



# West Bengal Accelerated Development of Minor Irrigation Project *SINCE 2012*



An aerial photograph of a rural landscape in West Bengal, India. The image shows a vast expanse of green agricultural fields, likely rice paddies, divided into rectangular plots. A prominent feature is a long, winding, earthen irrigation canal that snakes through the landscape, providing water to the fields. The canal is bordered by low, light-colored earthen walls. In the background, there are clusters of trees and some small buildings, suggesting a village or farmstead. The overall scene is one of a well-maintained agricultural area.

## PROJECT OBJECTIVE

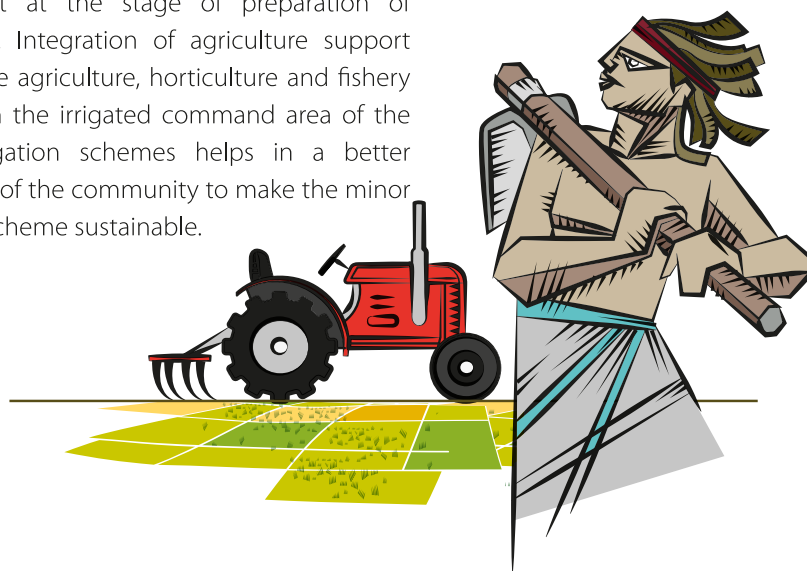
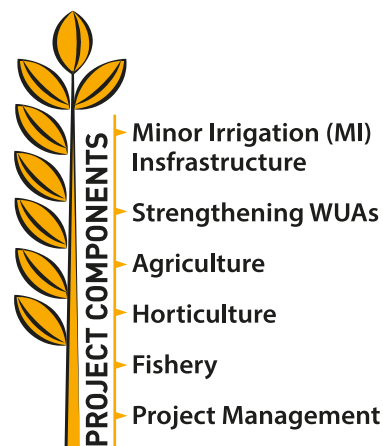
Enhancing the  
agriculture  
production of  
**1,00,000** Small  
& Marginal  
farmers of single  
cropped rain fed  
areas in  
West Bengal by  
providing assured  
irrigation potential  
in **75,000** Ha  
area and  
agriculture  
support services  
on Agriculture,  
Horticulture &  
Fisheries through  
Water User  
Associations  
(WUAs).

# GROW WITH ITS FLOW

## PROJECT COMPONENTS

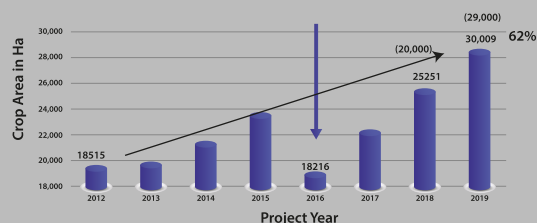
West Bengal Accelerated Development of Minor Irrigation Project (WBADMIP) has been designed to create minor irrigation infrastructure, mobilize community around the created infrastructure to ensure its sustainable use and provide agriculture and support services. The focus is on the ultimate outcome of increased productivity through a single window delivery of water availability as well as agriculture and support services to the Water User Associations (WUAs).

Any standalone irrigation infrastructure development without community involvement is not sustainable. In this project community involvement has been ensured through formation of Water User Associations and involve them right at the stage of preparation of micro-plan. Integration of agriculture support services like agriculture, horticulture and fishery activities in the irrigated command area of the minor irrigation schemes helps in a better ownership of the community to make the minor irrigation scheme sustainable.



# ACTUAL GROWTH OF CROPPED AREA SINCE INCEPTION OF THE PROJECT [2012 to 2019] IN RABI AND PRE-KHARIF SEASON (on field)

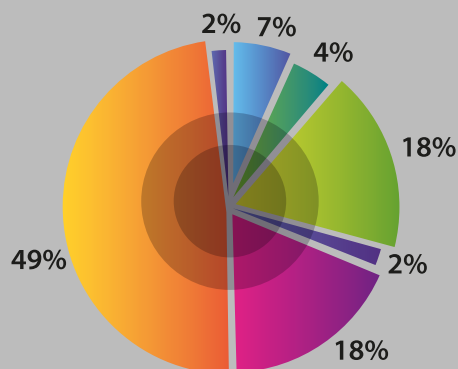
Fall of crop area due to drought



Note: Obtained through remote sensing analysis on Google Earth Engine



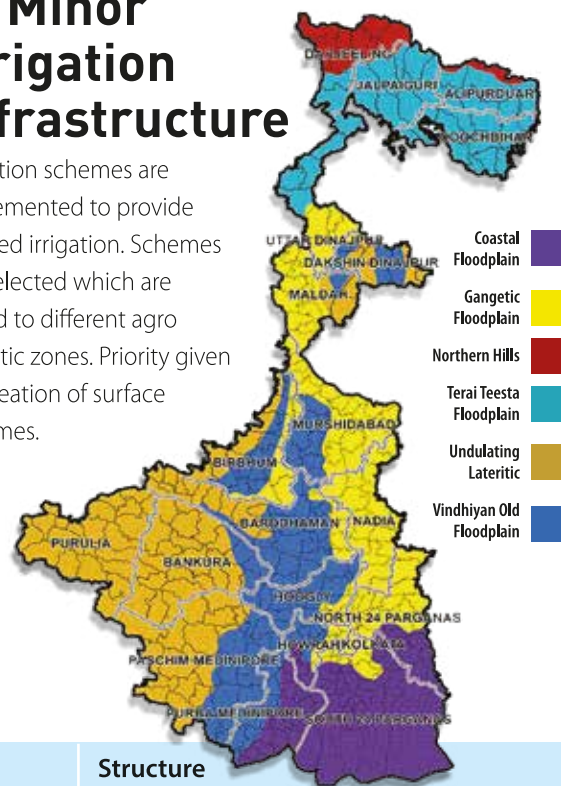
## Types of MI Schemes



CD LI PDW SFMIS TW WDS Others

## Development of Minor Irrigation Infrastructure

Irrigation schemes are implemented to provide assured irrigation. Schemes are selected which are suited to different agro climatic zones. Priority given for creation of surface schemes.



Source	Structure
Surface Water	Check Dam (CD)
	Water Detention Structure (WDS)
	Re-evacuation of old creeks (canal)
	Jhora rejuvenation
Ground Water	Tube Well (TW)
	Pump Dug Well (PDW)
River/Water Bodies	Lift Irrigation scheme (LI)
	Hydram on Jhora
Others	Sprinkler & Drip, Solar operated scheme

Cropping area progressively improving every year due to agriculture support services provided to the WUA members.

# CREATION OF IRRIGATION INFRASTRUCTURE VISION 2050

IRRIGATION INFRASTRUCTURE  
AREA BASED APPROACH

- ▶ Surface Flow Schemes
- ▶ Ground Water  
(judicious use)
- ▶ Groundwater  
Recharging - Jhora  
rejuvenation, Hapa etc.
- ▶ Drip & Sprinklers  
for Water use Efficiency



## WATER USER ASSOCIATIONS (WUAs) ensure sustainability of MI schemes

All the water user farmers of the irrigation command area are organised in the form of Water User Associations (WUA) registered under Societies

Registration Act 1961. WUAs take active part in the project implementation, water distribution, operation & maintenance, resolving conflicts and collecting water charges for the water services provided to its members. Women & tribal dominated WUAs generally showing better performance.

**COME  
TOGETHER  
FOR  
THE  
BETTER**

## CLIMATE RESILIENT AGRICULTURE

- ▶ Demonstrations of best Agricultural Practices
- ▶ Appropriate Technologies (e.g. use of satellite imageries)
- ▶ Use of Drip/Sprinkler/Polyhouses
- ▶ Better Water Management (e.g. soil moisture meter)
- ▶ Organic/Indigenous Techniques/ Natural Farming
- ▶ Market Linkages

## AGRICULTURE - PROMOTING CLIMATE RESILIENT PRACTICES



## HORTICULTURE

### AREA BASE APPROCH



## HORTICULTURE SUPPORT SERVICES

- ▶ Demonstrations
- ▶ Good Practices & Technologies
- ▶ Floriculture (Gerbera, Carnation etc.) and fruit plantation (Mandarin, Avocado, Apple etc.) in the hills
- ▶ Mixed fruit Plantation & Intercrop on fallow lands in Western Lateritic Zone
- ▶ Diversified vegetable production using Coco Pit, Shed Net Nursery etc.
- ▶ Spice hub in North Bengal - Ginger, Turmeric, Black Pepper etc. - IPM, INM etc
- ▶ Organic & Natural Farming, Indigenous Techniques
- ▶ Protected Cultivation - High Value Crop, Floriculture etc. in the Hills, Central & Southern Zone



# FISHERY

A GAME CHANGER

## FISHERY SUPPORT SERVICES

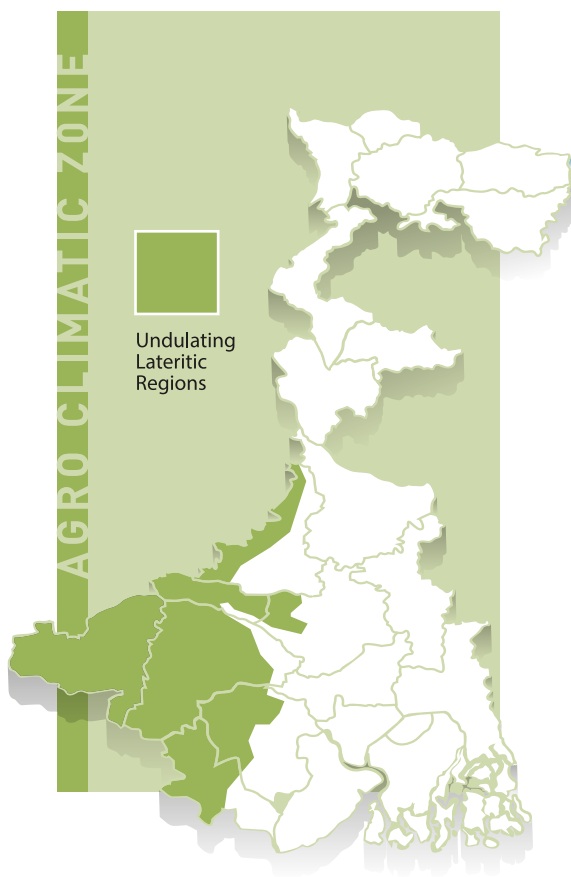
- ▶ Demonstrations of best practices - e.g. Spawn to Fish Fingerlings, Fish-feed, Water Quality
- ▶ Preserving Biodiversity - Hatchery for Indigenous fish - Magur Mahseer, Koi, etc; Hilsa conservation
- ▶ Convergence - WUAs, FIG, SHG & Line Department
- ▶ Developing area specific need based models – Convergence with Fishery Department
- ▶ Production clusters and Fishery entrepreneurs - Fresh water giant Prawns – Export market, Feed, Spawn, Fingerling etc.



## WATER USER ASSOCIATIONS (WUAs)

- ▶ Operations & Maintenance of MI Schemes
- ▶ Integration & Conflict Management
- ▶ Agriculture Support Services
- ▶ Better Water Management Services
- ▶ Resource Creation and Convergence
- ▶ Planning, Implementation & Review





# WESTERN LATERITIC ZONE

## Community Group

WUAs (1295), Farmers Covered (58984)

Average WUAs Members (45)

Self Help Group (Women) & Fishery Interest Groups (FIG)

## Minor Irrigation Schemes

Surface Water Schemes:

Check Dam (216), Pump Dug Well (378)

Water Detention Structure (1244)

Solar Schemes (413)

## Agriculture

SARP (System of Assured Rice Production), Aromatic Rice (50 Ha)

Oilseed - Mustard & Groundnut (350 Ha)

Pulses - Arhar, Blackgram etc.

Green manure - Dhaincha (10 Ha)

Good Agriculture Practices & Agriculture Implements (>41000 Farmers)

## Horticulture

Mix fruit plantation (>1000 Ha) on fallow land

Cashew, (260 Ha), Mango (225 Ha), Jackfruit (12 Ha),

Arjun (92 Ha) & Lemon (30 Ha) etc. with intercropping

Vermicompost (125 units)

Vegetable production

Nursery in Poly Tunnels

## Fishery

Water bodies - project/public/private (1600 Ha & 20500 Farmers)

Hatcheries (indigenous species) (17 Nos.)

Spawn to fingerling production (85 FIG)

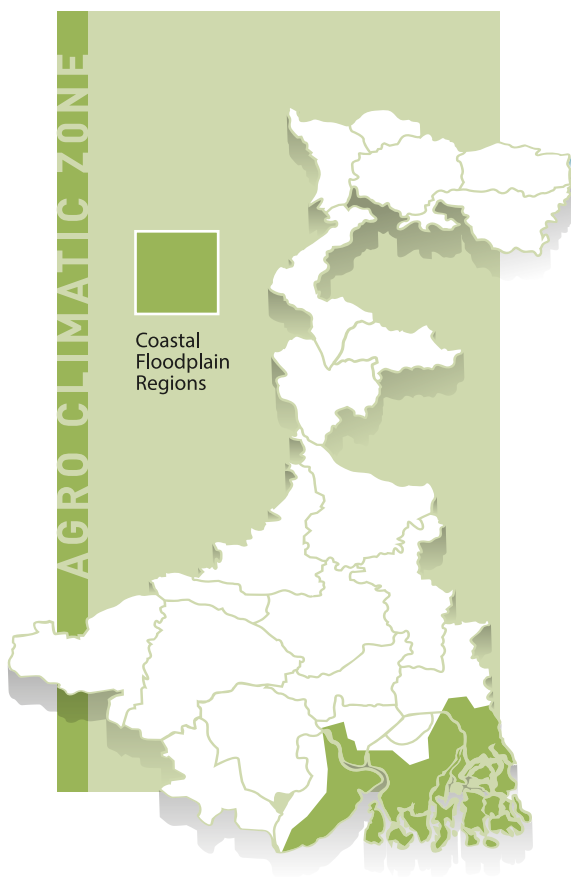
Culture of Indigenous Fish Species,

Chitala, Bhetki, Magur and

fresh water giant Prawn etc.

Monosex Tilapia in Water Detention Structures (WDS) (141 Ha)





# COASTAL SALINE ZONE

## Community Group

WUAs (276), Farmers Covered (>17000)  
 Average WUAs Members (62)  
 Multiple villages in a WUA  
 Surface Scheme based WUAs  
 Fishery Interest Group (FIGs)

## Minor Irrigation Schemes

Surface Water Schemes - Creeks  
 Re-excavation of old silted Creeks/Canals (410 Km)

## Agriculture

SARP - (System of Assured Rice Production),  
 Paddy followed by Boro-Paddy, Sunflower, Sweet Potato  
 Aromatic Rice (65 Ha)  
 Green manure - Dhaincha (15 Ha)  
 Good agriculture practices (>11000 Farmers)

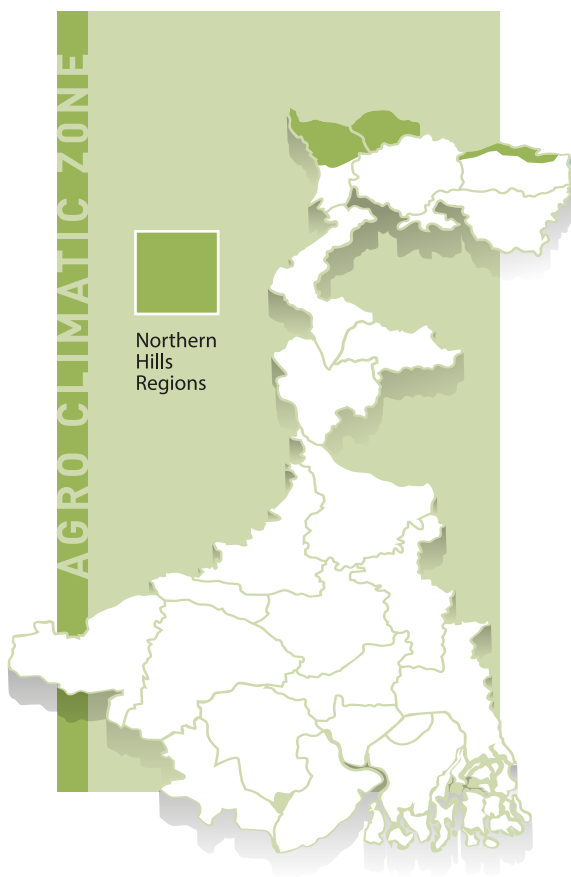
## Horticulture

Mix fruit plantation on banks (190 Ha) - Coconut (60 Ha),  
 Aricanut (5 Ha) etc.  
 Vegetable production on banks  
 Chilli, Cabbage, Cauliflower, Tomato etc.  
 Capsicum & Beetle (>175 Ha)

## Fishery

Canal fishery (216 Ha & 3400 Farmers)  
 Poly culture of IMC  
 Bhetaki, Fresh water giant Prawn/Scampi & Guppy  
 Mass production of IMC  
 Spawn to Fingerlings (16 FIG)  
 Fish production clusters emerging  
 Pond based seed rearing of Scampi -  
 9 lakh post larvae to Juvenile produced by 180 farmers  
 Pond based breeding & seed rearing of Scampi -  
 1.5 lakh post larvae produced by 20 farmers





# NORTHERN HILLS

## Community Group

WUAs (41), Farmers Covered (1561)

Average WUAs Members (38)

Spring/Jhora based WUAs

## Minor Irrigation Schemes

Surface Water Schemes

Jhora/Spring development (1)

Jhora/Spring rejuvenation (17)

## Agriculture

Paddy, Mustard & Maize

Organic practices/Natural farming

Agriculture implements

Micronutrient

Aromatic Rice (90 Ha)

Green manure - Dhaincha (5 Ha),

Good agriculture practices (>750 Farmers)

## Horticulture

Protected cultivation -

Flower cultivation (24 polyhouses) - Gerbera & Carnation

Spice hub (105 Ha) -

Garlic, Ginger (50 Ha), Turmeric (29 Ha), large Cardamom (12 Ha), Black Pepper (18 Ha), Chilli etc.

Mix fruit plantation (>140 Ha) -

Apple (4 Ha), Mandarin (15 Ha), Avocado (9 Ha), Lemon (36 Ha), Black Pepper (18 Ha), Banana (32 Ha), Papaya (16 Ha) etc.

Vegetable production (110 Ha) and High value crops (10 units)

## Fishery

Public/individual water bodies

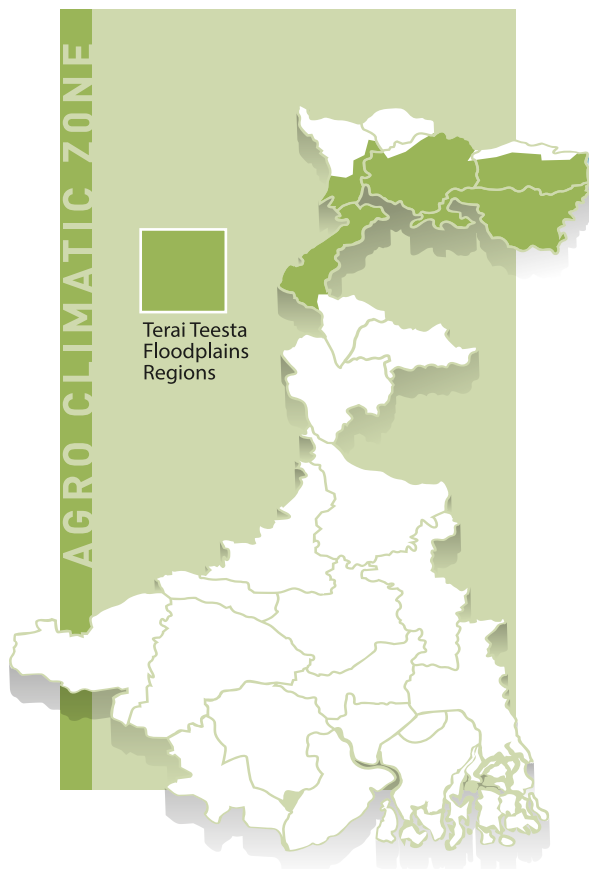
Backyard fishery - individual Hapa with poly lining (1047) No.

Culture of Grass carp, Deshi Magur & Common carp

Spawn to fingerlings program (1 FIG) & Hatchery (1 FIG)

Breeding of indigenous cold water fish (Chocolate Mahseer)  
(16000) fingerlings produced by (10 farmers)





# TERAI TEESTA FLOODPLAINS

## Community Group

WUAs (477), Farmers Covered (22285)

Average WUAs Members (47)

Ground Water based WUAs

Fishery Interest Groups (FIGs)

## Minor Irrigation Schemes

Ground Water Schemes

Tube Well (348)

River Lift Irrigation Schemes (46)

Pump Dug Well (82)

Solar operated Tube Well (129)

## Agriculture

Crop-diversification - Hybrid Maize, Mustard, Lentil, Sesame, Green Gram

Aromatic Rice (30 Ha)

Agriculture implements

Good practices (16000 Farmers)

## Horticulture

Protected cultivation - Polyhouse (16 units)

High value crop vegetable production

Spices hub (27 Ha)

Black Pepper (25 Ha), Bay leaf (6 Ha) etc.

Mix fruit plantation (130 Ha)

Betel nut (27 Ha), Banana (25 Ha), Papaya (18 Ha) etc.

## Fishery

Public/individual water bodies - 770 Ha & 8857 Farmers

Grass carp, Common Carp Catfish Culture

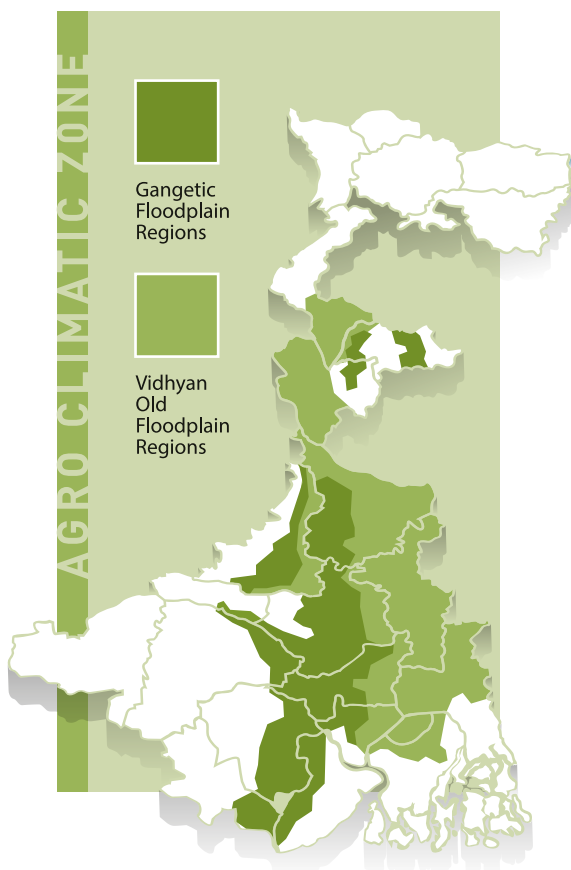
(Deshi Magur, Singhi, Pabda)

Hatchery (10 FIG)

Spawn to fingerlings (29 FIG)

Mass production





# GANGETIC & VINDHYA FLOODPLAIN

## Community Group

WUAs (440), Farmers Covered (39000)

Average WUAs Members (88)

All type of WUAs (Surface/Ground/Lift based)

## Minor Irrigation Schemes

Ground Water Schemes - Tube well (219)

River Lift Irrigation Schemes (86)

Water Detention Structure (112)

Solar based Schemes (33)

## Agriculture

SARP - (System of Assured Rice Production), Aromatic Rice (70 Ha)

Diversification to less water intensive crop - Oilseed and Pulses

High value crop - hybrid Maize

Oat (7 Ha)

Green manure - Dhaincha (20 Ha)

Good Practices (>27000 Farmers)

## Horticulture

Polyhouse -

High value all season vegetable production (25 Ha)

Flower cultivation (40 Ha)

Mix fruit plantation (<100 Ha) - Mango, Lemon etc.

## Fishery

Public/private water bodies - 77 Ha & 719 Farmers

IMC fish production

Spawn to fingerlings program (17 FIG)

Hatchery (1 FIG)





# WOMEN INVOLVEMENT IN THE PROJECT

- Directly involved women >21300
- Women Members in WUA 18%
- As WUA executive committee member and normal member
- As activity group member FIG/SHG etc.
- Key activities - Spawn to fingerlings, hatchery, guppy fish, nursery, mixed fruit plantation and intercropping etc.
- Performing in challenging situation and innovative activities
- Utilizing their (WUA/SHG) own resources
- Proven vibrant entrepreneurial group, adopting & scaling up
- Vibrant cohesive group with values, transparency & integrity
- Bringing new hopes for women, village community and beyond



## WUA (FIG/SHG etc.) INVOLVED IN



### EMERGING ENTREPRENEURIAL ACTIVITIES

- Fishery – Hatchery, Spawn to fingerlings, Guppy, Fish feed etc.
- Implements - Custom hire basis, seed production/ prevention, aromatic/ commercial paddy
- Vegetable production
- Production of remunerative crops – watermelon, spices etc.
- Nursery, Vermicompost, organic farming, floriculture, high value crop in polyhouse

# BRIDGING THE LAST MILE

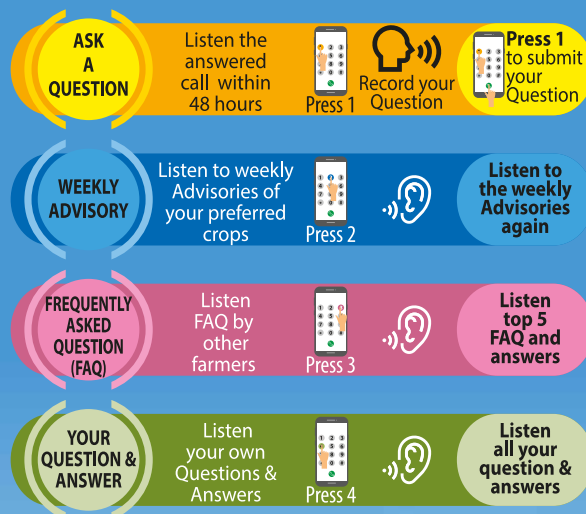
## KRISHI KATHA

### MOBILE BASED FREE ADVISORY SERVICES

on Agriculture, Horticulture, Fishery and institutional aspects

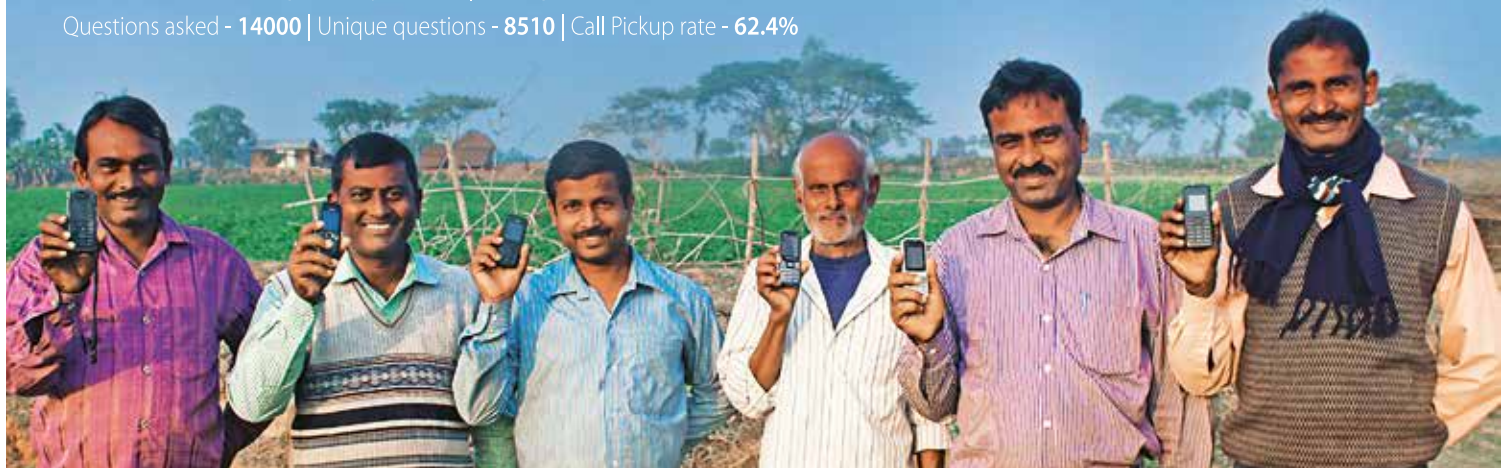
TO THE WUA FARMERS WITHIN **48** HOURS  
Give a missed call to **033 68 11 66 66**

- IVR based audio message service for preferred crops
- Question based audio advisory service on all the crops
- WhatsApp group message service - text, audio and video
- WUA level information service
- Language - Bangla/Hindi
- Specific - Agro climatic zone specific advisory
- Activities - Agriculture, Horticulture, Fishery, WUA and Irrigation Schemes
- On practices, technologies, weather, disaster, remedial measure, market, news etc.
- **1,00,000** WUA farmers to be covered
- Value added services through smart phone users



**43000** farmers receiving advisory services | Messages sent - **29.57** Lakhs

Questions asked - **14000** | Unique questions - **8510** | Call Pickup rate - **62.4%**



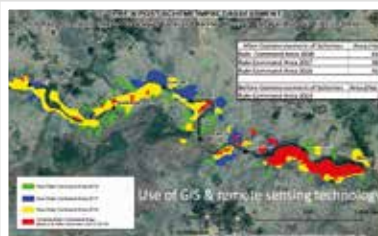
# IN HOUSE REMOTE SENSING & GIS TECHNOLOGY FOR PLANNING MONITORING & IMPACT ASSESSMENT

- Reaching the real needy areas & communities in a focused manner
- Agro Climatic Zone and watershed based planning
- Planning (scheme identification, selection & approval), implementation and monitoring
- Improved design, estimation and integration with allied activities
- Data integration and better representation/interpretation on maps
- Interactive and transparent system (open public access 24X7)
- Quick analysis of environmental impact assessment
- Impact assessment - Change in cropping area, cropping intensity based on vegetation indices, crop productivity before & after MI scheme based on time series satellite imageries & corrective action
- GIS based advisory services on scheme performance, residual moisture based on live remote sensing data

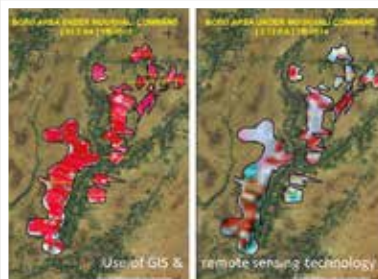
Change in cropping intensity



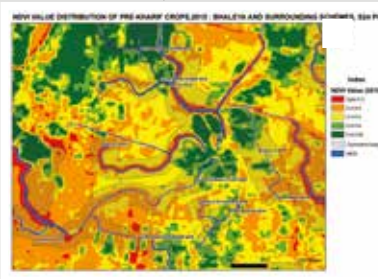
Year wise change in cropping area



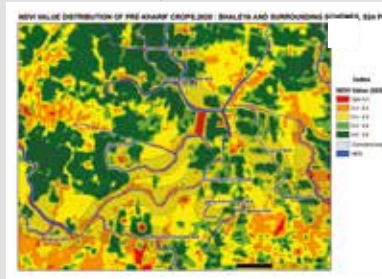
After & Before project



Before Project Intervention



After Project Intervention



## TECHNOLOGY SHOWS THE WAY

- TECHNOLOGICAL INTERVENTIONS
- ↳ GIS - In-house facilities
  - ↳ Solar based pumping system
  - ↳ Mobile based advisory services "Krishi Katha"
  - ↳ Soil moisture meter based irrigation practices
  - ↳ Polyhouse – floriculture and high value crop
  - ↳ Introducing agriculture implements & machineries
  - ↳ Promotion of appropriate technology & practices
  - ↳ Digital technology using mobile – Google Meet, WhatsApp

# WBADMI - PROJECT AT A GLANCE

## Minor Irrigation Schemes

**(MI)** - Check Dam (CD)-195, Water Detention Structure (WDS)-1436, Pump Dug Well (PDW)- 450, Tube Well (TW)-750, Lift Irrigation (LI)-198 and Jhora-18 Nos. **Solar operated schemes** - 563 schemes with 9345 Ha irrigation potential

**WUAs** - 64% WUAs are rated grade A/B. Corpus funds of INR 2.80 Crore. Corpus used as a revolving fund to meet the development needs and about 22 Lakhs to help needy people during corona & other pandemic situations. Approximately INR 2 Lakh donation to Relief funds.

**Agriculture** - 49244 number of demonstrations carried out to facilitate adoption of good technology & practices

Indicator	Unit	Achievement
Change in value of outputs	%	182
WUA members	Nos.	123339
WUA members - Female	Nos.	21301
Minor irrigation schemes constructed	No	2945
Operational WUAs	Nos.	2028
Small and Marginal Farmers	%	83.6
Tribal farmers	%	13.7
Irrigation potential created	Ha	75000+
Increase in water harnessed	Ha-M	2028
Area diversified-less water Intensive crops*	%	30
Cropping intensity**	%	192
<b>Baseline value * 5%, **122</b>		<b>Status as on 01st May 2021</b>

on agriculture. Assured lifesaving irrigation facility made available for kharif paddy. Bio-inputs- to reduce use of chemical fertilizers & pesticides Integrated pest management demonstrated at 960 sites in 2335 Ha area.

**Horticulture** - More than 40000 demonstrations carried out to facilitate adoption of good

technologies & practices on vegetables, high value crops, plug tray nurseries etc. Mixed fruit tree plantation of 16+ Lakhs in 1623 Ha cultivable fallow land (924 Ha with intercropping of pulses/vegetables) by 850 WUAs benefited 27,895 farmers including ST (26.87%) & women (14.49%). Polyhouse-138 (including 24 floriculture), Vermicompost pit- 977 units.

**Fisheries** - 6600 water bodies covering 2352 Ha demonstrations with more than 30000 farmers.

- 18 Hatcheries and 148 FIGs producing various spawn to fingerlings for mass production.
- Darjeeling- Breeding of indigenous cold water fish (Chocolate Mahseer), fingerlings produced- 16000 in last two years involving 10 farmers
- Purba Medinipore- Pond based breeding & seed rearing of Scampi 1.5 Lakh post larvae produced involving 20 farmers
- South 24 Pgs.- Pond based seed rearing of Scampi (post larvae to Juvenile) produced 9 Lakh juvenile by 180 farmers

Since inception in 2012 total 1282 Crore (One thousand two hundred and eighty two crore rupees only) spent under WBADMIP till 31st March 2021.

**Krishi Katha (Mobile based advisory services)** - 43000 farmers receiving advisory services on agriculture, horticulture and fishery activities.

Messages sent - 29.57 Lakhs, Questions asked - 14000, Unique questions - 8510, Pickup rate - 62.4% **(on missed call-033 68 11 66 66)**

## AWARDS & RECOGNITION

- Best Community Project of the year in Water Sector- Government- 2018-19 by The Water Digest in Association with UNESCO India and supported by Ministry of Jalshakti, GOI.
- “Durlavpur MDTW WUA of North 24 Parganas District” received 3rd Prize under Best WUA category, National Water Award 2019 by Ministry of Jalshakti, Government of India. It includes One Lakh cash prize along with certificate and a citation.
- Best Water Efficient Project of the year in Water Sector-Government 2019-20, by The Water Digest in Association with UNESCO India and supported by Ministry of Jalshakti, GOI.
- Association of Geospatial Industries (AGI) India Water Award 2020 recognized WBADMIP for exemplary work in Water Sector using GIS.
- “Digital India Handbook” by IIM Lucknow. Collection of 100 best projects in India as an e-project using WEBGIS.





**Supported by**  
**THE WORLD BANK**

**Implemented by**  
**Water Resources Investigation & Development Department**  
Government of West Bengal

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**For more details**  
**[www.wbadmip.org](http://www.wbadmip.org)**

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