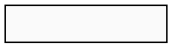
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19 Operationalisation of the PWM concept

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In the national process of developing guidelines and rules for Participatory Water Management, the broad definition of PWM was focussed and – in effect – narrowed-down[Notes 1] (see chapter 4.1). The opposite tendency took place in the application of the Participatory Water Management Rules from

the onset to the completion of BGP. The experience in BGP shows how, beginning with the project formulation, the PWM-concept took on a wider meaning. This amplification can be described by four trends, discussed in the next sections, followed by a final discussion on the future of PWM ('sustainability').

Briefing Materials



The following materials illustrate concepts, interventions, outcomes and lessons learnt, including through stories from community members.

Slide decks

• WMOs: building sustainable partnerships for participatory water management

Thematic brochures

• Commercialisation of agriculture: improved water management conditions driiving reductions in poverty
• In-polder water management: maximising returns from agriculture and aquaculture
• Lessons learnt for scaling out: how participatory water management contributes to inclusive development
• WMOs: building sustainable partnerships for participatory water management

Case studies

• Building strong and functional water management organisations: Kholsibunia WMG

Videos

• What water management means to me (Bangla with English subtitles)
• PWM: an integrated approach - animation (Bangla with English subtitles)
• Water Management Organisations (Bangla with English subtitles)

□

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- 8 See also

Trend 1: 'Water management through business development' or 'business development through water management'[edit | edit source]

A first and fundamental amplification of the PWM concept took place as early as in the program document. Here, the WMOs were – in line with the then applicable rules – defined as cooperatives and the project document amplifies their role from managing local water resources to business-oriented organisations, specialised in agriculture and with back- and forward market linkages. This amplification justified the involvement of the Department of Agricultural Extension (DAE) as an implementation agency for BGP alongside BWDB; as well as the involvement of the Department of Cooperatives as a partner agency. The justification for the amplification is that a direct link between water management and economic development would result in both a need for timely maintenance as well as in the resources to implement timely maintenance.

To ascertain sustainability, the Program will put more attention on the cooperatives, as driver for economic development, and the productive sector as the main basis for the economic development envisaged[1].

For some stakeholders, the 'role of cooperatives as driver for economic development' meant that BGP should strive to develop multi-purpose cooperatives, that would work as independent business entities. Others, already at an earlier stage of the project implementation, deemed the establishment of Water Management Cooperative Associations fundamentally flawed, as adhering to collective decisions by a large group of farmers and fisherman, with diverging production systems and wealth bases, would go against human nature. This is especially worrisome as Water Management Cooperative Associations (WMCAs) comprise substantially more members per organisation than what is normal for the agricultural cooperatives registered under the Cooperatives Act; and this was cause for some concerns on their viability in the Department of Cooperatives.

The BWDB, in a move to relieve water management organisations of the obligations associated with registry under the Cooperatives Act, drafted Rules for Participatory Water Management (gazetted in 2014), which introduced Water Management Groups and Water Management Associations under registration by the Office of the Chief Water Management of the BWDB. WMOs no longer had to issue shares to their members and no longer possessed the mandate to be run as a business.

The view that WMOs should work as business entities was, however, resilient and continued to be upheld as an ideal for BGP. This was most clearly expressed by the Mid-Term Review Mission of 2015.

> *The goal would be for WMOs to develop as multifunctional business entities with O&M of infrastructure and water management as a key task.*[2]

Well into 2017, a community mobilisation expert engaged on recommendation by the 2016 Annual Review Mission argued for:

> *… developing WMO as a "members' share-holding entity" so that profits from WMO-managed services and other business would provide additional income to members and enhance share value*[3]

As said, the legal basis for setting-up WMOs as business entities had by this time already been removed by the 2014 Rules for Participatory Water Management. Moreover, the inherent risks of doing business were perceived as too high and potentially dangerous to the core public function of managing water resources. Community-based organisations generally do not possess the business acumen that the private sector does; and failure of the WMG's business enterprises could subsequently affect the organisation's capacity to manage water resources; or even affect its continuity.

The outcome of the protracted debate summarised above is that BGP focussed on improving local water management to support higher production and profits, while stimulating smaller or larger groups within the WMOs command area to undertake collective actions, such as input supply, coordinated marketing and high value crop cultivation.

BGP's slogan '*water management for development*' had existed since the project's inception. By defining the role of water management organisations as concerned primarily with creating conditions for 'business'; the slogan in earnest became the flag under which BGP would henceforth perform.

Trend 2: Supporting functional water management organisations[edit | edit source]

A second area in which BGP's interpretation of participatory water management evolved – and by which the concept was indeed amplified – was in the formation of water management organisations.

In the period 2013 into 2015 BGP, and especially its TA team, assumed a strong focus on the formal establishment of WMGs in accordance to the applicable regulatory framework. Whereas the component was named 'community mobilisation and institutional strengthening'; the focus was clearly on the first aspect and even more so on achieving targets in terms of number of WMGs being registered. This focus was driven by two circumstances:

- The first batch of polders where BGP engaged comprised of polders supported by the precursor IPSWAM project. This meant that WMGs and WMAs had already been established under the Cooperative Act. A survey in 2013 found, however, that of 242 WMGs formed in 9 former IPSWAM polders three-quarters required reorganisation (including over 40% of those being labelled as 'dormant' or inactive)[4][5]. Similar percentages apply to the status of 21 WMAs established under IPSWAM. What should have been relatively easy (re-engaging with IPSWAM WMOs) proved to be more work than expected.
- In 2014, when good progress was achieved in re-vamping organisations, GoB published ('gazetted') new rules for BWDB Participatory Water Management. As a consequence of this, the Water Management Cooperative Associations were de-registered as cooperatives and re-registered as WMGs under BWDB's Participatory Water Management Rules PWMR (2014).

The expanded work load resulted in time pressure; under which WMG formation was expedited by emphasising to incumbent members that membership offered a wide range of benefits, including access to earthwork opportunities for landless people; participation in farmer field schools (including the opportunity to get free seeds and fertilisers) and provision (through FAO) of free farm machinery to be jointly managed. As a consequence, there was a rapid influx of WMG members, but the function of the WMG – other than being a conduit for free services – was obscured.

In the course of 2015, the valid concern was raised whether the re-established WMGs would not face the same future as their predecessors in IPSWAM; i.e. rapidly becoming dysfunctional and 'dormant'

upon withdrawal of project support. Substantiated by a review of the frequent and positive relations of active WMGs with Union Parishads, BGP postulated that for WMGs to remain active they should become part of a local partnership with LGIs, line departments, other community-based organisations and private sector agencies[6] (See also chapter 18). WMG actions with respect to water management benefit from the active involvement of and support from Unions; and this relationship is likely to help sustain the WMG.

While promotion of cordial relations with LGIs proved useful, the focus on building organisations that comply to the letter of the regulatory framework remained strong. In the period 2015 – 2017, the BGP TA team took several steps to enhance the focus of the field staff on making WMGs functional:

- A field manual on Participatory Water Management (in English and Bangla) was issued in early 2017, after extensive discussions within BGP and within its TA team. The field manual describes a unified approach, whereby all erstwhile component activities of the TA team were made part of a single work process per polder. No longer was community mobilisation an activity separated from agricultural development or business development. The functionality of the WMG was defined as the outcome of combined actions on organisational strengthening, agricultural transformation and business development.
- While since 2015, WMGs were supported to undertake or facilitate collective economic actions, the focus on actions with an element of improved water management was enhanced. This was best expressed by an approach for stimulating optimisation of water management for an improved cropping pattern, known as Community-led Agricultural Water Management (CAWM). Here agricultural advice and inputs, improvement of local infrastructure and organisation of farmers were combined to introduce short-duration HYV T Aman paddy, followed by early drainage and the production of one or two dry season crops, using residual moisture and sometimes supplementary irrigation.
- Integrated polder teams were formed, designating all erstwhile component field staff as Community Development Facilitators and delegating a greater degree of autonomy to the TA polder teams on how to support the WMGs in their polder.
- Instruments to gauge WMG performance were re-defined using criteria of functionality; rather than criteria that relate to organisational establishment only. Thus, indicators were framed in the fields of partnership, water management and economic orientation.

In addition to gearing the field staff more towards WMG functionality, also WMGs and WMAs were supported to play an explicit role in water management:

- Water management planning was supported through a catchment planning exercise, whereby - based on the aspirations of the constituent WMGs - a priority plan was made for each catchment; which were in turn consolidated at polder-level.
- technical assistance and funds were made available for the development of small and intermediate water management infrastructure by WMGs.
- To set a standard for good practices, **water management manuals** (pictorial version and full-text version) have been developed, in particular for the use by the executive members of WMGs and WMAs. These manuals encourage good water management practices, thereby also serving as source of knowledge and information for future executive members, who did not receive BGP support. Two versions of the manual were developed, both in Bangla: a 'text-based' manual for a more literate audience and a 'picture-based' manual for an audience that is less familiar with text-based advice.

The Water Management Manuals were developed in close cooperation with field staff and representatives of WMGs and WMAs. Their feedback was incorporated in the manuals to ensure that the needs and interests of the communities are served, especially those groups most affected by water management as farmers, fisherfolk and *gher* operators. Feedback sessions were held with BWDB zonal staff, to ensure that all required topics had been covered. In the first quarter of 2021 copies of the manuals were distributed to all WMAs and WMGs in the 22 BGP polders. The content of the manuals can be summarized as follows:

- Introduction to water infrastructure in the polders
- The reasons why operation and maintenance of infrastructure are required
- How proper water management can increase crop and aquaculture production, and thus incomes
- Responsibilities of WMGs and WMAs for the operation and maintenance of water infrastructure, including the scheduling of sluice operations
- Catchment planning and O&M agreement, focusing on the complementary roles of BWDB and WMAs, also addressing the required resources for O&M, such as cash and in-kind (labour) contributions, internal decision-making on O&M, and the option of enforcing agreed measures, if occasionally needed
- Resource mobilization by WMOs (WMGs and WMAs)
- Practical advice on the operation and maintenance of the different infrastructural works in the polders.

Trend 3: From O&M to Local Economic Development; from task to mandate[edit | edit source]

The third amplification of the role of WMOs is the interpretation of the core responsibility of the WMO. The original view, loosely based on the PWMR and explicitly expressed in the TA Inception Report, is that the scope of responsibility of the WMO is operation and routine maintenance of infrastructure (with BWDB remaining responsible for periodic and emergency maintenance). This scoping of the responsibility of the WMG and/or WMA reflects concerns on the sustainable functioning of the infrastructure that is constructed or restored by BWDB. Briefly put: WMOs are formed to keep the infrastructure running. This scope is strongly task-based (operate and maintain) and output-centred (infrastructure in working condition).

Gradually, however, the scope for which the WMOs are established and supported became more comprehensive:

- In addition to mere operation and maintenance, the WMGs and WMAs widened their activities in the field of water management:
    - From 2015 onwards, WMGs were assisted through the Community-led Agricultural Water Management instrument to move beyond operation and maintenance of the infrastructure as is to include actions to **modify** the water system and its associate infrastructure. New canals were dug and small-scale infrastructure made or rehabilitated.
    - During 2018 and 2019, matching grants were provided for development of small-scale infrastructure by the WMGs. In effect, this provided an added possibility to modify the polder system.
- Both CAWM and the matching grants for small-infrastructure enabled a substantial portion of the WMGs, or sections thereof, to control the water system around them. This was further pursued when, from late 2017 onwards, Catchment O&M plans were developed. Through the

O&M catchment sub-committee of the WMA, WMGs in a sluice catchment jointly develop an activity plan for the management of the whole catchment. The focus on keeping infrastructure running changed to a scope on running the water system. The output of WMOs was redefined to 'in-polder water management'.

- As remarked already above, participatory water management has in the course of BGP increasingly been placed in a context of economic development. WMOs are not merely there to keep infrastructure in working condition or to pursue in-polder water management; they are there to enable local economic development through water management. This provides a strong justification for their close relation to local governments, line agencies, other community-based organisations and the private sector; but always from the realisation that they are primarily an in-polder water management agent. The scope of responsibility was augmented with an objective at outcome-level (local economic development).

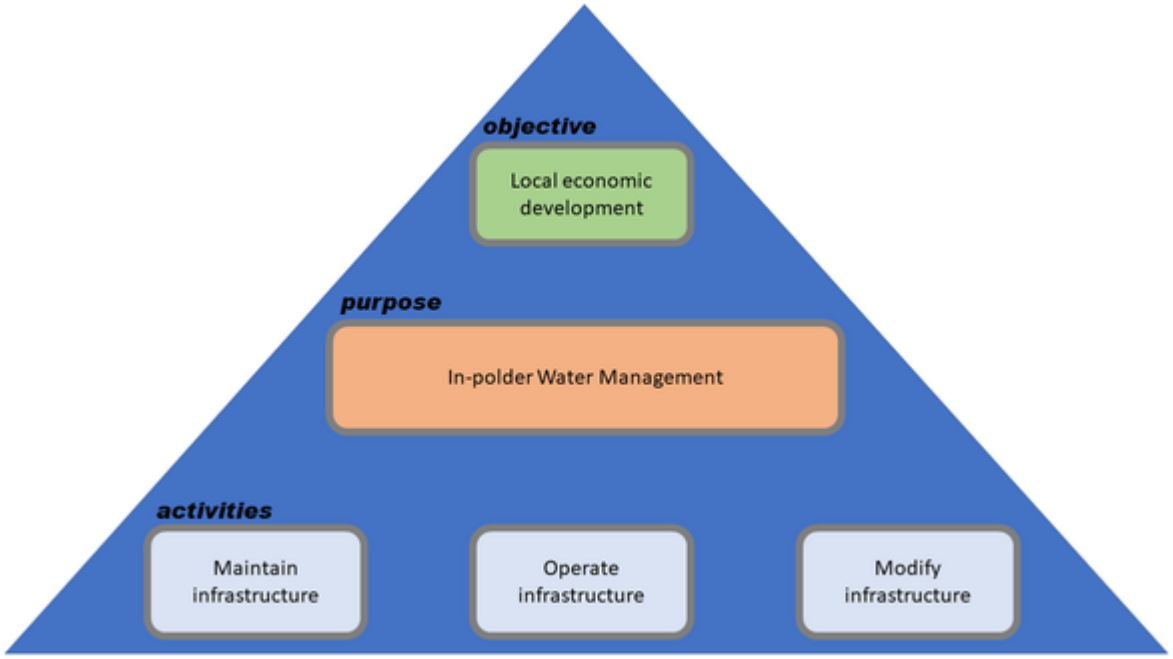


Figure 19.1: WMG and WMA emerging organisational mandate

The above argues that the scope of the WMGs has widened to include more activities; and that the initial task-centred scope transformed into a full organisational mandate, covering activities, purpose and long-term objectives.

Some of the WMGs supported by BGP have indeed progressed to take up a broader responsibility for in-polder water management, thereby striving to create conditions for improved production and subsequent local economic development. Other WMGs still remain focused on basic O&M tasks only, without heeding a wider mandate.

In 2019, twenty-seven of 36 WMAs are assessed to be functional[7][8]. In a self-assessment by WMAs in late 2020, 21 WMAs came out as good, and 14 as medium, while one did not participate in the exercise[9]. So while the trend for now appears to be positive, it is not guaranteed that the WMAs will be able to hold on to this level of performance. Nor is there much certainty that those WMGs that presently still have a restricted scope will develop into purpose- or objective-driven organisations by their own volition after project completion.

One area of concern for the future sustainability of WMOs is that the regulatory framework, while allowing them to enter into the area of in-polder water management, does little to enable their involvement in planning of major infrastructure. As Bangladesh is emerging on a long-term investment strategy for better water resource infrastructure, this is a remarkable omission.

Trend 4: Unit of organisation: from pre-defined to pragmatic[edit | edit source]

The coastal polders that BGP works in range in size from 500 ha to 17,500 ha and are considered to be medium-sized water management systems. The PWMR (chapter 3, clause 5.3) defines three nested tiers of water management organisation:

(3) For medium sized projects two- or three-tier Water Management Organization will be formed, as indicated below:

a) Water Management Group (WMG) at the primary level;

b) Water Management Association (WMA) at mid-level; and

c) Water Management Federation (WMF) at the apex level[10]

As BGP continued where IPSWAM left off, initial decisions with respect to the scale and relative position of the new entities adhered to the previous experience. This means that WMGs were (re-)established along village boundaries. In five of the nine IPSWAM polders, a single WMA was established at polder level, whereas in two polders two WMAs each were formed. The remaining two polders had each six WMAs, which were either in need of reorganisation or fully inactive.

BWDB subsequently stipulated that WMGs were to be formed on a catchment/sub-catchment basis and that each polder would be represented by one WMA[Notes 2]. This decision was applied as follows:

- There has been no retro-active implementation, meaning that the first batch of 9 polders (the IPSWAM polders) remained village-based; whereas the 13 polders taken into the program at a later stage did form WMGs per (sub-) catchment. As a consequence, the average area of cultivable land per WMG in the earlier nine polders is 133 ha, whereas for the later batches the cultivable area per WMG increased to an average of 232 ha. The average number of inhabitants went up as well from 1,150 per WMG to 1,870.

- Delineation of the sub-catchments followed existing roads and other topographic features. Proposals by the TA team were reviewed by the WMGs, sometimes modified and subsequently agreed upon. Given the extremely flat topography, hydrological boundaries cannot be defined otherwise than with a degree of arbitrariness.
- The ‘one WMA per polder’ decision has been applied with flexibility. Larger polders may have more WMAs, and polders with a history of small WMAs (especially polders in Patuakhali) were allowed to retain more than one WMA for historic reasons. However, only one O&M agreement per polder was signed between BWDB and all WMAs of the polder.
- Each polder has several (2 – 3) main regulators or outfall sluices that control the drainage to the river system, which each serve a catchment. *“However, it is not desirable and possible for the WMA to make detailed decisions in O&M in every catchment of the polder. The formation of a limited number of O&M sub-committees gives the WMA the opportunity to ensure their responsibilities are met through working with these committees. Communication between the O&M sub-committees and the WMA is ensured through including the WMA members in the O&M committees concerned”*[11].

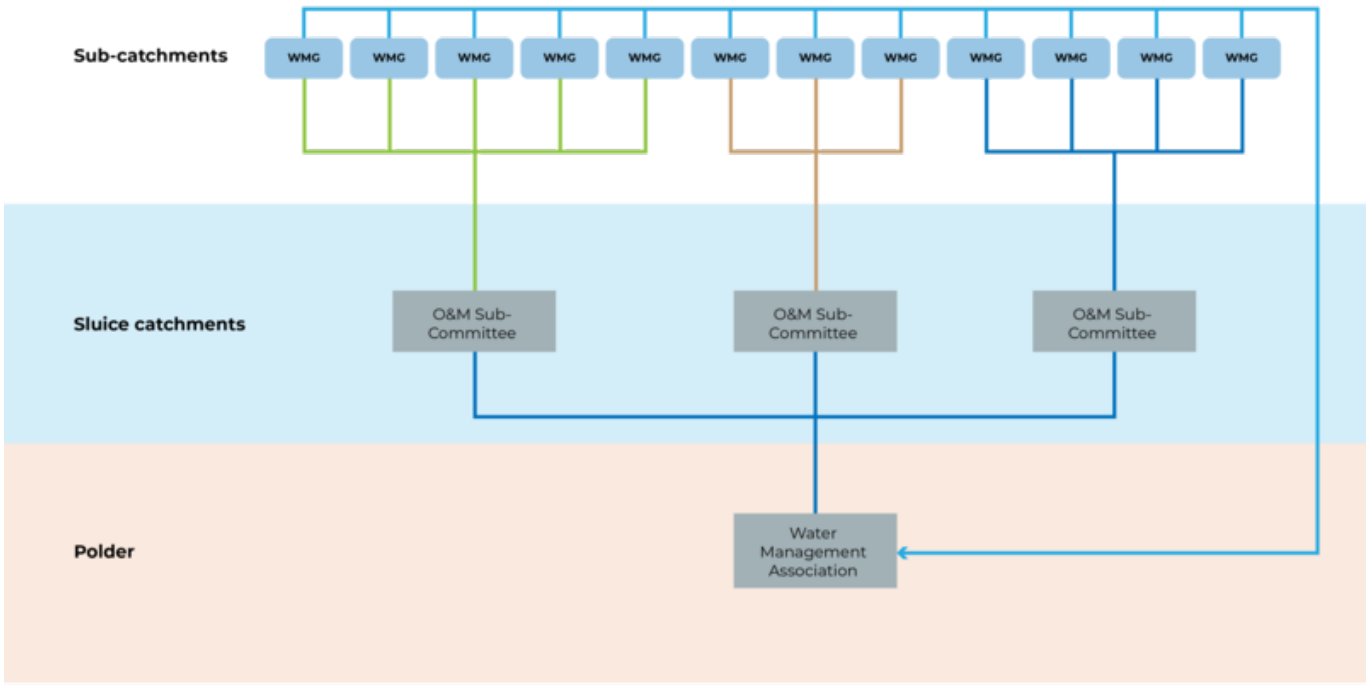


Figure 19.2: Structure diagram of the nested organisation of WMGs, catchment committees and the WMA

In this way a three-layered structure of two organisational tiers emerges; shown in Figure 19.2. While the Catchment O&M sub-committee is a sub-committee of the WMA; it is constituted with representatives from the concerned WMGs.

The term 'catchment' that is used for WMG areas and for areas served by a sluice is not a geographically well-delineated unit. In the flat geography of the coastal zone the network of khals is very intricate and often connects an area via several outfalls to the main river. Moreover, due to the flat topography, the 'watershed dividers' separating different catchments are easily overflown during rainy season inundations.

Sustainability – a discussion[edit | edit source]

Whether a sub-catchment has the prospect of improving its local water management for higher productivity and profitability depends on its topography and on the degree the area is served by the primary polder infrastructure. Especially relative elevation and proximity to a main khal are key determinants for the possibilities of early post-monsoon drainage and of water retention for dry season agriculture. WMGs that presently do not have a prospect to improve their water management will not be sustainable!

Likewise, the prospects of WMG sustainability in sub-catchments where – through WMG initiatives – the water management is optimised, are slim. Once the system is optimally configurated and responsibilities for routine maintenance and operation are assigned, there is very little need for regular meetings and recurrent elections. It is not realistic to expect executives to continue their volunteer role once all improvements that could be identified have been realised.

The implication of the above is that WMGs are likely to be temporary organisations, that either become 'dormant' between periods of action for water management optimisation, or that need to be revived or re-established once new water management problems or opportunities are to be addressed.

At the same time, water management becomes a more continuous concern if a (sub-) catchment is larger. When a WMG becomes dormant, regular maintenance is ignored. This is not much of a problem if the infrastructure concerned comprises say a secondary khal with little to no annual sedimentation. But silt removal from the outfall of a sluice is, in a large part of the coastal zone, an annually recurring task. The larger the (sub-) catchment, the higher the need for organisations to stay 'awake' and to remain alive.

On the basis of the above, one could postulate that WMGs are actually temporary organisations that can be established whenever there is a need to address local water-related problems or opportunities. Once the problem is adequately addressed, the WMG would in all likelihood become inactive and, eventually, dormant. The implication is that in the post-project situation and whenever a new challenge or problem emerges, the WMGs will need to be (re-)established. Relying on OCWM to take this initiative is not realistic, as OCWM cannot be aware of the need for re-establishment. Relying on the Project is likewise not useful, as the Project would have been concluded. It seems therefore prudent that in future, local organisations, such as the LGIs or the WMA are empowered to initiate WMG (re-)establishment.

Secondly, one could postulate that the natural development path for WMGs is to either be short-lived; or to merge into larger units. It is conceivable that in future, a single WMG will coordinate stakeholder interests for an entire sluice catchment, thereby making the formation of Catchment O&M sub-committees obsolete.

Similarly, for those polders where – for historic reasons – there are several WMAs, the likely course of development is a concentration of these entities into one WMA per polder.

For future projects engaging in WMO formation the consequence is that the sequence of the intervention could be reversed. Rather than first building WMGs, then catchment coordination and only then WMAs; a future project could begin with building, hand-in-hand with the LGIs, a WMA at polder level and subsequently engaging it in forming WMGs at catchment level; and in stimulating rather more informal groups at local (sub-catchment) levels to take initiatives for better water management.

References[edit | edit source]

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2. ↑ *Mid Term Review Mission, Aide Memoire, Mid Term Review* (PDF). Blue Gold Program, Updated 27 September - 13 October 2015.
3. ↑ C.M. Wijayaratna (August 2017). *Community Mobilization Specialist, Assignment Completion Report, Draft*.
4. ↑ *Outcome of Functionality Assessment for Water Management Organizations – Polders 22, 30, 43/2D and 43/2F, Report no. 3* (PDF). Euroconsult Mott MacDonald & Associates. November 2013.
5. ↑ *Outcome of Functionality Assessment for Water Management Organizations Vol. 2 – Polders 29, 43/2A, 43/2B, 43/2E and 43/1A, Technical Report no. 10* (PDF). Euroconsult Mott MacDonald & Associates. September 2014.
6. ↑ *Engaging Local Government Institutions in Water Management – DRAFT Sourcebook* (PDF). Euroconsult Mott MacDonald & Associates. February 2015.
7. ↑ *Participatory Monitoring at WMA Level October 2018, Working Paper 08E* (PDF). Euroconsult Mott MacDonald & Associates. January 2019.

8. ↑ *Participatory Monitoring at WMA Level Ocotber 2019, Working Paper 10B* (PDF). Euroconsult Mott MacDonald & Associates. December 2019.
9. ↑ Euroconsult Mott MacDonald & Associates (January 2021). *Self-monitoring of WMOs Using Mobile App: A monitoring system for future*.
10. ↑ *Participatory Water Management Rules (applicable to BWDB)*. Government of Bangladesh. 2014.
11. ↑ *Blue Gold Program Inception Report* (PDF). Euroconsult Mott MacDonald & Associates. November 2013.

Notes[edit | edit source]

1. ↑ In the trajectory from the 2001 Guidelines for Participatory Water Management to the 2014 BWDB Participatory Water Management Rules the ambition vis-à-vis consultation has been toned down and a great deal of flexibility in the constitution of Water Management Organisations was removed. See Section 5.1
2. ↑ Chief Water Management BWDB, In reference to formation of Water Management Organization in the Polders under BWDB South zone Barisal and BWDB South-West zone Khulna within BGP, Letter 295(11) of 8/11/16

See also[edit | edit source]

Previous chapter: **Chapter 18: Water Management Partnership**

Blue Gold Lessons Learnt Wiki
Section D: BGP Interventions: Participatory Water Management

Next chapter: **Chapter 20: Way Forward**

Section D: BGP Interventions: Participatory Water Management

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Chapter 20: Way Forward

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A process by which the local stakeholders are directly and actively involved in identification, planning, design, implementation, operation & maintenance and evaluation of a water management project.

A process by which the local stakeholders are directly and actively involved in identification, planning, design, implementation, operation & maintenance and evaluation of a water management project.

Blue Gold Program

A defined set of temporary activities through which facilitators seek to effect change

human intervention in the capture, conveyance, utilisation and drainage of surface and/or ground water in a certain area: a process of social interaction between stakeholders around the issue of water control.

Water Management Organizations - The common name of organizations of the local stakeholders of a water resource project/sub-project/scheme. The concept WMO typically refers to WMGs and WMAs (and/or WMFs) together

Also known as 'business linkages'. Linkages refer to the trading relationships between and among producers, input providers and traders, and other enterprises in a supply chain or value chain. We refer to Backward linkages on the input side and Forward linkages on the output side of the producer.

Department of Agricultural Extension, a department of the Ministry of Agriculture responsible for disseminating scientific research and new knowledge on agricultural practices through communication and learning activities for farmers in agriculture, agricultural marketing, nutrition and business studies.

Bangladesh Water Development Board, government agency which is responsible for surface water and groundwater management in Bangladesh, and lead implementing agency for the Blue Gold Program

actions taken to prevent or repair the deterioration of water management infrastructure and to keep the physical components of a water management system in such a state that they can serve their intended function.

Water Management Group - The basic organizational unit in Blue Gold representing local stakeholders from a hydrological or social unit (para/village). Through Blue Gold, 511 WMGs have been formed and registered. The average WMG covers an area of around 230 ha has 365 households or a population of just over 1,500.

Water Management Association - In Blue Gold, the polder-level representative of WMGs, and signatory to an O&M Agreement with BWDB

Water Management Organizations - The common name of organizations of the local stakeholders of a water resource project/sub-project/scheme. The concept WMO typically refers to WMGs and WMAs (and/or WMFs) together

Water Management Group - The basic organizational unit in Blue Gold representing local stakeholders from a hydrological or social unit (para/village). Through Blue Gold, 511 WMGs have been formed and registered. The average WMG covers an area of around 230 ha has 365 households or a population of just over 1,500.

Collective action - by a producer group is one way to partially overcome constraints such as in weak markets, where inputs and services essential to production innovations, are generally scarce, costly to access and/or to obtain. Collective action is working in group instead of individually in order to gain economic or social benefit. Through collective action, farmers can address constraints in their market linkages, organise their activities jointly and use their collective bargaining power to reduce input costs through bulk purchase, or to obtain services from buyers such as farm-level collection of produce

The strapline of the Blue Gold Program for a transformative approach to smallholder agriculture which combines water infrastructure and locally-led initiatives for better water management, using modern agricultural technology and a business-orientation.

A process by which the local stakeholders are directly and actively involved in identification, planning, design, implementation, operation & maintenance and evaluation of a water management project.

Technical Assistance

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Integrated Planning for Sustainable Water Management

Water Management Association - In Blue Gold, the polder-level representative of WMGs, and signatory to an O&M Agreement with BWDB

Government of Bangladesh; a donor to the Blue Gold Program

assumed in this report to operate up to 0.5 acres (0.2 ha)

A process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them.

Food and Agriculture Organization

Local Government Institutions - Union Parishad, Upazila Parishad etc

The Blue Gold approach which integrated the earlier 'four components' (ie social empowerment, water management infrastructure, agricultural technologies and farming-as-a-business) into a single work process

An area of low-lying land surrounded by an earthen embankment to prevent flooding by river or seawater, with associated structures which are provided to either drain excess rainwater within the polder or to admit freshwater to be stored in a khal for subsequent use for irrigation.

Community-led Agricultural Water Management - with DAE, Blue Gold established a network of schemes for demonstration purposes where locally-applicable annual cropping patterns are introduced along with water level control facilitated by small-scale water infrastructure, and the development of value chain skills in farmers

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High Yielding Variety - Introduced varieties developed through formal breeding programs. HYVs have a higher yield potential than local varieties but require correspondingly high inputs of fertiliser and irrigation to achieve high yields.

Identification and planning of both interventions and operations & maintenance within the catchment, resulting in an action plan for the catchment.

an idealised hydrologically independent drainage unit within a polder - comprising a network of inter-connected khals draining to a regulator from where water is discharged to a peripheral river. Because the land levels in a polder vary within a small range (typically up to a maximum of 1.5 m), water flows can be affected by downstream water conditions and eventually drain through more than one regulator at diffferent times of year. .

An area enclosed by low embankments to store either freshwater or brackish water for the production of fish, shrimps or prawns.

the adjustment of gates in water management infrastructure to control hydraulic conditions (water levels and discharges) in a water management system.

A vertical gate to control the flow of water; also referred to as 'regulator'

Operation and Maintenance

Participatory Water Management Rules (2014)

Water Management Association - In Blue Gold, the polder-level representative of WMGs, and signatory to an O&M Agreement with BWDB

In-polder water management; term used in Blue Gold to describe water management interventions which aim to deliver excess water from the field through field drains to secondary khals and thence to primary khals for evacuation through the sluice/regulator

hectare

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Water Management Federation - The organization of local stakeholders at the apex level of the water resource project/sub-project/scheme

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Part of the catchment which is not directly connected to the regulator, and is hydrologically independent from other parts of the catchment.

drainage channel or canal

Sedimentation is the process by which fine particles of silt and clay suspended in river water settle out, for example when there is a drop in velocity.

Office of the Chief of Water Management (in BWDB) responsible for the 'establishment of water user organizations, their training and participation, in project planning, implementation, operation and maintenance and cost recovery'

Government of the Netherlands; a donor to the Blue Gold Program

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Variants

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Blue Gold Program Wiki

The wiki version of the Lessons Learnt Report of the Blue Gold program, documents the experiences of a technical assistance (TA) team working in a development project implemented by the Bangladesh Water Development Board (BWDB) and the Department of Agricultural Extension (DAE) over an eight+ year period from March 2013 to December 2021. The wiki lessons learnt report (LLR) is intended to complement the BWDB and DAE project completion reports (PCRs), with the aim of recording lessons learnt for use in the design and implementation of future interventions in the coastal zone.