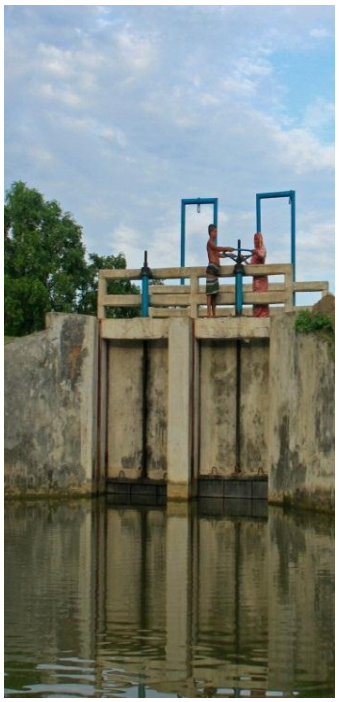
Bangladesh Water Development Board (BWDB)

Embassy of the Kingdom of the Netherlands (EKN), Dhaka, Bangladesh

Department of Agricultural Extension (DAE)

# Polder Development Plan (PDP) – DRAFT

## Polder 55/2C

**June, 2017**

BETS

Socioconsult Ltd. for sustainable development

FEMCONSULT

MOTT MACDONALD

# Program Data

| | |
|---|---|
| Activity Number | DHA 0116534/ Act. 24007 |
| Project Start Date | January 2013 |
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| Approval date DPP (BWDB component)<br>Approval date DPP (DAE component)<br>Signing Contribution Agreement | 30 July 2013<br>24 July 2013<br>04 December 2013 |
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| Contractor | Euroconsult Mott MacDonald<br>with Socioconsult, BETS and Euroconsult Mott MacDonald Bangladesh |
| Implementing Partners | Bangladesh Water Development Board (BWDB)<br>Department of Agricultural Extension (DAE)<br>and Department of Livestock Services (DLS) and Department of Fisheries (DoF) |
| Contribution GoN | € 27,320,000 to be administered by BWDB<br>€ 1,495,000 to be administered by DAE<br>€ 33,100,000 Technical Assistance |
| Contribution GoB | BWDB: € 13,499,000<br>DAE: € 535,015 |
| Total project budget | € 75,949,015 |
| Exchange rate | Euro-BDT: 100 (April 2013); 81.7 (May 2017) |

(Note: the program data has been updated according to revised DPP)

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# Issue and revision record

| Revision | Date | Originator | Checker | Approver | Description |
|---|---|---|---|---|---|
| 1.0 | 19/03/2017 | Polder Team 55/2C<br>Md. Shamim A. Yusuf<br>Md. Delower Hossain<br>Md. Shaifullah<br>Md. Joynal Abedin<br>Sk. Mohibullah | Md. Matior Rahman | Alamgir Chowdhury | PDP of Polder 55/2C v-1 |
| 2.0 | 30/05/2017 | Zonal Review Team<br>Md. Shamim A. Yusuf<br>Md. Delower Hossain<br>Md. Shaifullah<br>Md. Joynal Abedin<br>Sk. Mohibullah | Md. Matior Rahman | Alamgir Chowdhury | PDP of Polder 55/2C v-2 |
| 3.0 | 15/06/2017 | Central Review Team<br>Mofazzal Ahmed<br>Ashraful Islam<br>Shahidul Haque | Md. Matior Rahman | Alamgir Chowdhury | PDP of Polder 55/2C v-3 |

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# List of Abbreviations

| | |
|---|---|
| BADC | Bangladesh Agricultural Development Corporation |
| BBS | Bangladesh Bureau of Statistics |
| BRRI | Bangladesh Rice Research Institute |
| BWDB | Bangladesh Water Development Board |
| CAHW | Community Animal Health Worker |
| CBO | Community-Based Organisation |
| CDMP | Comprehensive Disaster Management Program |
| CDF | Community Development Facilitator |
| DAE | Department of Agricultural Extension |
| DLS | Department of Livestock Services |
| DOC | Day Old Chicks |
| DPP | Development Project Proforma |
| DoC | Department of Cooperatives |
| DoE | Department of Environment |
| DoF | Department of Fisheries |
| DP III | Director of Planning III of BWDB |
| DPHE | Department of Public Health Engineering |
| DRR | Disaster Risk Reduction |
| DTL | Deputy Team Leader |
| EIA | Environmental Impact Assessment |
| EKN | Embassy of the Kingdom of the Netherlands |
| FCD | Flood Control and Drainage |
| FCDI | Flood Control, Drainage and Irrigation |
| FFS | Farmers Field School |
| FGD | Focus Group Discussion |
| FO | FFS Organiser |
| FT | Farmer Trainers |
| GAP | Gender Action Plan |
| GIFT | Genetically Improved Farm Tilapia GIFT |
| GoB | Government of Bangladesh |
| GoN | Government of Netherlands |
| GPWM | Guidelines for Participatory Water Management |
| Ha | Hectare |
| HH | Household |
| HYV | High Yielding Variety |
| IGA | Income Generating Activity |
| IAPP | Integrated Agriculture Productivity Project |
| IPM | Integrated Pest Management |
| IPSWAM | Integrated Planning for Sustainable Water Management |
| IPSWARM | Integrated Planning for Sustainable Water Resources Management |

| | |
|---|---|
| IRRI | International Rice Research Institute |
| KII | Key Informant Interview |
| LCS | Landless/Labour Contracting Societies |
| LGED | Local Government Engineering Department |
| LGI | Local Government Institutions |
| M&E | Monitoring and Evaluation |
| MRL | Monitoring Reflection and Learning |
| MFI | Microfinance Institutions |
| MFS | Market Oriented Farmers Field School |
| NGO | Non-Governmental Organisation |
| O&M | Operation and Maintenance |
| PC | Polder Coordinator |
| PCD | Program/Project Coordinating Director |
| PD | Program/Project Director |
| PDP | Polder Development Plan |
| PSF | Pond Sand Filter |
| PWMR 2014 | Participatory Water Management Rules 2014 |
| SAAO | Sub-Assistant Agricultural Officer |
| SaFaL | Sustainable Agriculture, Food Security and Linkages |
| SMART | Specific Measurable Attainable Relevant Time Bound |
| SRDI | Soil Resources Development Institute |
| SWOT | Strengths, Weaknesses, Opportunities, and Threats |
| TA | Technical Assistance |
| TL | Team Leader |
| TOT | Training of Trainers |
| UP | Union Parishad |
| VC | Value Chain |
| VCA | Value Chain Analysis |
| VCD | Value Chain Development |
| VCS | Value Chain Selection |
| WASH | Water Sanitation and Hygiene Education |
| WMA | Water Management Association |
| WAP | Water Management Group Action Plan |
| WMF | Water Management Federation |
| WMG | Water Management Group |
| WMO | Water Management Organisation |
| XEN | Executive Engineer |
| ZSE | Zonal Socio Economist |

# Glossary

| | |
|---|---|
| Arotdar | Service provider to Bepari and Pikers in wholesale markets. Facilitates the buy/sell process. May provide purchase negotiation assistance, storage space, selling space, short term and seasonal credit, and arrange truck transport of goods purchased by Bepari to markets. |
| Beel | Naturally depressed land inundated under water for at least one season |
| Bepari | Key wholesaler in the supply chain. Moves goods between markets buying in source markets and selling in destination markets. Exerts the main influence on price earned by farmers. |
| bKash | bKash Limited is a joint venture between BRAC Bank Limited, Bangladesh, and Money in Motion LLC, USA. Less than 15% of Bangladeshis are connected to the formal banking system whereas over 68% have mobile phones. bKash utilize these mobile devices and the omnipresent telecom networks to extend financial services to the under-served remote population of Bangladesh. |
| Business service | Service that is sustainable through private sector transactions and that improves the performance of the value chain, its access to markets, and its ability to compete. |
| Capture Fisheries | Capture fisheries refer to open water fisheries resources in both marine and freshwater environments. Capture fisheries is exploitation of aquatic organisms without stocking the seed. Recruitment of the species occurs naturally. This is carried out in the sea, rivers, reservoirs, khal, beel, floodplain etc. |
| Climate Change | Climate change refers to any change in climate (average weather) over time, whether due to natural variability or as a result of human activity. Average weather includes temperatures, wind patterns and precipitation. |
| Cross-cutting issues | Issues that affect all areas of concern within their context. |
| Culture Fisheries | Culture fisheries are the cultivation of selected fishes in confined areas with utmost care to get maximum yield. The seed is stocked, nursed and reared in confined waters, and then the crop is harvested. Culture takes place in ponds, ditches, rice fields which are fertilized and supplementary feeds are provided to fish to get maximum yield. |
| Disaster Risk Reduction (DRR) | DRR is a conceptual framework intended to systematically avoid (prevent) and limit (prepare/mitigate) disaster risks with regard to losses in lives and the social, economic and environmental assets of communities and countries. |
| Embankment | An embankment is a high earthen dike surrounding an area in order to protect it from external floods and salinity |
| Enabling environment | Environment favourable to working, participating and demonstrating potentials |
| Farmers Field School (FFS) | FFS is a participatory group based learning approach where farmers can learn by doing and share their experiences. |
| Governance | Description of the dynamic distribution of power, learning, and benefits among participants in a value chain |
| Inlet | Inlets are small structures across the embankment to take in fresh water for irrigating high lands along the periphery of the polder. Outlets are small structures across an embankment to drain out local pockets in the polder. |
| Landless/Labour Contracting Societies | It is an approach to engage local poor people/labourers as a group for construction of rural infrastructures. The group is treated by the development authorities/project as a contractor for the work allocated. |
| Local governmental institutions (LGI) | The institutions formulated under different Acts/Ordinances to run the different administrative unites of Local Government system by the Government |
| Kharif-I | Pre-monsoon season, from March to half July |

| | |
|---|---|
| Kharif-II | Monsoon and post-monsoon season, from July to October |
| Khal | Excavated or natural routes across any land area for draining out excess water and flushing in required water. |
| Market Actor | Smallholder, input supplier and output market players directly participating the value chain |
| Market development based | Activities that try to make the interaction between demand and supply more effective |
| Market transaction | The exchange between demand and supply is at full market price (the price at which suppliers are prepared to sell and consumers are prepared to buy, in an unsubsidized situation |
| Market | A set of arrangements by which buyers and sellers are in contact to exchange goods or services—the interaction of demand and supply |
| Needs Assessment | It is an assessment of the needs and priorities of local population in a polder. |
| Piker | Buys directly from various farmers to ensure a bulk. Bulk is sold to Arotder or to destination market. Exerts the main influence on price earned by farmers. |
| Polder | A polder is an area protected by embankment all around, having necessary structures across the embankment to drain out excess rain water and flush in required fresh water for irrigation. |
| Rabi | Dry season, from November to March |
| Standing Committees of UP | Standing Committee means the Standing Committee formulated under the Local Government (Union Parishad) Act, 2009 |
| Sluice | A sluice is a structure constructed across an embankment to drain out excess water from a polder and / or flush in required water in to the polder. |
| Union Parishad (UP) | Union Parishad means the Union Parishad formulated under section 10 of the Local Government (Union Parishad) Act, 2009." It is the lowest tire of the Local Government system in Bangladesh |
| Value Chain | A 'value chain' can be defined as all the actors who buy and sell from each other in order to supply a particular set of products or services to final consumers. |
| Water Management Group Action Plan (WAP) | It is the plan and strategy of the WMG, to address issues and problems of their area at a given time as well as to implement their actions as part of the polder development planning. |
| Ward | Ward means the Ward of Union Parishad. Each Union Parishad consists of 9 Wards |
| Water Management Organisations (WMO) | It is a common name for all organizations formed for the purpose of water management in a polder, namely WMG, WMA and WMF. |
| Water Management Group (WMG) | Local people organized within a hydrological unit or at village level to manage water resources are collectively called Water Management Group. |
| Water Management Association (WMA) | It is a higher tier of water management organization formed by representatives of WMGs. |
| Water Management Committee (WMC) | It is a committee to initiate and coordinate operation and maintenance activities in a catchment area. It is formed by representatives of WMGs. |
| Water Management Federation (WMF) | This is the highest tier of water management organization in the polder. It is formed by representatives of all WMAs in a polder. |
| Zonal level | Blue Gold has two field offices in Patuakhali and Khulna to coordinate and manage the project interventions; these are sometimes called zonal offices. |

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# 1. Introduction

## 1.1 Blue Gold Program Context

The overall objective of the Blue Gold Program is to reduce poverty in the coastal area by enhancing the livelihood of the rural population, through more efficient water resources management and increase productivity of mainly crops, fishery and livestock in the polders and by empowering the communities to be the driving force.

The specific objectives of the Program are to:

- Increase sustainability of the development of the polders through effective community participation. The community organizations will become the driving force for the natural resources based development, whereby environment, gender and good governance are effectively addressed in their operations;
- Protect floods and use water resources effectively;
- Increase farmers' income and strength livelihood through improved productivity (For each Polder a Business Plan will be developed with the value chain analysis); and
- Improve environment, drinking water and sanitation. The living environment will be realised and sexual reproductive health rights (SRHR), balanced nutrition, and good governance issues are well understood and applied.

## 1.2 Definition and Objective of a Polder Development Plan

### *Definition of a Polder Development Plan*

A Polder Development Plan (PDP) contains an integrated analysis and planning for developing a polder in relation to community mobilization, water management, agriculture, business development, environment, gender, and institutions[1].

### *Objectives of a Polder Development Plan*

i) The provision of an internal discussion document for the Blue Gold TA team and the implementing agencies (BWDB and DAE) to plan, design and implement at polder level in an integrated manner;

ii) A clear outline for WMOs what type of activities Blue Gold is providing, which helps them to develop their own WMG Action Plans (WAP);

iii) A starting point for BWDB to prepare detailed rehabilitation plans and for DAE to fine-tune the FFS modules and stimulate business activities as well as a strategy to strengthen institutions like Union Parishad (UP);

iv) Linkages with Blue Gold's logical frameworks and M&E activities, to ensure that the proposed interventions at polder level are contributing to the overall program objectives and can be justified towards stakeholders and donors.

[1] An important consideration is that a polder is a multi-dimensional geographical unit delineated by water in which various and continuously changing development processes take place. Polder boundaries do not always coincide with administrative boundaries. The PDPs developed by the Blue Gold Program therefore do not capture the full picture. They zoom in on specific water and production related features of polders and try to make a dynamic analysis of the water management organisations operating in that sphere, their resources, their activities and their needs. Other Local Government Institutions (LGIs), NGOs and donors are operating in the same polders and they have their own sphere of interest, scope, analysis, plans and programs within or even beyond the physical boundaries of these polders. A Blue Gold PDP is thus not a substitute or umbrella plan for all types of activities and programs taking place in the polder.

# 2. Present Situation and its Challenges

## 2.1 Physical Features and Demography

Polder 55/2C is managed by the Bangladesh Water Development Board (BWDB) and was constructed during the Early Implementation Project from 1988 to1990. The characteristics of the polder can be found in Table 1 and the location map of the polder with respect to Upazilla and Union headquarters is shown in Figure 1**.**

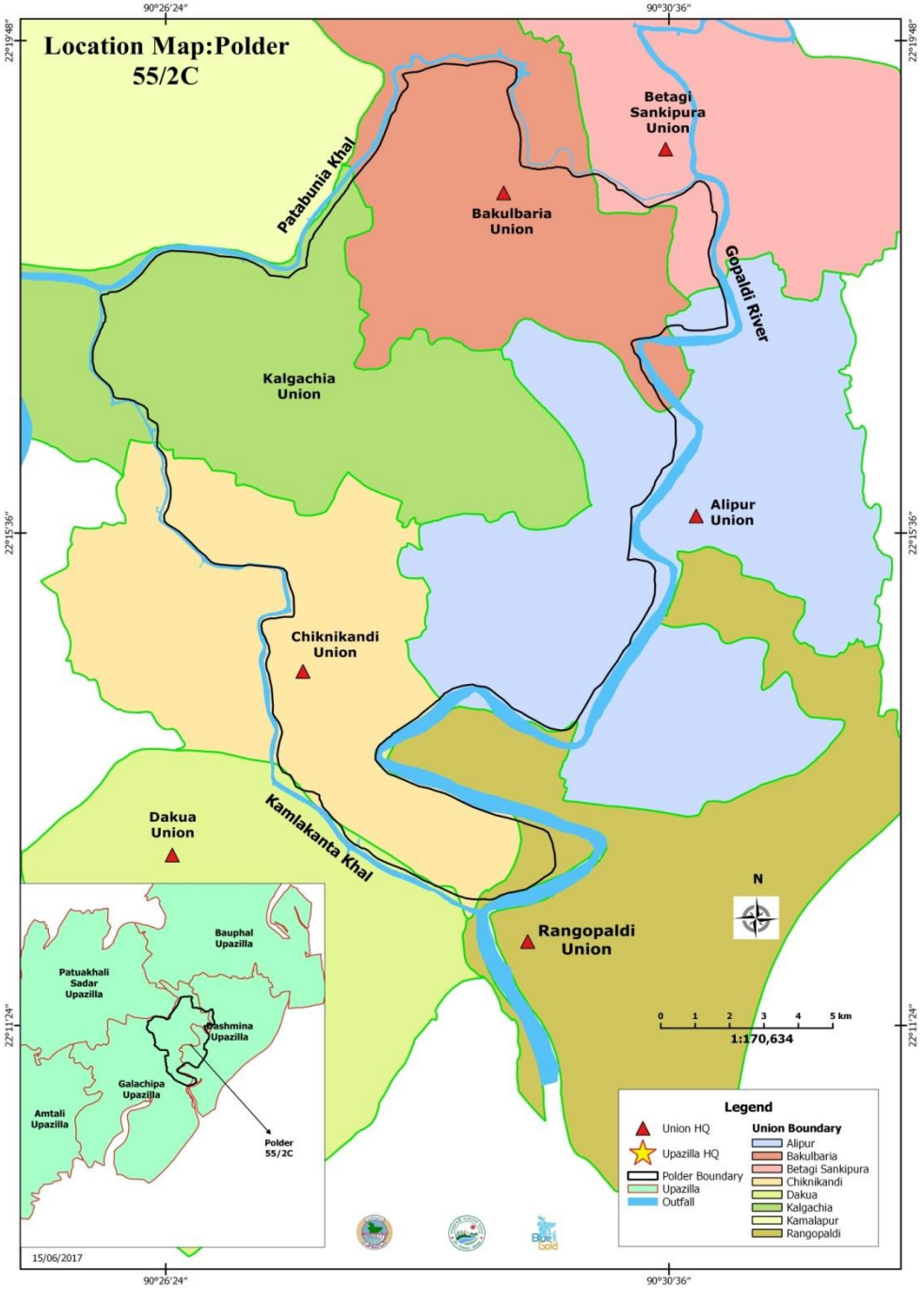


**Figure 1: Location of Polder 55/2C in Galachipa and Doshmina Upazilas**

**Table 1: Main Physical and Demographic Characteristics of polder 55/2C**

| Characteristics | | | |
|---|---|---|---|
| Included Upazila (s) | Galachipa and Doshmina | | |
| Included Unions | Kalagachia, Chiknikandi, Bakulbaria, Alipura and Betagi Sankipur. | | |
| Polder boundary (in km) | 47.546 | | |
| Total number of Mouzas | 19 | | |
| Total polder area (in ha) | 7,120 | | |
| Total number of households in the polder | 10,173 | | |
| Total number of catchments | 7 | | |
| Total cultivable land (in ha) | 6,275 | High land: 5.6%<br>Medium-high land: 84.4% | Low land: 10% |
| Population | 26,510 | | |
| Literacy rate | 72.0% | Male: 58 % | Female: 62% |
| Major occupations | Agriculture | Agricultural labour | Services |
| Economic condition | Rich: 3% | Middle class: 40% | Poor: 57% |
| Status of seasonal labour migration | Seasonal labour migration is very frequent phenomena under males in the months there is no work as agricultural day labourer. The majority of those who temporarily migrate for work go to Dhaka; other places that they temporarily migrate to include Patuakhali and Chittagong. The activities they engage in are rickshaw-pulling, labour in road construction & brick-field, work as a masionman & construction labour, Industrial labour and hawking in towns. Besides these, a substantial portion of labour works in fishing boat for fishing in the sea. | | |
| Status of internal road communication | Intra connectivity of the polder is road communication which is made by mixed with carpeting, herringbone and earthen roads. The markets/growth Centers are connected with pacca carpeting roads (40 km) but the villages are connected with markets by herringbone and earthen roads (70 km). The outside connectivity of the polder is road and naval route with Patuakhali and Galachipa and Dasmina upazila sadar. During monsoon it is very difficult to communicate through earthen roads inside the polder due to heavy mud formation. | | |

## 2.2 Water Resource Management and Infrastructure

In Table 2 the main characteristics of the water resource management and infrastructure of polder 55/2C are highlighted and Figure 2 shows the existing infrastructure and Khals in polder 55/2C. Further details can be found in Appendix 1.

**Table 2: Main Water Resource Management and Infrastructure characteristics of polder 55/2C**

| Characteristics | |
|---|---|
| Length of embankment (in km) | 47.546 |
| No of drainage/flushing sluices | 7 |
| No of inlets | 39 |
| No of (drainage) outlets | 0 |
| No of canals | 87 |
| Length of canals (in km) | 385 |
| Main outfall rivers and khals | Gopaldi Don, Patabunia Khal and Kamalakalia Khal. |
| Situation of tidal and river flooding | There is tidal flooding in polder 55/2C. River flooding takes place in monsoon. Expected depth of inundation is about 0.60m to 0.75m in monsoon. The duration of inundation about 2 months. |
| Locations with water logging and siltation. | Sutabaria, Majhgram, Lamna, Chandpur Choddokanir Beel, Banshbaria, Kallankalash, Modhupura, Sayedkati and Alipura the drainage congestion is slightly higher than other areas. In these areas, drainage congestion affects the transplantation period of the Aman season. |
| Most river erosion prone area | Modhupura, Sutabaria, Ronua Bazar and Alipura sluice areas. |
| Other relevant water issues | Polder 55/2C falls in the wind risk zone which possesses some vulnerability to strong winds and surge heights associated with cyclones. Three major cyclones have hited this polder during the recent years; Sidr in 2007, Aila in 2009 and Mohasen in 2013. |
| Key challenges in effective water management | - Poor operation and maintenance (O&M) of structures. During Sidr and Aila, some of the water management infrastructures were damaged to a certain extent but no major maintenance was done except routine maintenance.<br>- Most of the khals are full of water hyacinths.<br>- Erosion at Madhupur & Alipur embankment deteriorated to some extent in particular reaches. |
| Challenges in planning construction of water infrastructures within polder area | - Most of the Khals are obstructed by cross dams and other informally created structures to cultivate fish or retain water for other productive uses. These obstructions are illegally created by influential people without taking permission from proper authority.<br>- Unplanned road networks are also obstructing water flow. This creates in water logging and poor drainage in some areas and is causing water scarcity in other areas. |
| Current internal polder water management practices | There is no Internal Polder Water Management system practices in the Polder |
| Overall condition of internal polder water management | Poor |
| Opportunities for internal polder water management | In the fiscal year 2017-2018 establish one Community led Agriculture Water Management (CAWM) for internal polder water management. |

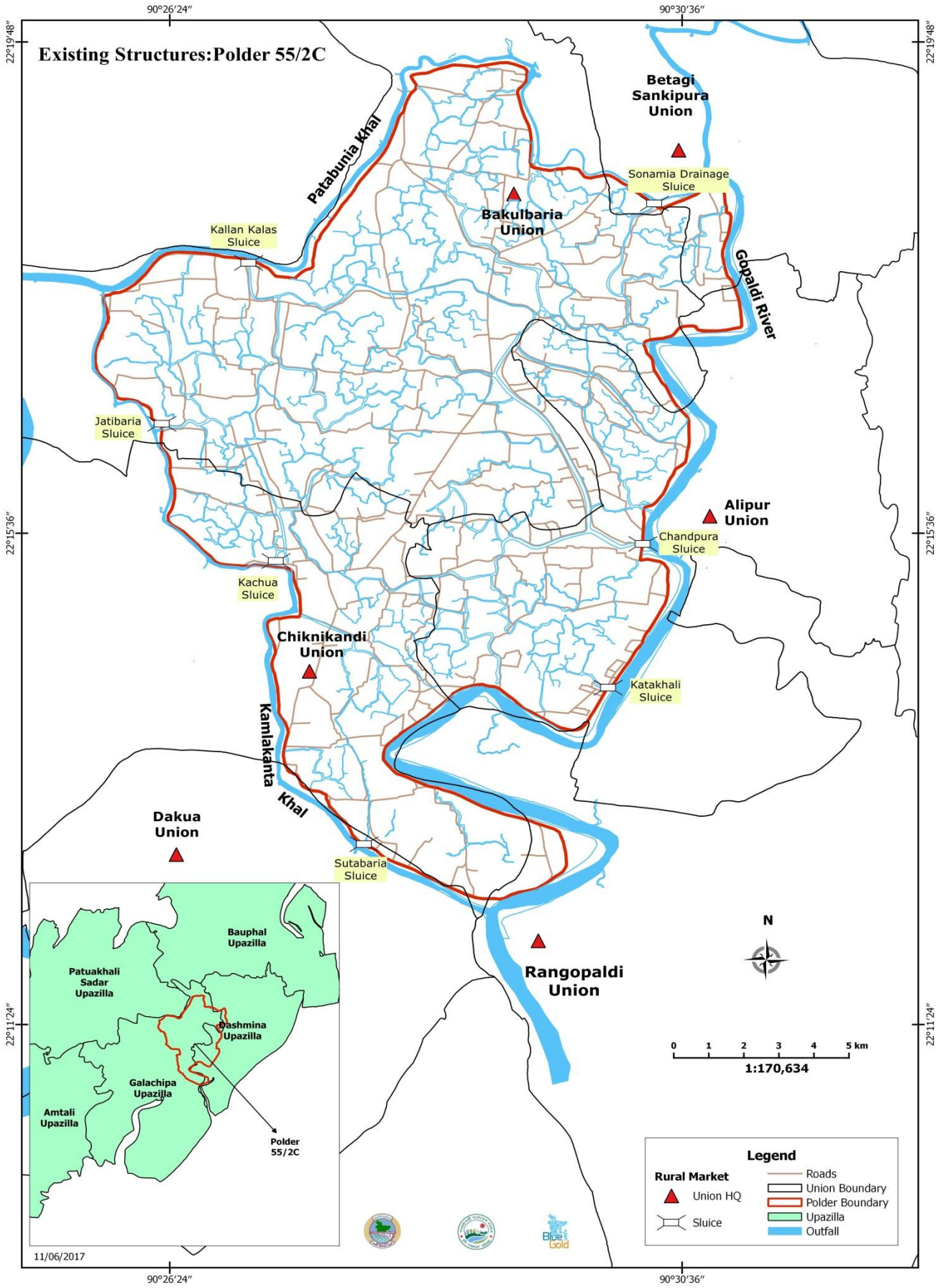


**Figure 2: Map of Polder 55/2C showing the existing khals and Water Management Infrastructure**

## 2.3 Institutional Framework for Participatory Water Management

The main institutional actors in polder 55/2C are Union Parishad (UP), its 9 Wards, Local GO/NGOs, Micro-finance Institutions, Market Committees, Water Management Groups (WMGs), Water Management Associations (WMAs) and Union Disaster Management Committees (UDMCs). Main characteristics of the WMGs and WMAs and other institutional actors are highlighted in the
Table 3. The boundaries and names of the WMG and WMA are shown in figure 3.

**Table 3: Main characteristics of the Institutional Framework of PWM in polder 55/2C**

| Characteristic | | | |
|---|---|---|---|
| Number of WMGs | 16 | Registered: 16 | Non-registered:0 |
| Members of WMGs | 7,502 | Female:3,366 | Male:4,136 |
| HHs being part of WMGs | 6,308 | | |
| Number of WMAs | 2 | Registered: not registered | |
| Female representation in WMGs | 44.86 % | | |
| Total deposited fund (BDT) | 1,68,400 | | |
| Total savings of WMGs (BDT) | 0 | | |
| Total number of WMGs with O&M fund | 16 | | |
| Names of projects and organisations with similar / related activities | • Integrated Farm Management Component (IFMC) – DAE (DANIDA funded)<br>• Quality Seeds Production at Farm Level-DAE<br>• South-West Region Small Holder Farmers Assistance Project-DAE<br>• Safe Drinking Water & Sanitation Project – DAM<br>• Hygiene, Sanitation and Health Program – BRAC | | |
| Existing WMOs linkages with other stakeholders | Generally strong linkage with UPs, however linkages with other service providers like DAE, BWDB, LGED and NGOs and private sector actors could still be further strengthened. | | |
| Number of WMGs member including in UP standing committee | 14 | | |
| O&M agreement signed with BWDB | No | | |
| Current participation of WMOs in O&M | Poor | | |
| Existing conflicts on water management | • Some internal Khals occupied by influential people, built cross dam and cultivating fishes<br>• Followers of some political leaders are setting nets in the Khal or in front of sluice gate led conflict in smooth water management. | | |
| Key challenges in strengthening PWM | • Adopt Collective Action<br>• Financially strengthening<br>• Keep continuous liaison with UP, BWDB, DAE<br>• Good Leadership<br>• Regular O&M activity<br>• O&M fund collection<br>• Regular Record keeping<br>• Involvement of not fully motivated but influential people in WMGs<br>• Some internal Khals occupied by influential people to cultivate fishes | | |
| Key challenges in relation to women participation | A general rather 'conservative' view on women participation in marketing activities, including active participation in WMGs | | |
| Key opportunities in PWM | - Linkages with other institutional actors could be further strengthened.<br>- Percentage of women participating in WMGs is above 40%, BGP can give women more active roles in decision-making | | |

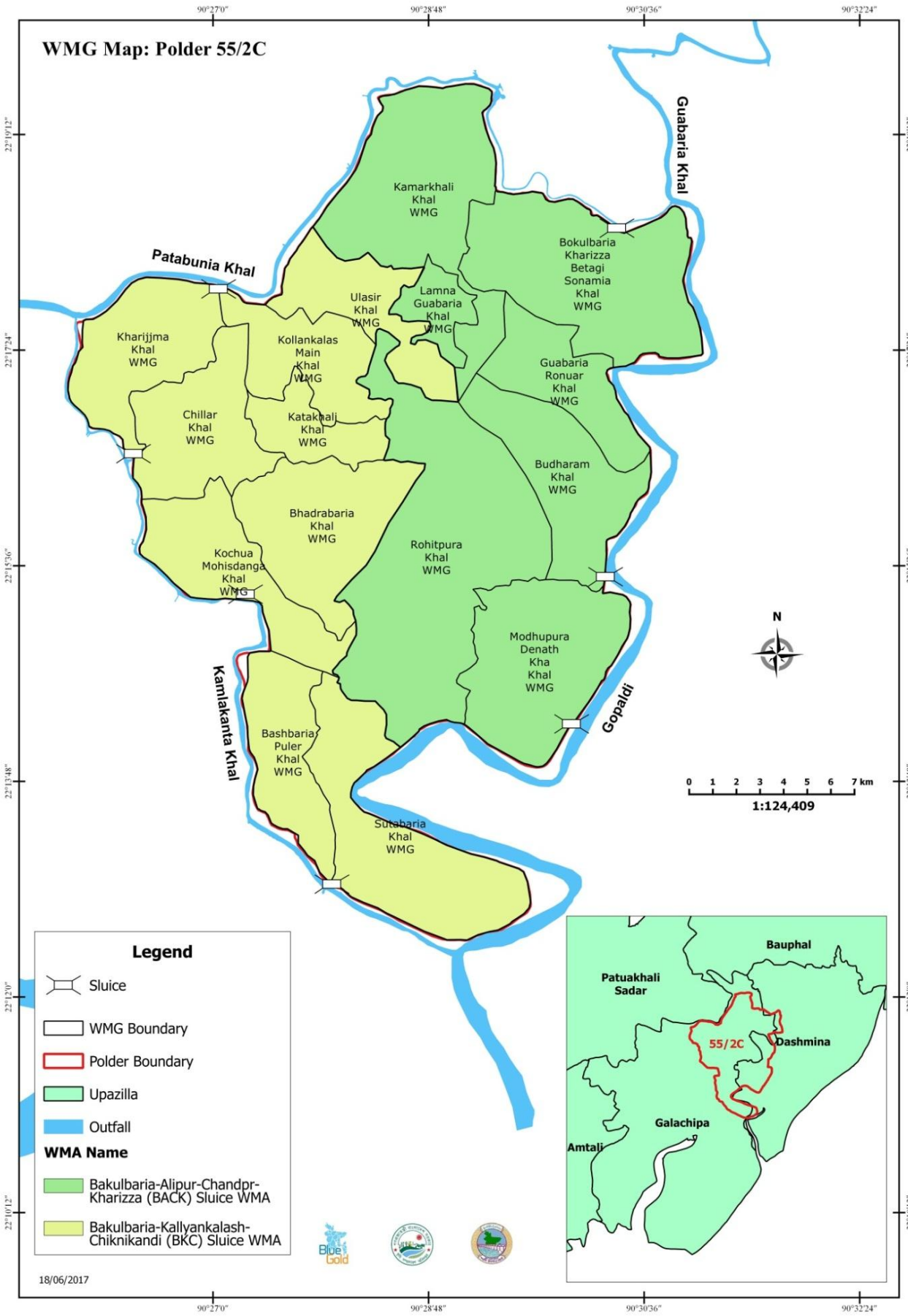


**Figure 3: Name of the WMG and WMA areas in Polder 55/2C**

## 2.4 Agricultural and Marketing Services

In polder 55/2C, most polder dwellers are involved in crop production and fish culture. Livestock keeping is to a certain extent important. The most important characteristics and challenges of agricultural production and marketing services can be found in Table 4.The main markets of polder 55/2C are shown in Figure 4.

.

**Table 4: Main characteristics of Agricultural and Marketing Services in polder 55/2C**

| Characteristic | | | |
|---|---|---|---|
| Main crops (top three) | 1. T. Aman | 2. Mungbean | 1. Chilli |
| Current most common cropping pattern(s) | Mungbean-Fallow-T. Aman<br>Kheshari/Mung-T. Aus-T. Aman<br>Watermelon-Fallow-T. Aman<br>Fallow-Fallow-T. Aman<br>Kheshari/Felon -Fallow-T. Aman<br>Chilli-Fallow-T. Aman<br>Groundnut -Fallow-T. Aman<br>Potato -Fallow T. Aman<br>Boro (HYV)-Fallow-Fallow | | |
| Current cropping intensity | 215% | | |
| Main vegetables | Sweet gourd, bottle gourd, snake gourd, white gourd, ridge gourd, bitter gourd, spinach, yard-long bean, country bean, cucumber, ladies finger, chilli, brinjal and tomato | | |
| Main fruits | Water Melon, Guava, Coconut, Palm, Betel nut, Lemon, Banana and Papaya and Hug pulmp | | |
| Available agricultural machinery | Agri-machineries are used for tillage, threshing, spray of pesticide etc. About 91 power tillers, 78 Low Lift Pumps (LLPs) and 20 power threshers are available in the polder. | | |
| Present irrigation practices | About 8-12 % land has been brought under irrigation facilities. About 78 LLP are used for surface water irrigation. | | |
| Availability of inputs | - The availability and quality of inputs is low, as the polder mainly consist of small-scale farmers renowned input companies are not interested to sell high quality inputs. 80% of the farmers use their own preserved seeds (local and HYV) for rice production. The rest from BADC or private companies.<br>- Most of the vegetables produced at homestead level are mainly hybrid & HYV vegetables. Hybrid vegetable seeds are collected from different seed company agents/local shops and from the local weekly market. LalTeer, ACI and Metal seeds are the hybrid seed suppliers. | | |
| Current knowledge on proper input use | A big portion of crop producing farmers have a lack of understanding on optimal fertilizer dose, seed rate, irrigation and IPM practices. They never use fertilizers in Mungbean fields. In homestead gardens farmers are using a low dose or no fertilizer. They always use high seed rate for both field crops and homestead vegetables. | | |
| Important business trend in crop production | Mungbean, Water Melon, Patato, Vegetable, betel-leaf and Fruit production are rapidly increasing. Farmers sell about 98% of their mungbean and watermelon & betel-leaf production. Road communication is improving, services and modern technologies are becoming relatively better available and the knowledge of farmers is increasing. Moreover, high market demand is making the farmers interested in producing market-based crops. In the recent years cropping intensity and per unit production volume has increased. | | |
| Key challenges in agriculture | - The polder has a substantial number of fallow lands during the winter season. There are also some unused BWDB acquired lands along the embankment.<br>- General lack of knowledge on improved agricultural production technology, in combination with a lack of quality inputs, lack of proper water management – water logging due to heavy rain, draught in winter season. | | |

| | | | |
|---|---|---|---|
| | - Not much vegetable production in summer due to scarcity of high land and waterlogging in low land areas. However, some high land pockets nearby sluices gates could be used and irrigated. | | |
| Percentage of households owning livestock | Cattle 70% | Goats 40% | Poultry 90% |
| Availability of inputs for livestock | In the Polder no formal livestock market chains exists, which causes a large unavailability of fodder and feed. Veterinary service providers (Vaccinators) available in the polder are very poor. Some input traders sell loose feed, like Til oil cake, rice bran and low quality veterinary medicines, but for commercial feeds one needs to travel to Patuakhali and Golachipa bazar Even in the urban areas of Patuakhali the quality, number and timely supply of for example 'Day Old Chick' (DOC) is found to be difficult. | | |
| Important business trend in livestock | An interesting business trend is the demand of native poultry. It is gradually augmenting and the market price is about double compared to Broilar birds. The surrounding industrial setup is still moderate, but quality services are gradually coming closer to the farmers and farmers slowly get more skilful in poultry rearing.<br>Duck rearing also has potential due to the easy access to water bodies, but duckling hatcheries are still absence in the district | | |
| Key challenges in livestock | - Poor knowledge for livestock rearing<br>- Lack of improve breeds/species<br>- A lack of vaccines and medicines<br>- Lack of adequate no. of livestock service provider (Paravat/vaccinator) | | |
| Percentage of households involved in fish culture | 70% of the households have culture ponds | | |
| Types of fish | There are more than 40 species of fresh water fish, and four species of exotic carp, one species of cat fish and two species of tilapia. Shell fish is represented by several species of fresh water prawns, including Golda. The common open water resident fishes are Bele, Chanda, Mola, Dela, Boal, Sing, Magur, Koi, Puti, Taki, small Chingri, Baim and Kholisha fish. | | |
| Availability of inputs | - Fry Hawkers collect fingerlings from Jessore area and surrounding hatcheries of the polder within the Patuakhali district and sell them. Sometimes they create temporary nurseries inside the polder area for Genetically Improved Farm Tilapia (GIFT) production. There are a lot of small nurseries for rearing Indian major carps to fulfil the local demand of the polder.<br>- Many renowned fish feed sellers' products (e.g. C.P. Bangladesh Ltd, Nourish, Paragon, Quality, and Godrej Agro vet Pt. Ltd. and After) are readily available in polder area. Fish feed is available on a credit basis, in some cases also for fingerlings. Fish medicines are available in Patuakhali sadar. | | |
| Important business trend in fisheries | As a secondary source of income fish cultivation in ponds and ditches has recently gained popularity in the polder, because of the DANIDA's Fishery Extension Program. Tilapia and Pan gush culture are increasing, while at the same time the utilization of quality inputs and number of nurseries is growing. | | |
| Key challenges in fisheries | Low fish production per hectare. This is caused, among other problems, by a lack of quality hatcheries and supply of quality fingerlings as well as a lack of knowledge on proper management – high fingerling density is one of the key challenges. | | |

| | |
|---|---|
| Existing extension services | DAE has 9 Sub Assistant Agriculture Officers (SAAOs) position in the polder but they could assign 4 SAAOs at this moment. Some of the NGOs and different companies are also providing extension services. There are 2 private Community Livestock Workers (CLW) at polder level and both the CLWs are found very active. DoF has one Upazila fisheries officer and one Assistant Fisheries Officer to assist in fisheries extension services providing new technologies. Overall, their services are not sufficient due to lack of manpower and funds, also the services mostly address big and medium sized farming households. |
| Name and location of markets | Chiknikandi bazar, Chiknikandi; Banshbaria bazar, Kolagachia; Gelabaria bazar, Kolagachia; Kotkhali bazar, Chiknikandi; Charu Sipahi bazar, Lakagachia; Kalamia bazar, Alipura; Modhupura bazar, Alipura, Alipura Sluice bazar, Alipura; Ronua bazar, Kolagachia; Patabunia bazar, Bokulbaria; Lamna Bara bazar, Bokulbaria; Kallayankalash Sluice bazar, Kolagachia; Jhatibunia bazar, Kolagachia; Kochua bazar, Chiknikandi. |
| Products provided | Paddy, Watermelon, Mungbean, Groundnut, Keshari pulse, betel-leaf is the main market products. Besides, different vegetables and fruits are sold along with Cattle-goat & poultry birds. |
| Surplus destination of products outside polder | The Polder has mainly surpluses for paddy, betel-leaf, Mungbean, watermelon, native poultry and captured fish. The primary destination of products is Golachipa Bazar, Kolagachia Bazar and Patuakhali bazar but it differs from product to product. Paddy goes to northern part directly or via to Golachipa & Patabunia Bazar. Mungbean goes to Barisal, Rajshahi or Dhaka. Betel-leaf goes to different districts via Patuakhali and Golachipa. Vegetable trade is usually restricted to this district. Most produced fishes are consumed by polder dwellers, but large producers can reach Patuakhali market. |
| Main value chain actors | There are about 810 - 815 permanent input traders located at different markets and 245 - 250 local Bepari or Paiker are available in the polder areas and most of them are seasonal. Besides, there are about 55 Arotdars including 18 fish Arotdars in this polder; they have a permanent setup. |
| Key challenges in marketing | - Lack of collective action among farmers. By collective action farmers could buy inputs cheaper and sell products in bulk and get higher revenues. The WMGs are not yet acquainted with collective action for productive purposes and evaluation of loan options is a new to them. It will take a while to change their mind-sets.<br>- Farmers pay high prices for low quality inputs and get low prices for their products, as they mostly sell at farm gate and syndicates control the market. Also market distortion by other projects/NGOs and donors form a threat. Middlemen may not welcome the market orientation of farmers and influential landlords may oppose the mechanization of agriculture. |

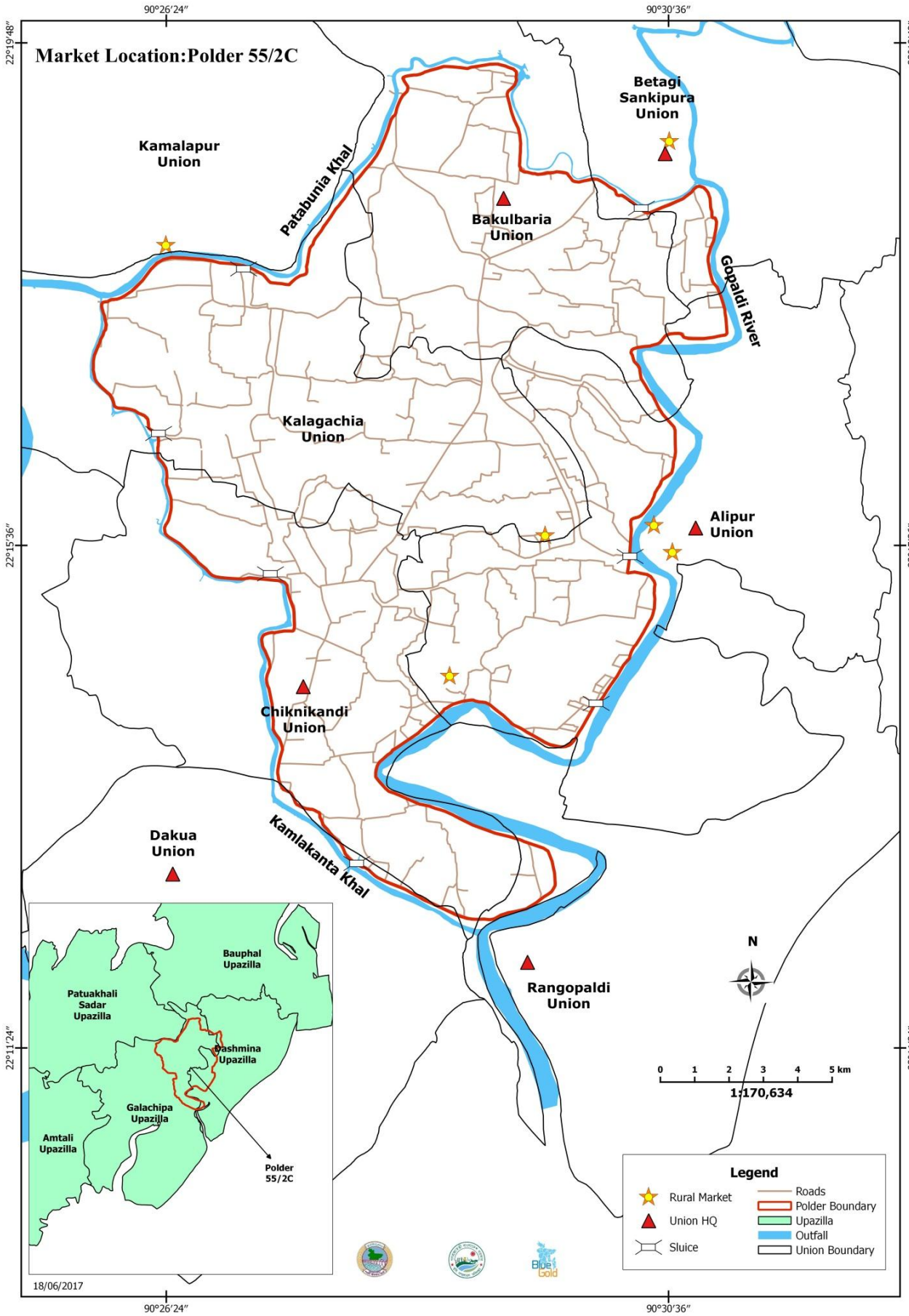


**Figure 4: Markets and Union headquarters in polder 55/2C**

## 2.5 Environmental Sustainability and Disaster Risk Reduction

**Table 5: Main environmental and DRR characteristics of polder 55/2C**

| Characteristics | | | |
|---|---|---|---|
| Existing environmental problems | 1. From the water and land use planning workshop we came to know the Potkatoli Khal, Talbaria khal, Chandpur khal are mostly silted up. On the other hand few khals are blocked due to road construction, cross dam or blocked by the influential people for their fish farming purpose. The Jangalar khal is near to dead due to cross dams were made by influential people;<br>2. The polder dwellers are suffering from drainage congestion at several low lying places i.e. near to Madhupura bazar, Bibirai to Hira Gazir Char, surroundings of Katakhali khal, Mazhigram Mouza amd Sutabaria Mouza. The cross dam on khal near Samsu fakir house and Kader Mridha's house making obstrucle for the natural flow. As a consequence of these waterlogging occurs which affects T. Aman rice cultivation.<br>3. The other environmental problems are including congestion of water hyacinth, embankment erosion, changes of water and land courses, indiscriminate use of chemical fertilizer and pesticides, scarcity of drinking water, lack of shelter place during any emergency etc. | | |
| Common hazards | Tropical cyclones, water logging, tidal and river flooding and salinity intrusion are very common phenomena in the polder area. | | |
| Cyclone shelters | There are 17 cyclone shelters (16 are school cum shelter and 1 is union office cum shelter). | | |
| Obtained environmental clearance certificate (ECC) | Not yet done | | |
| Formulated environmental and social management plan (ESMP) | Not yet done | | |
| Formulated community based disaster risk reduction (CBDRR) plan | Not yet done | | |
| Recruited WMG environment and DRR counselor | 32 counselors | 16 environmental counselors (female) | 16 DRR counselors (male) |
| Members of WMOs included in UDMC | 15 | | |
| Opportunities for environmental and DRR activities | 1. The Cyclone Preparedness Program is working in the polders. They are very active with different disaster management programs, and 315 volunteers (male-210 and female-105) who are trained on first aid, search and rescue and warning signal disseminations. We could make a joint collaboration with them and make linkages with our WMOs;<br>2. The social forestry program of the department of forest is working in the polder area. We could make partnership for plantation in beside of the embankment after completion of the rehabilitation works;<br>3. Awareness raising and encouragement of balanced fertilizer use; disaster preparedness before, during and after the disaster to cope with and recover from any disaster; WatSan etc. | | |

# 3. Achievement as of May 2017

The achievement which made as of May 2017 on the area of Water Resources Management and Infrastructure, Institutional Framework for Participatory Water Management, Agricultural and Marketing Services, and Environmental Sustainability and Disaster Risk Reduction is summarized below in the following Table:

| Sl. | Activities completed | Time Frame | Remarks |
|---|---|---|---|
| | **A. Water Resources Management and Infrastructure** | | |
| A-1 | Embankment Re-Sectioning | 2016-2017 | 1.8 km |
| A-2 | a. Formation of Labour Contracting Societies (LCS):<br>b. Formation and Training of LCS<br>c. Mobilize for earthwork | 2016-2017 | |
| | **B. Institutional Framework for Participatory Water Management** | | |
| B-1 | WMO (WMG & WMA) Formation & strengthening Activities Arrange registration with BWDB and conduct elections:<br>a. Form Ad Hoc Committees<br>b. Review and update/amend by-laws in accordance with Participatory Water Management Rules 2014<br>c. Update records/books/ ledgers<br>d. Firming-up membership list and membership enrolment with at least 55% households represented and increase female membership to at least 40%<br>e. Prepare and conduct elections for Executive Committee<br>f. Register WMGs & WMAs with BWDB | 2015- May 2017 | 16 WMGs got registration from BWDB |
| B-2 | Stimulate women participation in elections of WMA and WMG committees and increase their membership to at least 40% of which at least one in key-position through Gender & Leadership training for males and females | 2015- May 2017 | Continuous process |
| B-3 | Organize orientation training for UP and stimulate WMG members to participate in various UP committees to advocate for financial and in kind support:<br>a. Union Development and Coordination Committee<br>b. UP Standing Committees<br>c. Ward Shova (contribute in planning and budgeting)<br>d. Union Disaster Management Committee<br>e. Also stimulate UP members to participate in WMO meetings | 2015- May 2017 | Continuous process |
| B-4 | Support WMGs:<br>a. Ensure incorporation of WMG strengthening plan, Business development plan,<br>b. Organizes regular meetings with WMGs<br>c. Invite UP members to attend meetings. | 2015- May 2017 | |
| B-5 | Stimulate as much as possible participation of WMG members in Farmer Field Schools (DAE-FFS), especially females and vulnerable members, ask regular feedback on preferred (DAE-FFSs). | 2015- May 2017 | Continuous process |
| | **C. Agricultural and Marketing Services** | | |
| C-1 | Vegetable production & fruit tree plantation at homestead garden for utilization of homestead area through farmers field school | 2015- May 2017 | On going |
| C-2 | Activities to improve crop production:<br>a. FFS on crops (Rice and other field crops by DAE), homestead garden (vegetables) and nutrition, dyke vegetable production | 2015- May 2017 | On going |

| | | | |
|---|---|---|---|
| | b. Women focused FFS<br>c. Demonstration and trial on potential crops and vegetables<br>d. Field day and farmers rally as follow-up of FFS and trials<br>e. Participatory action research on underutilized and potential vegetable and fruit cultivation at homestead level | | |
| C-3 | Activities to improve livestock production:<br>a. Poultry and nutrition FFS<br>b. Poultry rearing trials with improved poultry-shed<br>c. Beef fattening trials with improved cattle-shed<br>d. Vaccination campaign for poultry & cattle<br>e. Field day on livestock activities | 2015- May 2017 | On going |
| C-4 | Activities to improve fish production:<br>a. Fish and nutrition FFS<br>b. Trials Pond with improved species<br>c. Field day on fisheries activities | 2015- May 2017 | |
| C-5 | Linkage workshop between WMGs and different service provider | 2015-May 2017 | |
| **D. Environmental Sustainability and Disaster Risk Reduction** | | | |
| D-1 | Awareness on Disaster Preparedness and WatSan through WMOs regular meeting and day observance programs | 2015- May 2017 | |
| D-2 | Recruit WMG's Environment and DRR Counselors | 2015- May 2017 | |
| D-3 | Orientation to LCS Leaders, contractors & WMA leaders regarding Env. Safeguards & Conditions of Env. Clearance certificates. | 2015- May 2017 | |
| D-4 | Orientation to UDMCs about their role on disaster management as specified in the standing order. | 2015- May 2017 | |

# 4. Development Action Plan

On the basis of the present situation and its key challenges as presented in chapter 2, the following Development Action Plan has been prepared by the Blue Gold Program:.

## 4.1 Water Resources Management and Infrastructure

A general meeting of the WMA of polder 55/2C was held on 06 and 07 June 2016 in Gilabaria High School and Alipur Primary school respectively. The representatives of all WMGs and representatives of UP Chairman, UP Members, representatives of DAE, Blue Gold TA Team including BWDB officials actively participated in the water management related need assessment in the polder. After thorough discussion and arguments with the local stakeholders the following infrastructures were identified and validated for inclusion in the Blue Gold implementation program. Retired embankment, embankment re-sectioning and repair/reconstruction of structures with gates, re-excavation of main khals were considered as priority-1 work. Construction of drainage Outlets and re-excavation of secondary khals were considered as priority-2 work while provision of Pipes and Temporary Protection Works were considered as priority-3 works[2].

Parties directly involved in implementation will be BWDB, LCSs, Contractors and Blue Gold staff. LGIs/ WMOs will be involved in conflict resolution in water management, and facilitating land availability for implementation of rehabilitation activities.

**Summary of Rehabilitation Works**

| SL. No. | Name of Work | Units | Quantity | Estimated Total Cost, BDT |
|---|---|---|---|---|
| | **Priority 1** | | | |
| 1 | Retired Embankment | km | 2.0 | 200,00,000 |
| 2 | Embankment Re-Sectioning | km | 15 | 150,00,000 |
| 3 | Repair of Sluices | Nos. | 07 | 300,00,000 |
| 4 | Construction of Sluice | Nos. | 1 | 200,00,000 |
| 5 | Repair of Irrigation Inlets | Nos. | 0 | 0 |
| 6 | Re-excavation of Khals | km | 25.0 | 300,00,000 |
| | **Total Priority 1** | | | **1150,00,000** |
| | **Priority 2** | | | |
| 6 | Re-excavation of Khals | km | 5.0 | 60,00,000 |
| 8 | Construction of Outlets | Nos. | 02 | 120,00,000 |
| | **Total Priority 2** | | | **180,00,000** |
| | **Priority 3** | | | |
| 9 | Drain pipe | M | 200 | 6,00,000 |
| 10 | Temporary Protection Works | km | 0.30 | 30,00,000 |
| | **Total Priority 3** | | | **36,00,000** |
| **Total cost for Rehabilitation Works in Polder 55/2C** | | | | **13,66,00,000** |

- A map showing proposed rehabilitation plan is given in Figure 5

[2]Actually all works are needed for efficient water management and to reduce health and environmental hazards in the polder. However, since fund is limited, prioritization will give a scope for phasing out the work depending on DPP provision and availability of fund. Priority-1 works include activities that are related to the safety/ immediate problem solution of the polder. Priority-2 works include activities that are required for proper functioning of the polder. Priority-3 works are not immediately needed but are desired for further improvement of the water management and environmental conditions in the polder. If DPP allows and fund is available all works will be done.

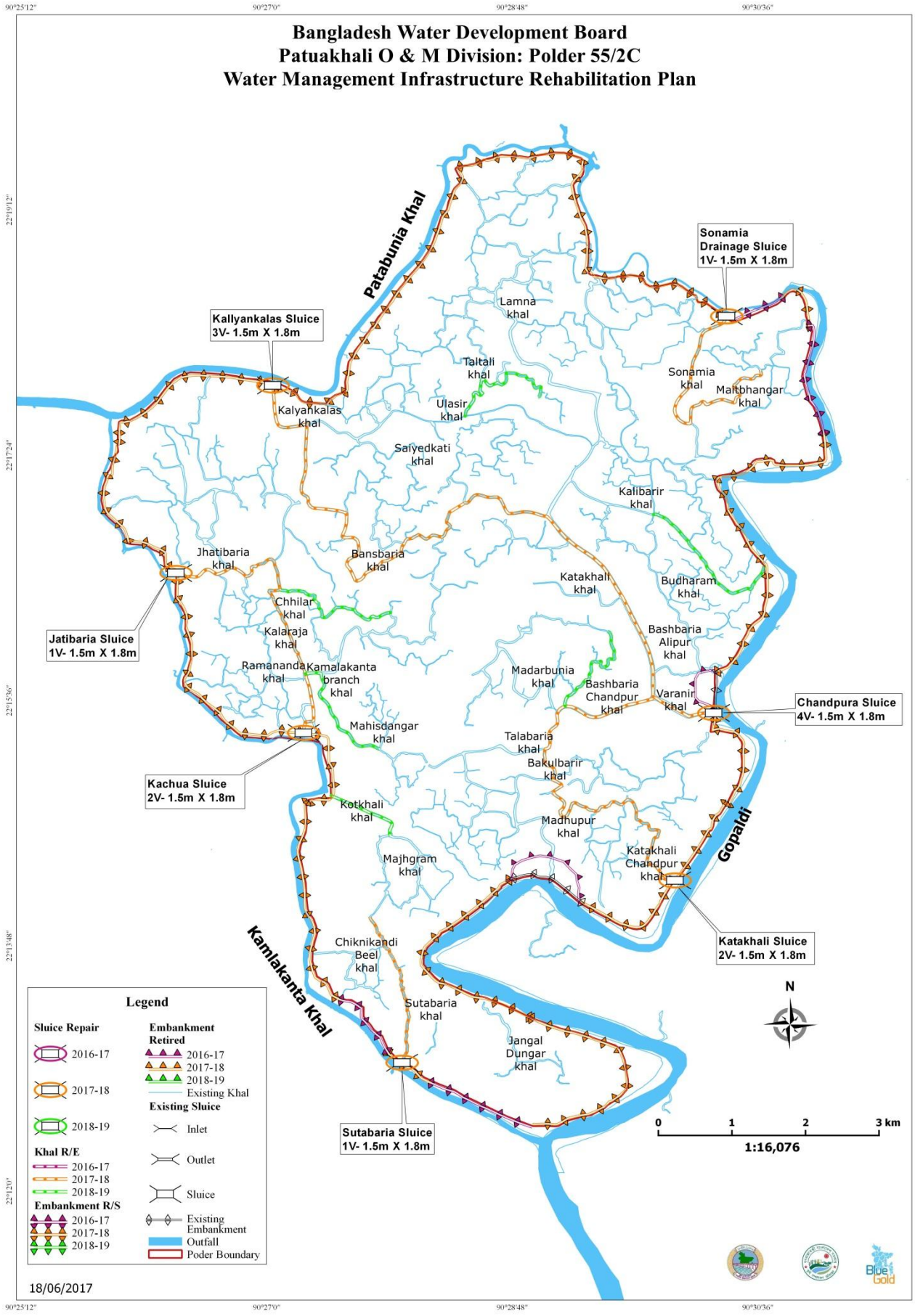


**Figure 5: Proposed rehabilitation plan in Polder 55/2C**

## 4.2 Operation and Maintenance and Internal Polder Water Management

After rehabilitation the Water Management Association (WMA) will play an important role in operation and maintenance, on the basis of an agreement between the WMA and the concerned BWDB Executive Engineer, to be finalised before the execution of the rehabilitation works. The O&M agreement will identify all operation and maintenance activities in the polder and delineate sharing of the responsibilities between BWDB and WMA. Small routine maintenance works will be implemented by WMA; and larger routine and periodic maintenance works implemented by BWDB. However, the real sharing can be anything according to the terms of agreement and mutual concurrence. The O&M agreement may also identify BWDB resources in the polder that can be used by WMA to partly or wholly mobilize resources for operation and maintenance. Technical knowledge will be provided by Blue Gold through training.

Based on this, in the first year after completion of rehabilitation, WMA's along with BWDB and TA Team will make operation and maintenance plans, implementation budget and resource mobilization plan. The WMGs will develop Internal Polder Water Management plans as part of their WMG Action Plans. All plans will be implemented by WMOs and BWDB with direct assistance from TA Team. In the second year after completion, as part of the exit strategy, WMOs and BWDB will make their plans as usual, but TA team will provide only backstopping support as and when required. At the end of the second year, there will only be TA support for monitoring of O&M and internal polder water management, and WMO's along with BWDB will continue the O&M activities in line with the agreement.

In the meantime, the TA team will continue to work with the BWDB at different levels to find an institution basis which will encourage effective commitment to and action for fulfilling the BWDB commitments under the O&M agreement with the WMA.

| Sl. | Activity | Time Frame | Responsible Actors | People to involve |
|---|---|---|---|---|
| 1 | Formation of Labour Contracting Societies (LCS):<br>a. Formation and Registration of WMGs<br>b. Formation and Training of LCS<br>a. Mobilize for earthwork<br>b. Stimulate women participation | 2017-2020 | OCWM, TA-Socio-Economists and PC/CDFs | WMO members and vulnerable groups including women willing to do earthwork |
| 2 | Implementation works like Embankment Re-sectioning/Construction, Khal Re-excavation and Repair/Construction of Structures | 2017-2020 | BWDB, TA- WRM Team | LCS, WMA and WMG Executive Committee, BWDB |
| 3 | Support the monitoring of implementation works by LCS/Contractor and issue Satisfactory Completion Certificate after completion of the works. | 2017-2020 | TA- WRM Team, Socio-Economists, PC/CDFs | WMA Monitoring Committee |
| 4 | Participation in routine O&M:<br>a. Signing of O&M agreement<br>b. Follow O&M training by Blue Gold<br>c. Polder inspection and identification of O&M requirements<br>d. Plan O&M activities<br>e. Resource Mobilization for O&M | Before implementation of O&M works | BWDB, TA-Socio-Economists, CDFs and WRM Team | WMA and WMG Executive Committee, BWDB |
| 5 | Internal Polder Water Management:<br>a. Identify WMGs interested to work along Community Agricultural Water Management (CAWM) model.<br>b. CAWM planning<br>c. CAWM implementation<br>d. Monitoring of CAWM | After main WRM infra is implemented: 2018-2019 | SAAOs, XOs, TA-Socio-Economists, WRM Team, PC and CDFs | WMA and WMG Executive Committee |
| 6 | Back-up support in the yearly joint polder inspection and assessment of O&M requirements, CAWM by BWDB and WMA | 2017-2019 | BWDB, TA-Socio-Economists, PC/CDFs and WRM Team | WMA and WMG Executive Committee, BWDB |

## 4.3 Institutional Framework for Participatory Water Management

Activities to strengthen the Institutional Framework for PWM have been planned with multi-fold objectives:

I. to help the WMOs to become active and sustainable organizations, and able to participate responsibly in polder development activities;

II. to stimulate effective women's participation and

III. To orient Union Parish ads and other relevant stakeholders to support planned activities effectively.

| Sl. | Activity | Time Frame | Responsible Actors | People to involve |
|---|---|---|---|---|
| 1 | WMO (WMG & WMA) Formation & strengthening Activities Arrange registration with BWDB and conduct new elections:<br>a. Form Ad Hoc Committees<br>b. Review and update/amend by-laws in accordance with Participatory Water Management Rules 2014<br>c. Update records/books/ ledgers<br>d. Firming-up membership list and membership enrolment with at least 55% households represented and increase female membership to at least 40%<br>e. Prepare and conduct new elections for Executive Committee<br>f. Register WMGs & WMAs with BWDB | Jun-Dec 2017 onwards | COWM, TA-CDFs, PC & ZSEs | WMOs, BWDB |
| 2 | Organize various training for WMO Strengthening: Organizational Management and Leadership, Financial management, O&M, Ensure the formation of sub-committees after training: O&M, Business, and Audit. | 2017-2020 | TA-CDFs, PC, ZSEs. Training Team, WRM Team | WMOs, BWDB, |
| 3 | Stimulate WMOs to identify BWDB unutilized land and water bodies and to apply to XEN for obtaining use-right of those resources for income generation | 2017-2019 | WMOs, BWDB | WMOs, BWDB, |
| 4 | Stimulate women participation in elections of WMA and WMG committees and increase their membership to at least 33% of which at least one in key-position through Gender & Leadership training for males and females | Next elections, regular follow-up | PC, CDFs, Gender Expert and Training Team | WMOs, COWM |
| 5 | Actively share PDP with Union Parishad (UP), organize orientation training for UP and stimulate WMG members to participate in various UP committees to advocate for financial and in kind support:<br>a. Union Development and Coordination Committee<br>b. UP Standing Committees<br>c. Ward Sabras (to contribute in planning, budgeting of UP)<br>d. Union Disaster Management Committee<br>Also stimulate UP members to participate in WMO meetings | Jul-Aug 18, with regular follow-ups | ZC/PC, CDFs, Institutional Expert, and Training Team | UP and WMG EC members, UZ officers |
| 6 | Support WMGs with WMG Action Plans (WAPs) formulation and implementation:<br>a. formulation of WAPs<br>b. ensure incorporation of WMG strengthening plan, O&M plan, Gender action plan, Business dev. plan,<br>c. organizes regular meetings with WMGs to update WAPs.<br>D. also invite UP members to attend meetings. | Jun 17 – Jun 18 onwards | COWM, PC/CDFs and ZSEs Gender expert | WMGs, UP, BWDB |
| 7 | Stimulate as much as possible participation of WMG members in Farmer Field Schools (FFS), especially females and vulnerable members, ask regular feedback on preferred FFSs. | 2017- Jun 2020 | DAE, PC and CDFs | WMGs, DAE |
| 8 | Organise regular discussion / coordination meetings with other organisations working in polder area | 2017- Jun 2020 | TA-Zonal team | WMOs, UP, BWDB, DAE |

## 4.4 Agricultural and Marketing Services

The agricultural production and business development aspects of the Development Action Plan focus on the development potentials and required actions in relation to crops, fisheries and livestock while taking into account development potentials of specific value chains.

| Sl. | Activities | Time frame | Responsible actors | People to involve |
|---|---|---|---|---|
| 1 | Activities to improve crop production:<br>a. FFS on crops (Rice and other field crops by DAE), homestead garden (vegetables) and nutrition, dyke vegetable production<br>b. Women focused FFS<br>c. Seed production and multiplication activity<br>d. Nursery management training<br>e. Demonstrations / trials on summer vegetables<br>f. Demonstration and trial on potential crops and vegetables<br>g. Field day and farmers rally as follow-up of FFS and trials<br>h. Participatory action research on underutilized and potential vegetable and fruit cultivation at homestead level | 2017- Jun 2020 | DAE, TA-FOs, Master Trainers, Agri. Expert Bangladesh Agricultural University (BAU) | WMG and WMA members |
| 2 | Activities to improve livestock production:<br>a. FFS on Cattle & Poultry birds<br>b. Livestock vaccine cold chain at WMG/WMA level<br>c. Fodder cultivation promotion in the polder areas.<br>d. Community Animal Health Worker and Community Poultry Workers training<br>e. Motivational tour for good knowledge sharing | 2017- Jun 2020 | DLS, PC/CDFs, FTs, Master Trainers, Livestock Experts, Agri. Expert | WMG and WMA members |
| 3 | Activities to improve fishes production:<br>a. FFS on fish cultivation in ponds<br>b. Set fish trial in FFS areas to transfer fish production technologies.<br>c. Organize fish nurserer training and establish Fish Nursery at WMG/WMA level<br>d. Promote fish cultivation in Khal as collective action of WMGs in the polder areas.<br>e. Establish linkage of WMGs/WMA with local DoF<br>f. Motivational tour for good knowledge sharing | 2017- Jun 2020 | DoF, PC/CDFs, FTs, Master Trainers, Fisheries Experts, Agril. Expert | WMG and WMA members |
| | **Business Development** | | | |
| 1 | Select or prioritize value chains for analysis (VCA) and consult the actors for VCA | 2017-2020 | BDCs & Polder Coordinator | Relevant actors |
| 2 | Collective Action (Economic) | 2017-2020 | BDCs, Polder Coordinator & CDFs | Relevant actors |

| | | | | |
|---|---|---|---|---|
| 3 | Workshop with WMO to promote C/A Business planning and /or private Co. | 2017-2020 | TA-CDFs, BDCs, Project Extension staff | WMGs, DAE, DLS, DoF |
| 4 | GL+CF+RF+PF+FT linkage workshop | 2017-2020 | TA-CDFs, BDCs and CFs,RFs,FTs | WMG |
| 5 | Promote collective actions by WMG members to overcome problems related with low quality inputs (fingerling/seed etc.), high price of input and low price of produce | 2017-2020 | TA-CDFs, BDCs | WMG, private company, other NGOs |
| 6 | Follow-up agricultural and business activities on the basis of farmer's needs | 2017-2020 | DAE, TA-Project Extension Staff, Project Value Chain staff | WMG and FFS members |
| 7 | Input Trader Capacity Building | 2017-2020 | Outsourcing Training Unit, TA-CDFs & BDCs | Relevant actors |
| 8 | Linkage meeting/workshop/seminar with VC actors | 2017-2020 | TA-CDFs, BDCs and CFs,RFs,FTs | Relevant actors |
| 9 | Actor Meeting (Linkage/discussion/ negotiation/intervention designing) | 2017-2020 | TA-CDFs, BDCs and CFs,RFs,FTs | Relevant actors |

## 4.5 Environmental Sustainability and Disaster Risk Reduction

The environmental sustainability and DRR aspects of the Development Action Plan focus on: i) compliance with social and environmental management regulations; and ii) strengthening DRR activities.

| Sl. no | Activities | Time frame | Responsible actors | People to involve |
|---|---|---|---|---|
| **1** | Awareness on Disaster Preparedness and WatSan through WMOs regular meeting and day observance programs | 2017-2020 | WMOs | Upazila PIO office, BRAC WASH program, DPHE, UP, Upazila Health Office |
| **2** | Conduction of EIA and obtaining Environmental Clearance Certificate | 2017-2018 | Outsourced Organization/Consultant | TA- Env. Expert, Polder Team, Zonal Team |
| **3** | Environmental Compliance Monitoring and reporting to DoE | 2018-2020 | TA- Env. Expert, Polder Team, Zonal Team | BWDB |
| **4** | Reconstitution of UDMCs and provide them capacity building support on disaster management | Jan-Feb, 2018 | Polder Team | TA- Env. Expert, Zonal Team |
| **5** | Implementation of CBDRR and ESMP | 2017-2020 | WMOs | Upazila PIO office, BRAC WASH program, DPHE, UP, Upazila Health Office |
| **6** | Training to Env. and DRR Counsellors and UDMCs on Env Safeguard and Dis.Mgt. | July 2017 to December 2018 | Hired SPs/Training Team | Polder Team, Zonal Team, and Env. Expert |
| **7** | Organize manual removal of hyacinth by villagers (through WMA/WMGs) where there is large scale hyacinth issue. | July 2017 to June 2020 (during dry months) | WMA/WMG, Upazilla, UP | Polder Team, Engineer team and Env. Expert |

| | | | | |
|---|---|---|---|---|
| **8** | **Awareness raising program**<br>a. Discussion on using fertilizer and pesticide use, and reducing indiscriminate fishing practices from the natural wetlands at WMG meeting, FFS & MFS session and FFD<br>b. National and International Day observance related to environment and DRR (i.e. World Environment Day, National Disaster Preparedness Day, International Day for Disaster Reduction etc.) | July 2017 to June 2020 | Env. and DRR Counselors, TA-Polder Team | Env. Expert, Zonal Socio-Economists |

# 5. Planning Timeline

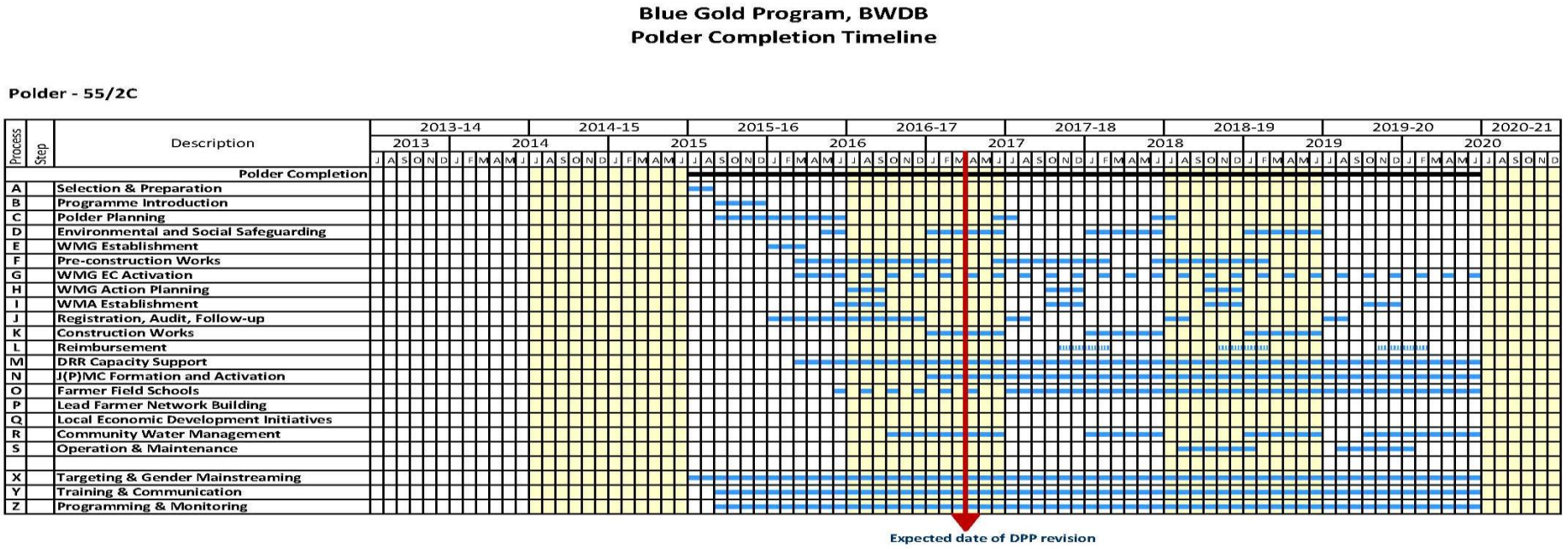


**Figure 6: Polder Completion Timeline**

# 6. Polder Budget

The overview of the estimated allocated budget for the polder activities in polder 55/2C is presented in the following Table 6.

**Table 6: Polder 55/2C Budget**

| Sl. | Task Name | Total Amount | |
|---|---|---|---|
| | | **BDT***x100000 | **EUR****x1000 |
| 1 | **Institutional Framework for Participatory Water Management** | 2.00 | 2.27 |
| 2 | **Main Infrastructure** | 1366.00 | 1607.00 |
| 3 | **Internal Water Management** *(Polder-wise budgets are based on an average amount per CAWM-site. In reality budgets will vary per CAWM-site)* | 24.0 | 23.52 |
| 4 | **Agriculture & Marketing Services** (Actual polder-wise budgets will be higher as exact #FFS per polder will be determined later, estimated DAE contributions have been included in these estimations) | 50.0 | 58.82 |
| 5 | **Environmental & Social Management / Disaster Risk Reduction (DRR)** | 31.00 | 36.47 |
| 6 | **Training** | 36.90 | 43.41 |
| | **Total:** | ***1509.9*** | ***1771.49*** |

Note: Exchange rate is 1 Euro=85 BDT

# Appendix 1. PDP Formulation Process[3]

The Blue Gold Program makes use of the 6-step planning approach described in the Guidelines for Integrated Planning for Sustainable Water Resources Management (IPSWARM) that was adopted by the BWDB in 2008 for its medium sized existing Flood Control and Drainage schemes. Polder Development Plans are the 4th step which follows after the participatory data collection and needs assessment (step 2) and the formation of WMOs (step 3).

In the PDP Formulation Process one can distinguish the following activities/tasks and their outputs (see Figure 6)

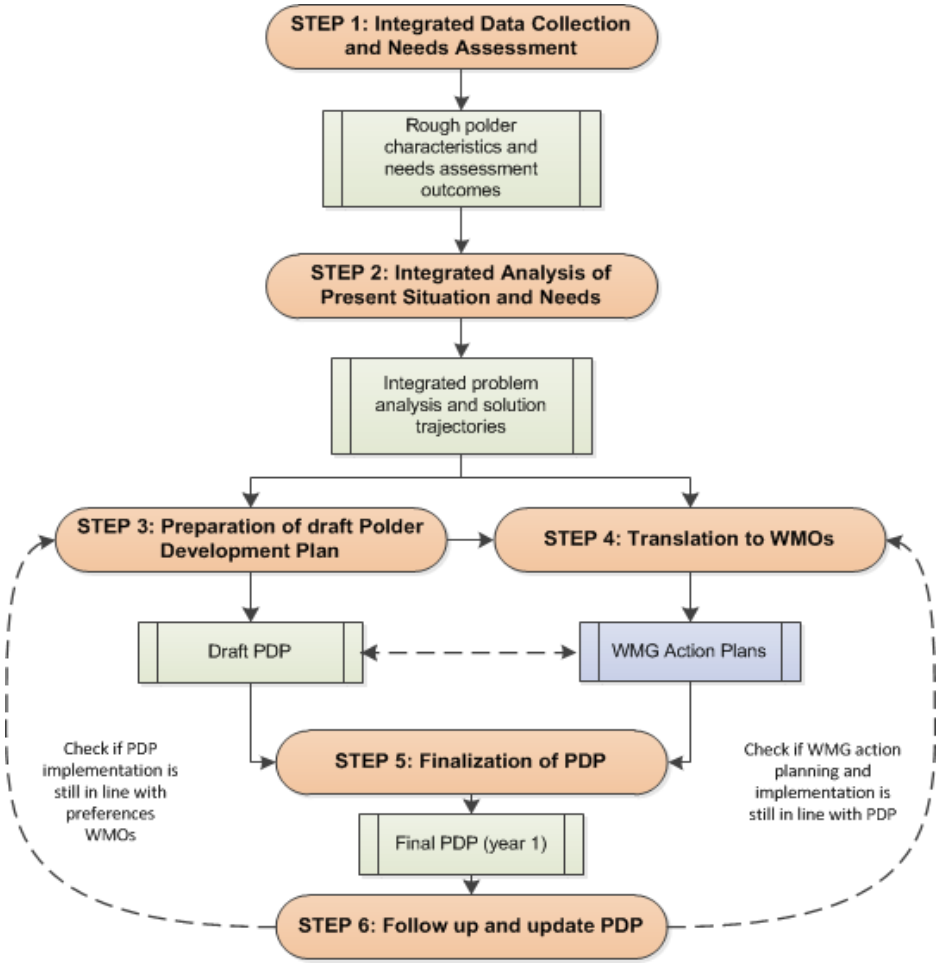


**Figure 7: The steps of the PDP Formulation Process**

**Explanation of the different steps:**

**STEP 1: Integrated Data Collection and Needs Assessment:** For the purpose of planning, data is collected through various methods: collection of existing information from governmental departments, observations in the field, informal interviews with people living in the polder area and key stakeholders, focus group discussions, consultation meetings, engineering surveys, agricultural surveys and value chain mapping and analysis. The various components do their field data collection individually, but coordinate their work to avoid overlap, gaps and misunderstanding among WMOs. The results and outcomes of each

[3] For the preparation of this PDP, focus group discussions were conducted with the existing WMOs and UPs. Polder Team and Zonal Experts were actively involved in the process of specific data collection. In the case of polder 55/2C, after drafting the PDP it was shared with the representatives of WMOs and UPs for data validation and updating

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field visit, meeting, interview or focus group discussion are recorded. Data among others includes the Integrated Needs Assessment executed by component 1 and 2 (WMO strengthening); engineering survey details collected by component 2 and data collected by component 4 in relation to the value chain selection and analysis. The rough data are managed by the GIS specialist and used to generate specific geo-information maps or figures, which are published on an open source website (Lizard Portal).

**Outputs:**
- Rough data of polder characteristics
- Needs assessment report

**STEP 2: Integrated Analysis of Present Situation and Needs:** The integrated data collection and needs assessment is used to describe the present situation of the polder by summarizing the collected info in tables, figures, pie charts and maps with supporting text, as one of the core chapters of a PDP. The present situation in combination with the Needs Assessment is an input for a joint SWOT (strengths, weaknesses, opportunities, threats) analysis workshop within the Blue Gold Team. The outcomes of this SWOT exercise are used in a second workshop at polder level to formulate solution trajectories and activities for polder development. Extra attention is paid to address the severity of problems and the potential of opportunities while selecting activities. The fact that Blue Gold has a limited scope and budget, and cannot address all needs, only those connecting to program objectives and those financially feasible are taken in consideration.

**Output**:
- An integrated problem analysis and solution trajectories

**STEP 3: Preparation of draft Polder Development Plan:** After the integrated analysis, a draft Development Action Plan (including actions related to strengthening WMOs; water resources management; agricultural production; business development; sustainable environmental management; community based disaster risk management; gender and institutional strengthening) is developed. The Blue Gold Team organises an internal meeting to make sure the planned activities across components are coherent and support each other and cross-cutting issues are integrated well (avoid overlaps and gaps). The draft Development Action Plan is integrated with the present situation and the integrated problem analysis and solution trajectories to result in a draft PDP.

**Output**:
- Draft PDP

**STEP 4: Translation to WMOs:** While the draft PDP is being developed, WMG Action Plan (WAP) meetings are organised for all WMGs. The proposed PDP activities of Blue Gold are presented and the potential actions for the community are discussed. The Blue Gold staff support the WMG to prepare a WAP on the basis of their preferred actions and the draft PDP.

**Output**:
- WMG Action Plans (WAPs)

**STEP 5: Finalization of PDP:** On the basis of feedback provided by the WMA and possibly other stakeholders like UP, the Blue Gold Team finalises the PDP. The PDP is forwarded to interested stakeholders and a limited campaign for awareness creation at local level is planned and carried out.

**Outputs:**
- Final PDP

**STEP 6: Follow-up and update of PDP:** Field staff of Blue Gold initiates the implementation of activities with WMOs. Regular follow-up meetings are held, participatory monitoring to keep track of implementation is stimulated and the WAPs are regularly updated by the WMGs. Furthermore the developments of specific value chains, gender issues, disaster risk reduction and environment actions, which are to be incorporated in the WAPs, are discussed. If required, PDPs are updated after 1 or 2 years.

# Appendix 2. Water Management Infrastructure of Polder 55/2C

### Embankment

Total length of the embankment around polder 55/2C is about 47.54 km. The entire embankment is an interior embankment with a crest width of 4.27m and crest level of 4.27 m PWD.

### Sluices

There are 07 drainage/flushing sluices in this polder:

| S.N. | Name of Sluices | Number of Vents | Size, (mxm) | Location, km |
|---|---|---|---|---|
| 1. | Katakhali Sluice | 2V | 1.5x1.8 | Ch.38.40 |
| 2. | Sutabaria Sluice | 1V | 1.5x1.8 | Ch.- 1.80 |
| 3. | Kachua Sluice | 2V | 1.5x1.8 | Ch.- 7.11 |
| 4. | Jatibaria Sluice | 1V | 1.5x1.8 | Ch.- 10.67 |
| 5. | Kallyankalas Sluice | 3V | 1.5x1.8 | Ch.- 15.50 |
| 6. | Sonamia Sluice | 1V | 1.5x1.8 | Ch.- 25.30 |
| 7. | Chandpura Sluice | 4V | 1.5x1.8 | Ch.- 35.43 |

### Drainage Outlets

There is no outlet in this polder.

### Irrigation Inlets

There are thirty nine inlets in this polder:

### Khals

There are about 87 recognizable khals with 1 or more branches and having a total length of about 385.0 km, which are shown in Figure 2.