# Annexure B1: Scheme Implementation

Table 1: Distritcwise implementation status

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| S. No. | District | A/A Given | Work in Progress (Implementation stage) | Completed & Handed Over |
| 1 | BANKURA | 76 | 35 | 28 |
| 2 | BARDDHAMAN | 93 | 56 | 19 |
| 3 | BIRBHUM | 126 | 69 | 45 |
| 4 | DAKSHIN DINAJPUR | 83 | 42 | 41 |
| 5 | DARJEELING | 37 | 32 | 5 |
| 6 | HOWRAH | 27 | 4 | 15 |
| 7 | HOOGHLY | 21 | 6 | 15 |
| 8 | JALPAIGURI | 192 | 95 | 72 |
| 9 | KOCH BEHAR | 124 | 38 | 73 |
| 10 | MALDA | 50 | 6 | 44 |
| 11 | MURSHIDABAD | 28 | 15 | 9 |
| 12 | NADIA | 28 | 2 | 21 |
| 13 | NORTH 24 PARGANAS | 17 | 3 | 14 |
| 14 | PASCHIM MIDNAPORE | 71 | 46 | 25 |
| 15 | PURBA MIDNAPORE | 47 | 5 | 42 |
| 16 | PURULIA | 92 | 46 | 28 |
| 17 | SOUTH 24 PARGANAS | 35 | 8 | 23 |
| 18 | UTTAR DINAJPUR | 59 | 0 | 47 |
|   |   | 1206 | 508 | 566 |

# Annexure B2: SWID

State water investigation directorate (SWID) and project needs to work jointly to provide right solution during planning with available information and also help in monitor the schemes particularly Groundwater. In addition project needs to share all the information being collected under the project including lithology and

**Upgrade surface water monitoring system at lift and surface irrigation schemes**

Installation of 64 nos. river gauges in Purulia, Bankura, Ps Medinipur & Birbhum dist. with community based monitoring system has been started. Installation of 3 nos. gauges with telemetry system & GSM facility at 3 nos. river sites in Jalpaiguri Dist. has been completed and on-line data transmission started.

DPMU under the project has also initiated monitoring of check dams. All of data needs to be brought on same platform and O&M with warranty need to be ensured as prescribed in NHP bids.

CWC has a online software e-SWIS that may be joined by the state to integrate all the data in one system, it will enable validation and analysis as well.

**Upgrade GW monitoring**

1. For Phase-I, 60 nos. DWLR supply has been completed. Protection Works for 41 nos. Hydrograph Stations completed. Installation work for 59 nos. completed and data transmission started.
2. For Phase-II, supply of 140 no DWLR has been completed.
3. RL connection work is in progress, 65% work completed.

Installation work for 1 no. DWLR with Telemetry system at Chilkkirhat in Coochbehar Dist. have been completed and on-line data transmission started

**Upgrade database management system in SWID: Prepare monitoring plan**

1. In order to manage database, SWID has GRASP software for GW however for SW they could collaborate with CWC and use e-SWIS software. SWID has appointed 10 Data Entry Operators have to digitize historical data.
2. Three has also been procured: MODFLOW, Hydro-GeoAnalyst & AquaChem (single user). MODFLOW is license free and more users should be possible. The SWID should collaborate with Research and academia to collaborate with the institutes and make use of them. Earlier this year a training on i-mod was also organized and some selected modelers may work with Deltares in Delhi who have been engaged for Ganga river basin by the World Bank.
3. Arc GIS software with 19 number of ArcGIS software and 1 no. ArcGIS server have been completed. SWID should ensure ot have floating license so that large number of system can utilize these softwares.
4. Out of 15 Data Centers, construction of 12 have been completed for other iis in progress.

**Prepare a draft plan for comprehensive monitoring of water availability and water quality with estimates.**

SWID needs to prepare monthly water availability report following the example of Andhra Pradesh or Gujarat.

Total 13 number of water quality testing equipment have been procured and in operation. They should upgrade water quality equipment with Sondes what were shown in various training programs.

One Bore Hole Logger has been procured. SWID needs to ensure to make use of logger and other equipment.

**Annex B3: Scheme planning and implementation**

**Annexure of field observations and recommendations for adopting new practices.**

**Yellow indicates urgent change of practice, Purple: for batch 4 projects,**

**White: gradual over the project period**

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| --- | --- | --- | --- |
| **No** | **item** | **Current practice** | **Recommended Mandatory new practice**  |
| **A** |  | **Site identification** | **Pre-site Selection & Pre approval**  |
| i. | Site selection  | Sites were selected within polygon but WBADMIP RS-GIS data were not used by DPMU staff resulting in poor site selection. | SPMU RS-GIS unit must provide technically sound preselected site geotags using the RS-GIS database to DPMU. |
| ii. | Site validation | IDS, SO, engineering and agri staff involvement in site selection was very weak. Most sites were selected by CPR and villagers without technical inputs resulting in large rejections in batch 4. | Technically pre-selected sites by RS-GIS unit to be verified in the field by IDS, SO, Asst Engineer and Agriculture staff and most suitable sites among them would be selected.  |
| iii. | Community involvement  | Whole community is not involved. Only potential scheme command area members send the request to EE for schemes with geotags of the project site which often are not technically suitable sites i.e. in bends for check dams, in ridge or mid ridge areas for SFMIS, WDS, PDW etc.  | Village meeting to be organized by IDS, SO to obtain community concurrence for EE to initiate the scheme at technically most suitable sites, donation of required land, permission to lay underground irrigation distribution pipes, spouts etc. If villagers don’t agree to these the DPMU may choose another village. |
| iv. | Schemes per village  | Multiple schemes are implemented in one village (E.g. Matitundra / Takipur etc) in selected polygons covering just 20% of the polygon. While 80% of the polygon villages don’t have even a single scheme in priority districts. | All potential minor irrigation structures in one village such as CD, RLI, SFMIS, PDW, TW and WDS to be bundled as one scheme for one /two village if check dam /SFMIS /WDS covers two villages.  |
|  |  |  |  |
| **No** | **item** | **Current practice** | **Recommended Mandatory new practice**  |
| **B** |   | **Scheme Feasibility Report (SFR)** | **Technical Scheme Feasibility Report (TSFR)** |
| i | SFR Annexes  | The SFR has preprinted format with annexes of secondary demographic data, geo tag of the site, JL numbers and potential command area beneficiaries which are insufficient for approval as the RS- GIS map doesn’t have the geotags or boundaries of the command areas are not attached with SFR | IDS to provide SFR with annexes of RRA report containing high resolution satellite images maps of the entire village marked with all water resources transect walk paths, seasonal crop calendar with current and proposed new rabi crops as attachments. Geotags and these to be uploaded by DPMU in the WBADMIP RS-GIS database for approval. |
| ii. | Geotags  | DPMU only provides community selected geotag of the project site and JL number of the command areas but without geotags of plots making it difficult monitor cropped command areas by the project. | Geo tags for the project site, geo tags for command areas and gis boundaries should be uploaded to the RS-GIS database for each structure by the DPMU staff for approval to prepare SFR. This will enable project to monitor the exact extent of cropped area by project using remote sensing during Rabi/Zaid/Pre Kharif to meet the results frame work indicators. |
| iii. | Site Rejections  | Often selected and SFR prepared sites are rejected at SPMU for not meeting the project schemes selection criteria as teams don’t use the WBADMIP RS-GIS database maps or don’t follow the manuals and modules. DPMU often sends back the same rejected schemes as new scheme.  | Site approval is done as these sites are already pre-selected reducing rejection of sites. Rejections if any should be provided with detailed reasons such as technical social etc.  |
| iv. | WUA registration  | The entire site identification to registration of the WUA and Bank account opening takes about 1-2 years. In some cases even after the schemes were handed over the WUA registration and bank accounts were not opened. WUA registration follow up is weak.  | Site identification to WUA registration submission to be simplified by 3 to 4 working weeks. The entire formats to be made into an online application which can be downloaded into printed book for WUA registration. A batch of 10 -20 registrations must be submitted together for registration and followed up systematically to complete the process in three months before bidding.  |
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| **Common issues across all projects** |  |
| **No** | **Item** | **Current practice** | **Recommended Mandatory new practice**  |
| **C** |  | **Detailed Project Report (DPR) for all types of Schemes.** | **Scheme Development and Management Plan (SDMP) for all schemes** |
|  i.    | Elements of DPR | DPRs were only engineering in nature and don’t include the key social and geographical aspects. The Project has already started to develop SDMP but they are not sequentially arranged as per process logic.  | New SDMP documents chapters should follow the logical sequence starting from site selection, TSFR, engineering aspects, O&M, Agriculture plan etc.  |
|  ii.      | DPR /SDMP formats  | The DPMU’s engineers don’t use digital signatures, though contractors have already started to use digital signatures for uploading tenders. DPRs were prepared as soft copy and printed as hard copy for signature. | SDMP to be fully made as digital format. All authorized signatories of DPMU must obtain digital signatures and use it. These online softcopies to be linked to the MIS/RS-GIS platform similar to E procurement.  |
|      iii.            | Tenders | Tender agreements conditions were found to be weak. Tenders were issued without ensuring land availability. Soil dumping locations were not known. Hydrological calculations were not clear. There was no soil compaction and detailed technical drawings for flood gates. | (a) Tender is invited only when land for dam seat is available. (b) Dumping zone must be finalized with proper lead to disposable of excavated stuff. (c)Design of structure should carry out with proper hydrology calculation, hydraulic design, stability of slope, sluice gate design and proper construction methodology.(d) Technical specification for earthen embankments are to be provided more elaborately to take care of proper compaction with OMC and achieved specify dry density of soil. (e)Drawings for gates/hoisting arrangement and for any alterations in structure component are necessary. |
| iv.         | Procurement  | DPMUs develop multiple schemes separately in the same village to keep the procurement costs under DPMU signatory limits wasting human and financial resources duplicating efforts to develop multiple WUA organizations, documents etc. in the same village. | Project resources to be used optimally and one WUA can have sub WUA groups for each structure in the village same as LDTW schemes. All types of project structures i.e. RLI, CD, SFMIS, WDS, PDW, TW, etc., should be made into one SDMP with separate chapters with detailed drawings, bill of quantities. They should be bid as one to ensure procurement guidelines and financial limits are strictly followed. |
| v.        | DPR elements  | DPR technical drawings, bill of quantities for earth works, civil, mechanical, electrical, and other works are vaguely detailed. Often bill of quantities estimates are not clear and were hard to verify using in the field leading to poor quality of execution by contractors and making QA/QC monitoring ineffective.  | DPR drawings to be revised thoroughly for all schemes for batch 4 by designs experts. Bill of quantities specifications for earth works, civil works mechanical and electrical works to be detailed to the fullest extent. Each type of project interventions should have clear QA/QC indicators.  |
| vi.            | Command area map | Command area maps were not prepared despite having state of the art WBADMIP GIS with high resolution satellite images and maps. Command area calculations were based on flood irrigation for Kharif and Rabi seasons. | Command area map for each structure to be geotagged and boundaries drawn in high resolution satellite image. Command area calculations for Kharif and Rabi to be based on flood irrigation, rain guns, sprinkler and drip and they must show survey numbers, type of crops in Kharif, Rabi & Pre Kharif with color coding.  |
| vii.            | Pump house | Pump house were built for all types of schemes using large land area and costs. These technologies were not required in modern pumping systems.  | Modern submersible pumps (mixed / radial flow) with multiple stages, high head and pressure can be used without pump house. |
| viii.            | MS Kiosks  | MS Kiosks were used in some places instead of pump house. These were poorly designed; badly fabricated and painting works were substandard as they were already rusting. | All weather cost effective plastic /fiber boxes with modern simple circuits to be used for all new schemes for digital starters. |
| ix.            | Distribution chambers | MS or Concrete ring / brick work distribution chambers were used which were out date technologies taking up large land and costs.  | The MS or Concrete ring / brick work distribution chamber is not required it needs to be replaced with high pressure and high head UPVC/HDPE modern cyclone sand filter and fertilizer tank for distribution. |
| x.            | Electrical  | DPR Electrical works were not detailed with circuit diagrams and bill of quantities without IS codes, were vague. The irrigation calculation and energy consumption are not shown clearly to optimize the pump size, pump head or pressure. The wire gauges are ok but may not withstand any low voltage. Most starters use non IS components  | All electrical works circuits, starters, motors and cables should be clearly specified as these are to be managed by communities. Irrigation calculation, scheduling and cost of energy should be clearly spelt for choosing the best high head, high pressure low voltage motor types.  |
| xi.            | Starters  | Shakti motor starter which were widely used in tube wells were found to be assembled with substandard non IS components and they were not as per the DPR specifications. Only few were found to be using L&T GSM starter and without GSM component.  | GSM/Android app integrated starter to be used and all components to be specified clearly with electrical circuit diagram. The software should have voltage display on smartphone, on off time, dry run and over load cut off, Under voltage and over voltage cut off etc. recorded on server. This data to be used for indirect estimation of water volume reducing the costs, time and effort. |
| xii.            | Cables  | 2.5mm Copper cables are ok for normal voltage, but considering the low voltage situations these cables may be inadequate and would lead to motor coil burn out.  | The project should invest marginally higher and use 4 mm thick copper cables to ensure that low voltage fluctuations don’t affect the motor coils.  |
| xiii.        | motors  | Motors specification was very vague described with HP, low discharge in cubic meter for normal voltage conditions were mentioned. Almost all motors were not suited for efficient irrigation systems. The Only few projects seem to use good motor and others were using poor quality motors.  | Multi stage radial / mixed flow submersible pumps with 5 stages and high delivery head of more than 50 - 60 cubic meters for 5 hp with 4 -6 bar pressure must be attained at spouts. These motors should be able to withstand low voltages and be energy efficient with five star rating.  |
| xiv.            | Water meters  | WAMCO water meters were of very poor quality and were broken in many places  | Water calculations could be measured using Android app starters  |
| xv.            | Gate Valve  | very large cast iron gate valve were used even for 5 HP low pressure pumping with flanges | HDPE simple direct threaded non return valve to be used to avoid any return pressure affecting the pumps |
| xvi.            | Pipe fittings | GI and MS pipes and fittings were used above ground. MS fittings were not primer coated often and badly painted.  | All pipes and fittings to be converted to high pressure minimal PVC/UPVC/HDPE fittings. |
|  xvii.            | Distribution pipelines | Irrigation distribution pipe lines to command area and spouts were not shown in mouza map or RS-GIS satellite image map. The PVC distribution pipes specification were insufficient they may not withstand more than 2.5 -3 bar pressure of delivery.  | DPR drawings for underground delivery pipeline design to be done for each structure on the RS-GIS database with command area boundaries with kharif/rabi/ zaid cropping differentiation. The distribution HDPE/PVC pipes should be able to provide 4- 6 bar pressure up to spouts.  |
| xviii.            | Spouts  | Large cement brick work based spouts are used with flap jack valve and delivery head has no pressure due to use of large dia (4-5 inch PVC pipes.  | Spouts to be modernized with prefab cements pipes, gravel /sand filling with ball gate valves. The spout mouths to be should be connectable with any modern irrigation systems (Rain guns, sprinkler and drip) the design unit to provide detailed specifications. The spouts need to be located every 12 -30 meter rain gun design for delicate crops.  |
| xix.            | Efficient irrigation schemes  | All schemes command area calculations were based on flood irrigation wasting a lots of water and costing very high | All must adopt multiple efficient irrigation systems calculations for command area calculations using Rain guns, sprinklers and drip. Appropriate HDPE/PVC pipe sizes to deliver 4-6 bar pressure at delivery point  |
| xx.            | Energy costs  | Energy costs per hour were found to be higher than diesel pumps costs in most schemes which are affecting the expansion of the water use beyond command areas even if water was available.  | Energy costs per hour of water pumping must be made lower by 50% of diesel costs by using energy efficient water pumps and water saving irrigation technologies.  |
| xxi.            | ROI and Cost benefit analysis | It is observed that the cost-benefit ratio was less than 1.5 in some schemes and costs per hectare irrigation looks substantially on higher side than the national average. | Cost/Benefit Ratio has to be finalized by SPMU and issue to DPMU through technical circular. Cost of scheme per hectare irrigation requires to be worked out and costly schemes should be dropped. |
| xxii.            | Schedule of Rates | Schedule of rates (SoR) for many items were higher than even high wage states and national average. Specifications are not elaborate and were not updated with new technological innovations in same or other departments for similar work across the country. | Comparison of various SoRs from high medium and low wage states to be done to arrive at new SoR. All items to be revised and new technologies and materials to be included.  |
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| **Check dams (CD)** |  |  |
| **No** | **Item** | **Current practice** | **Recommended Mandatory new practice**  |
| **C** |  | **Detailed Project Report (DPR) for all types of Schemes.** | **Scheme Development and Management Plan (SDMP) for all schemes** |
|  i.    | Progress | Out of 145 completed check dams only 30 are handed over to WUAs. Progress of check dams are not as per mile stones in most of ongoing works. | SPMU has to review all works where stipulated time limit is over. It is necessary to complete all works at earliest and to hand over all completed scheme to WUAs |
|  ii.      | CD locations  | Some CD s were constructed in unsuitable locations like bends or wider or in meandering sections or just after two merging points of two streams or in large rivers without clear irrigation options making ROI difficult to estimate. Some districts have done series of CD structures located in less than 700 m have submerged or breached or overtopped or eroded. | CD Site location must be technically very sound meeting all project selection criteria and must avoid more than 30 degree bends. Sites should have straight line at least 100m downstream / upstream. Distance between existing structures should be at least 1000m or more based on multiple hydrological analyses available WBADMIP RS-GIS data base data to avoid submergence, embankment breaching outflanking, local flooding etc. Structures more than 50m must to be taken rarely only if ROI is very clear.  |
| iii.            | Total Station survey | Original Total station (TS) survey data was not made available of CD sites when requested. Additionally consultants were paid for TS survey during DPR preparation. In cases where TS survey data were done geotags of the zero point were not provided and no permanent points were maintained at the sites. TS data is not used in designing and estimating earth cutting works and also not used in QA/QC for estimating the actual soil excavation and to measure dumped soil.  | GPS integrated Total station / 3D imaging station data must be made mandatory for CD. If Geotag accuracy is an issue DGPS service may be availed. Entire stream embankment should be surveyed for designing series of check dams. If existing structures are there at least 1 km upstream and 1km downstream of the embankments must be scanned. GPS integrated TS / 3D imaging station data to be uploaded into MIS /GIS for design unit to provide 3D AutoCAD designs. CD must not be approved without GPS integrated TS / 3D imaging data upload in to GIS database.  |
| iv.         | Building Codes  | Project teams were found using BIS 6966 code used for small dams. CWC guidelines if water storage in check dams reservoir lesser than (30000 M3) and hydraulic head of less than (3 m) they cannot be classified as small dams. Check dams are very small structure compare to small dams hence lesser return flood is considered. | SWID should use current meter just u/s of check dams to measure velocity with different flood discharge and calibrate depth/discharge curve and this to be used for further check dams design. Appropriate codes to be identified and used for Small check dams in the project. |
| v.        | Designs | All check dams use only one design across the state which seems to be miniature version of small barrage gate design. Aesthetics, Landscaping, architecture, community recreational use are totally missing. | Multiple designs need to be modeled for small stream (5m-15m), medium stream (15.1m-30m), large stream (30.1m-45m) and very large stream/river (45.1m -60m). Very large streams to be tapped exceptionally only if RLI is not a feasible. Department Engineers and contractors may be trained in multiple designs from various parts of the country and other parts of the world. Architect to design cost effective structures Aesthetics, Landscaping, architecture, community recreational use are totally missing. |
| vi.            | Designs and drawings  | DPR CD design drawings were sometimes identical with same measurements indicating they have been copied or with slight changes in measurements. Without GPS integrated TS survey it is hard to verify the original stream structure before construction to get factual positions. | DPR check dam drawings to be developed by the SPMU design center using Geotag linked Total station data /3D imaging data. These data to be preserved in data base for plan approval, QA &QC.  |
| vii.            | Dam failures  | Number of Check dams has breached with overtopping, outflanking, submergence, gate failures, gangway collapse etc. pointing to bad design and poor construction quality. There is no Design unit or consultant at SPMU /DPMU to review the designs or calculations. Total station data with GPS tags are not used in designing in software such as AutoCAD 3D / STADD pro. | Design cell must be established. A multi-disciplinary team with national/international experience consisting of Senior Architect, Senior Civil Engineer, Senior Mechanical engineer with ability to handle design soft wares of 2D, 3D AutoCAD, STADD pro, Flow, Ansys, etc. to design all CD structures. An institution may be hired through MoU/ procurement to provide hand holding support to build the design center initially and private consultants may be hired only if no institution is available. Civil structures 3D AutoCAD design for each site should be validated with STADD pro / similar software for structural stability of all materials to be used to avoid structural failure. Flow /ansys fluent/ similar software to be used for each structure to simulate high flood level flows based on past rainfall data to avoid hydrological failure. |
| viii.            | Earth works  | DPR CD Earth Works in bill of quantities were vague, ineligible items like water pumping per hour cost while construction, soil disposal without clearly showing the dumping lead, no soil compaction etc. are few examples. Total station survey data of embankment were not provided to estimate what earth works was actually done.  | DPR Earth work for CD in bill of quantities should be based on AutoCAD 3D design earth work removals estimated from the total station / 3d imaging station data.  |
| ix.            | Soil compaction  | Embankment soil compactions were nonexistent.  | Soil compaction to be done for the stream bank for at least 200m in the upstream and 200 m in downstream using the stream bed clay/ soil / gravel based on GPS integrated 3D imaging station/ total station data. Only excess or unsuitable soil should be disposed. QA/QC should verify this.  |
| x.            | Soil removal and dump  | . In some areas contractor had dumped the excavate soil in side of upstream and downstream which resulted in more siltation. Additional items for extra Leads/Lifts were noticed for soil dump with higher rates. Soil removal and dumping were not clearly mentioned and in contract agreement the responsibility were given to the contractor to reduce the rate of excavation which were higher than national average at INR 211/m3 | The 3D imaging /total station data based design to provide clear calculation on soil removal. The location of excavated soil dump can be identified and geotagged with consultation in unusable land. Dumping zone locations must be specified in tender and area of disposal should be clearly marked on GIS database satellite image map in the SDPMP for clear lead distance to estimate in bill of quantities and any deviation to this to be re approved by EE and QA/QC should verify this. |
| xi.            | Embankment protection  | The lengths of bank protection in some locations were extended beyond design length on request of villagers increasing the project cost. Stone pitching were rarely used. | The u/s and d/s bank protections are to be carried out as per design and not as per public requirement. The stone pitching or GI mesh gabion may be used to protect the inner banks to manage flash floods.  |
| xii.            | Bio engineering of banks  | Bioengineering of the embankment were made with grass layering only. Grass lining of the slopes were found to be eroded and in effective against flash floods. | The upper and outer slopes of embankment must use medium size non thorny bamboo rhizomes or palms or fruits trees to provide permanent embankment strengthening in place of grass. |
| xiii.        | Concrete works  | M15 Concrete rates used is among the highest in the country and were executed badly in most places.  |   |
| xiv.            | Concrete shuttering  | Wood shuttering and without needle vibrator were resulting in poor quality of deformed concrete works in foundation, check dam, abutment, retaining walls and gangway. Wood shuttering is resulting in undulated side walls. Gangway civil works is with very poor finish, launching apron and concrete blocks in upstream and downstream are not properly laid. | CDs must use steel shuttering only. RMC may be used to overcome the issue of not using needle vibrator. This may be a cost effective considering the savings from steel shuttering, fast setting, less curing and no need for using needle vibrator. The quality of the concrete would be also good if M15/M20 RMC is used. Some of the elements could be done with prefab.  |
| xv.            | Cement types | M15 concrete is not needed for abutment, retaining walls and some of the check dam structural elements. | Abutment and Retaining walls can adopt stone masonry in place of concrete M 15. Maximum shotcreting or concrete cladding above masonry could be done. Alternatively retaining walls could be assembled using prefab concrete similar to highway bridges and culverts.  |
| xvi.            | Concrete blocks | Just beyond the end of the impervious floor, cement concrete blocks generally be of 1 500 x 1 500 x 900 mm size are at present provided as per BIS 6966 used in alluvium reaches of rivers. Check dams are small structure and hence such costly concrete cubes are not required. | Silt traps pool with steps to be used in place of concrete blocks after the impervious floor. This can also act as a pool for water lift / local swimming pool. Design unit must make new designs incorporating this aspect.  |
|  xvii.            | Reinforcement  | Large amount of Reinforcement is noticed in upstream and downstream. | Nominal reinforcement in u/s and d/s RCC cut off is adequate considering small water head and short period of water storage. |
| xviii.            | Mechanical works | Mechanical Works CD for gates not adequately detailed in the DPR. Specifications in bill of quantities for nuts bolts, mild steel plates were not clear and relevant IS codes were not provided for many items. Deviations in gate designs were permitted and seem all bill of quantities were paid without major deductions. Nuts and bolts are found to be rusted due to use nonstandard items. MS plates, pipes were not primered or painted well to protect against rust. Welding segments and finishing were poor.  | DPR Mechanical works for CD must be accompanied with detailed IS specifications for each item including nuts and bolts. Only virgin MS plates/pipes and fittings from reputed companies must be used. Primer and Painting must be done and QA/QC must be included.  |
| xix.            | Gate designs | CD’s gate designs were based on BIS 6966 code to permit 20% of flood flows through sluice gates which were on the higher side. Poor quality gates and deviations in designs were responsible for leakages of stored water.  | BIS 6966 specifies 10% to 20% flood disposal through sluice gates for small dams. As check dams are smaller 10 % flood disposal through gates seems adequate in place of 20% discharge to determine the number of gates.  |
| xx.            | Gangway | The gangway construction was found to be useful at locations where there were many gates. The quality of gangway construction was poor. It was observed most locations didn’t even have walking path and the gangways were not used even during floods. As people are habituated with short duration monsoon flooding the gangway is not used to cross the stream. Hence providing bridge for limited time (1 to 3 days) is not really needed.  | Metal prefab gangways or cause way design with large Hume pipes may be reduce the concrete cost and at the same time provide better load bearing capacity. In longer structures, steel railings may be used for gate operation. Virtual design simulations may be used in detailing the gangway as per the need of the location. |
| xxi.            | Silt trap | Silt trap were not provided as it is assumed silt will pass through the stream to river. The present series of CD structures only move silt from upstream to downstream and no effective mechanism built in it to remove it. | Silt traps such as including permeable boulder GI mesh gabion to be used at the beginning of the check dam adjoined with a ponding area to trap large sized particles. The Apron /Inverted filter converted into a depressed tank in upstream and downstream would act as fine silt/sediment trap to facilitate yearly removal.  |
| xxii.            | Absence of irrigation | Some locations, check dams works are completed and water is also stored, but Lift irrigation schemes are not completed / proposed , therefore the timely benefit of schemes are not getting to WUAs. | Lift irrigation should be taken up simultaneously with construction of check dam. Milestone for L.I. is required, with clear understanding that L I activity will complete simultaneously with check dam activities.  |
| xxiii.            | Innovation | CD structures lack any modernism or innovation or recreational or fishery integration aspects. | Each of CD structure should be aesthetically designed by an architect using cost effective materials such as more use large boulders, step designs of the side and main walls, for women, children access downstream water for domestic use (bathing/washing etc.). Converting the inverted filters of upstream and downstream into a 2 meter deep longitudinal pools with same amount/lesser concrete, for silt trap, fishery etc. Side flank walls can artistically done using prefab concrete structures with local motifs. Park/picnic spots with shops where possible should be considered.  |
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| **Surface flow minor irrigation scheme (SFMIS) / Water Detention structure (WDS)** |
| **No** | **Item** | **Current practice** | **Recommended Mandatory new practice**  |
|  |  | **Detailed Project Report**  | **Scheme Development and Management Plan (SDMP)** |
|  i.    | Site selection  | Site selection of SFMIS is very poor. Some large WDS were classified as SFMIS and implemented in upper / mid ridge areas where there was no / insufficient surface flows. WDS were proposed in waste land or private agriculture land and the land use purpose will change.  | SFMIS sites should be only where there is an established surface flow on the stream or on the side of the stream in the lower reaches of the valley or on flat ground on seepage areas to tap into sub surface flow in Rabi season. SFMIS areas to be identified by GIS unit of SPMU. Before making investment to create new water body, survey numbers need to be modified for the WDS/SFMIS |
|  ii.      | Total station survey  | It is not known if SFMIS schemes use total station survey as DPRs or bid documents were not available during the mission.  | Total station data with GPS / 3D imaging station data must be made mandatory for all the SFMIS/WDS schemes if needed DGPS service may be availed. Original survey data to be uploaded into MIS /GIS for design unit to extract topographical layers for providing 3D AutoCAD designs. SFMIS/WDS designs to be improved by SPMU design center using with inputs from other projects and other states. |
|      iii.            | Design | Entire new earthen embankment is to be constructed above ground level in WDS. SFMIS/WDS are often built with fours side enclosed structures limiting entry of the flow. Some SFMIS site, the soil was dumped in catchment area. Such materials will again fill up reservoir. Dumping zone locations is not specified in tender and responsibility is given to contractor to find out dumping zone locations. The rate of excavation is as high as INR 211/m3. Further contractors are quoting abnormally high rate for excavation items. | SFMIS/WDS are small earthen water ponding tank/structures. It is sufficient if it is bounded on one or two sides and four sided bounding may not be required. Rock pitching may also require on slope of earthen embankment. The location of excavated soil should be not in the catchment and it should be dumped in a site where it wouldn’t reenter structure. The site satellite map and route in consultation with villagers in tenders should show the dumping zone area clearly in all new tenders of SFMIS. Excavated material can be used in earthen embankment after carrying out required laboratory tests QAQC agency. |
| iv.         | Renovation  | SFMIS /WDS in some places were done as renovation/extension of existing ponds. The renovation works were deepening/de-silting pond, earthen embankment, rock pitching or turfing on slopes, water inlet and out let structures etc. | SFMIS /WDS should be established only at new locations.  |
| v.        | Soil Compaction  | Soil compaction on the banks was not done and was eroded. Dumping sites were not known. Not sure if total station survey was undertaken and earth cutting was estimated based on that. DPR on SFMIS/WDS Earth Works bid document were not provided during field visits so it was hard to verify them in the field. | Total station / 3D imaging station data to be used for estimating the soil removal and compaction. DPR, Bill of quantities specifications to be detailed to the fullest extent based SFMIS/WDS to be analyzed in next technical missions. Until all SFMIS/WDS in priority districts only proposed on streams or in close proximity with less than 1-2 m elevation difference to stream not to be taken up. |
| vi.            | Innovation  | Most SFMIS/ WDS were not integrated with irrigation systems and the command areas were not clear. | SFMIS /WDS to be located with clear command area. Only small WDS which are purely for water harvesting to be exempted. For SFMIS drawing for pipeline design to be made online with RS-GIS data base and be mandatory for bid document.  |
|  |  |  |  |
| **River lift irrigation (RLI)** |  |
| **No** | **Item** | **Current practice** | **Recommended Mandatory new practice**  |
|  |  | **Detailed Project Report**  | **Scheme Development and Management Plan (SDMP)** |
|  i.    | Site selection | RLI schemes visited some of them were in old RLI areas or almost overlapping a defunct scheme. Very few projects are located on an existing check dam/SFMIS that was built by another project as part of convergence. | RLI scheme to be integrated with CD but with a hybrid version of infiltration gallery that facilitates flow from stream and a pump dug well to tap into subsurface flow during Rabi /even zaid.  |
|  ii.      | DPR | DPR or Bid documents of RLI were not made available to the team at the time of mission. The team is yet to review all aspects of the DPR.  | DPR Drawings, bill of quantities specifications to be detailed to the fullest extent by design cell and that to be adopted from batch 4 onwards. |
|      iii.            | Source stabilization  | Many RLIs were failing due to lack of strengthening the source using infiltration gallery or using a pump dug well design. | Infiltration gallery or using a pump dug well design. |
| iv.         | Innovation | No innovation in the RLI schemes. | CD/RLI infiltration gallery cum dug well with 25 KV Solar scheme with 10 –to 15 HP motor with pipes up to upstream to fill upstream ponds for fishing to be innovated.  |
|  |  |  |  |
| **Pump Dug wells (PDW)** |  |  |
| **No** | **Item** | **Current practice** | **Recommended Mandatory new practice**  |
|  |  | **Detailed Project Report**  | **Scheme Development and Management Plan (SDMP)** |
|  i.    | Site selection | Site Selection was very poor locating shallow PDW in mid ridge / upper ridges which had very limited subsurface recharge and usually dry during Rabi and Zaid. | Pump dug wells to be located mostly on the stream or close to the stream to tap into the sub surface flow during Rabi /zaid. Where possible they could be located on public stream land with infiltration gallery for tapping stream flow and the sub surface water during Rabi season pumping up to the ridge there by maximizing use of surface sub surface water.  |
|  ii.      | DPR Quality  | DPR Drawings/ bid document drawings were not provided for pump dugs wells. However the visited wells had very thick 12-18 inch retaining brick walls with plastering, had iron mesh in some places for safety, brick pillars with iron rails to hoist the motor with a chain pulley, some had a distribution chamber with / without spouts and a pump house/kiosk. These designs are totally out dated, over engineered and very expensive if compared with costs in other states.  | The entire dug well system drawings need to be revised with simple modern designs. All electrical works should be clearly specified as these are to be managed by communities. Irrigation calculation, scheduling and cost of energy should be clearly spelt for choosing a motor type. Design cell or institution to be hired for redesign of the pump dug wells taking into consideration other large well designs. (Item wise detail changes are provided in common section above) |
|      iii.            | Rock blasting  | Rock blasting was proposed in Priority districts for pump dug wells and no geophysical survey has been done to select optimal sites near major or minor lineaments which could help in identification of the optimal sites for Pump dug wells.  | Geophysical investigations comprising resistivity profiling and sounding or imaging are to be preceded by lineament mapping to demarcate areas with thick (> 15 m) weathered zone to identify major and minor lineaments by SWID Geologist and equipment. The 15-20 m no rock zones along the lineaments would be opted for pump dug wells. Selection of no rock zones will reduce the need for blasting. |
| iv.         | Innovation | Pump dug wells are not integrated with boreholes in rock zone or to tap into deeper aquifers. The size of the pump dug wells is around 3-4 meters which is smaller as it holds lesser recharged water. | In high ground water potential zones on lineament Dug-cum-Bore well (DBW) to be dug to depths of 60-100 m. |
| v.        | Retaining wall Civil works | DPR for civil works Pump dug wells brick works are excessive with 12-18 inch thick plastered walls but without space for shallow recharge. | Retaining walls to be made with 6inch concrete retention walls excluding the rocky sides. |
|  |  |  |  |
| **Tube wells (TW)** |  |  |
| **No** | **Item** | **Current practice** | **Recommended Mandatory new practice**  |
|  |  | **Detailed Project Report**  | **Scheme Development and Management Plan (SDMP)** |
|  i.    | Schemes | Out of 1206 schemes approved till today, 614 schemes (51%) were Tube wells and almost 90% of all tube wells are located in non-priority districts and only very few TW are in priority districts.  | Priority districts should have more tube wells based on SWID reports and geo physical survey may be undertaken to identify potential TW with water potential for minimum 6 months from November to April with 12 hour pumping potential. Few test bores could be done along large streams where shallow subsurface water could be tapped.  |
|  ii.      | DPR | DPR quality was poor without dated technology, designs and specifications for tube well on all aspects of civil, mechanical and electrical works. No irrigation distribution drawings were provided | SDMP technical drawings needs to be thoroughly revised and detailed for tube wells with modern technology by SPMU design cell. All tube well civil works to be redesigned with prefab platform, casing, pipes, cables, motors, starters, gate valves, pipe fittings, distribution lines spouts using pipes and ball valves for efficient irrigation attachments. (Details above in common aspects for all schemes) |
|      iii.            | Geophysical survey  | Geo physical surveys were not conducted in priority districts even along the lineament.  | Geophysical investigations comprising resistivity profiling and sounding or imaging are to be preceded by lineament mapping to demarcate rock zones 30 – 150 m rock zones along the lineaments for tube wells.  |
| iv.         | Depth | The project has merged all of light/medium and heavy duty tube wells but the depth of bore holes have not been updated. It was found most tube wells were drilled beyond to 100- 150 m which are classified as heavy duty tube wells but motors were placed at 30 -50m half way of the bore hole. | The depth needs to be revised depending on the yield of the zone and FAO design for tube well motor placement in the bore hole may be considered. If water yield is high than higher capacity motor may be used to draw higher amounts of water.  |
| v.        | Innovation | Some solar schemes were implemented but many were destroyed or stolen. | Solar schemes to be developed near habitations with dual purpose of lighting if there is no power supply. Tube wells could also adopt rainwater harvesting aspects for rapid aquifer recharge with the platform design. Also some tube wells could be drilled within pump dug wells or along streams.  |
|  |  |  |  |
| **RS-GIS unit**  |  |  |
| **No** | **Item** | **Current practice** | **Proposed new practices**  |
|  i.    | RS-GIS computer processors  | RS GIS staff has very low configuration computers with Intel i3 and i5 for processing heavy high resolution satellite images.  | All GIS and design computers to be updated to Dual CPU Xeon E5 2600 processor computers with 64 GB DDR4 RAM and dual 23-27 inch full HD / 4k screens.  |
|  ii.      | Staff for RS GIS  | RS GIS staffs are not sufficient needs to carry out the additional work load in high priority districts and handle all additional tasks due to pre selection of sites.  | High priority districts to be provided with one Postgraduate RS- GIS expert combined with Agri or Civil Engineering or Forestry or NRM or Geography or geology. They should also be trained in 3D imaging survey / Total station survey.  |
|      iii.            | RS-GIS data base | RS-GIS were not user friendly for non GIS staff to use all the analytical tools. The Scheme wise dash board and reports without drop down menu and reports hyperlinks are no easy to get factual situation of the project.  | RS – GIS data base should redesign to be user friendly for all staff and smartphone compatible. It should have a drop down menu like Google maps with hyperlinks to MIS, QA/QC MIS and a tool to auto generate detailed reports scheme wise.  |
|  |  |  |  |
| **QA/QC** |  |  |
| **No** | **Item** | **Current practice** | **Proposed practices**  |
|  i.    | Workmanship issues | QA/QC third party has identified workman ship issues like (a) quality of construction materials (b) compaction of earthen embankment (c) pore pressure, (d) pitching on slopes.(e) water to cement ratio (f) pouring of concrete compaction without using needle vibrator (f) fixing of gates, etc.,  | DPMU has to resolve & comply with all such issues immediately during construction itself. SPMU level, a general technical circular is to be issued covering all important points observed by QA/QC third party to avoid repetition of such defects during ongoing and in future works. All new tender documents from batch 4 should ensure these issues are well detailed in SDMP drawings, bill of quantities with clear QA/QC indicator for each item. |
|  ii.      | Incomplete Tenders  | In some of check dams tenders, it is seen that technical specifications of concreting, embankment and other items are very general. No testing for cement, steel, sand etc. is stipulated. QAQS third party engagement for such works is also not spelt out. QAQC contract agreement also does not covered cement, steel and water tests. In condition of contract, the clauses like price adjustment, advance payment, secure advance, defect liability, extra item/excess, delay payment etc. required to be reexamined considering 4 to 6 months contract period. | Detailed standard technical specifications should be drafted for all items. Quality control aspect for construction materials and all end products like concreting, embankment etc. should be stipulated in technical specifications.QA/QS agency works should also spelt out in tender document. If contract period is less than 12 months, all such clauses require recasting in consultation with WB procurement cell. |
|      iii.            | Defect Liability  | Present defect liability stipulated in tender is only six months which is very less in comparison to all schemes.  | Defect liability should be minimum one year with one full monsoon period after QA/QC completion certificate and handing over till then some part payment should be withheld. Uniform clauses are also essential in such types of tenders. Hence mission desired a standard sample tender document or a Model tender is to be prepared and accepted by SPMU and thereafter adopter by all DPMU. |
| iv.         | Partial coverage  | QA/QC third party is currently covering only 30% of the structures at present and the reports are bringing out various issues and it seems these may be in all the structures.  | To ensure quality of all structures it is suggested to have 100% QA/QC quality check in all check dams. |
| v.        | Weak QA/QC | Third part QA/QC only carries out basic standard tests of construction materials for sand, Boulders, cement, concrete, bricks etc. The QA/QC didn’t cover the carry out any checks of DPR/Bid document, drawings, bill of quantities, estimates, agreement conditions, relevance of the design, materials, etc. The team is not carrying out on site measurements and quality of civil works such as excavation works, soil compaction, dumping sites, stone/brick/ concrete work measurements, mechanical parts quality, fabrication drawings, MS fabrication work, painting works etc. They are not using total stations in QA/QC.  | An office order to comply immediately with all QA/QC recommendations to all EE/AE of the DPMU. QA/QC compliance to be made mandatory for fund release at each stage. An office order to be issued to third party QA/QC to do 360\* evaluation from DPR up to O&M over as per TOR with very pointed reports. Project director to send order to all DPMU that all QA/QC third party points and above points to be adopted for batch 4 in the SDMP, Bid document and in Agreement.  |
| vi.            | Lengthy QA/QC reports  | QA/ QC report is lengthy without a scheme wise dashboard /Compliance to previously identified defects were not clearly mentioned in QA/QC reports. | Third party QA/QC to create a scheme wise dash board and online single web page report  |
| vii.            | Weak QA /QC reports  | All QA/QC testing reports were without contractor and DPMU staff signature. | All field testing sample collection must have contractor, DPMU and WUA signatures. Test reports to be shared with contractor and linked with bill of quantities payments to ensure compliance.  |
| viii.            | Training  | Staffs are not trained in all aspects of QA/QC and the manual is very elaborative. | Short brief booklet is requiring with all DPMU staff with training immediately. |

# Annexure C1: Agricultural Support Services

1. This component provides support to beneficiaries who have been provided with irrigation services and were not used of irrigated agriculture and aim to improve the economic water productivity of farmer. Though the initial delays in scheme completion, had held back progress of this component, promising progress was noted in selected areas for horticulture and agricultural activities, during this mission (see box 1 below). The approach for conducting demos have been improved through value chain approach supported by a trust fund (Water partnership program). Now project needs to work on systematic scaling up of these activities across the project sites/districts for transformative outcome. This will require continued efforts for strategic action plan preparation, timely procurement of goods and services, and rigorous field level implementation and monitoring. Fishery activities also could be improved following the strategic road map of agriculture/horticulture activities. Based on the results so far, Component implementation is rated *Moderately Satisfactory*.
2. Streamlining productivity improvement measures: The mission appreciates the effort of project leadership to actively seek convergence with Agriculture, Horticulture and Fishery departments. Towards ‘co-creation of transformational outcomes’, more active and cohesive engagement of project functionaries with the department officials particularly for planning, implementation, knowledge management and monitoring at state and district levels, is recommended. However, initial productivity improvements (3.5 T/ha compared with baseline of 2.9 T/ha) for initial rice crops indicate that the end of project target (4.1 /ha) should be achieved. Impressive yields have been recorded for vegetables (12.7 T/ha compared to baseline of 10.3 T/ha) and for mustard (1.1 T/ha compared to baseline of 0.4 T/ha). The yield has improved for vegetables (11 T/ha compared to baseline of 10.3 T/ha) and for mustard (0.63 T/ha compared to baseline of 0.4 T/ha). Improvement in yields is quite impressive in fishery as well (3.4T/ha compared to baseline 1.12T/ha).



**Figure 10.** Vegetable Nursery Demonstration

1. Intensive demonstrations for enhancing adoption: The project reported 6510 agriculture demonstrations (covering 2670 Ha), 6865 horticulture demonstrations (covering 915 Ha) and 144 fisheries demonstrations. The adoption rate (percent farmers adopting the technologies; refer table 2 in annexure 4 for the analysis) of the demonstrations currently is very low and yet to be made more inclusive and impactful. A couple of production cycles may be required to achieve good technology adoption and see productivity improvements. The overall purpose of conducting technology and method demonstrations should be to accelerate adoption of improved technology and practices within WUA members and beyond in the targeted villages. Towards this, the mission recommends to prepare a comprehensive plan for technology and method demonstrations with clearly laid out strategies on demonstration objectives, farmer/plot selection criteria, linking the demos with FFS training and a simple mechanism for monitoring and capturing the lessons learnt preferably using ICT tools. Also, a close working with the Agriculture, Horticulture and Fishery departments (as noted above) is advised to plan, develop and implement the demonstrations for effective and transformative outcomes in the project areas. ‘Bio-village pilots’ were initiated in six villages (one for each agro-climatic zone) for village -level dissemination of good agricultural practices. Adopters are defined as farmers adopting critical elements of a technology package over at least two crop cycles.
2. Integrating Farmer Field Schools with Famer Water Schools:The project has adopted Farmer Field Schools to enhance outreach and ultimately improve farm practices. The mission notes the FFS orientation programs, materials development workshop and ToT workshops undertaken. This led to initiation of FFS in pre-Kharif in 14 districts, one in each of the 14 districts (12 FFS covering field crops and two in horticulture crops). The mission recommends FFS activities be integrated into Farmer Water Schools (FWS) to comprehensively cover post-scheme water management priorities including participatory water resources monitoring, operation and maintenance of facilities, and accountable and transparent water resources management. The scope of activities of the PPP will be broadened to cover end-to-end services following the handover of schemes. WUAs would nominate members to attend FFS who in turn remain accountable to the WUA to share learnings among members.

Table 8: Summary demonstration under Agricultural Support services

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AGRICULTURE SUPPORT MILESTONES |   |   |   |   |
| Activity/ Milestone | Cumulative upto 31st March 2016 | Annual FY 2016-17 | Overall achievement (till July-2016) | Project Target |
|  | **Agriculture** |  |  |  |
| No of demonstration of Agriculture | 3989 | 2521 | 6510 | 12600 |
| No of adopters of agriculture technologies | 7920 | 4228 | 10812 | 40000 |
| No of female adopters  | 1422 | 760 | 2405 | 7200 |
| No of tribal adopters | 1029 | 549 | 1578 | 5200 |
| No of small & marginal farmer adopters. | 7066 | 3789 | 10855 | 36000 |
| Area for agriculture demonstration(HA) | 1526 | 1144 | 2670 | 5040 |
|  | **Horticulture** |  |  |  |
| No of demonstration of Horticulture | 4217 | 2648 | 6865 | 4800 |
| No of adopters of Horticulture technologies | 4553 | 975 | 5528 | 24000 |
| Area for Horticulture demonstration(HA) | 514 | 217 | 915 | 252 |
| No of female adopters  | 819 | 176 | 995 | 4320 |
| No of tribal adopters | 592 | 126 | 718 | 3120 |
| No of small & marginal farmer adopters. | 3142 | 673 | 3815 | 19200 |
|  |  | **Fishery** |  |  |
| No of Fisheries Demonstration | 102 | 42 | 144 | 600 |
| No of female adopters  | 0 | 0 | 0 | 1080 |
| No of tribal adopters | 71 | 48 | 119 | 780 |

1. Good Agricultural Practice, GAP, Village (“Bio-Village”): The Bio Village initiative (one village each in each of the 6 agro-climatic zones in the state) started about 2.5 years ago (although the actual work could not be initiated in the first 6 months; therefore, effectively, the work has been done for slightly less than 2 years now). Following are achievements (against target to be achieved by December 2016) in these 6 villages:

**Table 6: Results in the 6 GAP Villages (of the first Batch)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Progress Indicators**  | **Final Target** | **Target** up to December’16 | **Achievement** by June’16 |
| Number of farmers applying Recommended dose of fertilizers according to soil analysis report. | 1,776 | 1,066 | 743 |
| Number of farmers applying balanced dose of mixed fertilizer | 1,776 | 799 | 635 |
| Number of farmers adopting 25% replacement of chemical fertilizer by bio-inputs | 1,776 | 533 | 555 |
| Number of farmers avoiding the use of WHO Class 1A, 1B & Class 2 pesticides | 1,776 | 888 | 727 |
| Number of farmers practicing Integrated Pest management (IPM)  | 1,776 | 799 | 608 |
| Number of villagers aware about safe transport, storage, handling, application and disposal of synthetic pesticides | 1,776 | 888 | 724 |
| Land area under Good Agricultural Practice (ha) | 858 | 343 | 210 |

1. Achievements in these first set of 6 villages include: (i) about 30% of the total farmers of the villages are already practicing the intended good practices; and about 25% of the total farmland in these villages have been brought under expected good practices; (ii) crop calendars have been developed for each of the 6 agro-climatic zones in the state; and have been disseminated among the targeted farmers in the “bio-village” program; (iii) crop-specific integrated nutrient management packages have been developed; and are used in training and capacity building activities in the program; (iv) nine crop-specific vernacular training manuals have been developed; six of these – for Kharif paddy, betel vine, brinjal, chili, okra and tomato – are already being used in the training and capacity building activities in the program, and three more – for jute, tea and wheat – will be used for training starting November 2016; (v) a training manual for safe use of pesticide is also developed and being used; (vi) crop-specific integrated pest management practice modules have also been prepared. The mission recommended that the agro-climatic region-specific crop calendars are important innovation, and these should be used by the project as a whole and disseminated to all villages where the project is working. The SPMU agreed to print and disseminate these crop calendars.
2. Additionally, 29 azolla production units and 35 vermicomposting units have been established in these 6 villages. The program introduced new crops such as – black pepper (on beetle nut trees), elephant foot yam, “PUSA Sugandh” variety of paddy; and technology such as protected cultivation and SRI in these villages.
3. Based on the initial success of work in the 6 villages of first batch, the program has now been extended to 40 more villages of 8 clusters. Whereas the first batch of 6 villages did not have strong linkages to the project’s targeted polygons, the 40 villages of 8 clusters in the second batch were selected from the project’s targeted polygons. This will ensure that other activities of the projects could also be implemented in these 40 villages, and this expected convergence among project activities will truly transform these villages. Further, the villages in each of the 8 clusters are contiguous, and therefore for demonstration purposes, there will be larger impacts. Although, work in these villages have started about 6 months ago (contracts were signed in October 2015, but work could effectively start in May 2016, except in one cluster where it started only in August), there has been some noticeable initial progress (see Table 6). Further, in these clusters, technology such as protected cultivation and SRI has been introduced; 51 azolla production units and 20 vermicomposting units have been already established.
4. This program is about major change management in their agricultural practices and for improved adoption there is a need of improved attention and extension services with the expert who can think more holistically. The sustainability would depend on the accessibility to the product after the project. The linkages with providers and exposure to other bio-products is needed so that it doesn’t lead to any monopoly and accessibility is improved. In the past, mission team had indicated that scheme construction may be considered in bio-villages if necessary however it should not lead to wrong expectation of farmers. For instance in the Belia village (Jhargram) where mission visited, it was clear that farmers had their own arrangement of irrigation but they were indeed short of financial access that limited expansion of cash crops during Rabi season.From interaction with the farmers, it has emerged that awareness about the certified seed and paddy varieties suited for the village needs to be improved and adoption of GAP practices need to be made more visible.
5. Given that the work of 18 months (or less, as substantial delays occurred within these 18 months owing to contractual and payment difficulties, all resolved now) the 2nd year targets have been met, there is a chance that with increased focus the 4th year targets could be achieved by the 3rd year (January 2017). The VIB team agreed to try to squeeze the timeline. It was also agreed that an additional list of indicators will also be monitored regularly (say every 3 months), so that the outputs and outcomes are clearly reported. Given the mission observation with respect to village Ulah, the VIB team agreed to prepare a detailed results chain, and submit to SPMU and Bank for comments by January 25, 2015, which will clearly describe the additional actions needed to achieve the objectives and outcomes for this village. Once this village specific results chain is finalized, VIB will prepare similar results chain for all other villages, and will report achievements with respect to such village-specific results chain.

Table 7: Progress in the 40 GAP villages of 8 Clusters (of Second Batch)

|  |  |  |
| --- | --- | --- |
| **Criteria**  | **Target**  | **Current Achievement** |
| **Overall** | **Baseline** | **Jun’16** | **Mar’17** | **Dec’17** |
| Number of farmers applying appropriate dose of fertilizers according to soil analysis report | 7,692 | 0 | 400 | 1,540 | 6,155 | 1066 |
| Number of farmers applying balanced (mixed) dose of fertilizer | 7,692 | 0 | 200 | 1,155 | 5,000 | 387 |
| Number of farmers adopting 25% replacement of chemical fertilizer by bio-inputs | 7,692 | 0 | - | 770 | 1,540 | 162 |
| Number of farmers avoiding the use of WHO Class 1A, 1B & Class 2 pesticides. | 7,692 | 0 | 200 | 1,925 | 7,692 | 225 |
| Number of farmers practicing IPM  | 7,692 | 0 | - | 1,155 | 4,615 | 149 |
| Number of farmers aware about safe transport, storage, handling, application and disposal of synthetic pesticides | 7,692 | 0 | 200 | 1,925 | 7,692 | 204 |
| Total area under the above practice (ha) | 2,355 | 0 | 40 | 235 | 1,413 | 106 |

1. **The mission visited** 3 of these villages. In village Nadabhanga in the coastal zone, it was observed that about 100 farmers (out of 297) are already involved in the program, about 15 of them have started household vermicomposting, avoiding harmful pesticides, experimenting with “only organic” fertilizers (especially for rice, including 2-3 farmers who have experimented with a newly introduced variety, the “Pusa Sugandhi”), and are experimenting with locally available bio-material such as mahogany fruits. Overall, about 60 bigha (~8ha) of land is under such practice now, and none report any loss of productivity, and instead most of the 30 farmers met by the mission talk about improvement in crop. In village Belia in the red and laterite zone (which is also a remote place, but with substantial focus on cultivation of vegetables), the mission observed that about 130 farmers are already involved, and a stretch of 80 bigha (~11ha) under vegetable crops using the intended practices. The mission met about 40 farmers who are using minimum (lesser than recommended) amount of chemical fertilizers; and almost no chemical pesticides. In the village Ulah in new alluvial zone, the mission observed that the awareness about the program, awareness about harmful pesticides and the potential safer bio-alternatives, and overall penetration of the practices has been low (only 38 farmers out of 259 reached so far), and there are substantial question involved related to supply of bio-fertilizers and bio-pesticides.
2. Enhancing WUA farmers’ incomes through market-based approach**:** With availability of water in the Rabi season through the project interventions, there is now an opportunity for the farmers to go for additional cash crops. The mission appreciates the projects efforts to enhance farmer’s income through introduction of cash crops, like vegetables and high value pulses or cereals during Rabi season through on-farm demonstrations, trainings, exposure visits, linkages with agri-input and output markets by aggregating their produce and linking them with local markets. Initially, these interventions have been initiated in the project priority districts of Bankura, Purulia, Paschim Midnapur, Birbhum and Howrah in Rabi 2015-16. The mission recommends expansion of these activities to all districts to enable farmers to take advantage of the availability of water in the Rabi season and improve their incomes.

|  |
| --- |
| **Horticulture demonstrations improved with Market based Approach**The project has initiated a new pathway for the Agriculture Support Services activities and steered initiation of sustainable and market linked agriculture by the farmers in the project command areas of five districts. Using the trust fund, the bank has organized intensive technical support, which included a rapid assessment of the project sites and advisory for strategic area based activity plan preparation for the first set of five focus districts. The members of Water User Association (WUA) were engaged in identifying the crop segments as part of a bottom up, inclusive and participative process. Overall, the guiding principle (refer Annexure 4) was to take forward the existing cropping system of the area to the next level with new generation technologies and including small number crops in the system for sustainable intensification. The crops which has existing demand from local market were only considered for such systematic intensification. The basic premise of such a strategy was to optimize crop productivity and farm production through judicious use of irrigation water and promoting balanced use of improved inputs, preferably emphasizing ‘low-chemical use’. The project is demonstrating use of improved technologies such as protected tray pug nursery, poly tunnels, poly house, drip irrigation, farm machineries such as potato planters etc. besides introducing improved agronomic practices for soil-moisture conservation, balanced soil nutrition and crop productivity. Further, towards developing a market based production system, project facilitated provision of ‘Mobile SMS based weather/market information and crop advisory’ through a private company (Reuters Market Light), and plans to systematically develop famer capacity in marketing skills through Farmer Field Schools. The linkage of WUAs with immediate market actors will be facilitated through conducting ‘buyer-seller meetings’. This is expected to lead to reduced cultivation costs, improved productivity and increased farmer income. Till date, 888 farmers from 27 water user association in 5 districts have been brought under the scope of such activities (refer table 1 in annexure 4) and scale up strategy development plans for the entire state is currently under preparation. |

1. Knowledge management and documentation:While theproject accelerates the ASS activities, documenting the lesson learnt and effectively managing the knowledge for internal and external stakeholders becomes absolutely critical. The mission recommends that concerned ASS staff from SPPU and DPMU to lead the knowledge management and documentation activities and develop a simple yet effective system to collect, manage and relay knowledge information using ICT tools. The field level activity reports (demonstrations, farmer training, exposure visits etc.) should be systematically processed to develop success stories stories/learning notes. Such inputs then should be used to accelerate further knowledge dissemination across the project areas (use in farmer training material). The project officials participated in the International Exhibition on Agri-Machinery[[1]](#footnote-1) at New Delhi, and identified a number of new technologies for due scoping and introduction in the project areas. The mission recommends arranging knowledge events (viz., WUA knowledge Mela), exposure visits (for the lead farmers of WUA and concerned ASS staff from SPMU/DPMU, to knowledge events/institutions within and outside the state), private sector road show etc. to bring in new knowledge and fresh perspectives to the ongoing activities.

|  |
| --- |
| **Table 1 Summary of current activities initiated under ASS** |
| **WB ADMI project Districts** | **Block (#)** | **WUAs (#)** | **Villages (#)** | **Farmers (#)** | **Area (Acres)** | **Lead Crops** |
| Purulia | 2 | 4 | 2 | 100 | 33 | Tomato & Chilli |
| Bankura | 2 | 6 | 6 | 51 | 16.83 | Cauliflower & Sweet Pea |
| Birbhum | 1 | 2 | 2 | 105 | 34.65 | Tomato & Potato |
| P. Medinipur | 3 | 4 | 4 | 182 | 60.06 | Brinjal & Potato |
| Howrah | 2 | 7 | 7 | 450 | 148.5 | Potato & Sunflower |
| **Total** | **10** | **23** | **21** | **888** | **293.04** |  |

# Annexure D1: MIS and M&E framework

1. The Bank mission that visited West Bengal from Sept 5-10, 2016 reviewed the current status of M&E and MIS of the project and the ongoing efforts being made by the SPMU MIS team to redesign the system and migrate past data into the newly developed systems.
2. Since the last mission, the SPMU has been able to replace the earlier MIS modules with a new in house system in order to resolve the many programmatic issues that there were saddled with earlier. Based on earlier mission suggestions, the MIS team has successfully migrated data from the old MIS system into the newly developed one. The MIS team has successfully exported the past scheme related information from excel database to newly developed web based MIS. Presently, the MIS team is in the process of improving LIVE graphical interface, ensuring data quality, developing relational integrity among database into the newly developed one.
3. The SPMU has been able to export large chunk of the past scheme related information was resides in an excel database into newly developed system. Though the data has been migrated but there is huge concern on data quality, source and final output. Bank mission has observed that the result chain indictors and more that 60% data found inconsistent and inaccurate in reporting while compiling project related information. This issue has been still a matter of great concern and it has been flagged and discussed during several past occasions by the Bank mission team. It was agreed that by January 30, 2017, all data quality issues will be resolved and graphical interface will be more logical with reference to result chain indicators and management dashboard will able to show complete snap shot of the entire project.
4. On the M&E, it was noted that the reports were being generated and reviewed mainly during Bank missions and whenever there has been a demand for project progress data by senior officials. In order to effectively use the MIS database for progress monitoring and decision making purposes, it was suggested that the MIS reports be generated and reviewed during regularly held SPMU team meetings. Also, it was suggested that the reporting formats be re-oriented to bring in consistency in reporting and real time information availability at all times.
5. The other aspects of MIS and M&E that were reviewed and discussed during the mission are given below:
	1. ***Fine tuning the monitoring and evaluation (M&E) framework:*** Although project has downsized the budget the targets for M&E framework are yet to be matched with the funds. The project has revised the results framework (with Bank assistance): dropping redundant indicators and redefining indicators in line with core sector indicators. The original targets were arbitrary and unrealistic and hence were redefined. During earlier missions, guidance was provided on preparation of a results chain to link indicators clearly to component activities and establishment of a monitoring framework. A milestone monitoring matrix was developed by including progress milestones that clearly track progress and performance of different field units. Till restructuring of the project is finalized, two sets of monitoring frameworks are being maintained. One is based on original indicators and the other one with the proposed indicators (Annexure 1.a and. 1.b).
	2. ***Results Chain:*** The Bank team and the SPMU reviewed in depth the results chain and results indicators prepared during the previous mission. The results indicators have now been suitably refined and the results matrix populated with appropriate information on indicator description, sub indicators, data source/ methodology, parameters, responsibilities for data collection etc. It was agreed that the final version of the results chain would be adopted by the SPMU to serve as the main monitoring tool for tracking project progress and achievement.

	The SPMU MIS team will incorporate the revised results chain in their MIS after which the DPMU staff will be expected to regularly maintain and update. The bank mission had suggested to develop an online training mechanism and the SPMU has agreed that by January 30, 2017 the entire exercise of updating the MIS and the remaining training of DPMU staff on results chain would be completed.
	3. ***Project Management & Training Module***: To ensure that there is continuous interface and smooth flow of information between SPMU and the DPMUs, a project intranet has been developed with rights to access by all SPMU, DPMU and SO level staff. The Bank mission had suggested on sharing technology to develop the mechanism to LIVE state and districts project management unit staff data, training assessment and Live progress review. The Bank mission also worked with MIS team to define distinct dashboards with live and graphical data at SPMU and DPMU levels and it was agreed that the final version of the dashboard would be adopted by the SPMU to serve as the main interface tool for tracking project progress and achievement. The Bank mission has suggested to share technology for the development of training and related reference material to plan and enhance the overall capacity of project management unit staff members.
	4. ***MIS Dashboard:*** The current web based MIS system captures all project related data in various reporting formats that have been specifically developed to track project progress. However, the current dashboard which is the key user interface page lacks a coherent user friendly look. The Bank team worked with MIS team to ensure data quality, graphical measureable parameters and LIVE data scenario in depth the management level requirements of dashboards and it was agreed that the final version of the dashboard would be adopted by the SPMU to serve as the main interface tool for tracking project progress and achievement. Bank Team also reviewed various levels of reporting structures.
	5. ***Management Information System (MIS):*** Since the last mission, the SPMU has been able to replace the earlier MIS modules with a new in house system in order to resolve the many programmatic issues that there were saddled with earlier. Based on earlier mission suggestions, the MIS team has successfully migrated data from the old MIS system into the newly developed one. The MIS team has successfully exported the past scheme related information from excel database to newly developed web based MIS. The Bank team and the SPMU reviewed in depth the results chain and results indicators prepared during the previous mission. The results indicators have now been suitably refined and the results matrix populated with appropriate information on indicator description, sub indicators, data source/ methodology, parameters, responsibilities for data collection etc. It was agreed that the final version of the results chain would be adopted by the SPMU to serve as the main monitoring tool for tracking project progress and achievement. During the mission bank team observed that there is huge discrepancy in MIS in terms of the result chain indicator values. The mission has suggested to sharing knowledge base and technical support in terms of reducing such data gaps. This is major area of concern which mission observed and the same need to rectify on highest priority. The MIS team has organized training programs for all DPMU staff on the results chain, MIS and how the related information need to be obtained and entered in a regular manner. The bank mission had suggested to develop an online training mechanism and the SPMU has agreed that by January 30, 2017 the entire exercise of updating the MIS and the remaining training of DPMU staff on results chain would be completed.
	6. The Bank team reviewed the MIS framework and provided technical suggestions to improve the system. The MIS staff will be provided with database framework, MIS coding and the current knowledge on other required technologies which would enhance their capacity of the in house model and help them develop a sound work program to coordinate the workflow from DPMU.
	7. ***Agriculture Support Services:*** To ensure the flow of information regarding agriculture, horticulture and fishery demonstration with reference result indicators both target and achieved; the bank mission has suggested on sharing technologies to develop LIVE data availability on management dashboards inclusive summary of technology demonstration under Agricultural Support Services. The bank mission also suggested to provide live information on gross command area, actual irrigation area, cropping intensity and productivity based on various schemes. Bank mission has suggested on sharing technologies to develop live data availability and GIS data integration to measure plot/sub scheme/scheme wise net area with reference to various crops. Project MIS has initiated the system to capture Agricultural or Horticultural data scheme, season and crop wise. Gross command area, actual irrigated area, productivity are yet to verified and calculated online. However modification is required to calculate the cropping intensity and value of produce through online reporting mechanism.
	8. ***Project* Intranet*:*** To ensure that there is continuous interface and smooth flow of information between SPMU and the DPMUs, a project intranet has been developed with rights to access by all SPMU, DPMU and SO level staff. The intranet of SPMU and DPMU have developed for sharing information required for missions, letters and notices, general, guidelines, mass petitions, online reporting, data sharing, and WUA Grading.
	9. ***Project Web Site:*** At present project website developed on third party open source mechanism “Jhumla” with lack of security and lot many technical serve based issue. Bank Mission as suggested to share technology to develop the project website integrated with MIS, based on in house technology and to host the same over secured cloud based server. MIS team has already initiated the development and secured cloud based server has been selected. The SPMU has agreed to launch the new secured integrated MIS website by January 2017.
	10. ***Data Retention System:*** In the present system, all the project related information are being stored in the personal computers of the SPMU staff. This is not a good practice and a proven protocol within an organization for retaining project information for operational use. Hence it was discussed and agreed that a data retention policy would be established in order to keep important and critical information in a cloud based server so that it can be searched and accessed whenever required. It would also help in disposing redundant data.
6. The mission worked with the SPMU to develop a cohesive work plan for MIS & M&E task execution and the timelines have been agreed for completion of specific tasks. It was also suggested that success stories emanating from project implementation were to be identified and shared with all the project staff including the Bank team and for achieving this, any freely available online tool could be adopted and suitably designed to serve the purpose. Later if found essential, in house application would be developed to integrate this feature with the feedback section of the MIS.
7. A Quality Assurance and Quality control (QAQC) consultancy team for scheme implementation is on board and this agency is also working in parallel to develop a MIS based solution for monitoring civil work progress of its schemes and its quality aspects. It was advised that this QAQC team would be in regular discussion with the SPMU to identify suitable mechanisms by which their database could sync with the project MIS.

**Agreed Actions**

|  |  |  |  |
| --- | --- | --- | --- |
| **S. No.** | **Agreed Action** | **By Whom** | **By When** |
| 1. | Generate MIS monitoring reports for review during monthly SPMU meetings | SPMU MIS team | Monthly |
| 2. | Develop a Project Management Dashboard | SPMU MIS team | December 30, 2016 |
| 3. | Data quality insurance mechanism  | SPMU MIS team | January 30, 2017 |
| 4.  | Improved graphical interface (MIS dashboard) and data entry screens as part of quality enhancement of MIS | SPMU MIS team | November 30, 2016 |
| 5. | Incorporate all results chain indicators with all its parameters in the MIS database and management dashboard. | SPMU MIS team | February 28, 2017 |
| 6. | Develop a training module | SPMU MIS team | February 28, 2017 |
| 7 | Linkage all DPR’s with schemes & Develop application program interface with third party QAQC module | SPMU MIS team | March 30, 2017 |
| 8 | Migration of Project website from open source to in house architecture advanced security provisions. | SPMU MIS team | January 30, 2017 |
| 9 | Live Agriculture Support Services with MIS dashboard inclusive cropping intensity and rate of produce | SPMU MIS team | March 30, 2017 |

# Annexure D 2: Summary of Environment Safeguard

1. Overall, the environmental management systems and arrangements in the project continues to be moderately satisfactory. Momentum from planning, environmental screening and implementation of Batch IIIsubprojects has continued, although further improvement expected did not fully materialize. Implementation of the third batch of sub-projects is ongoing. Environmental screening was completed for 557 sub-projects in Batch-III out of which only 409 sub projects received administrative approval due to various reasons, and all were found to be of “low impact category”, with subprojects maintaining safe distance from environmentally sensitive areas. Notably, similar environmental screening was completed for 436 “Batch II” subprojects; and during implementation the environmental screening results were found to be true for all except 1 subproject (command area of Majhirbundh surface flow minor irrigation subproject was found to be situated within 100m of Siartola forest).
2. Areas of improvement include continued use of the detailed screening formats for groundwater and surface-water subprojects; and the influence of environmental screening on selection of subprojects. Emphasis on surface water subprojects (against a preponderance of groundwater subprojects in Batch I) has been continued from Batch II (where 45% were surface water subprojects including check dams, water detention structures, surface flow, and river lift irrigation schemes) to Batch III, where 130 of the 409subprojects (32%) are based on surface water. Earlier projection of 44 % of proposed surface water based subproject has been reduced to 32 % due to drop of surface water based sub projects in the district of Bankura. First 2 contracts(both involving 1 village each in each of the 6 agroclimatic zones in the state have progressed well although performance varies among the 6 villages likely. In each of the village, the second year target(of the 4 year contract) have been achieved. Last 8 contracts(involving 5 villages in each contract) covering 40 villages has started from Oct 2015 since than inception report and action plan has been submitted against 8 contract. SPMU has abled to organize a training for DPMU staff(IDS, AE and Environment Specialists) and SO staff on environmental due diligence in this period.
3. **Environmental screening**: Overall, the environmental screening exercise had been satisfactory. Of the 557 subprojects in Batch III that were subjected to environmental screening, and were found to be of “low impact category”, all ground water based sub project under batch III has obtained SWID recommendations, surface water based 266 sub projects under batch III were submitted for SWID recommendation. 9 LI obtained SWID recommendations in terms of adequate water availability. Given that, in one batch 2 subproject, violation of environmental avoidance condition( proximity to forest) discovered later, SPMU has now started, in the districts of Birbhum, Bankura and Purulia, and additional check regarding distance from forest using a forest map developed by DST. To strengthen environmental safeguard, 10th State level Steering Committee (SLTSC) in its meeting has taken decision to induct district forest officer of the representative district as a member of district level implementation committee(DLIC). This will help to avoid, violation of and environmental avoidance condition (proximity to forest) .As per the environmental screening results, all 291 groundwater subprojects are in “safe” blocks as per the the dynamic ground water assessment 2009 prepared by SWID, and each of these are more install than 200 m away from closest existing groundwater abstraction structures. Most of these subprojects are tube wells; with only 50 are pumped dug wells. Separately, 46subprojects are located in fluoride affected blocks; however water quality tests done on nearby groundwater sources are all within “permissible” ranges. Only 7 nos of tube wells are being planned in arsenic affected blocks out of which 6 nos of tube wells were considered in kaliganj block and 1 no of tube well in Nakashipara block under Nadia District. Ground water quality test are within permissible range. Considering arsenic test results (dedicated and normal), around 9 villages of Kaliganj block were screened out. On a positive side, in 6 of these Pump Dug Well sub projects, Energization provided by solar power installation. Specific water quality tests for these 57 subprojects will be required to the mandated information and usage by WUAs prohibiting drinking/domestic use of these subprojects.
4. Of the 266 surface water subprojects,53 are check dams, 93 are water detention structures and water harvesting structures, 73 are surface flow schemes, and 47 are lift irrigation schemes. Of the 47 LI sub projects Lean flow issues are expected for 4 subprojects located on river Dharla (in Coochbehar) where in the months of April-May, adequate low water use and management regime will be required among the responsible WUAs. Close monitoring will also be required for 5 such subprojects located on ponds (in Howrah) and6 of which are on irrigation canals (DVC canal, Boromoyra canal); as well as the 2 subprojects on river Khari (in Burdwan) where these two together use about 30 percent of the estimated stream discharge.
5. SPMU has also undertaken visits to the sites of 72 subprojects to complete the requirement of 10% site verifications comfortably for Batch III. SPMU has visited 50 nos of batch III sub project sites to verify environmental screening. At the same time SPMU also able to visit 22 sub projects under batch II. Nonetheless, given the capacity constraint of SPMUs, it was agreed not to alter the target of 10% site verifications prior to approval. The way forward is to improve supervision during implementation and prior to completion. SPMU also undertaken visit of 4 gap villages in the Coochbehar district under Batch I and II North Bengal contract (new).
6. Environmental supervision: Supervision of implementation of the Batch-1 subprojects at the field was inadequate, and shows no signs of improvement in Batch II (although it was expected that joining of 6 environmental specialists in DPMUs, one of whom left the job, will improve supervision). The 5 DPMUs who have environmental specialists have diverted them for other roles, and have not assigned any specific responsibilities for environmental management. Consequently, there has been no report on environmental supervision and compliance reporting from the DPMUs except Nadia, Purulia and South 24 Paraganas. Other DPMUs did not have the resources, and no information on environmental management during construction is available. Even significant deviations, such as violation of environmental avoidance conditions, or indiscriminate disposal of excavated material (excavated muck is being dumped randomly, without minimum protection, sometimes upstream of water body itself) is noticed only through SPMU or World Bank mission, which could cover only a small sample of subprojects. The mission proposed that the SPMU should undertake at least two site visits and verification (one during initial stage of construction, and one prior to completion and release of final payment to contractors) to ensure compliance to the environmental management plan as well as the environmental codes of practice. The mission also urged that final payment to a contractor is not made until environmental compliance report is available at the SPMU (made by the contractor, certified by DPMU and verified by SPMU). To make this work, it will however be required, and the SPMU agreed to depute all 5 environmental specialist to SPMU.
7. **Good Agricultural Practice, GAP, Village (“Bio-Village”):** Presently, Good Agricultural Practices (GAP) are going on in 46 villages under 10 contracts. The VIB has submitted its second half yearly progress update, second half yearly monitoring update and annual evaluation report on good agricultural practices on North and south Bengal. The achievements are in line with the target and it is expected that VIB will be able to achieve the annual target that is 31 December 2016 as per schedule. For 8 new contracts covering 40 villages till now VIB has submitted inception report and annual action The summary achievement by 30 month of the contracts is as below.

Table 16. Progress of GAP Village Program till 30th June 2016 on 6 GAP villages

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Total Target Group** | **Baseline** | **3rd Year Target (as on 31st Dec. 2016)** | **Current Achievement (as on 31st June 2016)** |
| Number of farmers applying Recommended dose of fertilizers according to soil analysis report | 1776 | 0 | 1066 | 743 70 |
| Number of farmers applying balanced dose of mixed fertilizer | 1776 | 0 | 799 | 635 79 |
| Number of farmers adopting 25% replacement of chemical fertilizer by bio-inputs | 1776 | 0 | 533 | 555 104  |
| Number of farmers avoiding the use of WHO Class 1A, 1B & Class 2 pesticides | 1776 | 0 | 888 | 727 82 |
| Number of farmers practicing IPM  | 1776 | 0 | 799 | 608 76 |
| Number of villagers aware about safe transport, storage, handling, application and disposal of synthetic pesticides | 1776 | 0 | 888 | 724 82 |
| Land area under this practice (*ha*) | 858.07 | 0 | 343 | 210 61 |

**Summary of Achievement:** List of Activates carried out till June 2016 in 46 GAP Villages

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S No | Items | Unit | Target | AchievementBy June 2016 |
| 1 | Total No of Household Enlisted | No | As Number of household | 9468 |
| 2 | Farmers Enlisted | No | As No. Of Farmers | 9468 |
| 3 | Details of crop specific improved practices developed / selected for GAP | Type | As required time to time | 7 |
| 4 | Capacity and awareness building | Nos. | 12 x 3 x 6=180 + 9x40 =360Total= 540 | 345 |
| 5 | Publicity campaign organized for IPM and INM | No. | 540 | 345 |
| 6 | Field visit by the experts organized | Nos. | No Target | 174 |
| 7 | Farmers training/crop clinics organized | Days | 522 | 248 |
| 8 | Training manuals developed for para workers | Nos. | 2 | 2 |
| 9 | Training of para workers: | Mandays | 1844 | 774 |
| 10 | Exposure visit of the selected farmers in VIB Neempith | Nos. of farmer | 1160 | 240 |
| 11 | Exposure visit of the selected farmers in outside VIB Neempith | Nos. of farmer | 1160 | 240 |
| 12 | Distribution of promo materials | Nos. | 28000 | 880 |
| 13 | Village level meeting organized to identify lead farmers | Nos. of Farmer  | 1160 | 1160 |
| 14 | Soil samples analyzed / collected for analysis | Nos. | 5800 | 2378 |
| 15 | Installation of Sign board | Nos. | 232 | 349 |
| 16 | Members of monitoring team | Nos. | 5 members | 5 |

1. The mission visited Belia village (Dubra GP, Jamboni Block, Pashim Midnapore District) is located in red and laterite agro climatic zone. This village produces paddy mostly in kharif season and paddy, mustard, sesame, vegetable and maize in Rabi season. This village is highly irrigated and is inundated by overflow canal water at times. Fertilisers and pesticides used is reportedly high, the farmer are switching over there agricultural practices towards organic as much as possible. Farmers shown their adoption of GAP in their villages. The mission team advise to prepare a map which will show adopted plot within the Mauza. Water resource map is also required. The mission noted that farmer who have experimented with newly introduced SRI are getting benefitted with paddy plant growth and disease prevention as compared conventional methods. The mission also observed that awareness about the program, harmful pesticides and potential safer bio alternatives, and over all penetration of the practice has been better. Around 80 farmers( against target of 70 farmers for 31st December 2015) has been using appropriate volume of fertilisers in accordance with the soil testing report. Approximately 16.66 Ha of cultivable land holding is covered by the farmer by the adoption of GAP. It is also observed that the farmers are maintaining diary to keep record of the expenditures for GAPs.
2. As agreed earlier, Given the progress of the first 2 contracts, 8 more contracts (for 5 villages each covering the different agro-climatic zones) have been signed between VIB and SPMU to implement the program in a total of 46 villages (against the progress target of 50 villages) each of these contract will work on 5 contiguous villages located within the project polygon to be able to leverage other activities in the project. In the inception report, VIB has identified 40 villages against 8 new contract after selection of 40 villages due to some problem the SPMU has agreed to shift 5 GAP villages from Bardhaman to Malda district where village selection has been started again. In murshidabad, 2 villages out of 5 villages expected to shift from present location considering some local problem.
3. **Study of bio-accumulation of persistent synthetic pesticides in popular food crops:** Terms of reference for a systematic study on bio-accumulation of persistent synthetic pesticides in popular food crop was in September 2013, but the study is further delayed, as procurement of the required laboratory equipment at SWID is delayed. The mission discussed the options of SPMU procuring the required equipment, and placing it at the Calcutta University until space in the SWID premises is ready (when the instruments could be shifted to SWID), so that the team of Calcutta University can start the work. SPMU will discuss with SWID and inform the Bank whether this will be practical, or what other measures are being taken to minimize the delay.
4. **Water quality monitoring**: Whereas, the plan for statewide monitoring of water quantity and quality (especially for smaller streams which are not covered under state or central monitoring programs) has started regarding upgraded surface monitoring system at lift and surface irrigation schemes, work order for installation of 64 nos river gauges in Purulia, Bankura, Paschim Midnapore and Birbhum district with community based monitoring system has been issued. And installation of 3 nos gauges with telemetry system & GSM facilities at 3 nos river sites in Jalpaiguri districthas been completed and online data transmission started. SWID has also been strengthen with one geophysical borehole logger from Century Geophysical Coropration, USA. Also received training and demonstration conducted by the supplier. SWID has now been equipped with 13 in-situ water quality testing equipment, and the speed and coverage of tests are expected to increase. SPMU continuing monitoring quality and flow of water as of July 2016, a total 1317 water quality tests were undertaken for the sub projects (661 completed by Nov 2015 and 656 since then). In Nadia district, dedicated Arsenic test for 18 nos of Ground water samples were conducted in accordance to the test result(dedicated and normal). Around 9 villages of kaliganj Block are screened out where arsenic concentration is high. In malda district, 24 ground water quality test were conducted in Habibpur block for batch IV(Planning phase) shows water qualities are good. Maximum limit of fluoride concentration is within permissible limit and acceptable. Under batch IV in planning phase 22 nos of water qualities has been tested in Murshidabad district. Primarily, Jethia east and Jethia south location shown higher concentration of arsenic and rajnagar and rajnagar east location shown lead concentration above limit but confirmatory test suggest the water quality of the above 4 location are safe in terms of lead and arsenic. Issues such as high salinity in few surface water sub projects (in Bankura, Purulia, North 24 paraganas, South 24 Paraganas). High iron concentration in ground water sub projects in Pashcim Midnapore, Jalpaiguri and Nadia. Low dissolved oxygen is noted in surface water based sub project in howrah district and River Jalangi in Nadia district separately, SPMU has also started, on a pilot basis, groundwater level monitoring for 8 subprojects in South 24 Parganas, and has now mandated DPMUs to start flow monitoring for surface water subprojects (and a simple manual has been circulated to all DPMUs).
5. The above, however, is not an adequate replacement of the expected state level monitoring of availability and quality of water (focusing on surface water and groundwater resources which are not covered by the established monitoring programs of the Central and the State government agencies). The mission urged SWID/SPMU to prepare a plan for such monitoring.

# Annexure D 3: Social Safeguard

**Strengthened Institutions of the Farmer:**

1. So far project has identified 3657 schemes and it has received 2265 applications from community for implementation of schemes. A total of 1292 WUAs have been mobilized with membership touching nearly 100,000. Governing Body and Sub-committees of these WUAS have been formed. A total of 764 has already received registration certificate and another 100 WUAs are awaiting. Out of total membership, little over 13 % are women and nearly 12% are tribal. Among the governing body members, 28% are woman and over 72% are small and marginal farmers. A total 226 WUAs are performing well (as rated A/B) against the project target of 1764. So far 134 fishery interest groups (FIG) have been formed with 161 tribal members. Project has handed over 522 schemes and all WUAs are registered with a total membership of 42, 615 of which 10% are women. Among the total beneficiaries 77% are small and marginal farmers. Among the governing body members, 24% are women. Women representation in sub committees is relatively higher with a strength of 28%. Over 2750 training has been completed and 207 WUAs had exposure visits to different schemes under implementation. A total of 664 WUAs are regularly collecting membership fee and on an average 57% of the members attends monthly or bi monthly meetings. Among the handed over schemes, 452 WUAs are maintaining bank account and 396 of them also have corpus fund of about INR 6.4 million. Water meter has been installed in 231 schemes.
2. **Streamlining Facilitation Support to WUAs:** As of now, every district has a separate support organization (SO) unit. The number of persons engaged in each district varies with the number of existing schemes and targeted schemes. Generally SO engages a team of 13 persons in focused district. In order to strengthen implementation of sub-projects apart from SOs, the project has identified small and marginal farmers who have successfully implemented irrigation services in their own villages as Community Service Providers (CSPs). A total 142 Community Service Provider has been appointed in 15 districts (see table 1 below). These CSPs will be the farmer resources pool assisting and supporting WUAs and will be responsible for (i) mobilization of community to form WUA and empower WUA; (ii) facilitating project implementation through WUAs; (iii) ensuring WUAs maintain documentation and records of progress; and (iv) coordinating with farmers and other stakeholders. DPMU supported by SOs will organize capacity building for CSPs on a regular basis.

**Table 1: Number of Community Service Providers appointed in the districts**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **District** | **Number of CSP** |
| 1 | Nadia | 2 |
| 2 | Murshidabad | 6 |
| 3 | Jalpaiguri | 15 |
| 4 | Purulia | 15 |
| 5 | Darjeeling | 8 |
| 6 | Uttar Dinajpur | 6 |
| 7 | Dakhin Dinajpur | 6 |
| 8 | Coochbehar | 10 |
| 9 | Paschim Medinipur | 11 |
|  |  |  |
| 10 | Howrah | 6 |
| 11 | Hooghly | 6 |
| 12 | South 24 Parganas | 10 |
| 13 | North 24 Parganas | 4 |
| 14 | Birbhum | 20 |
| 15 | Bankura | 17 |
| **Total** | **142** |

**Social Safeguards**

1. **Land Donation:**The project has stabilized procedures for voluntary donations / purchase of land for project implementation. The land donor provides advice in writing on Rs 10 non-judicial stamp paper and the willingness to donate is recorded in WUA minutes books as a resolution. All details (such as total land owned by the donor, extend of land donated, detailed address and a map of the donated land) are included. So far 4,885farmers have donated land for various schemes implemented of which 4803 are small and marginal farmers. Nearly 1500 land donors gave unconditional land where as others received some kind of facility from WUA towards land donation (see table 2B below). Percentage of land donated out of total land holding varies from less than one percent to 11%. In South 24 *Paragana*, all WDS and SFIS have been constructed on government land and hence there is no land donation. The mission was informed that in western districts such as *Bankura, Purulia, Birbhum*, West and East *Medinipur* where interventions are largely water retention structures, land is not donated or pledged to WUA. The land owners only provides right to easement for water usage. There is a need of some formal resolution between the land owner and users in the village.

**Table 2A: District wise distribution of land donors and extent of land donated**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **District** | **Number of farmers donated land** | **Number of small & marginal farmers donated land** | **Extent of land donated (Ha)** |
| **Sl. No.** |  |  |  | **Average** | **Minimum** | **Maximum** |
| 1 | Burdwan | 397 | 397 | 0.01 | 0.01 | 0.02 |
| 2 | Coochbehar | 522 | 522 | 0.00 | 0.00 | 0.01 |
| 3 | Hooghly | 86 | 85 | 0.00 | 0.00 | 0.07 |
| 4 | Nadia | 36 | 36 |   |   |   |
| 5 | Jalpaiguri | 577 | 577 | 0.93 | 0.40 | 1.46 |
| 6 | Purulia | 483 | 483 | 0.28 | 0.13 | 0.66 |
| 7 | Bankura | 467 | 452 | 0.23 | 0.00 | 2.47 |
| 8 | Uttar Dinajpur | 262 | 262 | 0.01 | 0.00 | 0.01 |
| 9 | Maldah | 246 | 210 | 0.00 | 0.00 | 0.00 |
| 10 | Howrah | 403 | 403 | 0.00 | 0.00 | 0.00 |
| 11 | N 24 Prgns | 84 | 84 | 0.44 | 0.01 | 0.48 |
| 12 | Birbhum | 200 | 200 | 0.44 | 0.01 | 0.48 |
| 13 | S Dinajpur | 492 | 492 | 0.01 | 0.00 | 0.01 |
| 14 | Paschim Midnapur | 224 | 194 | 0.005 | 0.004 | 0.012 |
| 15 | Darjeeling | 166 | 166 | 0.000825 | 0.0009 | 0.0028 |
| 16 | Murshidabad | 240 | 240 | 0.00402 | 0.002 | 0.033 |
|  | **Total** | **4885** | **4803** |  |  |  |

**Table 2B: Entitlements given to land donors**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl.No** | **Districts** | **Pump operator** | **Position in Governing Body** | **Subsidized water charge or free Water for a fixed period** | **Free water for lifetime** | **Free water for fixed land size** | **Un conditional donation** | **Not yet decided** |
| 1 | Burdwan | 30 | 10 | 0 | 0 | 6 | 17 | 397 |
| 2 | Coochbehar |   | 160 | 362 |   |   | 522 |   |
| 3 | Hooghly | 10 | 36 | 32 | 0 | 0 | 1 | 29 |
| 4 | Nadia | 19 | 17 |   |   |   |   |   |
| 5 | Jalpaiguri | 144 | 119 |   |   |   | 122 | 192 |
| 6 | Purulia | 7 | 133 | 0 | 0 | 0 | 343 |   |
| 7 | Bankura | 6 | 28 | 0 | 221 | 0 | 212 |   |
| 8 | Uttar Dinajpur | 154 | 262 | 405 |   |   |   |   |
| 9 | Maldah | 235 | 242 |   |   |   |   |   |
| 10 | Howrah | 80 |   | 161 |   | 162 |   |   |
| 11 | N 24 Prgns | 77 | 7 |   |   |   |   |   |
| 12 | Birbhum |   | 10 |   |   |   | 159 |   |
| 13 | S Dinajpur | 14 | 322 | 478 |   |   |   |   |
| 14 | Paschim Midnapur | 45 | 108 | 12 | 0 | 0 | 59 |   |
| 15 | Darjeeling | 1 | 134 | 0 | 0 | 0 | 0 |   |
| 16 | Murshidabad | 0 | 172 | 0 | 0 | 0 | 36 | 32 |
|   | Total | 822 | 1760 | 1450 | 221 | 168 | 1471 | 650 |

1. **Citizen Engagement:** To increase community participation the project is developing a Scheme Development and Management Plan (SDMP). Under the SDMP the project is obtaining community feedback on scheme design. The project is also empowering WUAs to implement schemes independently in some schemes. Though 1449 SDMPs have been submitted, 1206 has received administrative approval. Well performing WUA will be provided additional resources and activities to implement. To maximize project benefits several WUAs are providing irrigation water to non-members (including some outside the command area) and collecting user fees.

**Table 3: District wise distribution of SDMP submitted and number approved**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No.** | **District** | **Number of SDMP/DPR submitted** | **Number of SDMP/DPR approved** |
| 1 | BANKURA | 127 | 76 |
| 2 | BARDDHAMAN | 110 | 93 |
| 3 | BIRBHUM | 137 | 126 |
| 4 | DAKSHIN DINAJPUR | 101 | 83 |
| 5 | DARJEELING | 41 | 37 |
| 6 | HOOGHLY | 21 | 21 |
| 7 | HOWRAH | 29 | 27 |
| 8 | JALPAIGURI | 213 | 192 |
| 9 | KOCH BEHAR | 124 | 124 |
| 10 | MALDA | 50 | 50 |
| 11 | MURSHIDABAD | 28 | 28 |
| 12 | NADIA | 29 | 28 |
| 13 | NORTH 24 PARGANAS | 43 | 17 |
| 14 | PASCHIM MIDNAPORE | 77 | 71 |
| 15 | PURBA MIDNAPORE | 98 | 47 |
| 16 | PURULIA | 126 | 92 |
| 17 | SOUTH 24 PARGANAS | 36 | 35 |
| 18 | UTTAR DINAJPUR | 59 | 59 |
|  | **Total**  | **1449** | **1206** |

1. Project now has an online grievance system. So far project has received 22 grievances of which only 3 have been resolved. Discussion with the community and project staff revealed that grievances related to land donation or entitlements do not come to SPMU as they generally resolved at the WUA level in consultation with SO representative and concerned IDS and Executive Engineer.

**Convergence between WBSRLM and WBADMI**

1. In order to sustain WUAs formed under ADMI project, it is imperative that these WUAs are part of institution which will help them in providing gainful self-employment to reduce poverty. Since WBSRLM (*Anandadhara*) aims at providing long term self – employment to poor women, a workshop was arranged between the two projects to streamline the convergence on July 18th, 2016. During the workshop it was agreed that (i) an awareness program will be conducted for both SHGs of WBSRLM and WUAs to learn from each other; (ii) common blocks / GPs will be identified where interventions can be initiated; (iii) WBSRLM created Sangha and *Mahasangha* to participate in WUA meetings to explore possibilities of potential areas of convergence; (iv) women members of WUA will made members of SHGs under WBSRLM; (v) SHG members can be involved in activities of WBADMI; and (vi) Sanga and *Mahasangha* members to act as service providers to WUAs.
2. A MOU will be signed between the two projects to delineate the roles and responsibilities. The convergence can be initiated in four districts namely, (i) Darjeeling; (ii) *Murshidabad*; (iii) Hooghly; and (iv) *Birbhum*. A joint workshop will be arranged in all these districts to initiate the process. SPMU will handhold district teams preparing the action plan.
3. **Gender Actions:** Gender based actions include: introduction of all women WUAs to construct, operate and maintain the irrigation schemes; inclusion as member in WUA by making spouse as eligible member, women (28% as governing council) as committee member in WUA, and as lead farmers for ASS demonstrations. The total number of women beneficiaries are little over 13% of the total beneficiaries. Project also aims to improve the standard of living of beneficiaries especially of women beneficiary. Apart from irrigation scheme project has introduced few activities in selected districts to assist women such as (i) organic vegetable gardening including fruit plans through convergence from the Horticulture Department; (ii) vermi compost and (iii) pump repairing training and for delivery of services one by cycle and kits to support pump repairing.
4. Project has not advanced much in terms of all women WUAs. So far five all women WUA has been formed by PRADAAN in *Purulia* district with a total membership of 468 from 555 households. The governing body comprises of 35 members. The WUA office bearers are also members of Self Help Group and are from tribal community. Though SDMP has been submitted, no money has been transferred to WUAs so far. Mission was informed that ASS activities will be initiated from next cropping season. The project is supporting 6013 woman-headed households, which is just 13% of the total households covered as beneficiaries in the command area. A total of 2513 women participated in various ASS activities that included 1378 in agriculture demonstration; 740 in horticulture demonstration and 332 in fishery demonstration.

**Table 4: Number of women participants in different demonstrations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sl.No.** | **District** | **Total number of Women beneficiary in Agriculture activity**  | **Total number of Women beneficiary in Horticulture activity**  | **Total number of Women beneficiary in Fishery activity**  | **Woman Headed households in ADMIP** | **Total number of Women participated in ASS** |
| 1 | BANKURA | 6 | 2 | 84 | 1039 | 6 |
| 2 | BARDDHAMAN | 0 | 0 | 57 | 231 | 30 |
| 3 | BIRBHUM | 21 | 13 | 59 | 157 | 34 |
| 4 | DAKSHIN DINAJPUR | 15 | 12 | 0 | 2106 | 20 |
| 5 | DARJEELING | 175 | 0 | 4 | 0 | 189 |
| 6 | HOOGHLY | 70 | 130 | 0 | 42 | 203 |
| 7 | HOWRAH | 57 | 35 | NA | 203 | 92 |
| 8 | JALPAIGURI | 268 | 173 | 10 | 369 | 486 |
| 9 | KOCH BEHAR | 60 | 26 | 23 | 142 | 171 |
| 10 | MALDA | 368 | 135 | 0 | 82 | 503 |
| 11 | MURSHIDABAD | 5 | 0 | 0 | 0 | 5 |
| 12 | NADIA | 62 | 55 | 0 | 112 | 117 |
| 13 | NORTH 24 PARGANAS | 28 | 33 | 0 | 92 | 61 |
| 14 | PASCHIM MIDNAPORE | 145 | 67 | 26 | 827 | 238 |
| 15 | PURBA MIDNAPORE | 4 | 0 | 0 | 121 | 72 |
| 16 | PURULIA | 0 | 0 | 69 | 0 | 69 |
| 17 | SOUTH 24 PARGANAS | 18 | 27 | 0 | 46 | 109 |
| 18 | UTTAR DINAJPUR | 76 | 32 | 0 | 444 | 108 |
|  | **Total** | **1378** | **740** | **332** | **6013** | **2513** |

1. **Tribal Beneficiaries:** A total of 143 schemes have been implemented in 110 tribal mouzas across 26 blocks in 18 districts. So far 6,107 tribal households have benefited from the project. Project has spent nearly INR 450 million on tribal beneficiaries which is approximately 13% of the total project cost.

**Table 5: District wise distribution of tribal beneficiaries**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **District** | **Total number of tribal Mouza covered** | **Total number of Tribal HHs covered in ADMIP** | **Number of Non-tribal mouza covered** | **Number of Non-Tribal HHs covered** | **Number of tribal block** | **Number of Non-tribal block** |
| 1 | BANKURA | 11 | 70 | 94 | 3933 | 4 | 4 |
| 2 | BARDDHAMAN | 2 | 717 | 105 | 8547 | 3 | 12 |
| 3 | BIRBHUM | 13 | 653 | 85 | 5344 | 3 | 10 |
| 4 | DAKSHIN DINAJPUR | 15 | 1728 | 53 | 5058 | 1 | 2 |
| 5 | DARJEELING | 0 | 98 | 23 | 2069 |   | 2 |
| 6 | HOOGHLY | 0 | 0 | 83 | 3014 |   | 9 |
| 7 | HOWRAH | 0 | 0 | 44 | 1114 |   | 3 |
| 8 | JALPAIGURI | 7 | 515 | 19 | 1980 | 1 | 3 |
| 9 | KOCH BEHAR | 0 | 0 | 30 | 5932 |   | 3 |
| 10 | MALDA | 7 | 722 | 38 | 2760 | 3 | 3 |
| 11 | MURSHIDABAD | 0 | 10 | 33 | 2570 |   | 3 |
| 12 | NADIA | 0 | 0 | 36 | 2025 |   | 8 |
| 13 | NORTH 24 PARGANAS | 0 | 0 | 19 | 2260 |   | 4 |
| 14 | PASCHIM MIDNAPORE | 45 | 512 | 95 | 4345 | 6 | 16 |
| 15 | PURBA MIDNAPORE | 0 | 12 | 99 | 5863 |   | 17 |
| 16 | PURULIA | 9 | 863 | 178 | 2116 | 4 | 5 |
| 17 | SOUTH 24 PARGANAS | 0 | 25 | 15 | 5108 |   | 4 |
| 18 | UTTAR DINAJPUR | 1 | 182 | 21 | 4148 | 1 | 9 |
|   | **Total** | **110** | **6107** | **1070** | **63856** | **26** | **117** |

**Site Visit**:

1. Mission visited one MDTW scheme (Village: *Durlabhpur*; GP: *Bodai* ; Block: *Amdanga*; and Sub Division: *Barasat)*. The command area of the scheme covers 150 ha of land. Mission met WUA members and governing body office bearers. The WUA was formed in 2011 and was registered in 2012. The scheme is operational since September 2015. The beneficiary community largely consists of small and marginal cultivators. Nearly four fifth of the women in the village are also engaged in agriculture activities. Prior to the WBADMI intervention, some farmers in the village had shallow tube well and would lease them out to other farmers charging INR 2000 per bigha. With the scheme made operational, the water charges has come down to INR 700 to 800 per bigha depending upon the crop type. The agriculture implements provided by the project such as power tiller, mechanized sprays, etc. not only helps the community; it has given an income generating opportunity to the WUA as they lease it out to non WUA members. Though it is early to say, but community reported increased household income. Discussion with the women members revealed that though they are members of four different sub committees of WUA, majority of them are not aware of their role and responsibilities. The women members however wants to form SHG.
2. The mission also met members of four Sangha of Amdanga block which apparently is model block of *Anandadhara*. The objective was to assess how two projects can work together for the benefit of the community and especially women members. The Sangha members and women members of WUA suggested that they should be given training in trades that has local market such as vermicomposting; sale of improved and hybrid seeds; organic pesticides; pisciculture; etc. They are also willing to take up training on repair of agricultural implements. Some women members suggested that agricultural equipment provided by the project should be transferred to one of the SHGs so that they can lease it out to generate income.
3. The Project Director of *Anandadhara* requested women members to come out with an action plan within a one month’s time that is linked to the objective of WBADMI. The Executive Engineer of WBADMI project suggested that Sangha and WUA women members should visit *Barasat* DPMU to learn more about the project to develop their proposal.
1. <http://www.eimaagrimach.in/> [↑](#footnote-ref-1)