women in Development (WID) approach.
Gender Awareness	An understanding of the socially constructed roles of women and men and the resulting difference in power relations, status, privileges and needs.
Gender equality	Desired result referring to equal opportunities and outcomes for men and women.
Gender equity	A process for achieving the goal or outcome of gender equality.
Gender mainstreaming	The process of assessing the implications for women and men of any planned action, including legislation, policies or programs, in any area and at all levels.
Gender prejudice	Reflects characteristics that are foisted on women and men but fail to recount actual individual ability.
Gender responsive evaluation	A systematic approach to assessing the policy intervention, program or project (from a gender perspective) whether it achieved its objectives, what the broad impact was and why it was successful or unsuccessful.
Gender stereotypes	Popularly held ideas about men and women.
Gender-related development index (GDI)	A comprehensive index measuring average achievement in the three basic dimensions of human development.
Helminthic infection	Infections caused by worms (hook worm, ring worm, whipworm) and their ova (eggs).
Impact	Positive or negative effect over a period of time
Infant mortality rate	Number of deaths of children under 1 year of age per 1,000 live births
Labor division by gender	The assignment of different tasks and responsibilities to women and men. Gender-based assignment of tasks is learned and pervaded by all members of a given community or society.
Livelihood	Means of resources required for living

Living standards	Access to well-being indicators to individual, group or nation such as health, education drinking water, sanitation, employment, nutrition, housing, transport and electricity.
Maternal mortality rate	Number of mothers dying due to complications of pregnancy and delivery per 100,000 live births
Neo-natal	Pertaining to the newborn period, specifically the first 4 weeks after birth
Practical Gender Needs (PGNs)	The needs women identify in there socially accepted roles in society.
Productive assets	Assets held or used in the production of goods or services
Productive role	Productive activities include all tasks that contribute to the income and economic welfare and advancement of the household and community.
Project affected area	The associated area affected by project interventions.
Reproductive role	Reproductive activities are those carried out to reproduce and care for a child.
Short-term	Related to day to day, not permanent
Strategic gender interests	The needs women identify with because of there subordinate position in society.
Total fertility rate	Average number of children delivered by a woman during her reproductive years
Under 5 mortality rate	Number of deaths of children under 5 years of age per 1,000 live births

IMPRINT

Document Background

Title	ANNEX C VOL 3 Social Development Plan	
Principal Author	Solveig Haupt	
Contributions	Dewan Ali Arshad (ILRP) ShamimaPervin (GAP) AnwarulHoque (PHAP)	
Review	Dr. Mohammad Zaman	
Document Development	09 November 2014	R1 Draft PHAP and GAP for WB input
	16 December 2014	V1 Updated after WB input and repackaged as SDP including ILRP, PHAP and GAP by Solveig Haupt.
	26 December 2014	V2 SDP as draft final report reviewed by Dr. Mohammad Zaman
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	18 January 2015	R2 for WB review (January 2015 WB Mission)
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