



Drainage and farmer solutions

Experiences from the Blue Gold Program

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Blue Gold Program

Water Management for Development

Bangladesh Water Development Board (BWDB)

Department for Agricultural Extension (DAE)

Embassy of the Kingdom of the Netherlands (EKN)





Content

- General introduction to Blue Gold Program
- Water productivity challenge = drainage challenge
- Farmer based solutions
- Success stories
- Blue Gold Innovation Fund



Program context

Over half the population in coastal Bangladesh lives below the poverty line, lack adequate governmental service provision and face high (disaster) vulnerabilities in terms of insecurity of food, income, water, health and poverty.

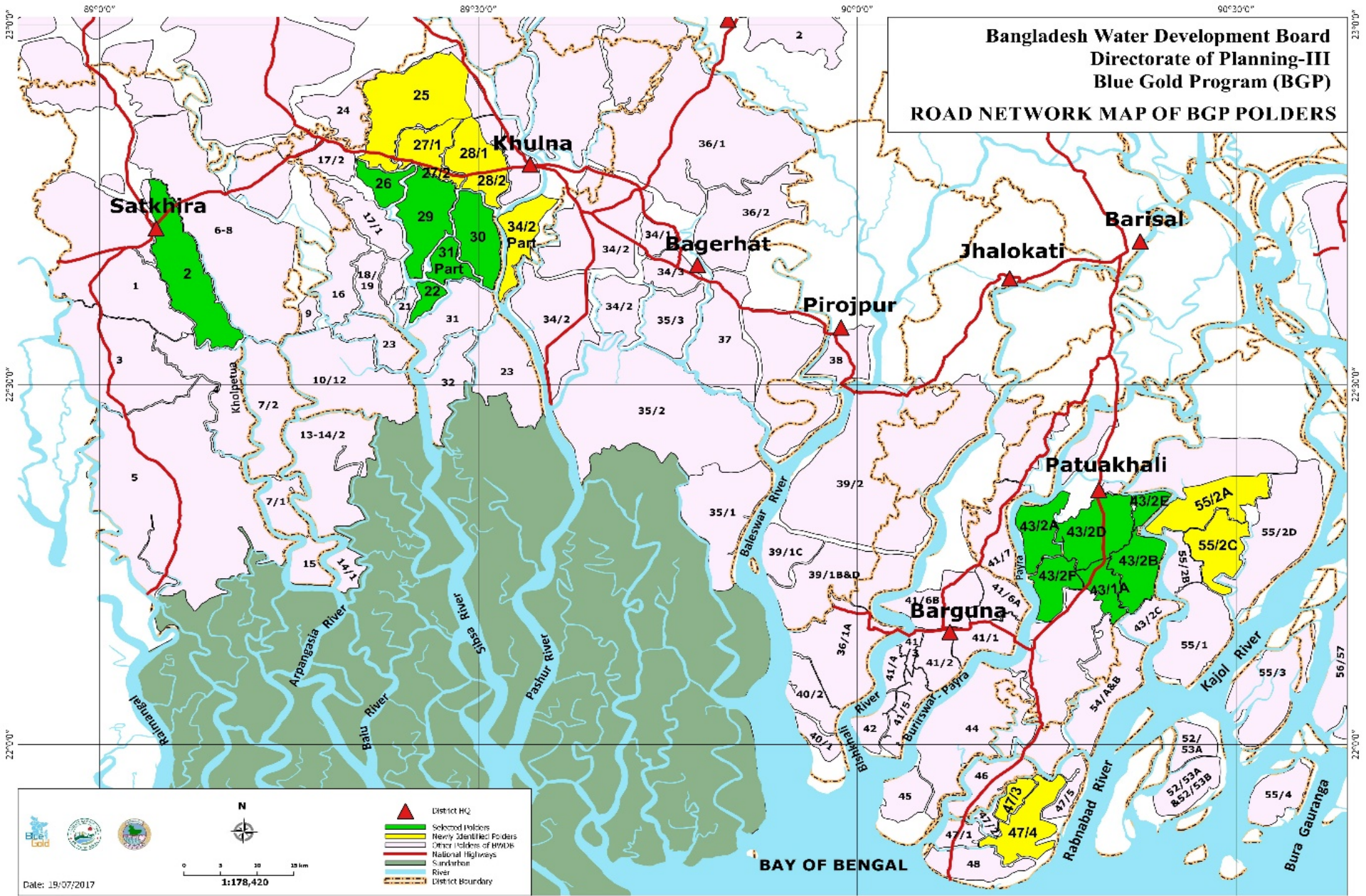
Program Objective

The Blue Gold Program aims to reduce poverty and improve food security through improved water management and increased and diversified agricultural production and profitability in approximately 119,000 ha in 22 coastal polders in Bangladesh.

Main Outcomes

Water Resource Infrastructure
Water Management
Partnership
Adopted new practices and innovations
Increased production and profitability

**Bangladesh Water Development Board
 Directorate of Planning-III
 Blue Gold Program (BGP)
 ROAD NETWORK MAP OF BGP POLDERS**



Legend

- District HQ
- Selected Polders
- Newly Identified Polders
- Other Polders of BWDB
- National Highways
- Sandbar
- River
- District Boundary

Scale: 1:178,420

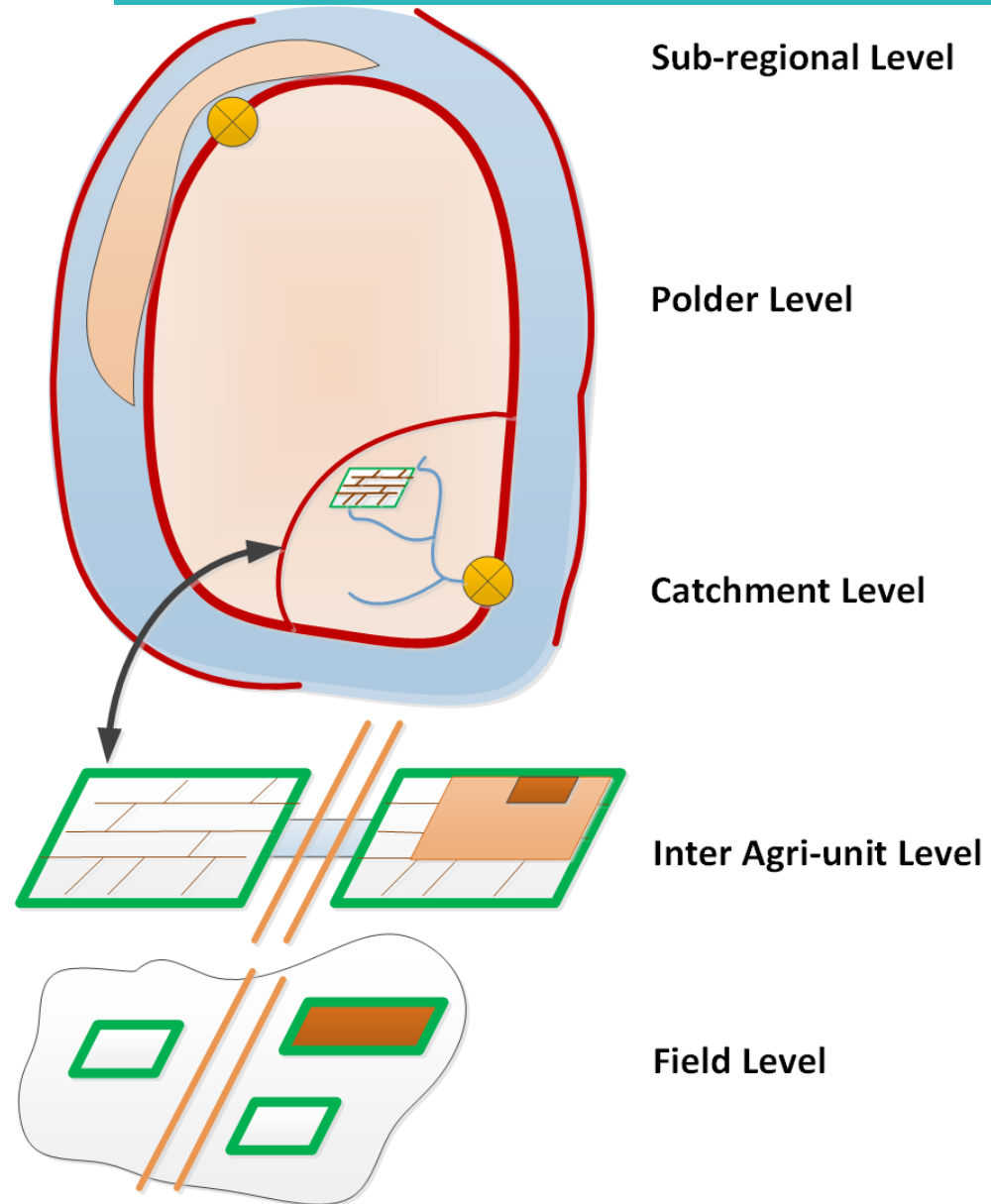
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BAY OF BENGAL

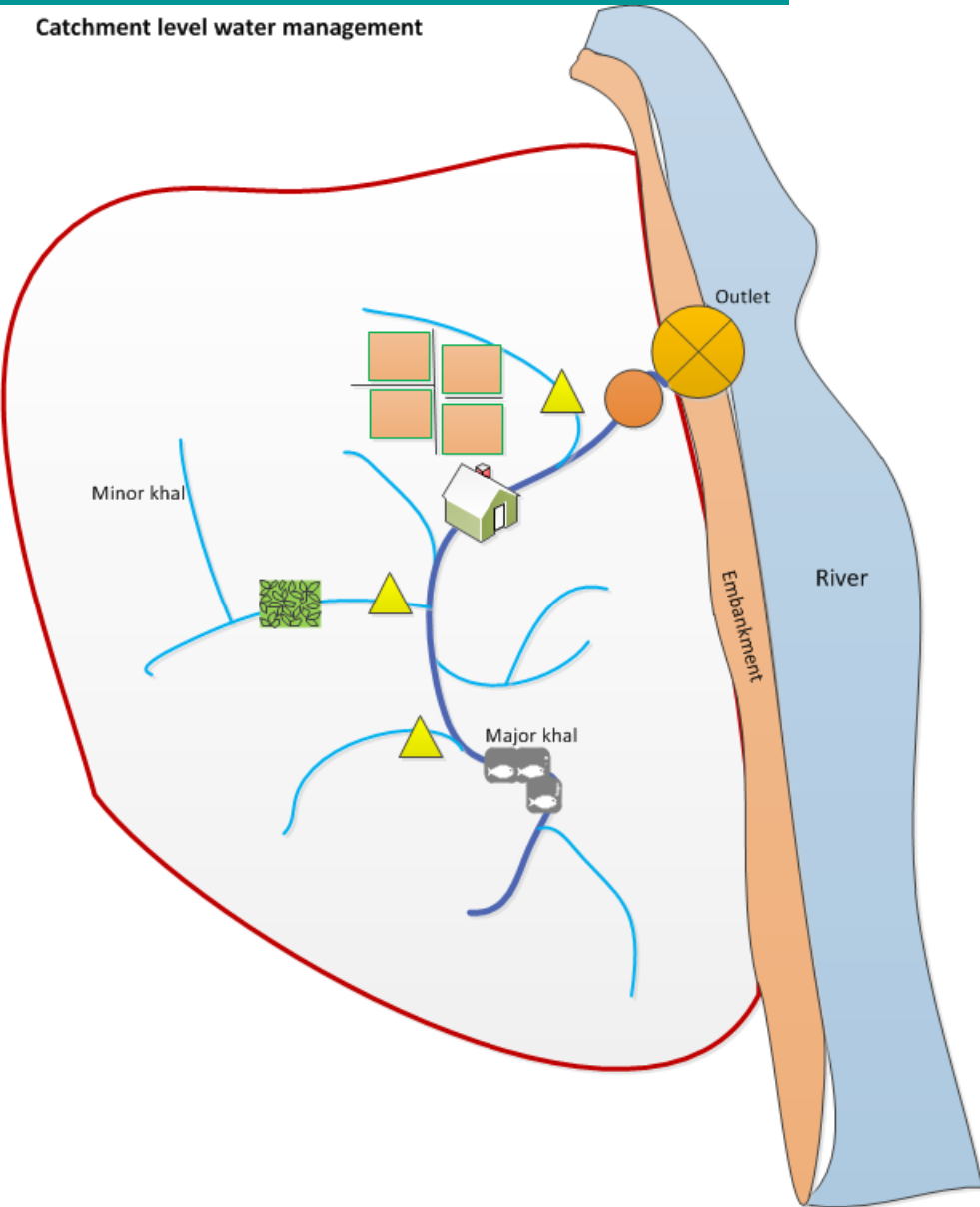
Interventions levels

Focus on community level

- Catchment boundaries are fluid in polders of Bangladesh
- Strong topographic variations
- Hydro-units/catchment boundaries do not per se overlap with social-institutional or market development boundaries
- Institutional gap between periphery embankment and internal water management



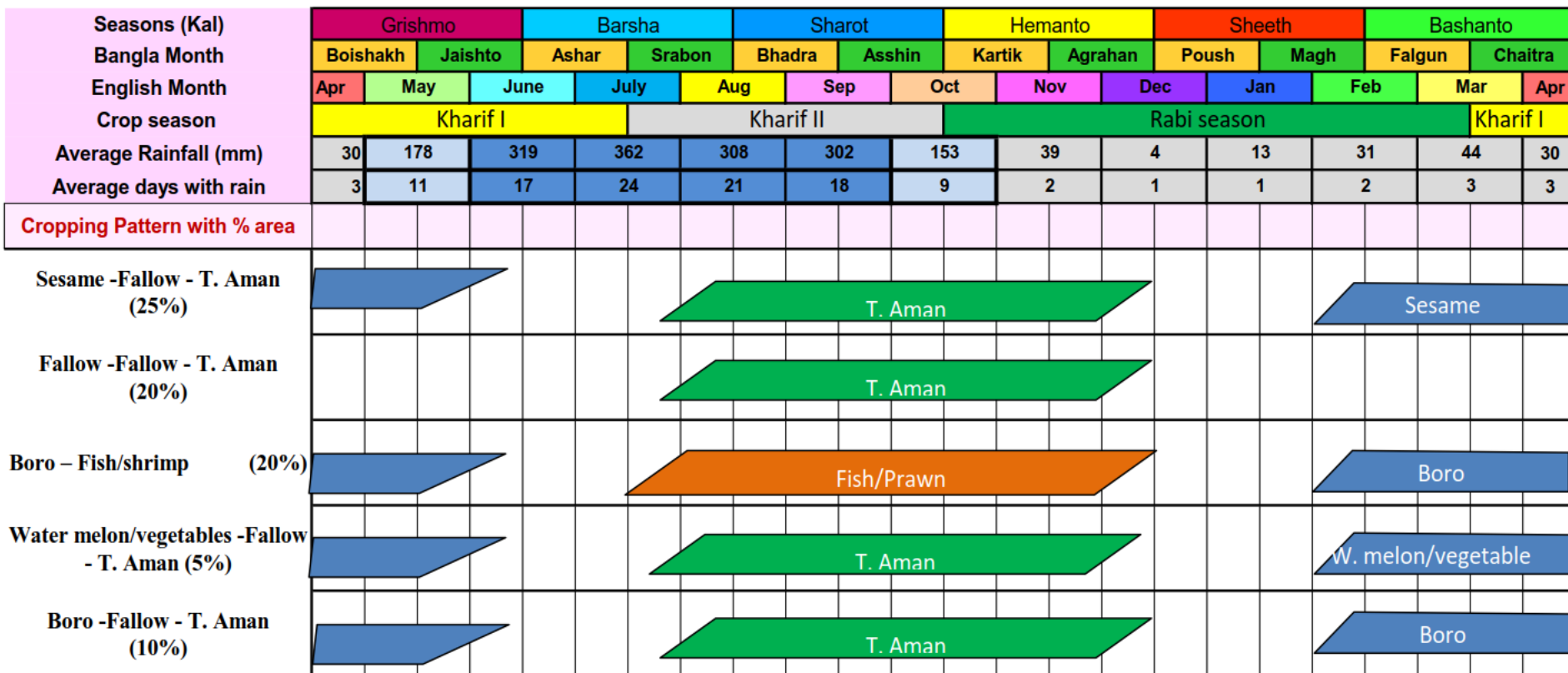
Catchment level water management



Complex water management

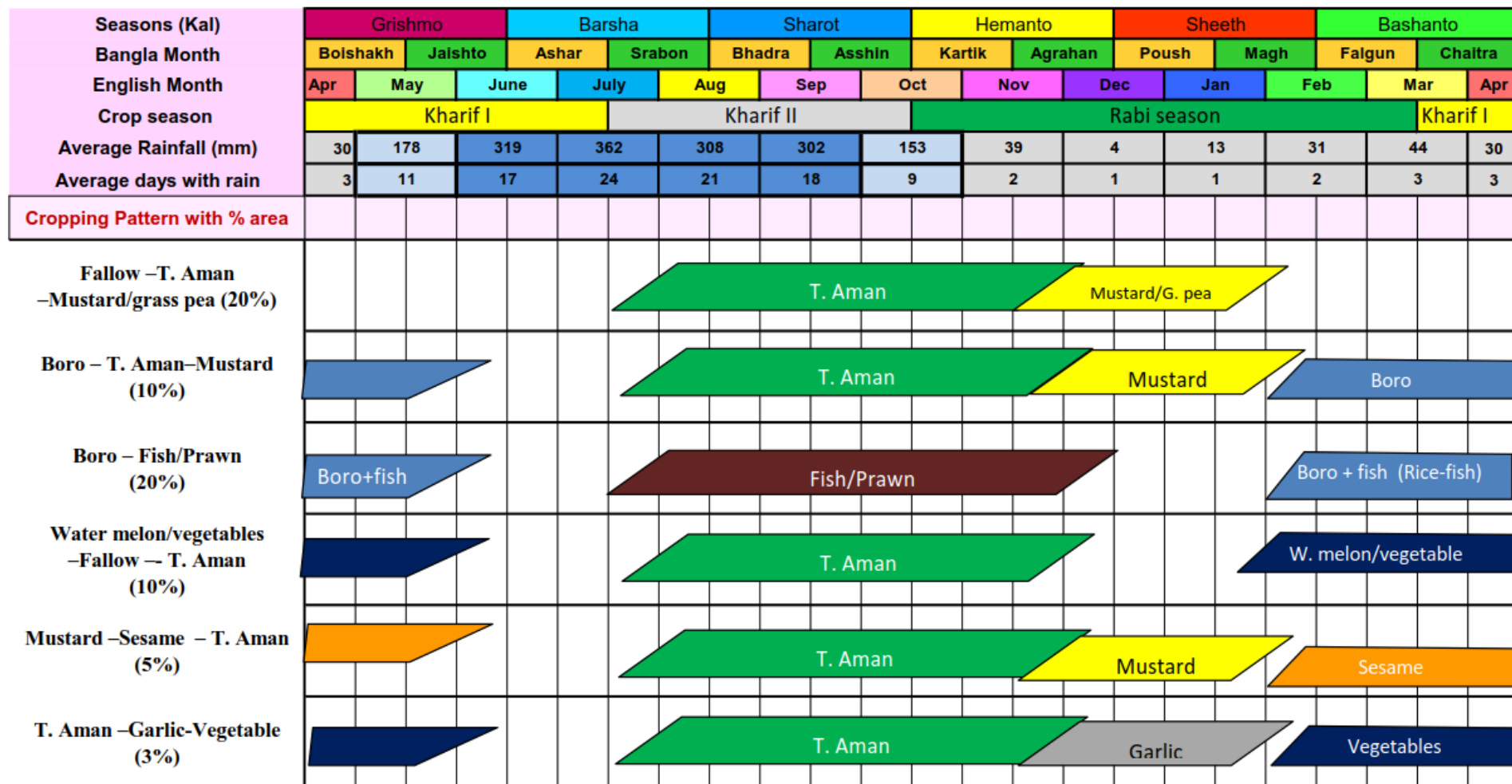
- Tidal rivers carry both fresh/saline water at different times of the year
- Climate change and unpredictable weather events
- Khals are both drainage and irrigation channels – water flows in both directions
- Different livelihoods = different priorities/interests
- Little/poor internal structures to control and regulate flow of water
- Road embankments obstruct flow because of under-sized or poorly located culverts
- Land fragmentation and little synchronisation of crops

Present cropping pattern Khulna



60% double cropped; 20% single cropped; 20% other

Potential cropping pattern Khulna



28% triple cropped; 40% doubled cropped; 12% single cropped; 20% other

Water Productivity Challenge

= DRAINAGE CHALLENGE

MAIN PROBLEM:

Water logging is the major constraint for improved agricultural production.

The current fragmentation of many small holder farmers establishing crops in a non-synchronized manner makes collective action and joint drainage more challenging.

MAIN SOLUTION:

Enabling production system change:

A process of water and crop production planning at agri-unit level and collective action through Water Management Organisations (WMOs) at appropriate level

MAIN OUTCOME:

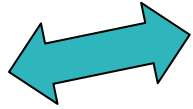
Increased production and profitability



Blue Gold Program intervention areas



Operation of water infrastructure



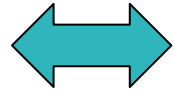
Change of annual cropping pattern



Water infrastructure rehabilitation



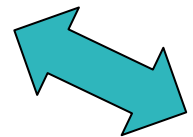
Infrastructure maintenance



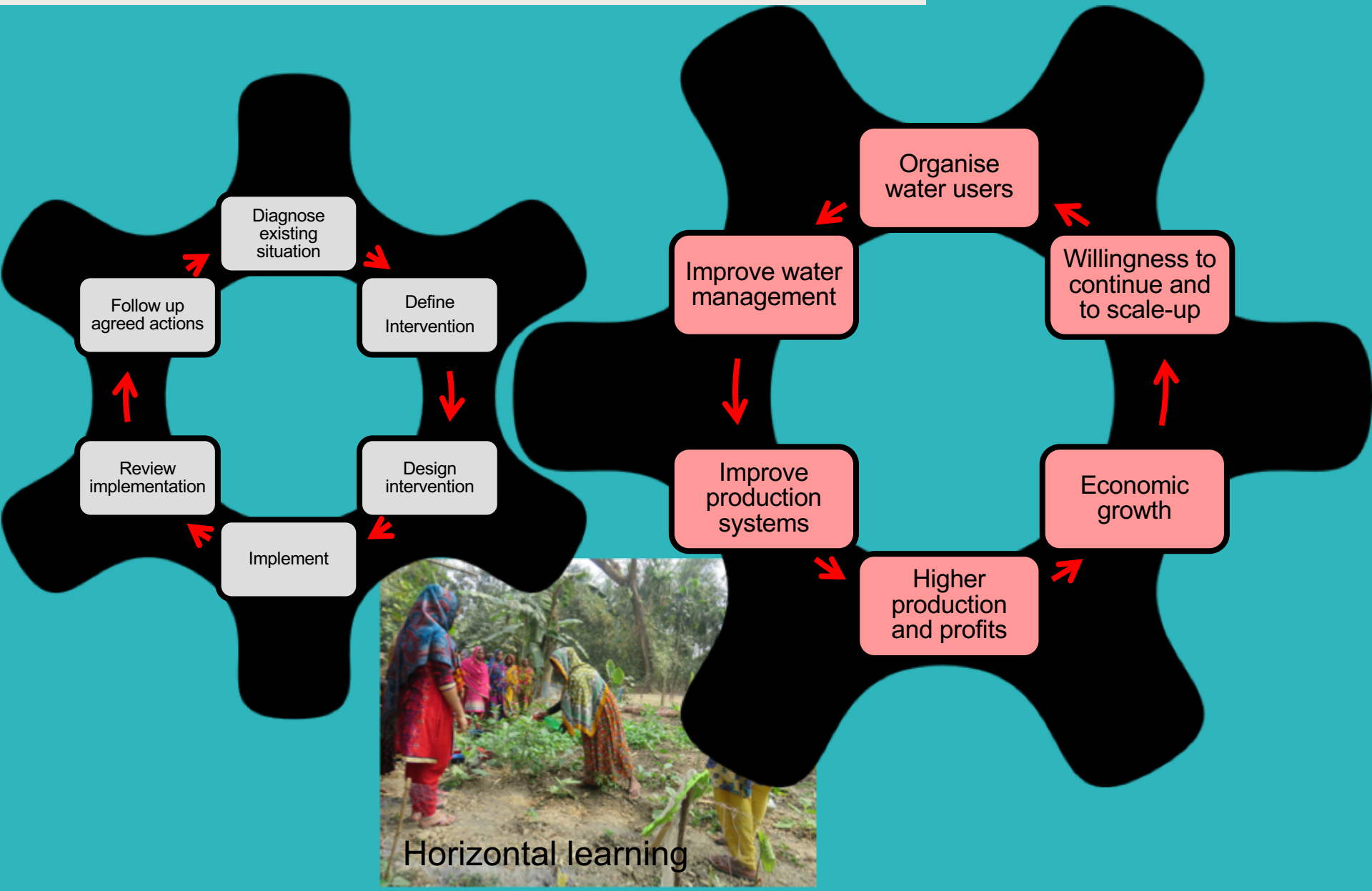
Optimising profitability



On-farm water management



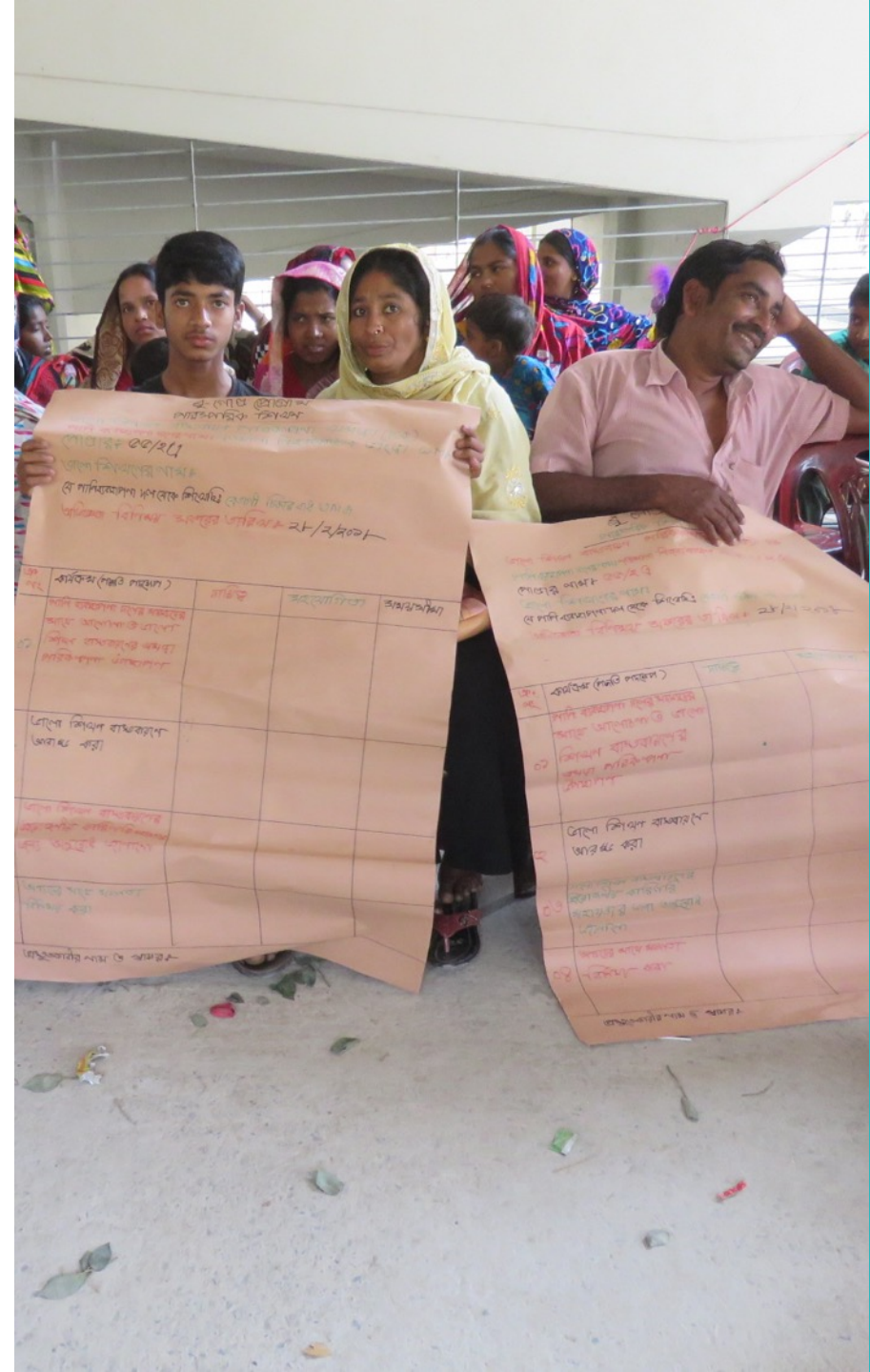
Enabling production system change



Farmer based solutions

Examples

- Action planning
- Develop common agreements on gate settings
- Synchronise crop / crop-fish patterns
- Digging field channels
- Installing fall board
- Removing obstacles
- Create fresh water ponds
- Jointly purchase inputs
- Community-led fisheries
- Lease out tractors
- Group micro credit facility



Success story

Removal of cross-dam created by influential shrimp farmers



Let me introduce you to Khalik

- Jeala-Badandanga WMG planned to cultivate HYV Aman rice instead of local varieties; enabling triple cropping: Aman - Boro – Jute/Mustard
- Sagla sluice gates in previous years closed by influential shrimp/fish farmers, creating water logging
- WMG leader Khalik mobilised his group; agreed with BWDB engineer to open gate
- When opened, sediment removal required; Khaled mobilised to 2 neighbouring WMGs for labour
- After opening, shrimp farmers again developed cross-dam; WMGs called for their Local Government Institution to handle situation
- WMGs started to develop an additional 1.5 km field channel to connect to the main sluice gate and benefitting 500 farmers; Khalik set ultimatum with shrimp land owners to create space for final excavation

Success story

Internal water management

- Unpredictable heavy rainfall in April, wiping out mung bean crop
- Farmers seek to cultivate T-Aush rice e.g. at Dakshin Pashim Kalibari WMG
- Challenged by poor drainage, facing waterlogging of 1-1.5 feet and more
- Digging a field channel would a good solution with limited resources required
- 40 WMG HHs prepared field channel by their own initiative and labour
- Prepared 2000 feet long, 5-6 feet width and 3-4 feet deep as required
- Immediate result, about 350-400 acre of land free from waterlogging
- Successful timely transplant of T-Aush
- Long term result: farmers can grow one additional crop, grow different winter crops, grow vegetable etc.
- Next crop will be relieved from waterlogging



Video In-polder water management

https://youtu.be/pH-DZQ_OuM0

Success story

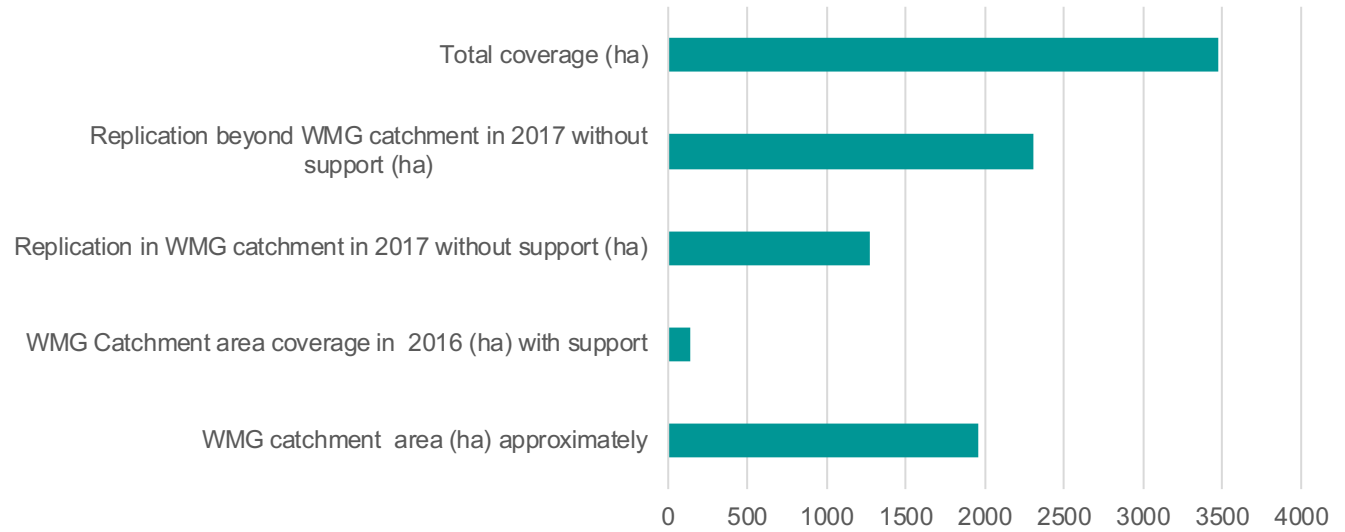
A doubling of fresh water in ponds

- Saidkhali WMG in P22 with no control over sluice
- Single cropped earlier, started with sesame as 2nd crop 5 years ago,
- In last 2 years sesame substantial damaged by heavy rain, while shifting brown to black
- Introduced this year water melon, which was possible with HYV Rice allowing them to drain early
- Meanwhile operate an inlet in an internal embankment, compromising for higher and lower land needs,
- Doubled fresh water storage by investing in digging small ponds and pump when needed, 300 of 360 HH involved.
- This year, water melon was damaged by rain but recovered,
- Some farmer went back to brown sesame using market information
- WMG organises operation and maintenance of their internal water infra



Overall success

Replication of HYV T. Aman rice – 5 polders Patuakhali



- Unfolding explosive increase in multiple cropping driven by (and driving) the introduction of new HYV T. Aman, crop synchronisation, improved water management and collective actions
- Leading to significant economic gains
 - Doubling of income from agriculture: evidence in house improvements, investment in education, purchase of motorbikes
 - Increased demand for labour: better crop sharing arrangement, increase in daily wages, young graduates taking up farming as a business, return of family labour



Water productivity increase realised not through “less drop per crop”, but enabling MORE crops/aquaculture with water available throughout the year

Any ideas how we could realise even more productivity and profitability within the Blue Gold area?



Blue Gold Innovation Fund

The Blue Gold Innovation Fund is a tool created to accelerate the development process in the program area of the Blue Gold program, by financing innovative approaches and new initiatives to socio-economic development.

Total fund: € 2.45 million

Water Management: € 1.4 million

Productive sector: € 1.05 million

Invitation to Unsolicited call procedure:

- Practical application
- Ready for field testing
- Community-led, Sustainable
- Upscaling potential & business case
- Max. EUR 50,000 per pilot
- Procedure Manual on website
- Open till June 2018

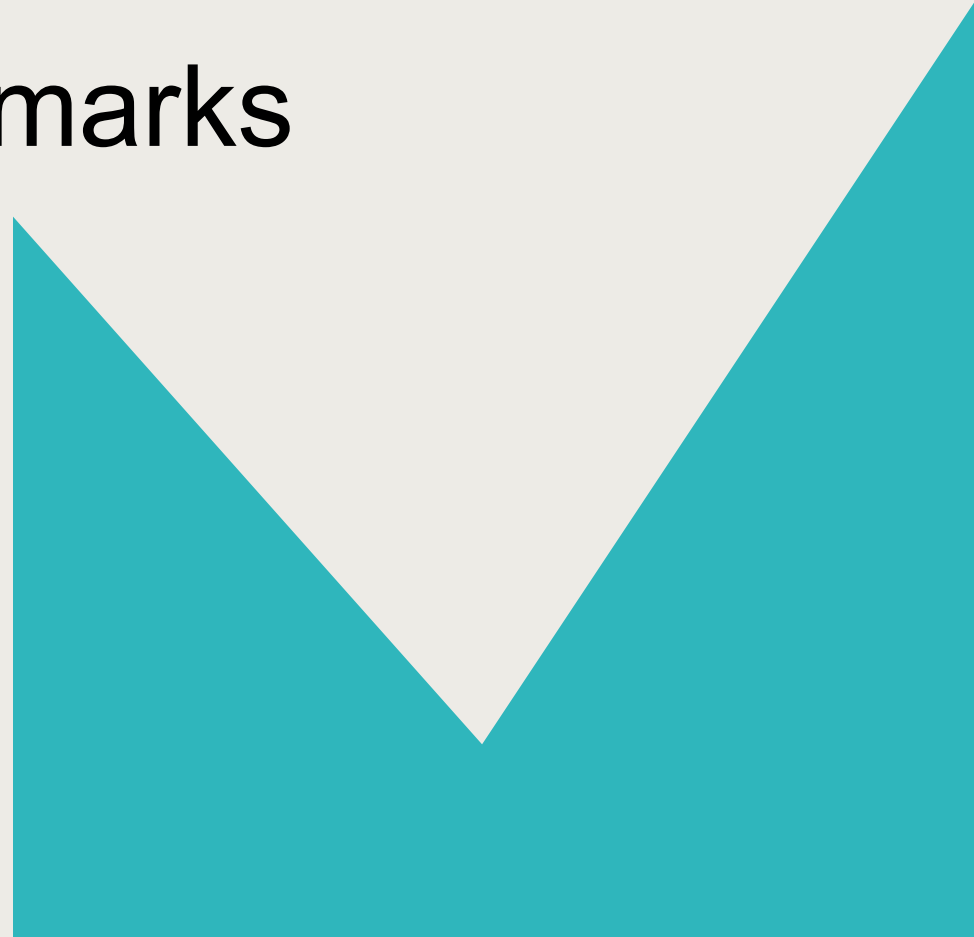
*Women friendly Ecopond -
WorldFish*



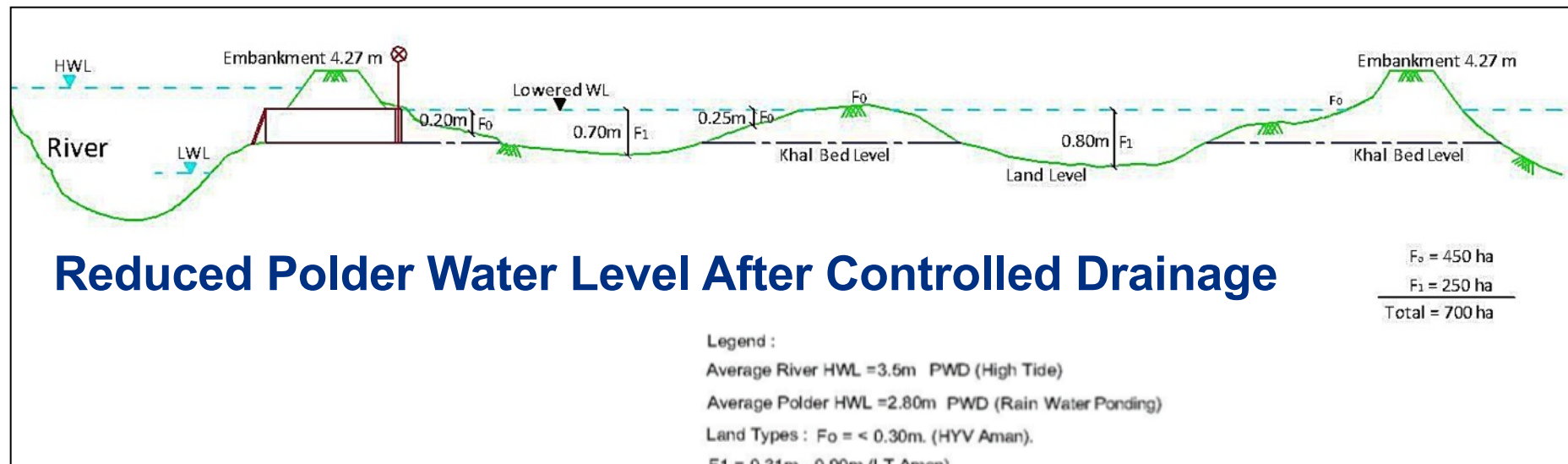
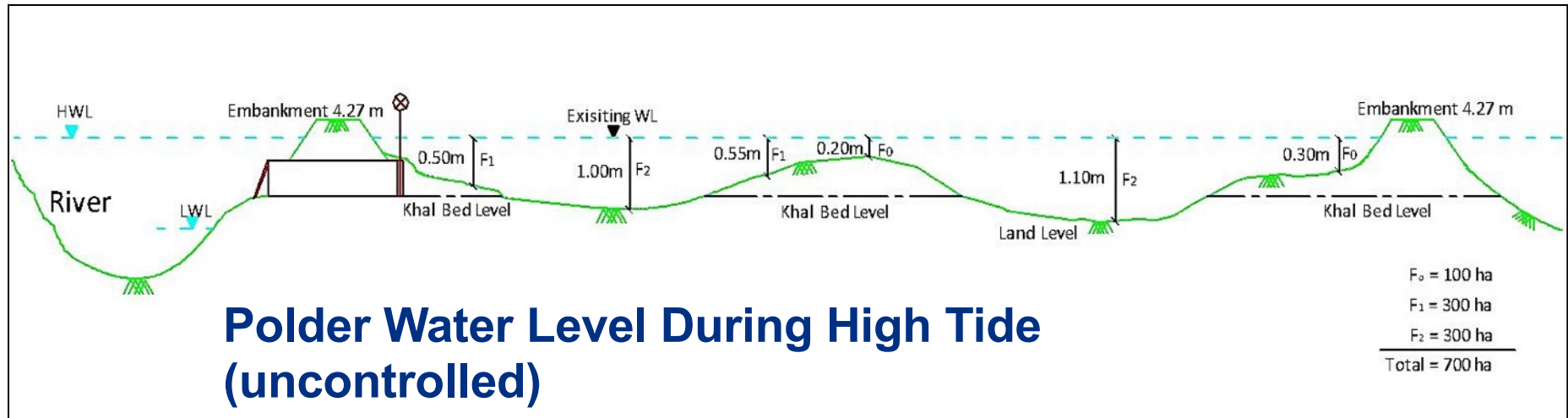
Blue Gold website: www.bluegoldbd.org

Facebook page: <https://facebook.com/bluegoldprogram>

Questions & Remarks



Gravity Drainage – Monsoon: Active Outfall



Legend :

Average River HWL = 3.5m PWD (High Tide)

Average Polder HWL = 2.80m PWD (Rain Water Ponding)

Land Types : F₀ = < 0.30m. (HYV Aman).

F₁ = 0.31m - 0.90m (LT Aman).

F₂ = 0.91m - 1.80m (B Aman).

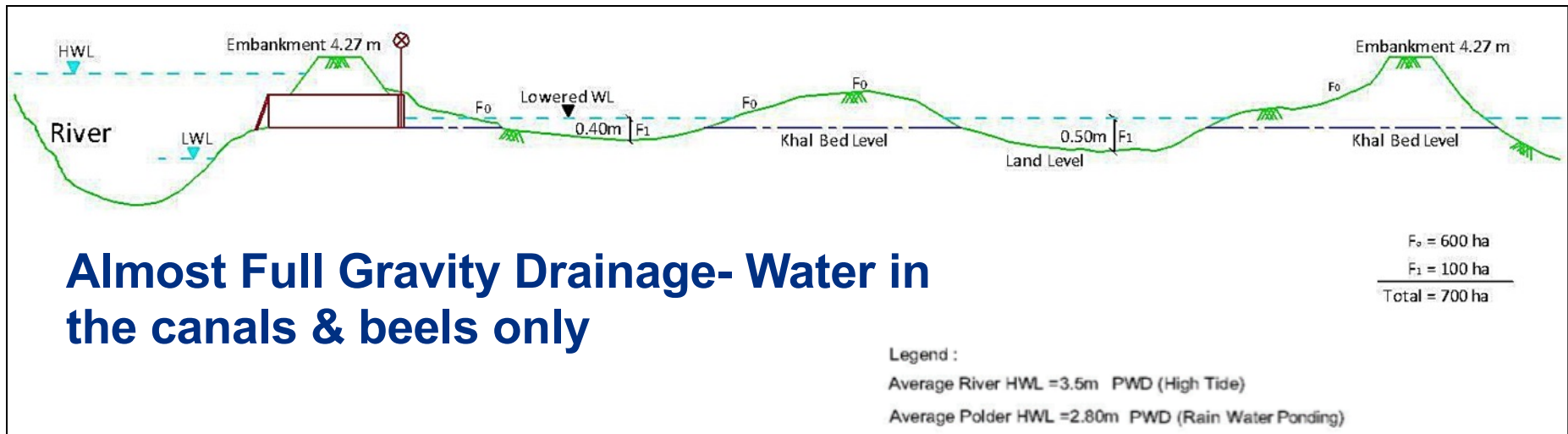
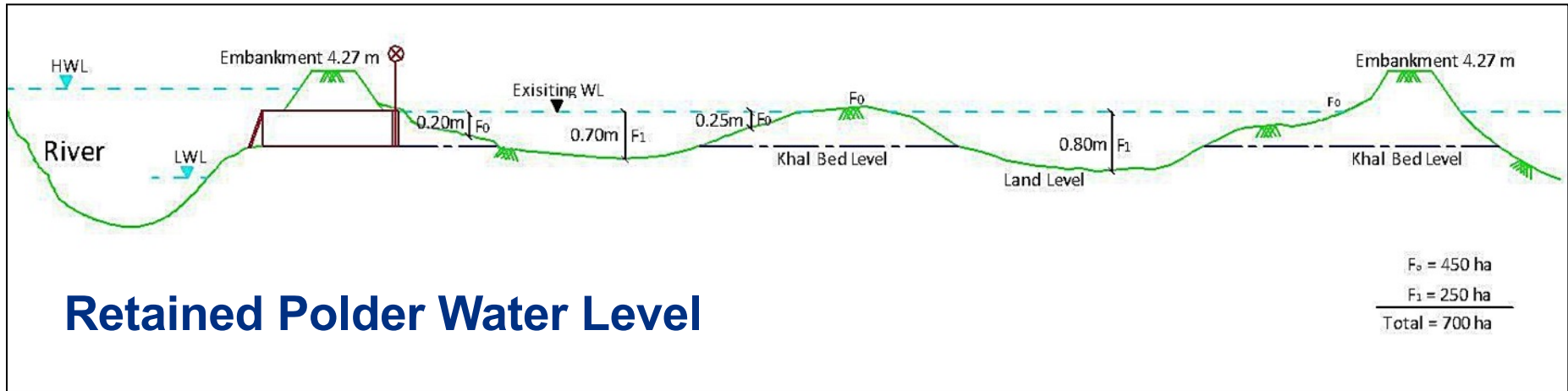
F₃ = >1.80m (Fish).

LL: Land Level

HS: Homestead

Note: 30 cm lowering

Gravity Drainage - Post Monsoon: Active Outfall



Legend :

Average River HWL = 3.5m PWD (High Tide)

Average Polder HWL = 2.80m PWD (Rain Water Ponding)

Land Types : F_0 = < 0.30m. (HYV Aman).

F_1 = 0.31m - 0.90m (LT Aman).

F_2 = 0.91m - 1.80m (B Aman).

F_3 = > 1.80m (Fish).

LL: Land Level

HS: Homestead

Note: Say 30 cm lowering