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Report No: 60529 - IN

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR 78.2 MILLION (US$125 MILLION EQUIVALENT)

AND A

PROPOSED LOAN

IN THE AMOUNT OF US$125 MILLION

TO THE

REPUBLIC OF INDIA

FOR A

WEST BENGAL ACCELERATED DEVELOPMENT OF MINOR IRRIGATION PROJECT

September 2, 2011

Sustainable Development Department
Agriculture and Rural Development Unit
India Country Management Unit
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective December, 2010)

Currency Unit = Indian Rupee (Rs.)
Rs. 46 = US$1

FISCAL YEAR
April 1 – March 31

ABBREVIATIONS AND ACRONYMS

CAS	Country Assistance Strategy
DLIC	District Level Implementation Committee
DPMU	District Project Management Unit
DPR	Detailed Project Report
DTW	Deep Tube Well
DWRID	Department of Water Resources Investigations and Development
EA	Environmental Assessment
EE	Executive Engineer
EiC	Engineer-in-Chief
EMF	Environmental Management Framework
EMP	Environmental Management Plan
FIG	Farmer Interest Group
FM	Financial Management
FY	Fiscal Year
GAAP	Governance and Accountability Action Plan
GoI	Government of India
GoWB	Government of West Bengal
IA	Implementing Agency
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
ICR	Implementation Completion Report
IDA	International Development Association
IFR	Interim Financial Reports
LA	Loan Agreement
LDP	Livelihood Development Plan
LDTW	Light Duty Deep Tube Well
MDTW	Medium Duty Deep Tube Well
MIS	Management Information System
ML	Monitoring & Learning
M&E	Monitoring and Evaluation
MLE	Monitoring, Learning and Evaluation
NCB	National Competitive Bidding
MOM	Management, Operation, and Maintenance
MT	Metric Ton
PAP	Project Affected Person
PD	Project Director
PFMA	Public Financial Management and Accountability
PIM	Participatory Irrigation Management
PIP	Project Implementation Plan
PMU	Project Management Unit
PSC	Project Steering Committee
QA&A	Quality Audit & Assurance
RAP	Resettlement Action Plan
RLI	River Lift Irrigation
RPF	Resettlement Policy Framework
SA	Social Assessment
SBD	Standard Bidding Document
SDMP	Scheme Development and Management Plan
SE	Superintending Engineer
SFAA	State Financial Accountability Assessment
SFMIS	Surface Flow Minor Irrigation Scheme
SO	Support Organization
SPMU	State Project Management Unit
STW	Shallow Tube Well
ToR	Terms of Reference
WUA	Water User Association

Vice President:	Isabel M. Guerrero
Country Director:	N. Roberto Zagha
Sector Director/Manager:	John H. Stein/Simeon K. Ehui
Task Team Leader:	Joop Stoutjesdijk

INDIA

West Bengal Accelerated Development of Minor Irrigation Project

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INDIA

WEST BENGAL ACCELERATED DEVELOPMENT OF MINOR IRRIGATION PROJECT

PROJECT APPRAISAL DOCUMENT

SOUTH ASIA

SASDA

DATA SHEET

Date: September 2, 2011 Country Director: N. Roberto Zagha Sector Manager: Simeon Kacou Ehui	Team Leader: Joop Stoutjesdijk Sectors: Irrigation and drainage (90%); General agriculture, fishing and forestry sector (10%) Themes: Water resource management (33%); Rural services and infrastructure (33%); Rural non-farm income generation (17%); Participation and civic engagement (17%)
Project ID: P105311 Lending Instrument: Specific Investment Credit and Loan	Environmental category: Full Assessment

Project Financing Data

[X] Loan [X] Credit [ ] Grant [ ] Guarantee [ ] Other:

For Loans/Credits/Others:
Total Bank financing (US$m.): 250.00
Proposed terms: IBRD Loan: Variable Spread Loan (VSL), repayment in 18 years, including 5 years grace period; IDA Credit: repayment in 25 years, including 5 years grace period.

Financing Plan (US$m)

Source	Local	Foreign	Total
Borrower/Recipient	50.00	0.00	50.00
International Bank for Reconstruction and Development (IBRD)	100.00	25.00	125.00
International Development Association (IDA)	100.00	25.00	125.00
Total:	250.00	50.00	300.00

Borrower:
India
Department of Economic Affairs
Ministry of Finance
New Delhi 110 001

India

Responsible Agency:
Department of Water Resources Investigation and Development (DWRID)
Government of West Bengal
Writers Building
Kolkata 700 001
West Bengal, India,
Tel: (91-33) 2214-3666 Fax: (91-33) 2214-5025

Estimated disbursements (Bank FY/US$m)									
FY	12	13	14	15	16	17	18		
Annual	10.00	30.00	50.00	50.00	50.00	40.00	20.00		
Cumulative	10.00	40.00	90.00	140.00	190.00	230.00	250.00		

Project implementation period: Start - January 1, 2012 End – December 31, 2017
Expected effectiveness date: January 1, 2012. Expected closing date: December 31, 2017

Does the project depart from the CAS in content or other significant respects? [ ]Yes [X] No
Ref. PAD I.C.

Does the project require any exceptions from Bank policies? [ ]Yes [X] No
Ref. PAD IV.G.
Have these been approved by Bank management? [ ]Yes [ ] No
Is approval for any policy exception sought from the Board? [ ]Yes [X] No

Does the project include any critical risks rated "substantial" or "high"? [X]Yes [ ] No
Ref. PAD III.E.

Does the project meet the Regional criteria for readiness for implementation? [X]Yes [ ] No
Ref. PAD IV.G.

Project development objective ***Ref. PAD II.C., Technical Annex 3***
The project development objective is to enhance agricultural production of small and marginal farmers in the project area. This will be achieved through development of minor irrigation (MI) schemes, strengthening community-based irrigation management, and support to agricultural development, including provision of agricultural services, encouraging crop diversification and use of new technologies, and creating income generating opportunities.

Project description ***Ref. PAD II.D., Technical Annex 4***
A. Strengthening Community-based Institutions (US$8.1 million). Development of water users associations and other farmer organizations to assume the responsibilities for management, operation, and maintenance of minor irrigation schemes and improved irrigated agricultural practices. This will be achieved by assisting with their formation and strengthening through various training and support activities.

B. Irrigation System Development (US$235 million). Construction of about 2,400 new minor surface water irrigation schemes (command area varying from 5 to 50 ha) and about 2,260 new minor ground water irrigation schemes (command area varying from 20 to 36 ha). The total area to be developed under the project is about 139,000 ha, benefiting an estimated 166,000 farm families.

C. Agriculture Support Services (US$22.1 million). Provision of agricultural support services in the project area to enhance productivity and diversification in agriculture. This will involve improvements in production and water management technologies for agriculture, horticulture, and fisheries, and more efficient and effective farm advisory services.

D. Project Management (US$34.8 million). Strengthening DWRID to ensure effective project management through State and District Project Management Units; provision of information management, and social, environmental, and fiduciary safeguard management systems, and monitoring & evaluation and impact assessment activities.

Which safeguard policies are triggered, if any? ***Ref. PAD IV.F., Technical Annex 10***
OP 4.01 - Environmental Assessment; OP 4.09 - Pest Management; OP 4.10 - Indigenous People; OP 4.11 - Physical Cultural Resources; OP 4.37 - Safety of Dams; and OP 7.50 - Projects on International Waterways.

Significant, non-standard conditions, **if any**, for:
Ref. PAD III.F.
Board presentation:
None.

Loan/credit effectiveness:
None.

Covenants applicable to project implementation:

West Bengal shall:

(i) carry out implementation of the project in accordance with the Project Implementation Plan (PIP), the Governance and Accountability Action Plan (GAAP), the Scheme Development and Management Plans (SDMP), and the provisions of the Anti-Corruption Guidelines and shall not amend or waive any provision of the PIP, the GAAP, and the SDMPs without the Bank and the Association's prior written approval;

(ii) maintain, at all times during project implementation, a State Project Management Unit within DWRID's regular structure, with functions, responsibilities and resources acceptable to the Bank and the Association, including, inter alia, the responsibility of said unit to coordinate and monitor the carrying out of the project;

(iii) ensure that the State Project Management Unit is, at all times during project implementation, led by a project director who is assisted by adequate professional and administrative staff (including procurement, financial management, environmental, and social development specialists), in numbers and with experience and qualifications acceptable to the Bank and the Association, operating under terms of reference satisfactory to the Bank and the Association;

(iv) maintain at all times during project implementation a District Level Implementation

Committee, with responsibilities and functions satisfactory to the Bank and the Association, including, inter alia, overseeing project implementation at the district level and coordinating project implementation among participating government departments and other stakeholders;

(v) maintain at all times during project implementation District Project Management Units at the district level, led by a joint team comprising a superintendent engineer and an additional district magistrate, and assisted by adequate professional and administrative staff in numbers and with experience and qualifications acceptable to the Bank and the Association, operating under terms of reference satisfactory to the Bank and the Association;

(vi) prepare and furnish to the Bank and the Association for its review and approval by November 30 of each year until completion of the project, commencing on November 30, 2011, an annual work plan and budget for implementation of the project for the following fiscal year and thereafter carry out said annual plan taking into account the Bank and the Association's comments thereon;

(vii) through DWRID, carry out the project in accordance with the terms, conditions and procedures set forth in the Environmental Management Plan (EMP) (including related environmental codes of practice), Social Assessment (SA), and Tribal Development Plan (TDP), in a manner satisfactory to the Bank and the Association, and shall ensure that the EMP, SA, and TDP shall not be revised, repealed or abrogated without prior agreement with the Bank and the Association; and

(viii) ensure that the cumulative monthly incremental water abstraction range for surface water irrigation schemes to be implemented in the Atrai and Sankosh river basins does not exceed 5 percent of the total available monthly discharge throughout project implementation, consistent with the EMP.

A. STRATEGIC CONTEXT AND RATIONALE

1. Country and sector issues

1. Water resources development is a major area of focus for the central and state governments in order to manage and exploit India's limited water resources. Development of irrigation infrastructure is necessary to reduce climatic risks and utilize the full potential of the agricultural sector in the country, including West Bengal. Major, medium, and minor irrigation schemes have traditionally played a key role in fostering sustained agricultural and rural growth and development, which have been key priorities for the Government of India (GoI) since independence. Irrigated agricultural development has always been a key tool of the Government's strategy for achieving the priority goal of ensuring food security for all. Rainfall, which occurs mainly within short monsoon seasons, is of high temporal and spatial variability that makes rainfed agriculture risky. Over the last fifty years, India has invested substantially in infrastructure necessary to usher irrigated agriculture to vast areas all over the country. The publicly financed infrastructure includes major (irrigated area > 10,000 ha), medium (2,000 ha < irrigated area < 10,000 ha), and minor (irrigated area < 2,000 ha) irrigation schemes. Within the minor irrigation (MI) category, a large number of small schemes for exploiting surface and ground water resources, e.g. lift irrigation schemes, deep and shallow tube wells, pump dug wells, tanks, and small water harvesting structures, have been developed. Such minor irrigation schemes aim in particular at benefiting small and marginal farmers.

2. Located on India's east coast, West Bengal comprises about three percent of India's land mass and eight percent of the population, with population density above 900 per sq. km, one of the highest in India. The majority of the population in the state lives in rural areas, most of whom are dependent on agriculture in some way or other for their livelihood. According to current available information, over 25 percent of the state's population lives below the poverty line. These people are primarily belonging to the rural agricultural sector. The main constraints to alleviation of their poverty are small land holdings and uncertainties of rainfall, including periodic occurrence of long dry spells, but also heavy cyclones and floods during the monsoon season. Agriculture is hardly possible during the non-monsoon season without irrigation facilities.

3. Agriculture accounts for about 20 percent of West Bengal's Gross Domestic Product (GDP) and provides employment to over 55 percent of workers in the state. Since agriculture is the backbone of the rural economy, it is evident that broad-based rural growth and reduction of poverty cannot be achieved without increasing the income generating potential of the agriculture sector. Boosting agricultural growth and production and reduction of rural poverty are high on the agenda of the Government of West Bengal (GoWB). Agricultural growth over the past two decades, fuelled by land reform and supported by public procurement of food grains, was on average around three percent per annum. At least maintaining this growth rate would be required to support rural growth and reduction of poverty. There is, however, little scope for further increasing the current cultivable area. The land holdings are already very small, as over 93 percent land holders belong to small and marginal farmer categories, with land areas of less than one ha and two ha, respectively. Consequently, it is becoming increasingly difficult to maintain the growth rate in the absence of adequate infrastructure support, crop diversification, and market access.

4. Average productivity levels are still low in West Bengal in comparison to that of advanced agricultural states in the country. This leaves room for enhancement of productivity, provided that timely supply of all inputs and supply of adequate irrigation water can be assured. The absence of assured irrigation supplies inhibits use of improved seeds, fertilizers, and other complementary inputs, which in turn further affects productivity levels. Given the importance of irrigated agriculture for increasing agricultural growth and providing rural employment round the year, GoWB attaches high priority to expanding irrigation facilities in the state and optimizing the utilization of available water resources.

5. West Bengal is relatively rich in water resources. The three major rivers systems of the state, the Ganga, the Brahmaputra, and the Subarnarekha, account for annual usable surface water of 58.8 billion cubic meter of surface water. Use of surface water is rather low as the state has created very little storage, and the potential to create major storage is limited. The state is also relatively richer compared to other major Indian states in terms of ground water, with assessed annual renewable ground water resources in the state of 27.4 billion cubic meter. From the total annual net replenishment of ground water, the state currently uses about 42 percent, so there is a large untapped potential.

6. Except for some pilot projects in the eighties, all MI schemes developed until 1990 were and are still maintained by the government through the Department of Water Resources Investigation and Development (DWRID) that has sole responsibility for the development of MI schemes. During the past 40 years DWRID has developed MI schemes commanding about 2.4 million ha. From 1990 onwards, based on a Government Order (GO) all schemes that were developed by DWRID have been transferred to the users that had to form a Water Users Association (WUA). As per GO, the WUA is responsible for management, operation, and maintenance (MOM) and future capital investments. The WUA has the right to charge and use irrigation service fees. After the handing over of a scheme, DWRID staff provides some technical advice to the WUAs, typically for a period of about three years, but otherwise has no major responsibilities anymore. Unfortunately there is no good database of the performance of these developed schemes so it is unclear how many of the schemes are defunct for lack of maintenance and repair. However, from limited surveys it seems that the trend is that most WUAs take charge of all MOM and replacement costs, considering the importance of the irrigation system for agricultural production. GoWB intends to increase the development of unused water sources for agriculture, keeping in view the need of other competing sectors such as domestic and industrial water supply and environment. The aim is to increase agricultural production and improve livelihoods by providing assured new irrigation facilities to selected areas.

7. A study, jointly undertaken by the Asian Development Bank (ADB) and the International Water Management Institute (IWMI), entitled "Pro-Poor Intervention Strategies in Irrigated Agriculture in Asia" (2005), has confirmed that poverty incidence is lower in irrigated than rainfed areas and that access to adequate and timely irrigation water reduces the severity of poverty. Irrigated agriculture reduces poverty through three direct effects: (i) increased food output (through improved productivity); (ii) higher demand for employment; and (iii) higher real income. A recent study (2010) by Michigan State University and the World Bank on "The Impact of Irrigation on Agricultural Productivity: Evidence from India" shows that irrigation has a strong and significant impact on land productivity, cropping intensities, and land prices. The study also finds that the impact of irrigation on productivity increases with the quality of

irrigation. The study makes the case for continuing support for investments in improving both access and quality of irrigation. Considering the similarities, the two studies show that the development of irrigation will continue to be critical to increasing agricultural production, incomes, and rural livelihoods.

2. Rationale for Bank involvement

8. The Bank has been an important partner in India with support to large-scale irrigation rehabilitation/modernization programs and broad-based water sector reform in various states. The Bank is also funding community-based rural development projects focusing on small irrigation structures and agricultural technologies for improvement of irrigated agriculture in such states as Assam, Karnataka, Andhra Pradesh, and Orissa. The proposed project is a continuation of this initiative to expand such programs to other states, in this case West Bengal.

9. The Bank has a long history in supporting irrigation developments that have promoted stakeholder involvement in rural infrastructure development and transferred improved agricultural technologies to farmers. As such, the Bank is well placed to assist West Bengal with an integrated approach that strengthens community-level institutions, develops small-scale irrigation infrastructure, and provides support services for the improvement of agriculture based livelihoods. DWRID has good experience in developing new minor irrigation schemes. It has also assisted with the formation of WUAs in these newly developed schemes. What it has done less effectively is to support and train the WUAs to become organizations that can sustainably take care of the operation and maintenance of the schemes. The Department of Agriculture, Department of Food Processing Industries & Horticulture, and Department of Fisheries have ongoing programs of support to farmers, but such programs have been fairly general and there have been no concerted efforts to maximize the benefits of the irrigation water. Therefore, through its international experiences, the Bank will support comprehensive training of WUAs and will involve other line agencies (agriculture, horticulture, and fisheries) to implement targeted programs in the newly developed project schemes to maximize the benefits of the water that will be made available to the beneficiaries.

10. The project is consistent with the World Bank Group Country Assistance Strategy (CAS) for the Republic of India, 2009-2012 (Report No. 46509-IN; November 14, 2008), which focuses, inter alia, on development of infrastructure, including water resources, and support for the poorer states. The project as planned aligns with the priorities of the CAS by supporting the development of irrigation infrastructure and increasing agricultural productivity in one of India's economically weaker states. The project also aligns with the strategic principles underlying the Bank's work in India by supporting reforms and by bringing in the best international knowledge for project development and implementation.

11. The project is closely linked to the Bank's water resources strategy that recognizes: (a) water resources management and development are central to sustainable growth and poverty reduction; (b) the Bank needs to assist countries in developing and maintaining appropriate stocks of well-performing hydraulic infrastructure; and (c) the Bank's water assistance must be tailored to a country's specific circumstances and be consistent with the overarching country strategy.

3. Higher level objectives to which the project contributes

12. The proposed project will contribute to the borrower's objective of sustainable economic growth and reduction of poverty through improved reliability of water resources for irrigation and increased agricultural production. It seeks to improve rural livelihoods using a community empowerment approach.

B. PROJECT DESCRIPTION

1. Lending instrument

13. The lending instrument is a Specific Investment Credit and Loan, which is an appropriate instrument, given that the project is well-defined and can be implemented over a finite time period. The Specific Investment Product is typically not a quick-disbursing lending instrument, and engagement with the participating state over a longer period will provide opportunities for comprehensive development of sufficient institutional capacity to manage, operate, and maintain minor irrigation infrastructure in a sustainable manner.

14. The total project cost is estimated at US$300 million, to be financed through a mix of IBRD loan and IDA credit of US$125 million each (83 percent of the project costs), with the balance to be financed by GoWB. The split between IDA and IBRD was requested by the Department of Economic Affairs (DEA) as part of its efforts to promote sustainable irrigation development in less performing states.

2. [If Applicable] Program objective and Phases

15. Not Applicable.

3. Project development objective and key indicators

16. The project development objective is to enhance agricultural production of small and marginal farmers in the project area. This would be achieved through accelerated development of minor irrigation schemes, strengthening community-based irrigation management, operation and maintenance, and support to agricultural development, including provision of agricultural services, encouraging crop diversification and use of new technologies, and creating income generating opportunities.

17. Key performance indicators, including relevant IDA core ones, will include:

- increase in yield of main agricultural crops (measured in MT/ha);
- operational water users associations created (measured in number, based on the majority of members satisfied with the performance of the WUA);
- resources generated by user groups to manage, operate, and maintain the schemes (as percentage of required resources); and
- number of female and male water users (defined as member of the WUA) provided with water delivery services: (i) number of female water users; and (ii) number of

male water users. In addition, (iii) the percentage of female WUA executive committee members will be measured.

4. Project components

18. DWRID has good experience in developing new minor irrigation schemes, of which around 34,000 have already been developed in West Bengal during the past decades. It has also assisted with the formation of WUAs in many of these schemes. The residual need for technical and financial support after a scheme development by DWRID to WUAs is very small, as all schemes are fully handed over to WUAs after construction and training. The Departments of Agriculture, Food Processing Industries & Horticulture, and Fisheries have ongoing programs of support to farmers, but such programs have been fairly general and there have been no concerted efforts to maximize the benefits of the irrigation water. The project will provide comprehensive training and support to WUAs and develop capacity within DWRID to provide monitoring of and as needed support to WUAs after project completion. In addition, the project will involve other line agencies to implement targeted programs in the newly developed project schemes to maximize the benefit of the water that will be made available to the beneficiaries. The development of MI schemes has been slow during the last years. Through the proposed project, GoWB intends to accelerate the development of MI schemes during the next years.

19. The key principles underlying project design are:

1. A decentralized setting where the main beneficiaries play an active role in planning, managing, and sustaining project interventions;
2. The scheme design and implementation activities meet technical quality and safety standards, and pay adequate attention to social, environmental, and fiduciary considerations; and
3. Access to improved agricultural technologies and practices for agricultural producers is as important as improving access to water for improving agricultural production and farmer incomes.

20. The West Bengal Accelerated Development of Minor Irrigation Project (ADMIP) has four components (see Annex 4 for a detailed description). It will focus on investments targeted towards: (i) strengthening community-based institutions to assume responsibilities for the management of minor irrigation schemes created under the project; (ii) development of surface and ground water based irrigation systems in 18 of the 19 districts of West Bengal (excluding Kolkata District); and (iii) agricultural development and providing improved support services to farmers.

21. **Component A. Strengthening Community-based Institutions (US$8.1 million)**. The component will enable community-based institutions, mainly WUAs, to assume responsibilities for management, operation, and maintenance of the minor irrigation schemes to be constructed under the project. The development of WUAs will be achieved by their formation and strengthening through various training and support activities. DWRID will recruit Support Organizations (SO) to assist with the formation of WUAs and with training and support during and immediately after scheme construction. The SOs will also provide assistance with the preparation, implementation, and monitoring of brief Scheme Development and Management Plans (SDMP) that will spell out the proposed developments and responsibilities at each scheme.

It is expected that 12 SOs will be engaged, as districts with few schemes will be combined. Not all SOs are expected to be engaged for the entire project duration. From experiences with other projects it is expected that there will be sufficient number of organizations with interest to participate as SOs, but that proper orientation at the start of the services and guidance throughout the services by the State Project Management Unit (SPMU) and District Project Management Units (DPMU) will be needed.

22. WUAs are now established under an Order of DWRID. As per Order, WUAs are responsible for the MOM of their systems and are entitled to collect and retain irrigation service fees. Therefore, even though GoWB is preparing Operation and Management Rules for Minor Irrigation Schemes and a dedicated WUA Act that will describe the rights and responsibilities of WUAs in more detail, these do not have to be a pre-condition for project implementation.

23. The support to WUAs will mainly focus on training and capacity building in key areas such as preparation and implementation of MOM plans; setting and collection of irrigation service fees; maintenance of records and accounts; improved and equitable water-sharing and utilization; and participatory monitoring, learning, and evaluation (MLE). Special studies will be carried out by consultants to assess the WUA development program and learn lessons and best practices. These in turn will be shared with SOs so that they can improve their performance, as needed. The results of the studies will also be used to train staff of DWRID so that they can eventually carry out monitoring of WUAs and provide support, as needed, to ensure the WUAs' long-term sustainability.

24. The project proposes to focus on gender issues through awareness creation and training. There will be specific focus on encouraging female plot holders to take up WUA executive committee positions and avoiding exclusion by women in the running of WUAs. Targeted training for women will be provided under the project to train them in effective committee membership and in technical subjects related to good irrigation and agricultural practices.

25. **Component B. Irrigation System Development (US$235 million).** The component will improve availability of water for agriculture and fisheries by developing new minor surface and ground water irrigation schemes on areas that are currently cultivated under rainfed conditions. The activities will include construction of about 2,400 minor surface flow irrigation systems (command area varying from 5 to 50 ha), comprising river lift schemes, gravity-fed schemes, and detention structures, and construction of about 2,260 minor ground water irrigation schemes (command area varying from 20 to 36 ha), comprising shallow tube wells, light and medium duty tube wells, and pump dug wells. The total area to be developed under the project is about 139,000 ha, benefiting an estimated 166,000 farm families. It is noted that the exact location of each scheme is not known at this moment. The numbers are based on estimates and requests from the districts. The numbers have been used for defining the overall project scope, implementation arrangements, and cost estimates. The final numbers to be implemented may be somewhat different. Drainage will be included in the scheme design, where needed, but the number of schemes where this is needed is expected to be small. The selection of the type of scheme will be based on hydrological and technical viability, as well as on users' requests. Where pumping is needed, priority will be given to schemes where pump sets can be electrified. Only in locations where electricity is not available nearby (typically a distance of 2.5 km) will diesel pumps be used. Electricity is not always reliable, but in blocks where it is unreliable the

project will encourage clear distribution schedules so that farmers know when electricity will be available. Prior to any intervention, the actual development activities will be determined for each individual irrigation scheme, summarized in a brief scheme development and management plan, prepared by DWRID and SO staff in consultation with the users. The component will also introduce, through pilots and demonstrations in close cooperation between DWRID and the Departments of Agriculture and Food Processing Industries & Horticulture, water saving technologies and will expand on the ground water monitoring program in project areas. The former will include the introduction of sprinkler and drip irrigation in strategically selected schemes to not only show the benefits of such types of irrigation, but also to link up interested private sector suppliers with potential customers. Specific pilots on water harvesting techniques are also planned.

26. **Component C. Agricultural Support Services (US$22.1 million).** The Agricultural Support Services (ASS) component will have three sub-components, namely Agriculture, Horticulture, and Fisheries. The component will enhance agriculture-based rural livelihoods by increasing production of agriculture, horticulture, and fisheries. Although the GoWB is supporting agricultural development in several ways, these activities will need to be scaled up in a focused manner within the project area to ensure that the assured availability of water will lead to enhanced production and diversification of agricultural production systems. This will be achieved through adoption of improved production technologies and water management practices and more efficient and effective delivery of key support services. The outputs are expected to be higher production in agriculture, horticulture, and fisheries, as well as better alignment of farm-based productive activities with water availability. The project will finance improvement of production and post harvest technologies, field demonstrations of modern agricultural technologies and practices, and more effective farm advisory services.

27. **Component D. Project Management (US$34.8 million)**. A State Project Management Unit and District Project Management Units will be supported to take charge of coordination and management of the implementation of all project activities. In addition, other main activities to be carried out by the units include: (i) design and establishment of a project-specific Management Information System (MIS); (ii) setting up and leading the project monitoring, evaluation, and learning activities; (iii) contracting resource agencies, including services of an external monitoring and evaluation (M&E) agency for specific M&E and impact studies; (iv) liaison and convergence with other agencies and government departments; and (v) documentation of project experience and its dissemination in the wider development community.

5. Lessons learned and reflected in the project design

28. *WUAs should be empowered to collect and retain services fees*. For the irrigation schemes to be developed under the project, WUAs will be empowered to levy, collect, and retain irrigation service fees for MOM. This is an important departure from general practice in India, although not necessarily in West Bengal, and is expected to significantly improve WUAs' access to financial resources. In West Bengal it is already possible for WUAs of minor irrigation schemes to retain and use irrigation service fees for MOM. The legal basis for this is an Executive Order of DWRID. Government is currently preparing Operation and Management Rules for Minor Irrigation Schemes and a dedicated WUA Act, but may in the interim strengthen WUAs' right to retain and use service fees by a new Government Order.

29. *Meaningful community participation requires substantial capacity building*. The proposed scheme implementation cycle with clearly defined stages (identification, pre-planning, planning, implementation, and post-implementation) provides a structured approach for identification of capacity gaps and sufficient time for these to be addressed through mobilization efforts, awareness generation, requisite training, and other measures.

30. *Irrigation development needs to be complemented by strong agricultural support services to maximize project benefits and promote sustainability*. This has been adopted as a guiding principle for the project design with substantial attention paid to provision of support services in agriculture, horticulture, and fisheries.

31. *Concurrent and independent evaluation enhances project impact*. This lesson has been incorporated through provision for an external monitoring and evaluation agency that will concurrently monitor and report on field level project performance and also carry out periodic impact evaluations during the life of the project.

32. *Project Management Units (PMU).* PMUs have been effective in India to coordinate and manage projects with a number of diverse components and with more than one participating line agencies and consulting firms. Well-performing PMUs include key staff on deputation from government agencies, strengthened by consultants for activities that are not common in these line agencies. These features have been incorporated in the project design.

6. Alternatives considered and reasons for rejection

33. An alternative considered was a project which focuses only on improving irrigation service delivery through infrastructure development. While this would have simplified project design, it would not have been possible to assure improvement in farm incomes associated with irrigation without complementary investments and efforts in agriculture, horticulture, and fisheries. Leaving these to a separate project or to other government programs has not worked well in the past since there was no coordinated effort to ensure maximization of development outcomes. Hence the decision to have a multi-disciplinary integrated approach.

C. IMPLEMENTATION

1. Partnership arrangements (if applicable)

34. None identified at the moment.

2. Institutional and implementation arrangements

35. The project will be implemented over a period of six years. The overall responsibility for the project management and coordination will rest with a State Project Management Unit and with District Project Management Units. The actual implementation of the day-to-day project activities will be carried out by staff of government departments, including the Department of Water Resources Investigation and Development, Department of Agriculture, Department of Food Processing Industries & Horticulture, and Department of Fisheries. The SPMU, DPMUs,

and departments will be supported by various consultants and NGOs, as needed. A technical steering committee will be established at state level, while at district level the project will be reviewed on a regular basis by a District Level Implementation Committee (DLIC).

36. The SPMU, headed by a senior government official as project director, will comprise a combination of seconded government staff and consultants. The government staff will include the project director, a senior officer from the State Accounts cadre and a team of engineers from DWRID. One of the Executive Engineers will be declared as the Drawing and Disbursement Officer (DDO) for the SPMU and will be supported by a dedicated Senior Divisional Accountant. There will also be (part-time) nodal officers of each of the three other line agencies involved in the project. Contractual staff will be recruited for the Fiduciary Unit (procurement and financial management), Safeguard Unit (social and environment), Agricultural Unit, Institutional Development Unit, Monitoring, Learning, and Evaluation Unit, and the General Management Unit. A consulting firm will provide all or most of the required contractual staff. The SPMU will be responsible for project planning and scheduling; coordination with other implementing partners; overall project budget control and financial management; quality assurance and control; monitoring of the project inputs, outputs, and outcomes; and providing timely and quality resources as well as technical assistance to DPMUs.

37. A total of 18 District Project Management Units will be established. The set-up of the DPMUs is very similar to the one of the SPMU, but there will be smaller multi-disciplinary teams, comprising a combination of key staff on secondment from government agencies, supplemented with qualified individually selected specialists, proposed to be recruited through a Human Resources recruitment agency. The teams will be led by one District Project Director (DPD) – Technical and one DPD – Administration. DPD (Technical) will be in the rank of Superintending Engineer of DWRID, holding this assignment as additional charge for two or three districts. DPD (Administration) will be in the rank of Additional District Magistrate of the Department of Personnel and Administrative Reforms. This person will be nominated by the District Magistrate, and will hold the function as additional charge. DPD (Administration) will be responsible for all communication with SPMU on day-to-day matters and reporting. A Technical Cell and Nodal Units of line departments will be staffed with government staff. Contractual staff will be recruited for the Fiduciary Cell, Agricultural Cell, Institutional Development Cell, Monitoring, Learning, and Evaluation Cell, which will also include safeguard staff, and a General Management Cell. DPMUs will also have a Consultant Coordinator to assist the DPDs with the day-to-day management of the project at district level. The DPMUs will be responsible for the implementation of district programs; overall achievement of physical and financial milestones; quality assurance; and working closely with communities to achieve the project development objective. It is expected that the DPMUs in the districts with smaller number of schemes do not have to operate for the entire project duration of six years. Based on an initial assessment three DPMUs may be abolished after three years and six DPMUs after four years, when all schemes in such districts have been constructed and WUAs have been trained. Nine DPMUs are expected to operate for the entire project duration. The continued need of DPMUs and their composition will be assessed on an annual basis by GoWB and the World Bank task team.

38. Activities related to agriculture, horticulture, and fisheries will be implemented primarily through the respective line departments with the coordination and integration function performed by agricultural experts in the SPMU and DPMUs. Funds will flow from the GoWB Finance Department to the SPMU through a budgetary allocation for the project as a line item under the DWRID budget. All project components and sub-components (including those which pertain to other departments like Agriculture, Food Processing Industries & Horticulture, and Fisheries) will be funded through the SPMU and DPMUs, and no funds will flow directly to the individual departments through their budget, which is a common practice in other Bank-financed irrigation projects as well.

39. It is estimated that about 4,660 minor irrigation schemes in 18 out of 19 districts of West Bengal will be constructed. The estimated number of proposed schemes ranges from a low of 31 in Howrah District to 1,030 in Jalpaiguri District. For most districts the number of schemes to be developed is less than 70 per district per year, which considering the decentralized level of engineering expertise down to block level and DWRID's experience with the development of minor irrigation schemes gained in the past is an acceptable number in most districts. Only two districts will have to develop between 150 and 200 schemes per year and the capacity of DWRID may be insufficient during peak periods. The project has therefore an allocation for the recruitment of engineering consultants to assist DWRID as needed with the investigation, design, and construction supervision of schemes. The project also has an allocation for the recruitment of a third-party construction supervision and quality assurance consulting firm to review the construction works at a randomly selected sample of schemes. The project will also finance a small Technical Unit attached to the SPMU to review the designs of especially surface flow irrigation systems with impoundments.

40. A Technical Steering Committee (TSC), chaired by the Chief Secretary, will be established at state level, comprising the Secretaries of Finance, DWRID, Agriculture, Food Processing Industries & Horticulture, and Fisheries, Engineer-in-Chief & Ex-Officio Secretary (EiC & EOS) of DWRID, as well as the Project Director of the SPMU, who will be the convener and secretary of the committee. The steering committee will review project progress every six months on average and provide strategic directions, guidance on policy matters, and will resolve conflicts, if any, amongst the implementing agencies. At the district level, the project will be reviewed at least once every quarter by a District Level Implementation Committee, chaired by the District Magistrate. The DPD (Administration) will serve as the secretary of the DLIC which will include the DPD (Technical) and have representatives from senior district level staff from involved departments, and on invitation basis, representatives of SOs, WUAs, etc. The DLIC will be the main forum for district level coordination of project activities with other ongoing government programs, approval of annual action plans, monitoring of project progress, redressing of grievances, and resolution of conflicts, if any, amongst the implementing partners.

41. At the scheme level, the focal point for organization and implementation will be the WUA to which all command area farmers will belong. Other water users, such as fishermen, may also be member of the WUA. It is noted that fishing will be feasible in selected tanks only, and that agricultural water use has preference. The WUA will be expected to play an active role in the scheme planning and supervision of works, and subsequent management, operation and maintenance of the system.

42. Support Organizations, recruited by the project through the SPMU, will facilitate community mobilization, participation, and institutional strengthening of the community-based institutions. It has been estimated that 12 SOs will be needed, as the requirements in some districts are low that can be covered by one SO per two to three districts, with the number of districts depending on the workload.

43. In each scheme, a SO will first of all work with the villagers to familiarize them with the project objective, expected outputs and outcomes, and the processes of implementation. It will engage with the community to objectively assess the willingness and preparedness to participate in the project. The SOs will then assist with the formation of WUAs. The SO will also facilitate the induction of fishermen into scheme development where opportunities exist. The SO, with technical support from line departments and DPMU staff, will work with the WUAs to prepare brief scheme development and management plans which will identify and prioritize desirable interventions as well as describe cost estimates and implementation plans. An SDMP will include: (i) cost estimates of construction works; (ii) identification of works that will be contracted out following agreed procurement procedures; (iii) proposed developments for field and horticulture crops, and fisheries, where applicable; (iv) as needed, plans to deal with social and environment safeguards; (v) assessment of training and capacity building needs; and (vi) estimates of annual MOM requirements. Once completed, the plan will be approved by the General Body of the WUA and submitted to DPMU for review, technical scrutiny, and consolidation, and ultimately, formal ratification by the DLIC.

44. The project will be implemented according to norms, rules, and procedures outlined in a Project Implementation Plan (PIP), laying out roles and responsibilities of different stakeholders and providing details of project activities, processes, and project cycle for different types of schemes. It incorporates experiences gained through implementation of other community projects in West Bengal as well as the outcomes of various preparatory workshops, studies, and analyses that were carried out as part of project preparation. The PIP will be subject to periodic reviews conducted jointly by GoWB and the Bank task team, with stakeholder participation at appropriate stages, to address any constraints to the successful implementation of the project.

45. The project implementing entities will adopt a disclosure policy in compliance with their duties under the Right to Information Act, both for on-demand information and *suo moto* disclosure. This will include development of a project website, a management information system, and a document management system. To the extent possible, all project related information will be electronically disseminated through the project website. The project will also establish an effective complaints handling system. At the district and village levels, oversight will be developed through social audits and public display of information.

3. Monitoring and evaluation of outcomes/results

46. A project monitoring, learning, and evaluation framework will be used to facilitate: (a) results-based management; (b) learning and process enhancement (through process monitoring by participatory methods, involving group self-ratings, reviews, score cards, satisfaction surveys, etc.); and (c) impact evaluation (involving use of appropriate baseline and controls).

47. The SPMU, through its dedicated MLE Unit, staffed as a minimum with one expert and one data analysis and documentation expert, will have overall responsibility for planning and coordinating MLE activities. The SPMU will coordinate MLE activities of the three sets of entities that will undertake the bulk of the data collection and analysis work: (i) the implementing departments at the state and district levels; (ii) an external M&E agency; and (iii) beneficiaries, primarily WUAs. The process of participatory MLE by beneficiaries will be facilitated by the SOs, by the external M&E agency, and SPMU/DPMU, as appropriate. The SPMU will have overall responsibility for developing systems and procedures for analysis and presentation of the collected data to ensure appropriate use of the indicators for project management, evaluation, and learning.

48. MLE activities will include: baseline studies; regular performance tracking of inputs and outputs by concerned implementing agencies; concurrent performance monitoring (on a sample basis) by external M&E agency; systematic ("panel data" type) analysis of project impacts through repeated monitoring of the same sample set of households through project lifetime; mid-term and final impact evaluations; and continuous participatory MLE by beneficiary groups at various levels. Reports from these MLE activities will be generated in agreed format according to a set schedule.

4. Sustainability

49. Sustainability is a core project principle and has been factored into project design through the following design features and measures.

50. *Institutional Sustainability.* WUAs will assume post-implementation MOM responsibility; WUA membership to be expanded to include important stakeholders like the fishing community, where feasible; WUA executive committee to be made a permanent elected body with a rotating membership; and as far as practicable line department staff will provide support services, thus facilitating farmers' linkages with institutions that remain beyond project closure.

51. *Financial Sustainability.* WUAs will collect irrigation service fees and use the same for MOM purposes; project interventions that enhance irrigation-based livelihoods will strengthen incentives to pay fees; training will be provided to WUAs on financial management; and project M&E indicators will monitor WUA maintenance of financial records.

52. *Technical Sustainability.* Training will be provided to WUAs to carry out routine MOM; scheme development and management plans will list activities to be carried out as part of routine MOM; and government will provide technical support services for several years after the construction of a scheme to enable WUAs to become capable to carry out MOM.

53. *Social and Environmental Sustainability.* Selected project activities (e.g. fisheries, employment opportunities during civil works, etc.) will aim at targeting the landless, tribal and other vulnerable groups; social development indicators will be embedded in the project MLE system; and safeguard action plans will reduce potential tension over negative project impacts.

54. *Monitoring and Evaluation.* A strong monitoring system will assist in monitoring sustainability of investments made under the project. Apart from regular monitoring, selected 'sustainability surveys' will be carried out at a number of irrigation schemes after the construction phase.

5. Critical risks and possible controversial aspects

Risks	Risk Mitigation Measures	Risk Rating with Mitigation
To project development objective		
Greater emphasis is placed on physical infrastructure development than on enhancement of community systems and capacities for better management of water resources and their more productive use.	Project design emphasizes centrality of better water management and use; SDMPs will explicitly link physical investments to better water management arrangements and livelihood development plans at the scheme level; extensive awareness and capacity-building efforts, at start-up and through implementation, aim to induce communities to take ownership of local water resource management and distribution issues; and multi-disciplinary implementation teams will aim to balance physical investments with social, environmental, and economic interventions.	M
MOM of schemes suffer because irrigation service fees collections are inadequate.	WUAs are empowered under the project to collect irrigation service fees and retain them for MOM purposes; project will emphasize through awareness and training sessions the importance of timely MOM and hence of fee collections, and the ultimate result of inadequate maintenance on the scheme's infrastructure and operation; project interventions that enhance irrigated agricultural production will strengthen incentive to pay irrigation service fees.	S
To component results		
Elite capture and entrenched interest groups prevent WUA from working fairly and equitably in interest of all members.	Awareness creation campaigns will be implemented to ensure that all water users understand the functioning of a WUA and the rights and responsibilities of members and WUA committees; a system of participatory M&E will be developed to enhance community-wide monitoring and benchmarking of WUA performance.	M
Delays in finalization of SDMPs due to inadequate capacity.	The necessary technical assistance, provided through field level departmental staff dedicated to the project as well as support organizations and consultants, will work on SDMPs in a timely manner; upfront training and capacity building will also be provided to concerned WUA members so that they can participate in a meaningful way in the preparation of the plans.	M
Construction deficiencies in execution of civil works in geographically scattered locations.	Continuous oversight of civil works by WUAs; DPMU staff to certify before any payments are made that works have been executed as per design and estimate; external monitoring and quality assurance through third-party construction supervision and quality assurance consultants.	M
Low adoption rate of new technologies and packages by farmers.	Project will support technology packages which are consistent with farmers' needs and skills, and with local market opportunities; adoption of technology packages will be backed up by project interventions strengthening input and output linkages; and support for technology adoption (through demonstrations) will be provided to farmers.	N
Coordination between line departments is weak or ineffective, adversely impacting	A District Level Implementation Committee will be constituted under chairmanship of the District Magistrate which will convene senior staff from relevant departments for planning and implementation of project activities. This will be backed up at the state level by the Technical	M

Risks	Risk Mitigation Measures	Risk Rating with Mitigation
implementation.	Steering Committee. This Committee will provide both strategic guidance and oversight, and the necessary higher-level push for effective line department coordination.	
Weaknesses at WUA level to maintain its accounts and report on use of funds.	The WUAs will not handle project funds. In order to build the financial management capacity at the WUA level for MOM, the project will arrange training programs in financial management for WUAs.	M
Weak procurement capacity of SPMU/DPMU.	Establishment of a dedicated procurement unit within the SPMU with staff having adequate experience and skills; regular training of departmental staff on Bank procurement procedures; use of compliance conditions derived from Bank's procurement guidelines and Standard Bidding Documents.	M
Low transparency in procurement decision making, inconsistent treatment of bidders, prevention of bidders from submitting bid documents, bid rigging, and delayed payments.	Disclosure of contract opportunities and bid documents on project website; bids to be accepted by post as well as in person within given time frame; bids to be opened on last day of bid submission and comparative statement of bids received to be prepared and signed by all tender committee members on same day; WUAs to be provided minutes of tender committee meetings; village level public display of updated information on contracts awarded, timely payments to be made, supported by required documents; compliance with Right to Information Act for *suo moto* disclosure as well as on-demand requests.	M
Overall risk rating		**M**

H-High, S-Substantial, M-Moderate, N-Negligible

6. Loan/credit conditions and covenants

55. There are no conditions envisaged for effectiveness of the Loan and the associated Credit. The key covenants applicable to project implementation include:

56. West Bengal shall:

(i) carry out implementation of the project in accordance with the Project Implementation Plan (PIP), the Governance and Accountability Action Plan (GAAP), the Scheme Development and Management Plans (SDMP), and the provisions of the Anti-Corruption Guidelines and shall not amend or waive any provision of the PIP, the GAAP, and the SDMPs without the Bank and the Association's prior written approval;

(ii) maintain, at all times during project implementation, a State Project Management Unit within DWRID's regular structure, with functions, responsibilities and resources acceptable to the Bank and the Association, including, inter alia, the responsibility of said unit to coordinate and monitor the carrying out of the project;

(iii) ensure that the State Project Management Unit is, at all times during project implementation, led by a project director who is assisted by adequate professional and administrative staff (including procurement, financial management, environmental, and social development specialists), in numbers and with experience

and qualifications acceptable to the Bank and the Association, operating under terms of reference satisfactory to the Bank and the Association;

(iv) maintain at all times during project implementation a District Level Implementation Committee, with responsibilities and functions satisfactory to the Bank and the Association, including, inter alia, overseeing project implementation at the district level and coordinating project implementation among participating government departments and other stakeholders;

(v) maintain at all times during project implementation District Project Management Units at the district level, led by a joint team comprising a superintendent engineer and an additional district magistrate, and assisted by adequate professional and administrative staff in numbers and with experience and qualifications acceptable to the Bank and the Association, operating under terms of reference satisfactory to the Bank and the Association;

(vi) prepare and furnish to the Bank and the Association for its review and approval by November 30 of each year until completion of the project, commencing on November 30, 2011, an annual work plan and budget for implementation of the project for the following fiscal year and thereafter carry out said annual plan taking into account the Bank and the Association's comments thereon;

(vii) through DWRID, carry out the project in accordance with the terms, conditions and procedures set forth in the Environmental Management Plan (EMP) (including related environmental codes of practice), Social Assessment (SA), and Tribal Development Plan (TDP), in a manner satisfactory to the Bank and the Association, and shall ensure that the EMP, SA, and TDP shall not be revised, repealed or abrogated without prior agreement with the Bank and the Association; and

(viii) ensure that the cumulative monthly incremental water abstraction range for surface water irrigation schemes to be implemented in the Atrai and Sankosh river basins does not exceed 5 percent of the total available monthly discharge throughout project implementation, consistent with the EMP.

D. APPRAISAL SUMMARY

1. Economic and financial analysis

NPV (economic) = Rs 5.4 Billion; ERR=25.1%; NPV (financial) = Rs 4.3 Billion; FRR=21.6%

57. The economic and financial analysis for the project is summarized in Annex 9. Major benefits that are quantified for the analysis include: (i) expected benefits from irrigated area expansion and intensification, as the project led investments in MI schemes will develop additional irrigated area of about 139,000 ha, with a cropping intensity of around 200 percent; (ii) benefits from 19 percent of the newly developed irrigation area getting diversified with high value crops; (iii) benefits from fisheries development in an estimated 1,270 ha of water spread

area; and (iv) benefits from the adoption of efficient resource use technologies covering 10 percent of the irrigated area.

58. Annual NPV (economic) is estimated at Rs 5.4 billion, contributed from multiple sources like irrigated area expansion and agriculture intensification (62 percent), diversification of crops and fisheries (18 percent), improved water management (8 percent), and drought mitigation (12 percent). Average incremental farm financial benefits realized across MI types is Rs 19,431 per small farm holding size of 0.63 ha on average. Rate of return analysis for the project as a whole revealed that irrigated area expansion alone produced an ERR of 13.5 percent, which goes up to 25.1 percent with the inclusion of benefits from other sources like diversification with crops and fisheries, and efficient water management. Financial rate of return for the project as a whole is 21.6 percent with a NPV of Rs 4.3 billion.

59. The sensitivity analysis considered key risk variables like reduced developed irrigated area, institutional inefficiencies, cost escalation, and implementation delays. Simulated ERR, by considering jointly 25 percent increase in costs and 25 percent decrease in benefits on the relevant risk variables, based on multiple runs, ranged from 12.7 to 22.6 percent with a coefficient of variation of 9 percent. Hence, the expected mean ERR, estimated by the risk model at 17.8 percent is considered reasonably stable, and in any case the project's ERR is not likely to fall below 12 percent as the probability of negative outcomes is predicted to be zero by the risk model.

60. The analysis examined the impact of incremental management, operation and maintenance cost on incremental farm revenues. The incremental MOM cost as share of incremental gross margin is higher (12 percent) for ground water schemes, which constitutes about 60 percent of total project area, than for surface irrigation schemes where it makes up around 10 percent of incremental gross margin per hectare. The incremental MOM cost constitutes a substantial part of the incremental gross margin for especially pumped dug well (27.5 percent) and shallow tube well (16.2 percent) schemes.

2. Technical

61. Development of minor irrigation systems is already widely practiced within DWRID and will not require significant revision of the design standards. However, hydrological assessment will be carried out for each surface irrigation system to ensure that it is feasible on hydrological considerations. The hydrological assessment will include water availability and quality assessment, and estimation of design flood using the protocols developed during project preparation under the hydrological studies carried out by consultants. Irrigation network design for surface flow schemes will be against 75 percent of dependability level of water availability as per Indian national guidelines. Irrigation systems that do not meet this criterion will not be included under the project. With respect to the distribution systems, care will be taken to ensure that the canal systems fully cover the intended command area, appropriate outlets are provided to farmers' fields, and requirements of equitable water distribution are met. Further details on technical issues are provided in Annex 4.

3. Fiduciary

Financial Management

62. A separate assessment of public financial management and accountability (PFMA) arrangements in the state of West Bengal has not been undertaken. However, findings of State Financial Accountability Assessments (SFAA) undertaken in several states (Orissa, Rajasthan, Karnataka, Uttar Pradesh, and Punjab) indicate the need for greater attention to issues of implementation. These conclusions are not likely to be very different for West Bengal, given that the overall PFMA framework is similar and largely determined at the central level.

63. For several reasons the state's financial position has deteriorated over the last decade, resulting in the need to resort to overdraft/ways and means advances. There is however, no evidence that this position of fiscal stress has resulted in delays in fund releases for externally assisted projects. GoWB legislated the Fiscal Reform and Budgetary Management Act in July 2010 and further amended the same in April 2011.

64. The project will be anchored within DWRID through its state and district offices. Financial management function arrangements will essentially remain centralized with DWRID and no project funds will be transferred to other participating line departments or user groups, including WUAs. WUAs will, however, be expected to participate in planning and implementation and assume responsibilities for MOM of the completed schemes. There is presently no generic institutional framework for the existing WUAs in the state (a proposed Act is in draft stage). Consequently, no standard rules for governance and accountability apply to the existing WUAs. Training programs will be arranged, particularly with respect to book keeping and record maintenance responsibilities during the MOM phase.

65. DWRID as a department of the GoWB follows the financial rules and procedures laid down in the West Bengal Financial Rules (WBFR), the West Bengal Public Works Department (WBPWD) Code (for the delegation of authority, etc.), and the Central Public Works Accounts Code (for accounting and reporting procedures). For all capital and maintenance works that have been budgeted for, funds are released by the Finance Department of GoWB, through the Letter of Credit (LoC) system, issued on a monthly or quarterly basis. This allows the Executive Engineer (EE) at the Divisions to issue Public Works (PW) cheques up to the limit allocated under the LoC. Each Division maintains its accounts and submits monthly accounts to the Accountant General's (AG) Office.

66. The guiding principles for designing the financial management arrangements for the project are to use the current DWRID financial management systems, which are considered satisfactory and meeting the essential fiduciary requirements. The project will be budgeted for as a separate line under Planned Demand for Grants in a manner that will allow for all project-related expenditures to be separately identified, accounted and reported in the consolidated Monthly Appropriation Report prepared by the AG of West Bengal. Details of expenditures by project components and sub-components will be tracked at the division level and updated information will be available both at the AG as well as the departmental level. Quarterly

consolidated project Interim Financial Reports (IFR) will be prepared by SPMU, tracking progress in expenditures by components and sub-components against the planned expenditures.

67. The financial management arrangements for the project have been documented in the form of a Financial Management (FM) manual. The manual describes the planning and budgeting, fund flows, internal controls, accounting, and reporting. The manual also documents the audit arrangements for the project. The prescribed audit arrangements include an annual statutory audit of the project financial statements to be conducted by the State Accountant General according to the standardized Terms of Reference (ToR) agreed upon between the Bank, DEA, and the Comptroller and Auditor General's (C&AG) Office.

68. The design of the financial management arrangements for the project envisages that disbursements will be made on the basis of quarterly IFRs. The back-to-back financing arrangements for externally assisted projects will apply to this project. The Bank will provide an initial advance to the GoI for the project which will be transferred by GoI to GoWB on a back-to back basis.

69. Overall project financial management risk is rated as Moderate. Financial management arrangements are described in detail in Annex 7.

Procurement

70. The SPMU will have responsibility for bulk procurement of especially equipment and certain consultancies. DPMUs will be responsible for the coordination and review of procurement of all civil works, goods, and services for activities that relate to a specific district. The actual procurement of civil works, etc. will be the responsibility of engineers of DWRID.

71. For procurement under the project, the project authorities have developed a Procurement Manual. All procurement under the project will be handled as per the provisions of this manual. The manual requires that procurement of all goods, works, and services will be carried out in accordance with the World Bank's "Guidelines: Procurement Under IBRD Loans and IDA Credits" dated January 2011 and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated January 2011 and the provisions stipulated in the legal agreements.

72. Most procurement activities at the district level will be for a large number of small value contracts for works and to a lesser extent goods. Some procurement at SPMU may be larger, using NCB methods, and will also involve selection of consultants for engineering, M&E, etc. For each contract to be financed by the Loan/Credit, the different procurement methods or consultant selection methods, estimated costs, and time frame are agreed between the Borrower and the Bank in the Procurement Plan. The Procurement Plan will be updated annually or as required to reflect the actual project implementation needs.

73. Overall project procurement risk is rated as Substantial, which with proposed mitigation measures may be brought down to Moderate. Procurement Arrangements are more elaborately discussed in Annex 8.

4. Social

74. The project aims at mobilizing local communities dependent on agriculture for their livelihood to participate in the development of irrigation systems and their subsequent MOM. The communities are quite diverse in many ways – social (scheduled castes, others), economic (landless, small, marginal, and large farmers), ethnic (scheduled tribe, others), and occupational (farmers, fishermen, livestock owners). This diversity makes mobilization a challenging task, demanding multi-pronged support and interventions. Taking this into account, the Social Assessment (SA) conducted as part of project preparation identified the following key social development issues/principles which should underpin the project's strategy and implementation: (i) participation; (ii) inclusion and equity; (iii) decentralization; and (iv) human and institutional development. Two issues are given particular attention, namely land acquisition and tribal population, while gender issues are covered as well.

75. *Land Acquisition.* As almost all schemes are small the requirement for land is minimal. The SA study indicates that land requirement arises for three purposes: (i) source works, mainly headworks and pump houses; (ii) spouts, which are outlets for regulating water distribution; and (iii) distribution system, mainly field channels for transmitting water to the plots. A spout is a small regulatory chamber requiring at the most an area of about 1.5 sq. m. Farmers actually prefer to have a spout in their plot as it provides them an advantage in securing water. No lands need to be involuntary acquired for a spout as not only the requirement is very small, but also that it is demanded highly by the farmers. The extent of land required for source works depends on the type and size of the scheme, but at the maximum it will require about 150 sq. m. The requirement for field channels is also small. In most instances it may not be necessary that land has to be acquired, as typically there will be enough flexibility available for the choice of land. Given that the requirement for land is normally very small, in those cases where private land is required it can be secured on a voluntary basis, through donations. Thus, there is no need for involuntary land acquisition under the project. In order to make the process of voluntary land donations transparent, a number of rules will be adopted (see Annex 10 for details), while there will be documentation of the process.

76. *Tribal Population.* West Bengal has a significant tribal population, and about 6 percent of the total population, or about 4.5 million people, are categorized as Scheduled Tribes (ST). There are 38 notified STs in the state, including the Santal that represents more than half of the total ST population of the state. The districts having significant tribal population in the state are: (i) West Medinapur; (ii) Purulia; (iii) Dakshin Dinajpur; (iv) Malda; (v) Jalpaiguri; (vi) Birbhum; and (vii) Burdwan. The tribal populations live predominantly in the rural areas and their social, cultural, economic, political, and historical characteristics induce vulnerability.

77. While the project interventions will not adversely affect the tribals, these groups do require special attention from the viewpoint of ensuring inclusion and equity. Hence, to ensure their inclusion, specific targeting is essential. Against this context, in accordance with the Bank's OP 4.10, a Tribal Development Plan was prepared with the following objectives: (i) ensuring inclusion through selective targeting/prioritization; and (ii) establishing anew or strengthening the existing tribal institutions to undertake irrigated agriculture.

78. *Gender*. It is recognized that rural women are involved in and contribute to over 60 percent of the farming operations in irrigated agriculture. The SA has recommended that interventions be designed to increase women's participation in decision making. For this, specific roles, tasks, and functions of women have been identified, including operating and maintaining irrigation systems. Thus project interventions are to recognize women participation in the agricultural economy, for which the following measures will be adopted:

- Efforts will be made at developing a cadre of women extension workers from among the local farming communities;
- Capacity building of self help groups (SHG) and NGOs will be undertaken to be able to conduct gender analysis and identify opportunities for enhanced interventions; and
- All governance and executive bodies of the project will aim at having a quarter or more of the members as women.

79. A gender audit will be undertaken during the mid-term review (MTR) in order to evince a feedback and chalk out mid-course corrections, as appropriate.

5. Environment

80. The Environmental Category for ADMIP is A (Full Assessment). An environmental assessment (EA) was undertaken during project preparation to determine the potential impacts of project interventions. The EA assessed the baseline conditions in the project area in relation to the existence of potential sensitive receptors, such as the natural habitats, sacred groves, culturally important water bodies, etc. Possible project interventions were studied to assess the potential for impacting each of these sensitive receptors. The major sources of potential negative impacts include construction activities impacting flora; stream or riverside construction accelerating erosion of stream banks; increasing command areas resulting in conversion of unprotected natural habitats and wildlife corridors; lack of drainage, salinity increase, and health impacts of inundation; enhanced use of chemical and synthetic fertilizers and pesticides; and possibility of using industrial wastewater for irrigation in urban fringes. The EA analyzed the ground water use profiles and suggested ways to minimize unsustainable ground water extraction, where relevant. The EA also assessed the need to ensure safety of the small tanks to be created by the project. The project has developed an Environmental Management Plan (EMP) that incorporates the key findings of the EA. The EMP contains a set of procedures for environmental management that will be used during implementation, including specimen EMPs and environmental codes of practice. A full-time Safeguard Unit in the SPMU and designated engineers and environmental specialists at each of the DPMUs will coordinate and ensure that environmental safeguard measures are adequately addressed and mainstreamed during project implementation.

81. The project's environmental screening and exclusion processes will ensure that no direct or indirect impact occurs on any forest or on any natural habitat, protected or not, such as wetlands, elephant corridors, mangroves, and community forests. Similarly, these will ensure that there will be no impact on physical cultural resources. There is adequate provision in the EMP that any enhancement measure, if feasible, will be undertaken if schemes are situated within a reasonable distance from local cultural resources valued by the communities.

82. Although the project is not expected to construct any dam higher than 15 meters, about 117 surface schemes in three districts will include the construction of a bund (small dam). These will require due diligence to ensure safety of the dams. All structures will be engineered, based on typical design standards and guidelines already adopted in the state. The design of each of the small dams will be certified by an Executive Engineer of DWRID to ensure it is compliant with the safety guidelines, and will be checked and verified by a qualified design engineer at the SPMU with experience of implementing safety norms during design and construction of dams. Quality control procedures during construction will include regular supervision of the dams and appurtenances, adequately recorded by site engineers and DPMU, and periodic inspection and reviews by SPMU engineers. The concerned district-level Executive Engineer will issue completion certificates only after verification that safety norms have been appropriately implemented by contractors.

83. The major issues related to incremental water use, direct and indirect impacts on water quality, the issue of downstream flow, specifically in case of river lift irrigation schemes, were analyzed, and the mitigation measures include: (a) avoidance of areas where ground water extraction is already critical or semi-critical; (b) avoidance of areas where ground water is contaminated with arsenic and/or fluoride; (c) specific screening to ensure that any water unfit for irrigation, particularly affected by industrial effluent, is not used in the project; (d) maintaining safe limits related to ground water abstraction and for overall incremental abstraction of water; (e) maintaining at least 50 percent of the peak agriculture season instream flow in small rivers and local streams used for the project to ensure that downstream villages are not impacted; and (f) a series of activities aimed to improve pest management in the state, including discouraging use of WHO Class 1B and Class 2 pesticides, encouraging organic farming, supporting production and entrepreneurship development in supplying bio-fertilizers and bio-pesticides, and a “bio-village” program to be implemented in up to 50 villages in different agro-climatic zones in the state.

84. Other than the Ganga, there are eight sub-basins that can be classified as international waterways shared among Bangladesh, Bhutan, and India. Water-sharing on the Ganga between Bangladesh and India is covered by a specific treaty, and the project will have no effect on the provisions of the treaty. By letters dated September 23, 2010, the Bank carried out the riparian notifications on behalf of India, to the riparian countries of Bangladesh, Bhutan, and Myanmar. The ADMIP activities include proposed investments in the river basins of the Teesta, Sankosh, Raidak, Torsa, Jaldhaka, Punarbhanda, Atrai, and 24-Parganas. The northern rivers are tributaries of the Brahmaputra River in Bangladesh. Part of the river system of 24-Parganas in southern West Bengal forms the border with Bangladesh and flows into the Bay of Bengal. The notifications included information on the potentially affected rivers, based on information obtained from DWRID, including their total monthly and annual discharge at 75 percent probability, i.e. the discharge expected on average 3 out of 4 years, the incremental abstraction expected under the project, based on the estimated number of schemes, and the abstraction as percentage of monthly and annual discharge.

85. For the eight rivers the incremental abstraction for the proposed schemes is negligible compared to the available flow, with the exception of two river systems (Atrai and Sankosh). To avoid any potential impacts on riparian countries, the Government of West Bengal will cap the

total number of schemes in these two sub-basins such that the total incremental abstraction is kept below five percent of the available monthly flow. Further, no schemes will be taken up in any of the estimated 48 small local rivers or rivulets flowing directly into Bangladesh, so as to avoid any impacts on downstream villages. The project will not install any shallow, medium-duty, or heavy-duty tube well within 600m, 800m, and 1000m, respectively, of the India-Bangladesh border.

86. The Bank received from Bangladesh a response to the riparian notification, requesting for water sharing agreements before the project can be implemented. The task team, however, concluded that the incremental water abstraction caused by the project will be a small percentage of the available river volume and the proposed investments are not expected to adversely affect either the quality or quantity of any of the water flows or otherwise result in appreciable harm to Bangladesh or any of the riparians. As per BP 7.50, concurrence from the Regional Vice President (RVP) was sought to proceed with the project as designed, as Bangladesh's response was not of a technical nature nor would any appreciable harm result. RVP's approval was received on July 21, 2011.

87. Overall, the environmental impact of the project is low to moderate, unless the environmental safeguard measures are ignored. The EMP includes a detailed environmental monitoring plan, which includes compliance monitoring, as well as indicator-based monitoring of impacts.

88. The SA and EA consultants held discussions with local communities and other stakeholders and informed them about the project and its likely impacts, both positive and negative. Regional and local level consultations were held with stakeholders (WUAs, NGOs, Panchayat Raj Institutions, representatives of line departments, and others) to discuss various technical, social, and environment aspects of the project, including the associated adverse impacts and possible mitigation measures. Feedback from these consultations provided inputs into the project design, including the project's EMP. The process of stakeholders' consultations will continue during project implementation when preparing and implementing the SDMPs and associated mitigation plans.

89. All environmental and social reports as well as the tribal development plan have been disclosed in the Project website [www.wbadmip.org] on December 9, 2010. The full EA and SA reports and their Executive Summary were disclosed at all 18 district headquarters in the State, where the project will be implemented. The availability of these documents and the location of the disclosure centers were advertized in local newspapers (leading English and Bengali dailies) between December 24 and 27, 2010. A complete set of the documents was also disclosed in the Bank's Info Shop in Washington DC on April 21, 2011. Finally, the summary reports have been distributed to the Bank's Board of Executive Directors on May 27, 2011.

6. Safeguard policies

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP 4.01)	[X]	[ ]
Natural Habitats (OP/BP 4.04)	[ ]	[X]
Pest Management (OP 4.09)	[X]	[ ]
Physical Cultural Resources (OP/BP 4.11)	[X]	[ ]
Involuntary Resettlement (OP/BP 4.12)	[ ]	[X]
Indigenous Peoples (OP/BP 4.10)	[X]	[ ]
Forests (OP/BP 4.36)	[ ]	[X]
Safety of Dams (OP/BP 4.37)	[X]	[ ]
Projects in Disputed Areas (OP/BP 7.60)*	[ ]	[X]
Projects on International Waterways (OP/BP 7.50)	[X]	[ ]

7. Policy Exceptions and Readiness

90. No policy exceptions are sought.

91. Elements of project readiness include:

- A multi-disciplinary team in the State Project Management Unit is mostly in place;
- Organizational and staffing arrangements at the state and district level have been confirmed by GoWB;
- The Procurement Plan for the first eighteen months of the project has been prepared;
- The Project Implementation Plan and construction quality assurance manual have been prepared, providing detailed operational guidelines for implementation of the project; and
- About 400 schemes are expected to be ready for construction by December 2011, at the start of the construction season.

* *By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas*

Annex 1: Country and Sector or Program Background

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

State Background

92. Located on India's east coast, West Bengal comprises about three percent of India's land mass and eight percent of the population with a population density of 904 per sq. km, one of the highest in India. The majority of the population lives in rural areas, most of whom are dependent on agriculture in some way or other for their livelihood. Despite its rich technological past and pool of skilled and semi-skilled work force resources, West Bengal over the years has become one of the country's less developed states. According to current available information, over 25 percent of the state's population lies below the poverty line compared to the national average of 21.8 percent. These people are primarily belonging to the rural agricultural sector. The main constraints to alleviation of their poverty are small land holdings and uncertainties of rainfall, including periodic occurrence of long dry spells and cyclones and floods during the monsoon season. Agriculture is hardly possible during the non-monsoon season unless adequate irrigation facilities have been installed.

93. The World Bank has not been a regular partner in the development efforts of West Bengal during the past few decades. However, in the agriculture sector the most recent project supported by the World Bank dates back to the 1980s when a Minor Irrigation Project based on ground water exploitation was taken up. At that time, the Minor Irrigation Department of the Government of West Bengal (later renamed as Department of Water Resources Investigation and Development) was responsible for the implementation of the project.

Sector Issues

94. Agriculture accounts for about 20 percent of the state GDP and provides employment to about 55 percent of workers in the state. Since agriculture is the backbone of the rural economy, it is evident that broad-based rural growth and reduction of poverty cannot be achieved without increasing the income generating potential of the agriculture sector. Boosting agricultural growth and reduction of rural poverty are high on the agenda of the Government of West Bengal. Agricultural growth over the past decade was on average about three percent per annum. At least maintaining this growth rate would be required to support broad-based rural growth and reduction of poverty. There are issues, however, related to the land holdings, which are very small, with over 93 percent of the land holders belong to small and marginal farmer categories. Consequently, it is becoming increasingly difficult to maintain the growth rate unless adequate infrastructure and agricultural support services can be provided.

95. Average productivity levels are low in comparison to that of advanced agricultural states in the country. This leaves room for enhancement of productivity, provided that timely supply of all inputs and supply of adequate irrigation water can be assured. The absence of especially assured irrigation supplies inhibits the use of improved seeds, fertilizers, and other complementary inputs, which in turn affects production levels. Average per hectare yield of paddy (which accounts for more than half the annual cultivated area in the state) is about 70

percent of the India average and less than half of what is obtained in more advanced agricultural states. An important reason behind the low productivity is that large cultivated areas are still rainfed and exposed to weather fluctuations. Given the importance of irrigated agriculture for increasing agricultural growth and providing rural employment round the year, GoWB attaches high priority to expanding irrigation facilities in the state and optimizing utilization of available water resources.

96. West Bengal is relatively rich in water resources, with three major river systems, the Ganga, the Brahmaputra, and the Subarnarekha. Use of surface water is rather low as the state has created very little storage, and the potential to create major storage is limited. The state is also relatively richer compared to other major Indian states in terms of ground water, with assessed ground water resources in the state of 27.4 billion cubic meter. From the total annual net replenishment of ground water, the state currently uses about 42 percent, so there is a large untapped potential.

97. Except for some pilot projects in the eighties, all minor schemes developed until 1990 were and are still maintained by the government through DWRID that has sole responsibility for the development of minor irrigation schemes. From 1990 onwards, based on a Government Order, all schemes that were developed by DWRID have been transferred to the users that had to form a water users association. As per GO, the WUA is responsible for management, operation, and maintenance, as well as future capital investments. The WUA has the right to charge irrigation service fees that can be kept with the WUA. After the handing over, DWRID staff provides some technical advice to the WUAs, but otherwise has no major responsibilities anymore. GoWB intends to increase the development of unused water sources for agriculture, keeping in view the need of other competing sectors such as domestic and industrial water supply and environment. The aim is to increase agricultural production and livelihoods by providing assured irrigation facilities to selected areas, by empowering WUAs to take charge of the MOM of the schemes, and by providing appropriate agricultural support systems.

Strengthening Irrigation Management Transfer

98. West Bengal is a pioneer in decentralization, and the Panchayati Raj movement, or decentralized local self government, in West Bengal has been very active for more than 30 years already. As a result, the Panchayats get involved in all developmental works in the rural areas, and this applies to a certain extent for minor irrigation development as well, where there is involvement with the election of executive committee members for users groups. WUAs are currently established based on the DWRID Order, with registration commonly under the Societies Act. The user organizations mainly restricts their activities at the moment to operation of pumps and distribution of water according to demand. These organizations are yet to play a more meaningful role in management of resources, conflict resolution, collection and retention of irrigation service fees, and maintenance of books of accounts.

99. GoWB has appreciated the need for legally empowering the water user organizations through a specific legislation, and is now in the process of drafting a specific WUA Act. Even in the absence of such Act, political and administrative commitment to the WUA approach is strong in West Bengal as the concept of decentralization has already taken deep root in the state. There

is therefore sufficient basis to start the implementation of the project with the full and active participation of WUAs, and provision of the requisite training and support to these WUAs.

Improving Cost Recovery

100. There has been marked improvement in recent years in the collection of service fees from irrigation schemes, with estimates that collection exceeds now 90 percent. The improvement in collection follows a concerted effort by the state government to improve cost recovery in the agricultural sector. For schemes constructed under the project, GoWB will transfer the responsibility of levying and collecting service fees to the WUAs, thereby providing an incentive to further improve fee collection which would be used by WUAs for scheme MOM purposes.

Annex 2: Major Related Projects Financed by the Bank and/or other Agencies

INDIA: West Bengal Accelerated Development of Minor Irrigation

Project Name	Approval date	Status	Loan Size (US$M)	Project Summary	Related sector issues	IP Rating	DO Rating	OED rating (completed project)
Orissa Community Tanks Management Project	September 30, 2008	Active	90	For selected tank based producers to improve agricultural productivity and for water user associations to manage tanks effectively.	Rehabilitation of degraded tank systems, stakeholder participation, integration of water and agricultural services delivery.	MU	MS	
Andhra Pradesh Community Based Tanks Management Project	April 19, 2007	Active	189	For selected tank based producers to improve agricultural productivity and for water user associations to manage tanks effectively.	Rehabilitation of degraded tank systems, stakeholder participation, integration of water and agricultural services delivery.	MS	S	
Tamil Nadu Irrigated Agriculture Modernization and Water Bodies Restoration and Management Project	January 23, 2007	Active	485	For selected sub-basin stakeholders to increase irrigation productivity in an integrated water resources management framework.	Rehabilitation of irrigation canal systems, restoration and revival of tank systems, integration of water and agricultural services delivery.	MS	S	

Project Name	Approval date	Status	Loan Size (US$M)	Project Summary	Related sector issues	IP Rating	DO Rating	OED rating (completed project)
Maharashtra Water Sector Improvement Project	23, 2005	Active	325	To strengthen the state's capacity for sustainable management of water resources and improve irrigation service delivery and productivity.	Addressing both irrigated agriculture performance and water resources management.	S	MS	
Assam Agricultural Competitiveness Project	November 12, 2004	Active	154	To increase the productivity and market access of targeted farmers and communities.	Lack of capital in farm and rural communities for productivity investments, inadequate market linkage, poor rural road networks.	S	S	
Karnataka Community Based Tank Management Project	25 April 2002	Active	98.9	To improve rural livelihoods and reduce poverty through community based tank irrigation. Strengthen community-based institutions and improve tank systems, including physical interventions, training and on-farm demonstrations.	Rehabilitation of degraded tank systems, stakeholder participation.	MS	MS	

S-Satisfactory, MS-Moderately Satisfactory, MU- Moderately Unsatisfactory.

Annex 3: Results Framework and Monitoring

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

I. Result Framework

PDO	Project Outcome Indicators	Use of Project Outcome Indicators
The project development objective is to enhance agricultural production of small and marginal farmers in the project area. This will be achieved through accelerated development of minor irrigation schemes, strengthening community-based irrigation management, and support to agricultural development, including provision of agricultural services, encouraging crop diversification and use of new technologies, and creating income generating opportunities.	• Increase in yield of main agricultural crops (rice, oil seeds, vegetables; measured in MT/ha); • Operational water users associations created (IDA core indicator; measured in number); • Resources generated by user groups to manage, operate, and maintain the developed schemes (as percentage of required resources); • Number of female and male water users (defined as member of the WUA) provided with water delivery services (IDA core indicator): (i) number of female water users; and (ii) number of male water users; and (iii) the percentage of female WUA executive committee members.	YRI - YR3: checks balance in project design between physical investments and social and economic interventions. Also will determine if project strategy needs to be adjusted.
Intermediate Outcome	**Intermediate Outcome Indicators**	**Use of Intermediate Outcome Indicators**
Outcome 1: Improved effectiveness and financial viability of irrigation water management by WUAs.	• WUAs holding regular General Body meetings (measured in percentage); • WUAs maintaining appropriate cash books and water regulation registers (measured in percentage).	YR1 - YR3: Low percentages suggest possible weaknesses in mobilization and training. YR4 - YR5: continued low percentages have implications for sustainability.
Outcome 2: Minor irrigation systems constructed and made operational as per requirements and project design.	• Area provided with irrigation services (measured in ha).	YR2 - YR5: Low areas suggest problems in planning and implementation of minor irrigation schemes.

Intermediate Outcome	Intermediate Outcome Indicators	Use of Intermediate Outcome Indicators
Outcome 3: Scheme-based producers adopt better production techniques.	• Farmers in project area adopting improved production techniques (measured in percentage); • Area under system of rice intensification (SRI) cultivation in scheme commands (measured in ha).	YR1 - YR3: Low percentages or numbers suggest problems with mobilization of producer groups, formulation of locally relevant plans, and appropriateness of technology/livelihood support packages promoted. YR4 - YR5: Continuing low percentages or numbers have implications for sustainability as there are likely other over-riding constraints, such as riskiness or access to suitable finance.

II. Arrangements for Results Monitoring

101. A project monitoring, learning, and evaluation framework has been designed to facilitate: (a) results-based management through timely monitoring, analysis, and feedback of relevant indicators; (b) learning for process enhancement, through a mix of participatory assessments, self-ratings and reviews, and special thematic studies; and (c) impact evaluation, through measurement of specific performance indicators, including use of appropriate baseline and controls.

Institutional Arrangements

102. The SPMU, through its dedicated MLE unit, comprising as a minimum one MLE expert and one data analysis and documentation expert as professional staff, will have overall responsibility for planning and coordinating MLE activities. In this role, the SPMU will coordinate MLE activities of the three sets of entities that will undertake the bulk of the data collection and analysis work: (i) the implementing departmental agencies at the state and district levels; (ii) an external M&E agency; and (iii) beneficiaries, primarily WUAs. The process of participatory MLE by beneficiaries will be facilitated by local SOs, and by the external agency, and SPMU/DPMU, as appropriate. The SPMU will have overall responsibility for developing systems and procedures for appropriate analysis and presentation of the collected MLE data (including participatory MLE data) to ensure their use for project monitoring, management, learning, and beneficiary capacity building.

Data Collection

103. Implementing agencies (line departments, field level project staff, service providers contracted by the project) will be responsible for collecting and reporting information on physical and financial input and output indicators as part of their regular implementation work.

This data will be fed into and assimilated by a computerized Management Information System which will be set-up and managed by the SPMU. The MIS will be designed to help consolidate, analyze, and use the data for management feedback at different levels, from scheme level to block, district, and project levels.

104. The external M&E agency will collect primary data about project implementation and impact through four types of data collection exercises: (i) baseline survey; (ii) special monitoring of implementation progress studies on relevant themes and in a format agreed in advance with the SPMU; (iii) outcome-focused impact evaluations, especially at Mid-Term Evaluation and Final Evaluation; and (iv) systematic ('panel data' type) evaluation of project impacts through repeated monitoring of the same sample set of households from the beginning to the end of the project. For each data collection exercise, information will also be collected from appropriate "control" or reference sites in order to help assess the incremental impact of project interventions vis-a-vis generic growth influences over time.

105. A complementary set of information on quality and effectiveness of implementation processes and on project impacts, from the beneficiaries' point of view, will be gathered through a structured process of participatory MLE. Project interventions at the field level will be primarily group-based (through e.g. WUAs, fishermen cooperative societies, and farmers' producer groups). As part of their implementation experience, each group will provide feedback on themes and through media and format understood and agreed in advance on their participatory experiences. The facilitating SO or implementing agency will record these self-assessments as well as quantified participatory assessments, and feed them into the overall project MLE system. The information will be monitored and used by project management at district and other relevant levels for improving: (i) effectiveness of project interventions and processes with regard to the communities; and (ii) management and capacity building of the communities themselves.

106. Government departments already regularly collect and report data on some of the indicators used in the project results framework. However, the administrative area units over which the information is collated and reported are larger than the scheme area units where project interventions are focused. Hence, since the data available from government sources includes both project and non-project areas (and typically over a larger scale), these numbers are not directly usable for project monitoring, management, and impact evaluation. However, in appropriate context, the official statistics will be used to "triangulate" output and productivity information, as well as to generate general information about the "without project situation" (the project MLE system will also directly monitor specific "control sites" for this purpose).

Data Reporting and Use

107. The focus of the project's MLE system is to enable appropriate oversight and management, self-learning by project staff and beneficiaries, and full evaluation of project experience. Management action at various levels will be guided by the following reports: (i) district-level monthly MIS reports on the status of implementation activities collated and produced by DPMUs; (ii) regular reports by external M&E agency on its concurrent monitoring activities; (iii) six-monthly consolidated reports produced by DPMU at district levels and by SPMU at the project level - these will form an important basis for the six monthly performance

review to be undertaken jointly by the Bank and GoWB; (iv) consolidated mid-term implementation report by SPMU and mid-term impact assessment report by the external agency, which will form the basis of the Mid-Term Review to be undertaken by the Bank and GoWB around March 2014; and (v) consolidated project implementation and assessment report by SPMU and overall project evaluation report by external agency at project completion, to be used for the preparation of the project Implementation Completion Report (ICR).

108. The six-monthly report submitted by SPMU to the Bank will include, inter alia: (a) up-to-date physical and financial expenditure data compared to annual and end-of-project targets; (b) updated indicators of project performance compared to annual and end-of-project targets; (c) successes and problems encountered during the reporting period with suggested remedial actions; and (d) socio-economic and environmental impacts of the project.

Learning and Knowledge Management

109. The SPMU in collaboration with DPMUs and concerned departments will organize experience sharing and exposure visits for beneficiary groups and implementing agencies. The SPMU will also use available media (e.g. video conferencing, teleconferencing) to organize discussions and communicate experiences on how implementation is facilitated and how topical issues are addressed by different units.

110. The project will have a dedicated website where all relevant information and data will be posted for a wider audience. The website will be designed to serve as a one-stop information place with user friendly features on different aspects of the project. It will be updated regularly to make the information as current as possible. Updating and managing the information flow shall be the responsibility of the MLE Unit under the SPMU. The website will also have a mechanism to handle feedback from the audience. Other mechanisms of feedback will be used as well, including mail and phone.

Capacities

111. Some local capacity regarding awareness, understanding, and use of MLE exists, and the project will seek to build upon this, in order to ensure availability of adequate expertise as well as methodologies and instruments for data collection and analysis. The SPMU, through help of a specialized consultant, will develop a standardized format for data collection and reporting, with special attention paid to user friendliness and capacity for the collected data to be integrated into a project-wide MIS. Second, basic training in data collection and reporting will be provided to all field level implementation staff, with repeater trainings on special themes as necessary.

III. Outcome Indicators and Targets

Outcome Indicators	Baseline	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Frequency of Reporting	Data Collection Instruments	Responsibility for Data Collection
• Increase in yield of main agricultural crops (rice, oil seeds, vegetables, measured in MT/ha, with increases starting two years from the year of construction; values shown are for first year schemes);							Annual	Survey	DPMUs and External M&E Agency
○ Rice	2.9	2.9	3.0	3.5	4.0	4.2			
○ Oil seeds	0.4	0.4	0.5	0.7	0.8	0.9			
○ Vegetables	10.3	10.3	11.0	12.5	14.0	15.2			
• Operational water users associations created (cumulative, measured in number);	0	0	500	2,000	3500	4,200			
• Resources generated by user groups to manage, operate, and maintain the developed schemes (as percentage of required resources, starting the	0	50	75	90	90	90			

Outcome Indicators	Baseline	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Frequency of Reporting	Data Collection Instruments	Responsibility for Data Collection
year after completion of construction; percentages shown are for first year schemes); • Number of female and male water users (defined as member of the WUA) provided with water delivery services: (i) number of female water users; (ii) number of male water users; (iii) the percentage of female WUA executive committee members.	0 0 0	5,000 20,000 5	10,000 40,000 10	20,000 80,000 20	28,000 130,000 25	30,000 136,000 25			
Results Indicators for Each Component									
Component A									
• WUAs holding regular General Body meetings (percentage)	0%		40%	60%	80%	80%	Annual	WUA records	SPMU, DPMUs, WUA through participatory M&E
• WUAs maintaining appropriate cash books and water regulation registers (percentage)	0%		40%	60%	70%	80%	Annual	WUA records	SPMU, DPMUs, WUA through participatory

Outcome Indicators	Baseline	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Frequency of Reporting	Data Collection Instruments	Responsibility for Data Collection
									M&E
Component B									
• Area provided with irrigation services (ha)	0		20,000	50,000	110,000	139,000	Semi-Annual	Implemen-tation Records, Survey	SPMU, DPMUs, External M&E Agency
Component C									
• farmers in project area adopting improved production techniques	0%		15%	20%	30%	40%	Annual	Implementa-tion records, Surveys	SPMU, DPMUs, External Agency
• Area under SRI cultivation in scheme commands (ha)	0		0	7,000	15,000	20,000	Annual	Implementa-tion records, Surveys	SPMU, DPMUs, External Agency

Annex 4: Detailed Project Description

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

112. The key principles underlying project design are:

- A decentralized setting where the irrigation scheme beneficiaries play an active role in planning, managing, and sustaining project interventions;
- The scheme design and implementation activities meet desired technical quality and safety standards, and pay adequate attention to social, environmental, and fiduciary considerations; and
- Access to better agricultural technologies and practices for agricultural producers is as important as improving access to water for improving agricultural production and farmer incomes.

113. **Component A. Institutional Strengthening (US$8.1 million).** The component will enable community-based institutions, especially Water User Associations, assume greater responsibility for irrigation system management and improvement of irrigation scheme based livelihoods. Activities to be financed under this component include: (i) formation and capacity building of community-based institutions; (ii) services of Support Organizations to assist with community mobilization and capacity building of community-based institutions; (iii) workshops, exposure visits, and capacity building for project staff and other relevant functionaries; and (iv) training of staff of DWRID to be better able to provide long-term support to and monitoring of WUAs.

114. The component will mainly focus on WUAs and enable them to assume responsibilities for management, operation, and maintenance of the minor irrigation schemes to be constructed under the project. The development of WUAs will be achieved by their formation and strengthening through various training and support activities. DWRID, through SPMU, will recruit Support Organizations to assist with the formation of WUAs and with training and support during and after scheme construction. The SOs will also provide assistance with the preparation, implementation, and monitoring of brief Scheme Development and Management Plans that will spell out the proposed developments and responsibilities at each scheme. It is expected that 12 SOs will be hired, as districts with few schemes will be combined.

115. The support to WUAs will mainly focus on training and capacity building in key areas such as preparation and implementation of MOM plans; setting and collection of irrigation service fees; maintenance of records and accounts; improved and equitable water-sharing and utilization; and participatory monitoring, learning and evaluation. Special studies will be carried out by consultants to assess the WUA development program and learn lessons and best practices. These in turn will be shared with SOs so that they can improve their performance, as needed. The results of the studies will also be used to train staff of DWRID so that they can eventually carry out monitoring of WUAs and provide support, as needed, to ensure the WUAs' long-term sustainability.

116. The project proposes to focus on gender issues through awareness creation and training. There will be specific focus on encouraging female plot holders to take up WUA executive committee positions and avoidance of exclusion by women in the running of WUAs. Targeted training for women will be provided under the project to train them in effective committee membership and in technical subjects related to good irrigation and agricultural practices.

117. **Component B. Irrigation System Development (US$235 million).** The component will improve availability of water for agriculture, and where feasible for fisheries, by developing new minor surface and ground water irrigation schemes. The activities will include construction of about 2,400 minor surface water irrigation systems (command area varying from 5 to 50 ha), comprising river lift schemes, gravity-fed schemes, and detention structures, and construction of about 2,260 minor ground water irrigation schemes (command areas varying from 20 to 36 ha), comprising shallow tube wells, light and medium duty tube wells, and pump dug wells (see summary table at the end of this Annex). Shallow tube wells, light duty tube wells, and pump dug wells will normally be constructed in a cluster of six, with each tube well covering six ha and each pumped dug well covering five ha. The selection of the type of scheme will be based on hydrological and technical viability, as well as on user requests where there are options. Prior to any interventions, the actual development activities will be determined for each individual irrigation scheme, summarized in a brief SDMP prepared in consultation with the users. A check list for scheme preparation and approval (see end of this Annex) will facilitate development of the SDMP. The component will also introduce, through pilots and demonstrations, water saving technologies and will also expand on the ground water monitoring program in project areas and the development of a statewide geographically referenced minor irrigation database. The former will include the introduction of sprinkler and drip irrigation in strategically selected schemes to not only show the benefits of such types of irrigation, but also to link up interested private sector suppliers with potential customers.

118. As indicated, it is estimated that about 4,660 minor irrigation schemes in 18 out of 19 districts of West Bengal will be constructed, with a total command area of about 139,000 ha, benefitting an estimated 166,000 farm families. The estimated number of proposed schemes ranges from a low of 31 in Howrah District to 1,030 in Jalpaiguri District. For most districts the number of schemes to be developed is less than 70 per district per year, which considering the decentralized level of engineering expertise down to block level and the experience with the development of minor irrigation schemes gained in the past is an acceptable number in most districts. Only two districts will have to develop between 150 and 200 schemes per year and the capacity of DWRID may be insufficient during peak periods. The project has therefore an allocation for the recruitment of engineering consultants to assist DWRID as needed with the investigation, design, and construction supervision of schemes. The project also has an allocation for the recruitment of a third-party construction supervision and quality assurance consulting firm to review the construction works at a randomly selected sample of schemes. The project will also finance a small Technical Unit attached to the SPMU to review the designs of impoundments, especially related to surface flow minor irrigation schemes and water detention structures.

119. The project proposes construction of ten different types of irrigation schemes, as listed below (for more details on some of the systems refer to the end of this component description).

The design is basically standard and the configuration and costs for each type of scheme are known with great certainty:

a.	Medium (40 ha) River Lift Irrigation (Diesel or Electrical)	577
b.	Mini (20 ha) River Lift Irrigation (Diesel or Electrical)	1,417
c.	Medium Duty (20 ha) Tube well (Electrical)	359
d.	Light Duty (cluster of 36 ha) Tube well (Electrical)	522
e.	Shallow (cluster of 36 ha) Tube well (Diesel)	1,309
f.	Pumped Dug Well (cluster of 30 ha)	75
g.	Surface Flow MI Schemes (30 to 50 ha)	284
h.	Water Detention Structure (5 ha)	117

120. The component will support: (i) assessment of availability of irrigation water for surface flow and river lift irrigation schemes as well as that for ground water based irrigation schemes to be developed under the project; (ii) proper design of proposed irrigation infrastructure, including electro-mechanical components; (iii) procurement of survey and quality control equipment for scheme preparation and implementation; (iv) district-level 3rd party construction supervision and quality assurance consultants to ensure that the works are carried out to acceptable construction quality standards; (v) contractual staff to bridge the gap, where necessary, between technical staff required and presently available in DWRID; (vi) a well qualified and adequately staffed Technical Unit attached to the SPMU for review of design and supervision of construction of key irrigation infrastructure to ensure adequate safety and performance quality; (vii) ground water monitoring and water quality monitoring in the project areas; and (viii) development of a statewide geographically referenced minor irrigation database to enable the DWRID plan future interventions in a better and systematic way.

121. The project does not propose any ground water structure in the areas bordering with Bangladesh. Surface water irrigation structures in the northern districts mainly comprise small capacity river lift schemes or pumped irrigation schemes from beels (local depressions or old ox-bow lakes), and are not expected to have insignificant impact on downstream flows, particularly after considering the effects of return flows. The scheme location process will be carried out keeping in view possible adverse effects, meeting the requirements of various Bank safeguard policies, while simultaneously focusing on the poor beneficiary communities in target areas.

122. *Surface Flow Minor Irrigation Schemes (SFMIS).* As the DWRID has limited in-house experienced technical staff in the design and implementation of surface flow structures, especially tank bunds, an adequately staffed Technical Unit will be set up in the SPMU to support field offices entrusted with the implementation of a large number of small surface irrigation schemes. The responsibility of this Unit will include guiding the field staff in investigation, planning, design, and implementation of SFMIS, reviewing and clearing designs, as necessary, and also checking if any of the proposed schemes requires special attention on engineering consideration to meet Bank's safeguard requirements.

123. All proposed SFMIS are located in five western districts bordering the states of Jharkhand and Orissa, except for an estimated 24 schemes which are located at the foot hills of Darjeeling (Siliguri Sub-division) and Jalpaiguri Districts. Average annual rainfall in the

western plateau districts where most of the SFMIS will be located is about 1,400 mm. This rainfall is for about 90 percent concentrated in the main monsoon months from June through September. In addition to dry winter and pre-summer months during the rabi season, dry spells even during monsoon months are quite common which necessitate limited supplementary irrigation for the kharif crops to facilitate for assured return. No major rabi crop is possible without assured irrigation supply. Consequently, the SFMIS propose supplementary irrigation to kharif crops (paddy – 85 percent, with some diversification to vegetables in about 15 percent of the culturable command area (CCA)), and full irrigation to at least 40 percent of CCA during the rabi season. The annual yield of surface water flow for SFMIS will be estimated based on hydrological studies that were conducted by external consultants during project preparation. In order to avoid inundation of areas, only a small portion of annual inflow will be stored in low height small reservoirs which are expected to be filled during the monsoon season, allowing a full storage level at the end of the kharif season. The live storage volume (above the dead storage level) together with additional water to be pumped from the dead storage will meet the above-mentioned irrigation requirements during the rabi season. Where possible, the water in the reservoir will be gainfully used for short duration fish farming.

124. The designs for evacuation of flood waters and supply of irrigation water to the agricultural areas will follow the Indian standards and practices. In the absence of precise long term hydrological data/information for the small streams that will be harnessed under the project, standard empirical formulae have been used to arrive at design floods. Standard practices have been adopted for the structural designs of the embankment, spillway, and irrigation outlets, following established guidelines.

125. *River Lift Irrigation and Tube Wells.* The design principles for these schemes are well defined in DWRID. The distribution system for these schemes comprises buried pressure pipelines of appropriate class and spouts for delivery of water to the fields. The design approach is sound and there are adequate numbers of technical officers who are well qualified and experienced to design and implement these systems. The key issues therefore are the selection of the best location, avoidance of the possibilities of over-abstraction, and costs and economic viability.

126. Shallow tube wells and low duty deep tube wells will cover only 6 ha CCA each, and therefore do not need any buried distribution system. However, portable lay-flat type of PVC pipes will be used to improve irrigation efficiency. Similar approach is contemplated for the pumped dug wells which can irrigate 5 ha CCA during the rabi season. Each scheme of these categories will generally comprise 6 (six) of these small structures developed as a cluster of MI structures.

127. **Component C. Agricultural Support Services (US$22.1 million).** The component aims at improving farmers' incomes in the project area by increasing production of agriculture, horticulture, and fisheries. This will be achieved by dissemination of improved production technologies and efficient on-farm water management practices, strengthening of agriculture support services, and by making agricultural production more demand-driven and better aligned with the emerging market opportunities. Since a large part of the project's command area is under paddy and other field crops, and there is limited scope for shift to high value horticultural

crops, the main focus of this component will be on increasing production of field crops and promoting efficient on-farm use of irrigation water. The component will build on the ongoing programs funded by GoWB and GoI for improving productivity of field and horticultural crops by bridging critical gaps and promoting large-scale adoption of improved crop husbandry and water management practices by the farmers in the project area.

128. The component will have three sub-components, namely Agriculture, Horticulture, and Fisheries. Although the GoWB is supporting agricultural development in several ways, these activities will need to be scaled up within the project area to ensure that the assured availability of water will lead to enhanced production and some diversification of agricultural production systems. This will be achieved through adoption of improved production technologies and water management practices, more efficient and effective delivery of key support services, and augmentation of community-level productive capacities. The expected outputs are higher productivity in agriculture, horticulture, and fisheries, as well as better alignment of farm-based productive activities with water availability. The project will finance improvement of production and post harvest technologies, field demonstrations of modern technologies and practices, and more effective farm advisory services.

129. The main focus of the agriculture sub-component will be on increasing productivity of paddy, maize, oilseeds, pulses, and other field crops, and promoting efficient use of irrigation water. Activities to be financed under this sub-component include: (i) dissemination of improved crop production, seed production, and water management practices through on-farm demonstrations and training of farmers and farmer groups; (ii) investments in group/community implements that promote efficient and sustainable use of natural resources; and (iii) training, capacity building, and exposure visits for farmer groups and staff from implementing agencies. The expected results from this sub-component are: (a) increased crop production; (b) crop diversification; and (c) greater cropping intensity.

130. The main focus of the horticulture sub-component will be on promoting diversification to high value fruit and vegetable crops. Activities to be financed include: (i) dissemination of improved seeds, production technologies, and water management practices for vegetable crops and fruits through on-farm demonstrations and training of farmers; (ii) demonstrations of micro irrigation practices for promoting efficient use of irrigation water; and (iii) training, capacity building, and exposure visits for farmer groups and staff from implementing agencies. The expected results from this sub-component are: (a) diversification to high value vegetable crops and fruits; and (b) increased production of crops.

131. The main focus of the fisheries sub-component will be on improving productivity of tank-based fisheries to provide improved livelihood to landless and marginal farmers. Activities to be financed include: (i) upgrading production practices through improved stocking; (ii) improved feeding, management and harvesting techniques; (iii) intensive fish cultivation in selected demonstration tanks; (iv) training, capacity building and exposure visits of fisheries interest groups (FIG) and line department staff; and (v) support for setting up of State and District nodal units and laboratory equipment at block level. The main expected result of this sub-component will be increase in fish and related aquaculture yield and consequent increase in income.

132. The sub-component activities will be implemented by the Departments of Agriculture, Food Processing Industries & Horticulture, and Fisheries. While agriculture and horticulture sub-components will cover all 18 districts, the fisheries activities will be implemented in 7 districts, those with potential for tanks. All the three departments have designated nodal officers who have worked with the project preparation team to develop the sub-component activities and implementation arrangements.

133. This is the first project in West Bengal in which the three line departments will be working closely with DWRID. For achieving the project development objective, the interventions proposed under this component have to be spatially and temporally linked and integrated with the activities planned under components 1 and 2. It is, therefore, necessary that there is complete ownership of the activities proposed under this component by the three line departments. There will be some contractual staff who will work under the technical supervision of the line department staff. The terms of references and qualifications for the contractual staff to be hired for the SPMU, DPMUs, Nodal Units in the Departments of Agriculture, Food Processing Industries & Horticulture, and Fisheries, and for implementation of ASS activities in the project areas are included in the PIP.

134. **Component D. Project Management (US$34.8 million)**. The component aims at ensuring smooth implementation of project activities, monitoring of project implementation progress and outputs/outcomes achieved, and learning from project experience. Activities to be financed include: (i) supporting project management units at the state and district levels; (ii) design and establishment of a project specific Management Information System; (iii) setting up and leading the project monitoring, learning, and evaluation activities; (iv) contracting resource agencies including services of an external M&E agency to be engaged as consultants for the duration of the project; (v) providing support for emerging needs and innovations during implementation; (vi) liaison and convergence with other agencies and government departments; and (vii) documentation of project experience and its dissemination in the wider development community.

135. DWRID has set up a State Project Management Unit, headed by a Project Director, for project preparation purposes, which will be expanded to serve also during project implementation. The Unit comprises a combination of seconded government staff and consultants. The government staff will include the project director and a team of engineers from DWRID, and there will also be (part-time) nodal officers of each of the three other line agencies involved in the project. Contractual staff will be recruited for the Fiduciary Unit (procurement and financial management), Safeguard Unit (social and environment), Agricultural Unit, Institutional Development Unit, Monitoring, Learning, and Evaluation Unit, and the General Management Unit. GoWB's preference is to recruit a consulting firm that will provide all the required contractual staff, rather than recruiting individual consultants, as this will increase reliability and control.

136. Currently, the SPMU is housed in a rented accommodation in a highly congested area, and there is significant space constraint. The component will fund construction of a water quality laboratory, GIS/MIS center, and a training center on land provided in Kolkata by the GoWB. Considering the serious lack of office accommodation, sufficient offices will be added

to the building plans for the SPMU. All equipment, instruments and furnishing for this facility have been budgeted under the component.

137. Fully staffed and equipped District Project Management Units will be set up, comprising key staff on secondment from government agencies, supplemented with qualified individually recruited specialists. The teams will be led by one District Project Director – Technical and one District Project Director – Administration. DPD (Technical) will be in the rank of Superintending Engineer of DWRID, holding this assignment as additional charge for two districts. DPD (Administration) will be in the rank of Additional District Magistrate of the Department of Personnel and Administrative Reforms, will be nominated by the District Magistrate, and will hold the function as additional charge. DPD (Administration) will be responsible for all communication with SPMU on day-to-day matters and reporting. Contractual staff will be recruited for the Fiduciary Cell, Agricultural Cell, Institutional Development Cell, Monitoring, Learning and Evaluation Cell, which will also include safeguard staff, and General Management Cell. The team will be assisted by a Consultant Coordinator to assist the DPDs with the day-to-day management of the project at district level. It is expected that the DPMUs in the districts with smaller number of schemes do not have to operate for the entire project duration of six years. Based on an initial assessment three DPMUs may be abolished after three years and six DPMUs after four years. At least nine DPMUs are expected to operate for the entire project duration.

Check List for Scheme Preparation and Approval

Sr. No.	Description of Activities	Response		Remarks
		Yes	No	
1.	Whether location map has been prepared and attached to the scheme report.			
2.	Whether the application from the prospective beneficiaries of the Minor Irrigation (MI) scheme has been attached.			
3.	Whether the application/proposal has been shared with Panchayat bodies, inviting their comments, to be received within a stipulated time.			
4.	Whether a socio-economic profile of the Mouza or Gram Panchayat and/or relevant other information has been given in the proposal.			
5.	Whether socioeconomic profile/information of the Mouza or Gram Panchayat has been compared with the socio-economic profiles of the block and/or the district as collected from the district administration and kept in the EE's office.			
6.	Whether a list of beneficiaries, along with gender, and their land holdings within the command area of the scheme has been submitted with the application.			
7.	Whether the participating departments have visited the site and carried out consultation with the proposed beneficiaries.			
8.	Whether socio-economic profiles of the identified beneficiaries have been collected, checked and recorded.			
9.	Whether the proposal has been examined and feasibility of the MI scheme has been ascertained by the concerned DWRID officer.			
10.	Whether an Executive Committee of the proposed WUA has been formed.			
11.	Whether the beneficiaries (through the WUA) have committed to take over the scheme after its completion, and to carry out MOM in a sustainable manner.			
12.	Whether command area contour map has been prepared, showing the locations of the key scheme features/components.			
13.	Whether social and environmental screening following the criteria developed under the project has been carried out.			

Sr. No.	Description of Activities	Response		Remarks
		Yes	No	
14.	Whether any land for irrigation infrastructure has been gifted (or promised to be gifted) by the beneficiaries.			
15.	Whether any land acquisition by the government will be required.			
16.	Whether the proposal meets the approved selection criteria for this category of MI scheme.			
17.	Whether proposed cropping pattern and water requirements have been computed and recorded.			
18.	Whether the designs and drawings, including other technical details, have been prepared.			
19.	Whether economic feasibility or B/C ratio of the scheme has been checked.			
20.	Whether cost estimate and bill of quantities (BoQ) for the MI scheme has been prepared.			
21.	Whether Standard Bidding Document and procurement guidelines for the World Bank project has been used in developing the bid document for the MI scheme or group of MI schemes.			
22.	Whether the designs and bidding document have been cleared by DPMU.			

Annex 4 (Attachment 1)

Project Phasing and Scheme Selection Criteria

138. The duration of scheme cycle varies from one scheme type to other. Typically, a surface flow irrigation scheme may take 30 to 36 months from the stage of community mobilization to the start of operation. The same for river lift and deep tube well schemes will be around 24 months, as the implementation period is typical shorter. Smaller schemes like shallow tube wells, water detention structure, etc. may require even less time, depending upon time taken for procurement of works and the availability of working season. An overall Project Implementation Schedule is given as Attachment 2.

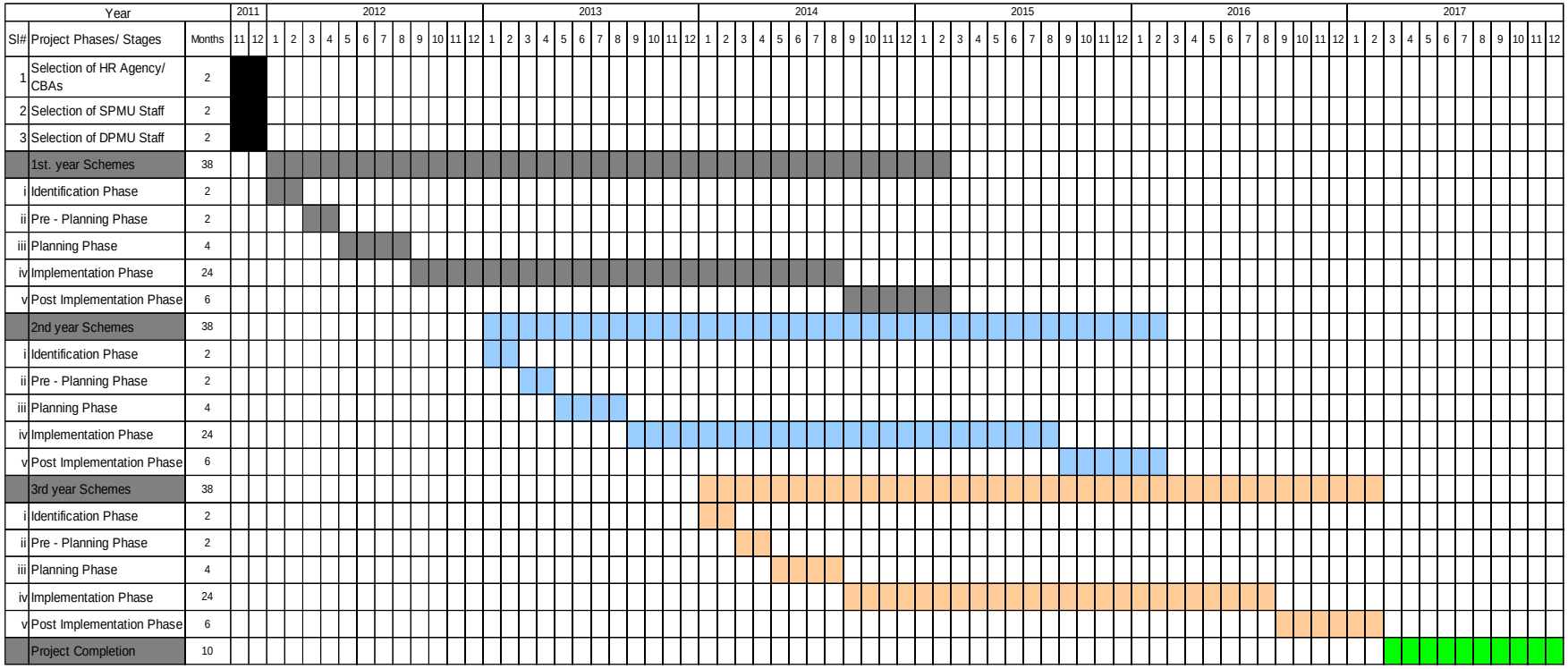
139. Irrespective of different implementation periods for different types of individual schemes, the project cycle for each scheme after identification at the district level (estimated to take 2 months on average) will follow the four stages indicated below:

(i) Pre-Planning Stage (2 months) – Social mapping, community awareness building, stakeholder consultations, formation of WUA, and preparation of resettlement action plan (RAP) (if applicable);
(ii) Planning Stage (4 months) – Implementation of RAP (if applicable), topographic/technical surveys as needed, mobilization of other users, training, participatory planning for the preparation of a SDMP, including design and estimate of civil works, ratification of such SDMP by WUA and appraisal by DPMU, preparation of procurement documents, preparation of maintenance plan;
(iii) Implementation Stage (12 to 24 months) – Public display of project information, procurement of contractors and implementation of civil and other works, training for WUA members, quality assurance, crop planning and crop-water budgeting for irrigation schemes, mobilization and formation of common interest groups; and
(iv) Post Implementation Stage (6 months) – Training/refresher trainings, updating seasonal MOM strategy, plan, and scheme costs, preparation of brief Scheme Completion Report (SCR), commencement of post implementation participatory monitoring.

140. The main principles underlying selection of schemes under the project are: (i) a phased approach to selection of districts and blocks giving priority to those areas where irrigation facilities are lacking and the proportion of scheduled caste/schedule tribe (SC/ST) population is high; (ii) communities are ready to form formal WUAs; (iii) communities are willing to actively participate in the planning and design of systems; and (iv) communities have made upfront commitment to take over management, operation, and maintenance of the irrigation system.

Annex 4 (Attachment 2)

Implementation Schedule for Project



Annex 4 (Attachment 3)

DISTRICT WISE MINOR IRRIGATION STRUCTURES TO BE TAKEN UP IN WB-ADMI PROJECT

		SURFACE WATER SCHEMES								GROUND WATER SCHEMES					
		RLI (MD) (40HA)		RLI (MN) (20HA)		WDS	SFMIS								
SL NO	DISTRICT	E	D	E	D	(5 ha)	(30 ha)	(40 ha)	(50 ha)	MDTW (20ha)	LDTW Cluster (36ha)	STW Cluster (36ha)	PUMP DUG WELL CLUSTER	TOTAL STRUCTURE (SW+GW)	TOTAL CCA (SW+GW)
1	COB	25	7	195	35	0	0	0	0	50	0	400	9	**721**	**21550**
2	JAL	4	0	220	104	50	0	0	10	30	0	550	62	**1030**	**29650**
3	BIRB	40	0	56	0	0	70	0	10	21	70	0	0	**267**	**8260**
4	BNKR	50	0	48	0	0	0	75	0	24	61	0	0	**258**	**8636**
5	N-24 PGS	20	0	23	0	0	0	0	0	0	0	0	0	**43**	**1260**
6	DARJ (SMP)	0	0	28	18	7	0	0	14	0	0	36	4	**107**	**3071**
7	N-DINJ	0	26	0	60	0	0	0	0	18	85	182	0	**371**	**12212**
8	S-DINJ	44	16	48	11	0	0	0	0	4	8	0	0	**131**	**3948**
9	MLD	25	50	25	75	0	0	0	0	30	66	141	0	**412**	**13052**
10	MURSHI	44	0	20	0	0	0	0	0	0	16	0	0	**80**	**2736**
11	NADIA	29	0	48	92	0	0	0	0	0	0	0	0	**169**	**3960**
12	BDN	29	0	97	0	60	25	0	10	40	87	0	0	**348**	**8582**
13	HOOGH	24	0	68	0	0	0	0	0	18	56	0	0	**166**	**4696**
14	S-24 PGS	6	4	1	45	0	0	0	0	0	0	0	0	**56**	**1320**
15	HOW	0	5	0	10	0	0	0	0	16	0	0	0	**31**	**720**
16	E-MED	23	0	0	0	0	0	0	0	48	47	0	0	**118**	**3572**
17	W-MED	101	0	15	0	0	0	0	20	60	26	0	0	**222**	**7476**
18	PURU	0	5	0	75	0	0	0	50	0	0	0	0	**130**	**4200**
	TOTAL	**464**	**113**	**892**	**525**	**117**	**95**	**75**	**114**	**359**	**522**	**1309**	**75**	**4660**	**138901**

Note: the exact location of each scheme is not known at this moment. The numbers are based on estimates and requests from the districts. The numbers have been used for defining the overall project scope, implementation arrangements, and cost estimates. The final numbers to be implemented may be somewhat different.

Annex 5: Project Costs

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

141. The total project costs are estimated at US$300 million, including a base cost of US$248.5 million and physical and price contingencies of US$51.5 million. The physical contingencies of 2 percent are included only in the cost of schemes while the price contingencies of 18 percent are based on the current inflation rates in India and have been applied to all works, goods, equipment, and services.

142. About 78 percent of the project amount will be spent for new investments in minor surface and ground water based irrigation schemes. The remaining 22 percent will be spent on strengthening community institutions, agriculture support services, and project management (see table below).

Components / Sub-Components	Project Costs (US$ million)
A. Strengthening Community-based Institutions	**6.9**
B. Irrigation System Development	**192.9**
C. Agricultural Support Services	**18.4**
C.1 Agriculture Development	11.9
C.2 Horticulture Development	1.9
C.3 Fisheries Development	4.6
D. Project Management	**30.3**
TOTAL BASELINE COSTS	248.5
Physical Contingencies	5.8
Price Contingencies	45.7
TOTAL PROJECT COSTS	**300.0**

143. The World Bank will finance 83 percent (US$250 million) of the project cost, split equally between IDA and IBRD. The remaining 17 percent (US$50 million) will be financed by GoWB. Components A, C, and D will be financed at 100 percent, while component B will be financed at 79 percent.

Annex 6: Implementation Arrangements

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

144. The Project will be implemented over a period of six years. The overall responsibility for project implementation and coordination will rest with the Department of Water Resources Investigation and Development of the Government of West Bengal. Additionally, implementation support will be provided by the Departments of Agriculture, Food Processing Industries & Horticulture, and Fisheries. Various private service providers will also be involved in project implementation.

145. The Directorate of DWRID that will have main responsibility for the implementation of the project has 195 professional staff, with a mixture of civil, mechanical, electrical, and agricultural engineers. The staff is located at the center in Kolkata and decentralized over eight circles and within these circles a total of 40 divisions. DWRID's main responsibility during the last 40 years has been the development of minor irrigation schemes that currently cover about 2.4 million ha. It is the policy of the department to hand-over completed schemes and so far about 34,000 minor schemes have been handed over to WUAs, through Pradhan of Gram Panchayet, for management, operation, and maintenance. Department engineers typically support the WUAs for a period of three years after handing over of the schemes. They will regularly visit the scheme, provide technical support, assist in book keeping of accounts, and if necessary provide assistance with the repair of pumps, etc., but the materials have to be funded by the WUAs.

146. District-level engineers have direct responsibility for the development of the minor irrigation schemes. Over the years, the department has used various sources of funding, including those from state government and National Bank for Agriculture and Rural Development (NABARD). It is envisaged that ADMIP will now become the main source of funding during the next years for the development of minor irrigation schemes. During the past decade, up to US$50 million could be spent per year on the development of such schemes. This will also be the average amount of funds to be spent under the project. When sufficient funds were available, on average 1,600 minor irrigation schemes were designed and constructed annually in the 18 districts of the state, which is on average about 90 schemes per district per year. ADMIP envisages the construction of up to 70 schemes per year per district, except for two districts where the number will be higher. In general, it has been determined that the engineering capacity is sufficient to develop this number of schemes. In the two districts with a higher number of schemes and in districts where the capacity may be inadequate, the project has a provision to hire the needed contractual technical personnel.

147. Based on the assessment of the technical and financial capacity of the department to implement the project, it has been determined that problems with technical capacity and disbursement are not expected. Based on past performance by the department, it can be concluded that the number of schemes to be developed per year and the funds to be spent are well within the range of the available capacity. However, as mentioned above, the project has made provisions to strengthen the capacity at district level, as needed, to ensure that the project

implementation can be as planned. The details of the project management and implementation arrangements are described in the next paragraphs.

148. A State Project Management Unit under DWRID will serve as the main coordinating and management agency for the implementation of the project. The SPMU is headed by a full-time Project Director, who is supported by a multi-disciplinary team dedicated to the project. Besides a Technical Unit (engineering, hydrology, etc.), there will be a Fiduciary Unit (procurement and financial management), Safeguard Unit (social and environment), Agricultural Unit, Institutional Development Unit, Monitoring, Learning, and Evaluation Unit, and General Management Unit. This inter-disciplinary team will be supported by adequate number of support staff to efficiently manage the activities of the SPMU. The SPMU will oversee and manage the activities of 18 District Project Management Units located at district headquarters that will be responsible for the implementation of the project at the field level. The DPMUs will be headed by a team of District Project Directors, one technical and one administrative, and have corresponding but smaller dedicated multi-disciplinary teams.

149. Committees at the state and district levels will review and guide project implementation. At the state level, a Technical Steering Committee, chaired by the Chief Secretary, will periodically (about every six months) review the progress of the project and provide strategic directions, guidance on policy matters, and conflict resolution, if any, amongst the implementing agencies. The Project Director (SPMU) will be the convener of the TSC, and its members will comprise Principal Secretary/Secretary level officers from Finance, DWRID, Agriculture, Food Processing Industries & Horticulture, and Fisheries, and EiC & EOS, DWRID.

150. At the district level, the project will be regularly (on average every three months) reviewed by a District Level Implementation Committee, chaired by the District Magistrate. The DPD (Administration) will be the secretary of the DLIC which will include the DPD (Technical), Krishi Karmadhaksa, Zila Parisad (Agriculture Activity Manager of the District Board; and elected member), senior district level representatives from the Departments of Agriculture, Food Processing Industries & Horticulture, and Fisheries, concerned Executive Engineers, staff of the Electricity Distribution Company, and SO and WUA representatives, as required. The DLIC will be the main forum for district level coordination of project activities with other ongoing government programs, approval of annual action plans, monitoring of project progress, and grievance redressal and resolution of conflicts, if any, amongst the implementing partners.

Roles and Responsibilities

151. **State Project Management Unit.** The SPMU will be responsible for project planning and scheduling; coordination with other implementing partners; project-wide budget control and financial management; quality assurance and control; monitoring of the project inputs, outputs, and outcomes; and providing timely and quality resources as well as technical assistance and guidance to DPMUs. The Technical Unit in SPMU will be staffed by DWRID engineering staff, whereas activities related to other line departments will be managed by staff on deputation from corresponding departments of GoWB. Consultants will be hired to supplement the government staff. At full strength the SPMU is expected to have about 30 professional staff of which roughly half will be government staff on deputation and the rest will be specialists contracted from the market. The flow of funds from the Finance Department to the SPMU will be through a

budgetary allocation for the project as a line item under the DWRID budget.

152. **District Project Management Units.** The DPMUs will be responsible for the implementation of district programs; achievement of physical and financial milestones; quality assurance; and working closely with communities to achieve the project development objective. Requisite authority will be delegated to the DPMUs for planning, decision making, use and allocation of funds, and monitoring in their districts. The focus is on creating a participatory institutional structure that will ensure accountable and efficient governance for project implementation. The DPMU will have subject specific cells that are very similar to that of the SPMU. The teams will be led by one DPD – Technical and one DPD – Administration. DPD (Technical) will be in the rank of Superintending Engineer of DWRID, holding this assignment as additional charge for two districts. DPD (Administration) will be in the rank of Additional District Magistrate of the Department of Personnel and Administrative Reforms. The officer will be nominated by the District Magistrate and will hold the function as additional charge. DPD (Administration) will be responsible for all communication with SPMU on day-to-day matters and reporting. Key staff in the Technical Cell will comprise a team of engineers. There will also be a Fiduciary Cell, Agricultural Cell, Institutional Development Cell, Monitoring, Learning and Evaluation Cell, which will also include safeguard staff, and General Management Cell. If adequate numbers of technical officers are not available, there will be an option to hire technical staff on contract to augment the strength of the DPMUs, as and where required. The staff of the other units of the DPMU will be a combination of existing government staff deputed to the DPMU and professionals hired on contract from the market.

153. **Line Departments.** Project implementation support for Component C will be provided by the Departments of Agriculture, Food Processing Industries & Horticulture, and Fisheries. For coordination and oversight, each department will set up a Nodal Unit at state level that will operate from within the mother department, but will liaise regularly with SPMU staff. The departments will also designate senior district level officers as focal persons for coordination of project activities at the district level. The nodal district level officers will participate in DLIC meetings and will act as the main departmental contact points for the DPMUs. All project components and sub-components will be funded through the SPMU and DPMUs, and no funds will flow directly to the individual line departments through their budgets.

154. **Water User Associations.** At the scheme level, the focal point will be the Water Users Association to which all command area farmers will belong. The WUA will be expected to play an active role in the planning, and management, operation, and maintenance of its scheme, and participatory monitoring of cost effectiveness and sustainability. Each WUA will have an Executive Committee and as needed various sub-committees, e.g. for works and water management.

155. **Support Organizations.** Support organizations, to be recruited by the project, will facilitate community mobilization, participation, and institutional strengthening of the community based institutions. Each SO team, consisting of staff with expertise in community mobilization, technical works, and agriculture, will be assigned a cluster of schemes in a district, and will be responsible for building capacities of WUAs and other groups, where present.

156. The project will be implemented according to norms, rules, and procedures agreed in the Project Implementation Plan. The PIP comprises detailed operational manuals for finance, procurement, technical works, and WUAs, and will outline the roles and responsibilities of individual agencies and provide details of project activities, processes, and project cycle. It incorporates the outcomes of various preparatory workshops, studies, and analyses that were carried out as part of project preparation. The PIP will be subject to periodic reviews conducted jointly by GoWB and the Bank task team to address any constraints to the successful implementation of the project.

157. Specific implementation arrangements for project interventions under Components A, B, and C are described below.

Implementation of Component A

158. Support Organizations will be recruited by the SPMU following an objective and transparent selection mechanism (based on competency and organizational capacity parameters) and detailed terms of reference. The Institutional Development Unit in the SPMU/DPMUs will have oversight of SO activities, and the units will monitor and report on performance of each SO at six-monthly intervals.

159. In each scheme, a SO will work with villagers to familiarize them with the project objectives, expected outputs/outcomes, and the processes of implementation. The main work will be with WUAs, but, where needed, the SO will also support non-agricultural members (e.g. fishermen). The SO will engage with the village communities to objectively assess their willingness and preparedness to participate in the project. The SO will implement a mobilization process at the village level and will assist with formation of a WUA. There will have to be an upfront commitment whereby the WUA commits to regular MOM of its scheme post-implementation and whereby DWRID commits to provision of technical support. After establishing a WUA's willingness to participate, the SO, with technical support from line departments and DPMU staff, will work with the WUA to prepare a SDMP which, through a participatory process, will identify and prioritize desirable interventions as well as prepare cost estimates for them. The SDMP will include: (i) scheme details with cost estimates following a joint walk through of the proposed benefited area; (ii) a livelihood development plan (LDP) covering field and horticulture crops, and fisheries, where applicable; (iii) plans to deal with social and environment safeguards; (iv) training and capacity building needs; (v) estimates of annual MOM requirements; and (vi) indicators and arrangements for participatory monitoring of project implementation progress and impacts. Once completed, the SDMP will be approved by the General Body of the WUA and submitted to DPMU for review and consolidation, and ultimately, formal ratification by the DLIC. The SOs will implement a training program to ensure that the WUA will become financially and technically sustainable.

Implementation of Component B

160. The overall technical responsibility for implementation of this component will rest with the Technical Unit within the SPMU. The corresponding responsibility at the district level will rest with the Technical Unit within the DPMU. The day-to-day technical work and procurement

will be carried out by DWRID engineers. With regard to implementation of the planned works, it is envisaged that works will be contracted out through Shopping or NCB. As much as possible same type schemes will be clustered to make the tender package more attractive for contractors. The quantity and quality of works will be closely monitored by the WUAs in association with DWRID's Assistant Engineers that operate in the area where the scheme is located. The engineers of the Technical Unit of DPMU will be responsible for overall supervision and quality assurance of works. In addition, a system of third-party construction supervision and quality assurance will also be adopted.

Implementation of Component C

161. The DPMU will prepare Annual Action Plans (AAP) on basis of the proposals submitted by various schemes. In preparing these AAPs, the DPMU shall be responsible for prioritizing various demands; ensuring consistency with available resources; and seeking advice on best practices and emerging market opportunities from relevant partners. These AAPs will be ratified by the DLIC, and vetted and consolidated at the state level by the SPMU. The DPMU will work in close coordination with relevant line department members of the DLIC to ensure implementation and supervision of the various activities. As far as practicable, demonstrations and technical back-up and supervision activities at the field-level will be undertaken by staff of relevant line departments. However, additional resource persons will be used to perform these tasks where deemed appropriate (e.g. because of departmental staff constraints).

162. At the scheme level, the SO will also be involved in planning and facilitation of AAP activities, including formation/mobilization of various farmer interest groups, identification of lead farmers according to specified criteria, logistical support for demonstrations, training, exposure visits, etc. Working in close cooperation with DPMU and the relevant line department staff, the SO will assist with implementation of the agreed set of AAP activities at the scheme level. The overall supervision of field level activities will be periodically undertaken by the DPMU and senior district-level line department staff. The SPMU and the state-level nodal officers of the various line departments will be responsible for overall coordination of the component.

Social and Environmental Management

163. In order to ensure that local communities are involved in addressing social and environmental concerns at the scheme level, the following institutional arrangements will be adopted.

164. **State Level.** Social and environmental specialists in the SPMU will ensure that social and environmental management plans are in conformity with the project's social and environment management plan, and that necessary guidance and budget is provided to implement these plans.

165. **District Level.** Similar arrangements are envisaged in DPMUs to ensure SDMPs include social and environment management plans, as needed, in conformity with the overall project EMP and Tribal Development Plan. The district level environment specialist will ensure proper planning, implementation and monitoring of these activities at the district level, and also

coordinate with the SPMU on these issues.

166. **Scheme level.** The responsibility of facilitating planning and implementation of social and environmental activities at the scheme level is vested primarily with the SO and WUA. The ToR for the SO will include specific responsibilities to manage social and environmental management activities. The project will develop capacities at both the WUA and SO levels through training and other information sharing measures to plan and implement social and environmental management activities. As part of their ToR, the external M&E agency will also undertake audits at mid-term and project completion stage to assess the implementation of the social and environment management arrangements of the project.

Bank Implementation Support

167. Project implementation will be reviewed by Bank implementation review and support missions conducted on a semi-annual basis. These will be complemented by short visits by individual team members to follow up on specific issues, as needed. The implementation support strategy will be based on a combination of site visits and proactively obtaining and following up on relevant information from multiple sources.

168. Bank review missions will visit selected scheme sites to assess and physically verify work financed under the project. These site visits will include interaction with concerned WUAs, farmer interest groups, and support organizations that are assisting with community mobilization and capacity building. Schemes to be selected for such visits will be based on a combination of the following criteria: (i) random selection from district-wise list of schemes supported under the project; (ii) special emphasis on schemes identified by grievance monitoring system; and (iii) relatively more complex schemes supported under the project.

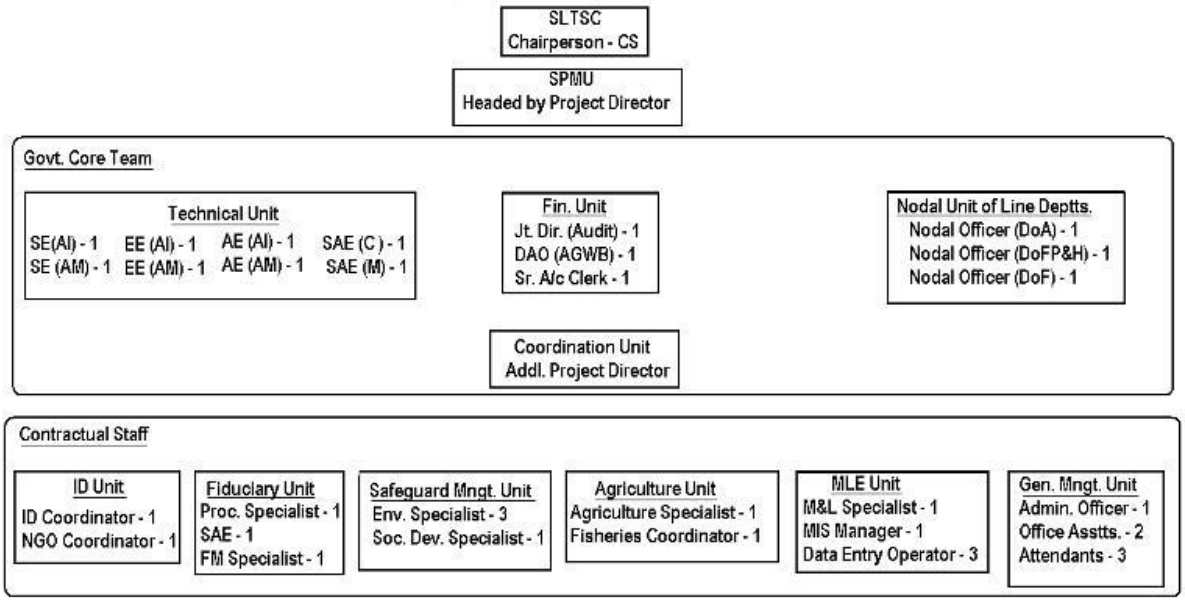
169. Apart from visits to scheme sites, at a district level each Bank mission will supplement the information gathered by feedback obtained from a larger set of project beneficiaries through meetings/workshops convened with a cross-section of WUAs being supported under the project in that particular district. Support organizations and private sector partners working on the project in the district will also be invited to these meetings/workshops to gain additional perspective. Project districts will be covered by rotation during review missions with priority accorded to: (i) districts with relatively large number of schemes; and (ii) ‘problem’ districts as identified by the grievance monitoring system and other information sources. At the state level, the Bank mission will focus on project management, MIS/GIS, fiduciary and other safeguard issues, and presentations from consultants undertaking: (i) third-party construction supervision and quality assurance; and (ii) external M&E.

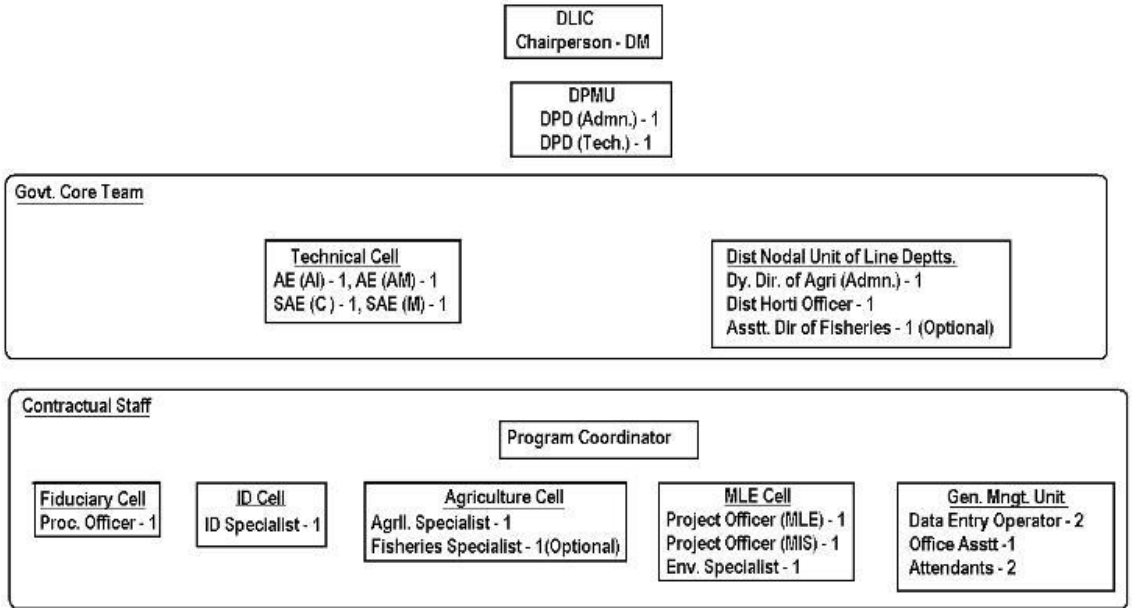
170. Regular feedback on project performance will be obtained through progress reports prepared by the SPMU as well as the regular monitoring reports to be produced by the various consulting teams. Key issues identified in these reports will be followed up, including through short additional visits to the state as necessary.

171. Fiduciary reviews during review missions will include post-reviews of a random sample of contracts and spot checks of accounting records and financial reporting systems at the state,

district, and scheme levels. Issues identified will be recorded in aide memoires and followed up post-mission.

Annex 6, Attchment 1: Organizational Structure





Annex 7: Financial Management and Disbursement Arrangements

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

State Public Financial Management and Accountability Issues

172. A separate assessment of public financial management and accountability (PFMA) arrangements in the state of West Bengal has not been undertaken. However, findings of the State Financial Accountability Assessments (SFAA) undertaken in several states (Orissa, Rajasthan, Karnataka, Uttar Pradesh, and Punjab) indicate the need for greater attention to issues of implementation. The SFAAs make it clear that much remains to be done to support enforcement of the legal framework. The incidence of irregularities reported by the Comptroller and Auditor General (C&AG) in areas such as poverty alleviation and infrastructure is of concern. There is reference provided to the benefits in catching up with the rapid evolution of internal control and audit practices that took place internationally in the 1990s. Questions are raised about the impact of public audit and legislative scrutiny. A more modern performance-oriented system of PFMA is encouraged. Attention is also needed on the constraints imposed by the existing PFMA rules and practices on efficient and effective resource use. These conclusions are, by no means, likely to be very different for West Bengal, given that the overall PFMA framework is similar and largely determined at the central level.

173. For several reasons the state's fiscal position has deteriorated over the last decade resulting in the need to resort to overdraft/ways and means advances. There is, however, no evidence that this position of fiscal stress has resulted in delays in fund releases for externally assisted projects. GoWB has legislated the Fiscal Reform and Budgetary Management Act in July 2010, and further amended the same in April 2011.

174. Reforms have been initiated by way of introduction of VAT and treasury computerization. In addition, the state has taken a number of steps to ensure smooth and timely release of funds. The administrative departments have now been authorized to release funds for approved plan projects within the budgetary provision without obtaining clearance from the Finance Department on each occasion. A Departmental Approval Committee has been constituted in each department, with a representative of the Finance Department as one of the members in order to ensure quick approval of plan schemes with estimated cost up to Rs. 3 crores.

Public Financial Management at Water User Associations Level

175. The implementation arrangements for the project as agreed with DWRID do not envisage any transfer of project funds to user groups (WUAs) for the implementation of the minor irrigation schemes. WUAs will, however, be expected to assume responsibilities for management, operation, and maintenance of the completed schemes. There is presently no generic institutional framework for the existing WUAs in the state. Consequently, no standard rules for governance and accountability apply to the existing WUAs. An institutional assessment of the capacity of a selected sample WUAs will be undertaken during the implementation

process including reviewing the draft financial rules prepared by GoWB and technical assistance provided to DWRID to develop and document the financial rules and accountability arrangements in line with the emerging best practice from across the country.

176. Studies in Orissa and Andhra Pradesh suggest that capacity for simple accounting and record keeping is generally weak and varies widely across WUAs, depending largely on the level of funds handled and capacity building inputs that have been provided. The key factors leading to weaknesses in the financial management capacities include: (i) absence of regular streams of income; (ii) lack of independence over financial transactions; (iii) no standard set of accounting books or manuals in place; (iv) no training provided or inadequate follow-up to initial training; (v) inadequate hand holding support; (vi) poor knowledge among WUA members of their roles and responsibilities; (vii) social audit processes not institutionalized; and (viii) no fixed office space for meetings or retention of financial records.

177. The project provides significant opportunities to strengthen the WUA capacity to satisfactorily undertake most of the activities pertaining to finances and procurement, provided adequate capacity building efforts are undertaken. Thus, the approach that will guide the design of the financial management arrangements at the WUA level will be to build financial management capacity to comply with the statutory framework of accounting, internal controls, financial reporting, and auditing. This arrangement will help to enhance the WUA's own fiduciary systems, thus strengthening ownership, internal capacity, and scheme sustainability.

Project Implementation Arrangements

178. The project will be anchored within DWRID, which as a department of the Government of West Bengal follows the financial rules and procedures laid down in the West Bengal Financial Rules (WBFR) and follows West Bengal Public Works Department Code (for the delegation of authority, etc.) and the Central Public Works Accounts Code (for accounting and reporting procedures). For all capital and maintenance works that have been budgeted for, funds are released by the Finance Department of GoWB, through the Letter of Credit (LoC) system, issued on a monthly or quarterly basis. This allows the Executive Engineer at division-level to issue Public Works cheques up to the limit allocated under the LoC. Each division maintains its accounts and submits monthly accounts to the Accountant General's Office. The guiding principles for designing the financial management arrangements for the project will be to use the current DWRID financial management systems, which are considered satisfactory and meeting the essential fiduciary requirements.

Risk Assessment and Mitigation

Summary of risk assessment and mitigation measures

Risk	Residual Risk Rating	Risk Mitigation Measures Incorporated into Project Design
Inherent Risk		
• State level Slow reform in PFMA.	S	• Reforms in PFMA at state level are outside the scope of the project.

Risk	Residual Risk Rating	Risk Mitigation Measures Incorporated into Project Design
• Entity/Project level SPMU may find it difficult to prepare consolidated quarterly project financial statements on a timely basis, as implementation is dispersed across several multiple line departments.	M	• It is proposed that financial management arrangements be centralized at SPMU, and no project funds will flow directly to the line departments. All expenditures related to activities implemented by the line departments at district level will be against advances or paid directly by DPMU.
Control Risk		
• Budgeting Budgeting exercise may not be linked to annual work plans.	L	• Annual work plans, prepared for the project following a bottom-up approach, will form the basis for budgeting of the project at the state level. • Project will be budgeted under multiple lines, representing the main project components in the state budget under the DWRID.
• Accounting Use of stand-alone project financial system requiring a second level (in addition to the State's own accounting system maintained by Accountant General, West Bengal) of data entry, with no in-built internal control measures for reconciliation, increases the exposure to risk that the expenditures reported may not be correct or reliable.	N	• The project financial management system is designed to work within the state's own accounting system and does not envisage second level of data entry at the project level.
• Internal Control Weak or non-existent internal audit at departmental level represents increased exposure to risks of loss and abuse which will remain undetected and uncorrected.	S	• The internal audit function is de facto built into the staffing of DWRID which has a Divisional Accountant attached to each field unit. The Divisional Accountants are staff of the AG deputed to departments and are specially trained in works accounting. While this established arrangement is seen as being by and large adequate, special provisions have been built into the GAAP to pilot third-party monitoring processes as well as putting systems in place to implement the Right to Information Act.
• Fund flow Liquidity constraints at state level may result in delays in fund flows, thus hampering smooth implementation of project activities.	S	• The State continues to face serious fiscal stress. There is, however, no evidence that there have been fund flow delays for externally assisted projects in the state. • Report-based disbursement method will provide funds in advance to the State equivalent to project requirements for two quarters on a rolling basis.
• Financing reporting Absence of timely information on project-related expenditures from DPMUs will hinder the process of submission of interim financial reports to the Bank as well as withdrawals from the	M	• The project is designed to obtain information on the aggregate spending from the monthly Appropriation Account prepared by the Accountant General's Office, Kolkata. This will eliminate the need for setting up parallel reporting mechanisms especially for the project.

Risk	Residual Risk Rating	Risk Mitigation Measures Incorporated into Project Design
Credit/Loan.		
• Auditing Timeliness of audit may be a challenge.	M	• Standard ToRs have been agreed with the Office of the Comptroller & Auditor General and will be applied for the project. •
Overall Risk Rating	**M**	

H – High, S – Substantial, M – Moderate, N – Negligible

Financial Management Arrangements for the Project

Budgeting

179. The project will be budgeted for as a separate line under Planned Demand for Grants in a manner that will allow for all project-related expenditures to be separately identified, accounted, and reported in the consolidated Monthly Appropriation Report prepared by the Accountant General of West Bengal. Details of expenditures by project components and sub-components will be tracked at the division level and updated information will be available both at the AG as well as the departmental level. Quarterly consolidated project Interim Financial Reports will be prepared by DWRID tracking progress in expenditures by components/sub-components against planned expenditures.

Funds Flow & Delegation of Financial Powers

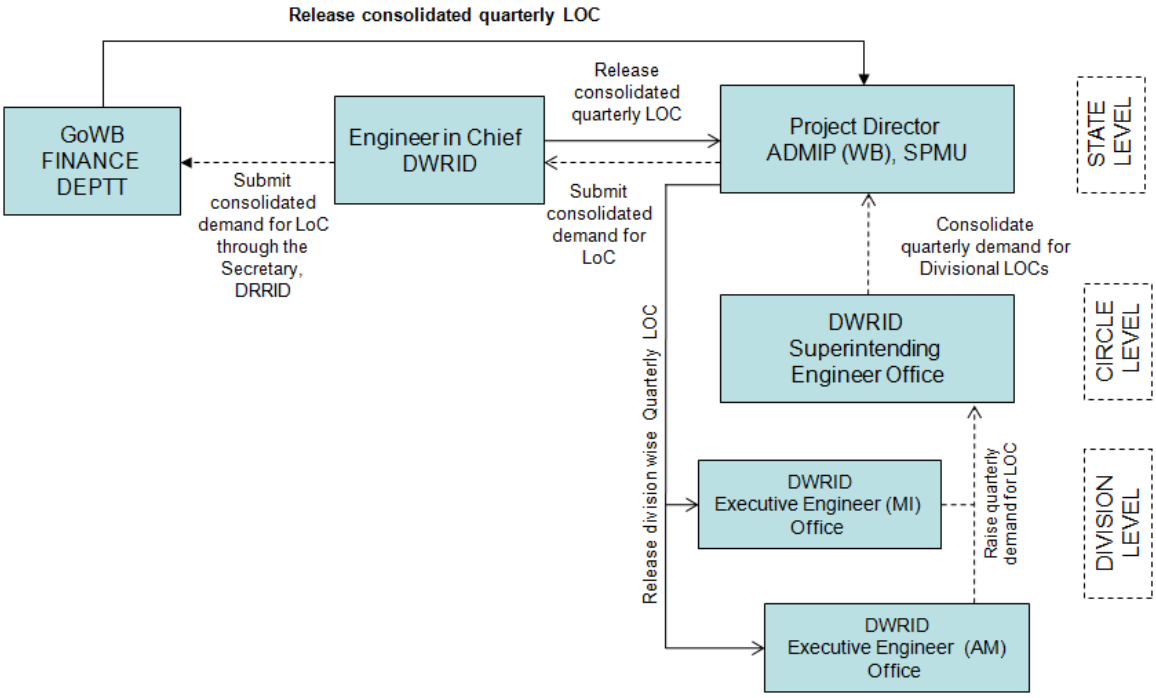
180. The standard fund flow mechanisms at DWRID will be followed to account for the project. Fund flows follow the Letter of Credit mechanism, with the Finance Department providing monthly LoCs as per DWRID's fund requirements. A LoC is the Finance Department's authorization to the bankers to honor payments from each implementing unit up to the limit set in the LoC. Under the LoC system, the Drawing & Disbursing Officers (DDO) have cheque drawing facility and the responsibility for the accounting remains with the department itself which sends monthly compiled accounts to the AG. Within this overall framework, the following arrangements have been agreed with respect to the flow of funds for the project:

- At the state level, an Executive Engineer posted at the SPMU will be the designated Drawing & Disbursing Officer authorized to issue cheques against the quarterly LoCs;
- At the district level, two separate quarterly LoCs will be issued by the Project Director, ADMIP (as per requirement) to the Executive Engineer (Agri-Mechanical) and Executive Engineer (Agri-Irrigation);
- One of the Executive Engineers at the district level will also act as the authorized DDO for the DPMU related expenditures. All DPMU expenditures will be approved by the designated DPD (Administration); and
- While the financial delegation of powers for works at the district and state levels are clearly defined, the project will need to establish a separate protocol for delegation of financial powers for the DPD for DPMU expenditures, including expenditures on

agriculture support services. This has been documented in the Project Financial Manual.

181. The funds flow arrangements are summarized in form of the following flow chart.

Fund flow Chart for Project



Accounting

182. Accounting for project expenditures will be maintained on cash basis as per GoI systems and as laid down in the PWD accounts and codes. This requires the DWRID to compile their accounts monthly, for submission to the AG. The field units close their books every month and submit the details to the AG by the 10th of the next month. The Monthly Compiled Accounts are fairly comprehensive and provide substantial financial details of all the transactions at the Divisions for that month and cumulative expenditure on works. Classified Abstract provides consolidated expenditure against each budget head, up to Sub-Head, and Objects and Works Abstracts give details of work-wise expenditure. The prevailing financial rules and regulations of GoWB will apply to all project expenditures.

183. Key aspects of accounting under the project are as follows:

- All payments to contractors, consultants, and suppliers are considered as expenditure, other transfers are considered as advances;
- Mobilization Advance is normally not given. If required, a provision is made in the contract agreement itself, under intimation to the Superintendent Engineer. In other cases, Mobilization Advance can only be given on specific approval of the Government. Such advances are generally against bank guarantees and booked to

expenditure at the time of payment. Subsequently, deductions are made from the running bills of the contractor and the net amount is then booked to expenditure; and

- Contractors/Works payments constitute a major part of the payments at the district level. The procedure for payment of bills of the contractors for works includes: (a) writing of Measurement Book (MB) by the responsible engineer; (b) Running Bill prepared by a Senior Assistant Engineer (SAE), duly checked and signed by the Executive Engineer (EE); (c) verification of Running Bill by Accounts Branch of the Division from financial angle; pre-audited and passed for payment; and (d) verification and passing of Running Bill by the EE.

Internal Control

184. GoWB's Financial Rules (WBFR) provide for the required control framework for procedural transaction control over individual items of expenditure and receipts. The WBFR also provides detailed guidance on internal controls including safeguarding of cash, control over inventories, segregation of duties and delegation of authority for approvals and operating the bank accounts. Reconciliation of expenditure with the Treasury and AG is concurrent and would be an essential control mechanism in the project and should be regularly followed up with the implementing departments. It was also agreed that each DPMU will maintain a commitment/payments register individually, tracking all contracts (works, consultant services, goods, materials, NGO services, etc.). This will provide the project with information required on pending payments and help track project progress. The form and content of the register along with the information flow mapping has been agreed and documented in the Financial Manual.

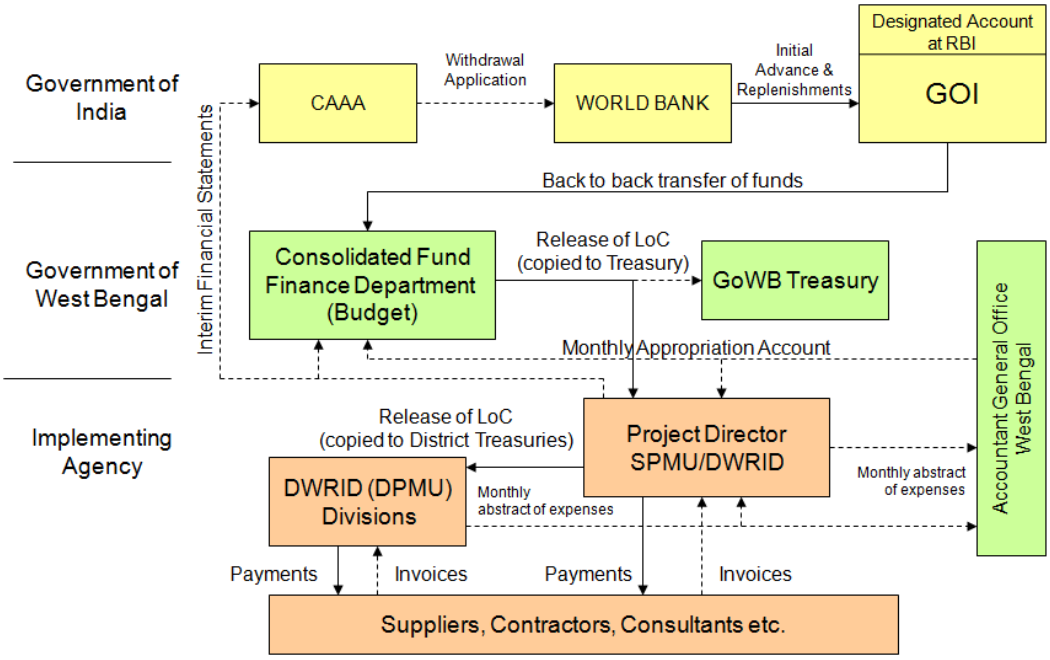
Financial Reporting

185. In the above design of budgeting and accounting, the information on project-related expenditures by project components obtained from the existing monthly financial reports prepared for the AG's Office will be used for purposes of preparation of interim unaudited financial reports. Activity level details of the expenditures will be captured at the project level in a manner that will allow Project Management to monitor financial progress against the Annual Work Plans. Projection of expenditures for the next two quarters will help determine the value of withdrawal application. The Interim Financial Reports will also include a list of payments against contracts that are subject to the Bank's prior approval.

Disbursements and Designated Account

186. Project funds will be deposited in advance into the designated account maintained in US dollars, based on the projection of expenditures for two quarters. The segregated designated account will be operated by the CAA&A, GoI. Funds will be transferred to GoWB on a back-to-back basis following the standard Centre-State mechanism of Additional Central Assistance. Fresh advances into the designated account will be based on the cash forecast included in the quarterly consolidated project IFRs and will be processed by CAA&A. The interim unaudited financial reports will also provide information on eligible expenditure made in the previous quarter and will be used for documentation of the expenditures against the advances.

Funds and Documentation Flow Diagram



Staffing

187. It has been agreed that the financial management function at the SPMU will be headed by a Financial Controller or an officer with equivalent seniority from the State Finance Cadre. The Financial Controller will be assisted by: (a) Senior Divisional Accounts Officer (DAO); (b) Cashier or Senior Accounts Clerk; and (c) Financial Management Expert (on contract). This team of dedicated staff will collectively be responsible for liaison on budget allocation, issuing and tracking of LoCs to various ADMIP Divisions, maintaining accounts for SPMU, submitting monthly accounts to AG's Office, Kolkata, and preparation of quarterly Financial Reports from the Monthly Financial Reports prepared by the AG's Office, Kolkata.

188. At the district level, the accounting and the financial reporting for the project will be handled by the DAOs positioned at the Divisional Offices of DWRID. As per existing practice, the DAOs will submit the monthly financial statements to AG's Office, including the project related expenditures, with information copies to the relevant Chief Engineer and DPD (Administration). No additional accounting staff at the DPMU is envisaged at this point of time, but the arrangement will be reviewed as the project scales up.

External Audit

189. Project Financial Statements (PFS) of the World Bank project will be audited by the CAG of India through the Office of the AG in West Bengal. The CAG's office will conduct an annual audit of the operations of the project. The audit report will be submitted to the Bank within six months of the close of each financial year. The CAG audit of the PFS will be in line

with the standard ToR for Bank financed projects. The following audit reports will be monitored in the Bank's Audit Reports Compliance System (ARCS):

Audit reports monitored in the ARCS

Implementing Agency	Audit	Auditors
DWRID, Government of West Bengal	Annual project financial statement	Office of AG, Kolkata
DEA/GoI	Designated Account	CAG of India, New Delhi

Allocation of Credit Proceeds

190. The allocation of credit/loan proceeds will be through two categories.

Allocation of Credit/Loan Proceeds

Category	Amount of the Loan (US Dollars)	Amount of the Credit (SDR, with US Dollars in brackets)	% of Expenditures to be Financed
Goods, works, non-consulting services, consultants' services, training, and operating costs under part A, C, and D of the Project	32,000,000	20,100,000 (32,200,000)	100%
Goods, works, non-consulting services, consultants' services, training, and operating costs under part B of the Project	92,687,500	56,300,000 (89,860,000)	79%
Front-end fee	312,500		
Refund of preparation advance		1,800,000 (2,940,000)	
TOTAL	**125,000,000**	**78,200,000 (125,000,000)**	

Supervision Plan

191. In the early stages, FM supervision activities will focus on the adequacy of the financial reporting arrangements, including the timeliness and completeness of the Treasury financial reports, as the basis for disbursements from the Credit/Loan. As the implementation moves forward, desk reviews of external and performance audit reports will be conducted. Key FM fiduciary work includes: (i) review compliance with all FM covenants; (ii) review compliance with State Financial Rules & Regulations; (iii) review of commitment tracking system; (iv) review of quarterly financial management reports and audit reports and follow-up actions taken on such reports; and (v) participating in site visits as needed to review internal control procedures and practices. Based on the assessed risk, FM supervision plans will be prepared.

Annex 8: Procurement Arrangements

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

A. General

192. Procurement for the proposed project will be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated January 2011; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated January 2011, and the provisions stipulated in the Legal Agreements. The various procurement methods are described in general below. For each contract to be financed by the Loan/Credit, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame are agreed between GoWB and the Bank in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

193. *Procurement of Works.* The activities will include construction of minor irrigation systems. Works contracts are expected to be small value contracts costing less than US$50,000 each which shall be procured following Shopping. The construction of schemes will be combined where possible to make the contracts more attractive for bidders. In that case National Competitive Bidding (NCB) will be used. International Competitive Bidding (ICB) is not envisaged for works. NCB procurement will be done using bidding documents agreed with and satisfactory to the Bank which will satisfy the NCB conditions as under:

- Invitations to bid shall be advertised in at least one widely circulated national daily newspaper, at least 30 days prior to the deadline for the submission of bids;
- No special preference will be accorded to any bidder either for price or for other terms and conditions when competing with foreign bidders, state-owned enterprises, small-scale enterprises, or enterprises from any given State;
- There will be no negotiations of price with bidders, even with the lowest evaluated bidder;
- Extension of bid validity: (a) for the first request for extension if it is longer than four weeks; and (b) for all subsequent requests for extension irrespective of the period when such concurrence will be considered only in cases of Force Majeure and circumstances beyond the control of the purchaser or employer;
- Re-bidding: the system of rejecting bids outside a pre-determined margin or 'bracket 'of prices shall not be used;
- The two-or-three envelope system will not be used; and
- Rate contracts entered into with the Director General of Supplies and Disposals (DGS&D) are not acceptable as substitute for NCB procedures. However, this can be accepted in lieu of Shopping.

194. *Procurement of Goods.* Goods procured under this project will include office equipment, vehicles, etc., and when not included in works contracts the procurement of material for irrigation schemes, including energy efficient pump sets, etc. For goods contracts valued at less than US$50,000 each, procurement shall follow Shopping. For bulk procurement of goods, the procurement will be done using bidding documents agreed with and satisfactory to the Bank and satisfying the agreed NCB conditions, as stated above. Procurement for agricultural development and support may include procurement of seeds, fish fingerlings, etc., which may be done using Shopping or Direct Contracting satisfying the Guidelines conditions. Procurement of goods using ICB is not envisaged.

195. *Selection of Consultants.* Consultants will be procured for third-party construction supervision and quality assurances, technical support for SPMU, project management information system, M&E, etc. Short lists of consultants for services estimated to cost less than US$500,000 or equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. Individual consultants will be recruited to assist DPMUs and line departments with the implementation of the project. Support Organizations will be procured by the project to facilitate community mobilization and participation and institutional strengthening of the community-based institutions. These SOs can either be recruited from qualified consulting firms or from qualified NGOs. The procedure for selection will be agreed using appropriate selection method as provided in the Guidelines based on nature, complexity, and size of the assignment.

B. Assessment of the agency's capacity to implement procurement

196. Procurement activities will be carried out by the SPMU at the state level and mostly by DWRID Executive Engineers at district level. The SPMU is staffed by one expert in procurement who will handle bulk procurement of material, procurement of consultants, hiring support staff, assist in finalization of bidding documents by DPMUs, and monitor procurement processes. The procurement at district level will be handled by concerned DWRID EEs for irrigation-related tasks and for other partner departments like Agriculture, Food Processing Industries & Horticulture, and Fisheries.

197. An assessment of the capacity of DWRID to implement procurement actions for the project has been carried out by the Bank's preparation team in August 2010, with a follow-up in April 2011, based on response by the project to the Assessment Questionnaire. DWRID is governed by PWD codes and has its own schedule of rates as pertinent to irrigation related works. It has procurement guidelines issued under a GO and financial delegation of power. Based on review of existing rules and procedures of DWRID, there is adequate transparency in inviting, receipt, and opening of bids. However, procurement processes lack standardization and procurement processes are not planned and monitored as required by good practice. DWRID acknowledges absence of complaint handling and grievance redressal mechanism which will be developed for the project. Contract administration requires to be built up as a part of the project.

198. The key issues and risks concerning procurement for implementation of the project have been identified and include:

Risks/issues	Corrective measures
Lack of familiarity of staff with Bank-funded procedures.	• Key staff has or will receive training at specialized procurement institutes in India: • A training plan has been developed for in-house training of DPMU staff and field-level EEs and others, with support of Bank; • Closely monitor first phase procurement so that on job learning takes place; • A procurement manual has been prepared that will be disseminated widely.
Inadequate financial delegation.	• GoWB is working out an enhanced financial delegation to SPMU's Project Director, commensurate with project needs.
Lack of contractors' capacity at local level.	• This is being addressed by suitable rationalization of qualification requirement, but not compromising quality, and will be periodically reviewed.
Lack of capacity for contract administration.	• This will be enhanced as part of procurement training.

199. Given the institutional structure of the project, the possibility of simplifying the local level procurement was explored during project preparation while satisfying the Bank's fiduciary requirements. DPMU and DWRID may follow their own procedures so long as agreed conditions are met. The agreed procedure at the local level for contracts up to US$50,000 (Shopping limit) are:

(i) The procurement will be based on comparing price quotations obtained from several suppliers (in case of goods) and several contractors (in case of works), with minimum of three;

(ii) Request for quotation shall indicate descriptions and quantity of goods or specification of works as well as delivery period and place;

(iii) Quotation may be submitted by letter, fax or by electronic means;

(iv) The evaluation shall follow the same principles as of open bidding;

(v) No special preference, price, or purchase will be accorded to any bidder, state-owned enterprises, small-scale enterprises, or enterprises from any given State;

(vi) There shall be no negotiation of price with the bidders;

(vii) There shall be no rate contracts. Only rate contracts entered into by DGS&D will be acceptable.

(viii) Selective exemption of bid security or performance security to any class of bidders shall not be allowed;

(ix) Bids shall not be invited on percent rate basis and shall not be rejected based on a ceiling on bid premium;

(x) Complete records of all procurements made shall be retained up to two years after the closing date of the project. A register for contracts must be maintained and available for inspection;

(xi) Strict compliance for maintaining stock and asset register by the participating agencies; and

(xii) Intimation to all stakeholders to permit the Bank to inspect their accounts and records and other documents related to the bid submission and contract performance and to have them audited by auditors appointed by the Bank.

200. Monitoring and oversight to ensure that implementing partners at district level are using mandated procurement procedures will be carried out using the following mechanisms:

(i) Institutional arrangements at district and field level will provide the framework for ensuring that there are checks and balances and transparency in the procurement process, including access to related information. Social audits and disclosure of procurement information are important tools to ensure that funds are used for the intended purposes;

(ii) Internal audits of the SPMU/DPMUs covering procurement management. Such internal audits shall be conducted on a quarterly basis throughout the duration of the Project. ToR/Checklist for this shall be agreed with the Bank; and

(iii) The Bank will conduct a sample checks/ex-post reviews during implementation review and support missions.

201. The overall project risk for procurement is Substantial.

C. Procurement Plan

202. DWRID, with assistance of other participating line agencies, has developed a Procurement Plan for project implementation which provides the basis for the procurement methods. This plan was agreed between the Borrower and the Project Team during negotiations, and will now be available at the offices of the SPMU and DPMUs. It will also be available in the project's database and in the Bank's external website. The Procurement Plan will be updated in agreement with the SPMU and others annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

D. Frequency of Procurement Supervision

203. In addition to the prior review of selected contracts in the Procurement plan, implementation review and support missions to West Bengal will carry out post review of procurement actions. Independent consultants, recruited by the Bank, will also carry out regular post review of procurement activities.

E. Details of the Procurement Arrangements Involving International Competition

204. International competition for Goods, Works, Non-Consulting Services, and Consulting Services is not foreseen under the project.

Annex 9: Economic and Financial Analysis

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

205. *Project Area.* The project focuses on sustainable use of minor irrigation schemes to enhance agriculture income of small farm holders. Project interventions are designed to strengthen community-based institutions, develop of irrigation systems, and provide agricultural support services to enhance agriculture productivity and income in the command area of 4,660 minor irrigation schemes proposed in the project. The project targets about 139,000 ha of cultivated land to be brought under the command of surface and ground water irrigation schemes (see T-1). Irrigation source wise, surface water (SW) schemes account for 46 percent of the irrigated area, while 54 percent is covered by ground water (GW) schemes. About 91 percent of the incremental irrigated area due to the project will come under lift schemes and the rest 9 percent area has gravity sources of water. The proposed MI schemes' command area is spatially distributed across the four major agro-climatic regions.

T-1 WBADMIP: Project benefited area

	Unit	Agroclimatic zones				
		Teesta and Terai	Gangetic and Vindya alluvial	Red and laterite	Coastal saline	Total
Project MI schemes	No.	1858	1720	877	205	4660
Project area	Ha	54271	50446	28572	5612	138901
SW schemes	Ha	14925	25170	20820	2640	63555
GW schemes	Ha	39346	25276	7752	2972	75346
Flow schemes	Ha	1485	1550	9100	0	12135
Lift schemes	Ha	52786	48896	19472	5612	126766

206. *Project Beneficiaries.* The proposed MI scheme interventions will directly benefit some 166,000 farm families in the project villages (T-2). About 73 percent of the beneficiaries are marginal farmers (MF) with an average land holding size of 0.50 ha and 19 percent are small farmers (SF) with an average land holding size of 1.60 ha. Average land holding size for marginal and small farm holders is 0.65 ha to support an average farm family size of five. Overall farm holding size in the project area is 0.82 ha. There is wide variation in the farm holding sizes across the agro-climatic regions ranging from 0.50 for coastal saline region to 1.00 ha for Teesta/Terai region. Two representative farm models for the small holders (< 2ha) and large holders (>2ha) for each of the agro-climatic zones for quantifying the project benefits have been used.

T-2 WBADMIP: Projected direct beneficiaries

	Unit	Agroclimatic zones				
		Teesta and Terai	Gangetic and Vindya alluvial	Red and laterite	Coastal saline	Total
Average FHS	Ha	1.00	0.75	0.85	0.50	0.83
Direct Beneficiaries	No.	54271	67261	33614	11224	166370
MF	No.	71%	74%	71%	88%	73%
SF	No.	20%	19%	21%	9%	19%
Others	No.	9%	7%	9%	3%	8%

207. Major sources of quantifiable benefits will come from irrigated area developed of rainfed areas, irrigated area intensification, efficient irrigation water management, irrigated agriculture diversification, and where feasible fisheries improvements.

208. *Data Base.* The analysis and with/without assumptions is based on data compiled from multiple sources such as cost of production data covering 540 farmers from nine districts representing diverse agro-climatic regions, technology adoption data covering 708 farmers from 18 districts, West Bengal agricultural and minor irrigation censuses, cost of cultivation data covering 600 farmers from 18 districts, West Bengal farm sector unit cost models for 102 agriculture investment activities, and district level agriculture data publications of GoWB.

209. *Methodology.* The project's cost-benefit analysis is conducted separately for the main investment activities: ten minor irrigation types, agriculture development, and support to community institutions, together accounting for 88 percent of the project costs, and then aggregated for the entire project taking total project costs (including project management and contingencies) into account. The project led irrigated agriculture benefits are quantified by using crop budgets differentiated by four major agro-climatic zones, namely Teesta/Terai alluvial region, Gangetic/Vindya alluvial region, Red/laterite region, and Coastal saline region. Major crops including paddy, differentiated by three seasons, jute, maize, wheat, potato, pulses, oilseeds, vegetables, fruits, and fodder, that all together account for over 90 percent of the cropping pattern in the project area, are used for formulating crop budgets for with (WP) and without project (WOP) situations.

210. To capture diversification prospects, crop/activity budgets are formulated for major fruits and vegetables. Four activity budgets for fisheries are formulated based on data from the latest census and ongoing schemes. A shift in cropping pattern is projected based on the available data from multiple sources across agro-climatic regions and aggregated by using the incremental irrigated area as weights (T-3). With full project development, cropped area will increase by 43 percent for cereals, 107 percent for pulses, and 5 percent for jute as compared to WOP. Cropped area under WP for high value crops like vegetables, potato and fruits is projected to cover at least 17 percent of the gross irrigated area.

T-3: Cropping pattern shifts (ha)

Crops	WOP	WP
Paddy	122859	160561
Wheat	6154	19523
Maize		3997
Jute	14891	15708
Potato		22017
Pulses	7162	14797
Oilseed	16183	15302
Vegetables	6209	19696
Fruits		7012
Total	173458	278613

211. Incremental crop productivity impacts are quantified by using the WP and WOP crop budgets. The production and productivity impact of the project interventions are assessed separately by agro-climatic region and aggregated with crop area as weights. For the existing cereal, jute, pulses, oilseed, and vegetable crops, productivity with community-led MI infrastructure will increase by 36 to 144 percent when full project development takes place (T-4). Substantial gain in productivity comes due to the shift in cultivation from rainfed to irrigated agriculture. Fish productivity is projected to increase by 72 percent in the schemes where fisheries will be feasible. Based on the available technology adoption evidences for the state and earlier bank-funded project

T-4 Agriculture productivity impacts

	Unit	WOP	WP
Paddy	t/ha	2.9	4.2
Wheat	t/ha	2.3	3.1
Maize	t/ha		3.4
Jute	t/ha	1.8	3.1
Potato	t/ha		25.7
Pulses	t/ha	0.3	0.8
Oilseeds	t/ha	0.4	0.9
Vegetables	t/ha	10.3	15.2
Fruits	t/ha		50
Fish	t/ha	3.4	5.9

experiences in the region, it is assessed that by full project development, at least 45 percent of the project benefited area will come under improved resource efficient cum production technology to be promoted under agricultural support services component. Paddy seed production is planned within the project area to produce quality seeds to cover one-third of the project benefited area, improving the seed replacement ratio substantially.

212. *Project Benefits.* Project benefits are generated from multiple sources, which are quantified as follows:

T-5 Irrigated area impacts

	Unit	WOP	WP	Increase
Cropping Intensity	%	125	201	61
Crop land area	ha	138901	138901	
Gross cropped area	ha	173458	278613	105156
Irrigated area	ha		138901	138901
Gross irrigated area	ha		278613	278613

213. *Expansion.* Proposed 4,660 MI schemes will expand the irrigated area by bringing 138,901 ha of net crop land area, currently under rainfed cropping, into irrigated agriculture in the project area (T-5). Delayed onset of monsoon, mid-monsoon breaks, and early withdrawal of monsoon during the main paddy growing aman (kharif) season, besides excess rainfall at times, contribute to low input use and fluctuating sub-optimal yields. The project will therefore improve and stabilize the crop productivity in the major paddy growing aman season, in addition to increasing the cropping intensity and crop diversification.

214. *Intensification.* There is wide variability in the cropping intensity across agro-climatic regions as well as across different MI infrastructure development proposed in the project. For different types of MI schemes, cropping intensity is expected to vary from 122 percent in gravity fed schemes to 208 percent in lift schemes. As compared to the WOP situation, weighted cropping intensity in the project area, across MI scheme types and agro-climatic regions, is projected to increase by 76 percent with full project development. While the gain in gross cropped area is 105,156 ha due to improved cropping intensity, gain in gross irrigated area is estimated at 278,613 ha (T-5).

215. With project, crop productivity is expected to increase by 36 percent (wheat) to 144 percent (pulses) and annual per ha gross margin is estimated to increase by Rs 12,104 (surface flow MI scheme) to Rs 36,716 (light duty tube well). Pulses and oilseeds show maximum increase in yield due to their low yield levels under rainfed cultivation. Irrigated area expansion and intensification alone generate annual incremental gross financial margin of Rs 2,932 million at full development, to be realized in phases over a three year period from the year of a scheme construction.

216. *Diversification.* Project-led agriculture support services will lead to market driven agriculture diversification, starting with the adoption of more high value crops in the project area at full development, to be realized in phases. With the projected shift in cropping pattern, high value crops like fruits and vegetables will cover 19 percent of the project benefited area as against 4 percent under without project conditions. Annual gross margin for fruits and vegetables, with project, vary from Rs 41,000 to 53,500 per ha of irrigated area. Crop diversification alone generates annual incremental gross financial margin of Rs 962 million at full development, to be realized in phases.

217. *Fisheries*. Fisheries development interventions will target improved stocking, feeding, and management to improve fish productivity by 2.5 t/ha in about 1,272 ha of water spread area, projected to be incrementally available for development in the project area. Composite fish culture, monoculture pangus, intensive composite culture, and polyculture are the different types of fisheries related interventions in the project area. Annual incremental gross margin from the fisheries program varies from Rs 54,800 (composite fish culture) to Rs 82,300 (polyculture) per ha of water spread. Diversification towards fisheries in the project benefited command area is estimated to generate Rs 79 million, with the financial gross margin per ha of water spread area at full development to be realized in 2 to 3 years.

218. *Efficient water management.* Sprinkler and drip irrigation interventions account for 4 percent of the targeted irrigated area. In addition to this, efficient irrigation water management will cover at least 6 percent of the incremental irrigated area to be commanded by the MI schemes through the spread of resource efficient technologies like SRI and ZT covering paddy, maize, and wheat. Annual gross margin for the efficient water management technologies varies from Rs 24,041 (wheat with ZT) to Rs 28,265 (Boro paddy with SRI) per ha. As compared to conventional production technology, crop productivity is expected to increase by 12 percent and water use efficiency to improve by 20 percent with resource conservation technologies. Water management efficiency related project interventions in the MI command area will generate incremental financial gross margin of Rs 281 million per year at full development to be realized in four years.

219. *Drought mitigation impacts.* Available evidences indicate substantial variations in the onset of monsoon, monsoon span (102 to 137 days), and withdrawal of monsoon, affecting the principal monsoon crop of aman paddy, but also with implications for jute cultivation. Both the harvested area and crop productivity are affected, resulting in the loss of about 33 percent of the value of crop production occurring once in three years. Project interventions include drought mitigating production management techniques as well as providing protective irrigation when dry spell occurs during the aman paddy growing season, including late onset and/or early withdrawal of monsoon. Project led drought mitigation impacts will help in minimizing the crop production losses to the tune of Rs 303 million, once in three years.

220. *Project costs.* The project cost for all the components including the borrower contribution is projected at US$300 million. The component wise share of project cost is as follows: Strengthening Community-based Institutions (3 percent), Irrigation System Development (78 percent), Agriculture Support Services (7 percent), and Project Management (12 percent).

221. *Economic and Financial Analysis* is conducted for assessing the viability of the overall project based on a detailed farm size wise and agro-climatic zone wise analysis to capture the non-homogeneous production and resource environment prevailing in the project area. The analysis is based on primary and secondary data on farm size, land use, cropping intensity, irrigation source, and cost of cultivation for major crops representing four diverse major agro-climatic zones. Representative farm models for marginal and small and other holdings were developed for four agro-climatic zones and aggregated for the project area as a whole using the irrigated crop area as weights. Project costs and benefits are estimated at 2010 prices over a period of 15 years with 12 percent as the opportunity cost of capital.

222. Financial analysis is done at market prices and economic analysis is done after netting out the taxes and subsidies from the financial cost and benefit flows for which appropriate conversion factors based on the import/export parity prices for the internationally traded inputs and outputs and standard conversion factor (0.9) for others are used. Financial models for different MI infrastructure types are used to test the financial sustainability of project investments from the beneficiary perspective. Annual financial gross margin from the project investments is estimated at Rs 4,557 million, contributed from multiple sources. Annual economic gross margin from the project investments is estimated at Rs 5,048 million, contributed from multiple sources of benefit like irrigated area expansion and agriculture intensification (61 percent), diversification of crops and fisheries (18 percent), improved water management (8 percent), and drought mitigation (12 percent).

T-6: Project Investment Analysis Summary (2010 prices, Rs Billion)

Sources of project benefits	*ERR (%)*	NPV-15 yr	*FRR (%)*	NPV-15 yr
Irrigated area expansion	13.5%	0.5	11.1%	-0.4
Plus Diversification	20.6%	3.4	18.9%	3.0
Plus Efficient water management	23.4%	4.6	20.8%	3.9
Plus Drought mitigation	25.1%	5.4	21.6%	4.3

223. Rate of return analysis reveals that irrigated area expansion alone produces an ERR of 13.5 percent which increases to 20.6 percent with the inclusion of benefits generated from diversification into high value crops and fisheries. The ERR further improves to 23.4 percent with the addition of benefits due to improved efficiency in the management of irrigation water. Finally, with the inclusion of drought mitigation impacts, the ERR for the overall project reaches 25.1 percent, with a NPV of Rs 5.4 billion. Financial rate of return for the project as a whole is 21.6 percent, lower than the ERR, which is mainly due to the parity prices being higher than the financial prices for cereal crops, which occupy about 65 percent of the gross cropped area.

224. *Sensitivity Analysis.* Overall project's rate of return is more sensitive to fall in benefits than to escalation in costs. Switching value analysis indicates that it requires 44 to 62 percent rise in cost or 31 to 38 percent fall in benefits to reduce the rate of return to 12 percent (T-8). Shortfall in the realization of projected irrigated area expansion by 20 percent will reduce the ERR to 20.9 percent, with a fall in the NPV by Rs 1.9 billion. Almost similar impact was observed if institutional failures occur at the user group level in sharing and maintaining the MI water resource. Hence, it is critical to ensure that planned irrigated area expansion both in terms of expansion and intensification is achieved through effective user participation in both the development and maintenance of the 4,660 MI schemes.

T-7 Risk analysis summary

	NPV, Rs Billion	IRR
Expected value	2.5	17.8%
Standard deviation	0.7	1.6%
Minimum	0.3	12.7%
Maximum	4.5	22.6%
Coefficient of variation	27%	9%
Probability of negative outcome	0.0%	0.0%

225. Sensitivity analysis revealed varying sensitivity levels for the project's rate of return to incremental irrigated area, institutional inefficiencies, cost escalation and implementation delays. To evaluate this, project costs, irrigated agriculture benefits, water use efficiency benefits, and drought mitigation benefits are considered.

226. By considering 25 percent increase in costs and 25 percent decrease in benefits on the relevant risk variables, monte carlo simulation was done (1,000 runs) to capture their combined effects on the projected results (T-7). The simulated ERRs ranged from 12.7 to 22.6 percent with a coefficient of variation of 9 percent. The expected mean ERR, estimated by the risk model at 17.8 percent is considered reasonably stable and in any case the project's ERR is not likely to fall below 12.7 percent as the probability of negative outcomes is predicted to be zero by the risk model (Fig.1).

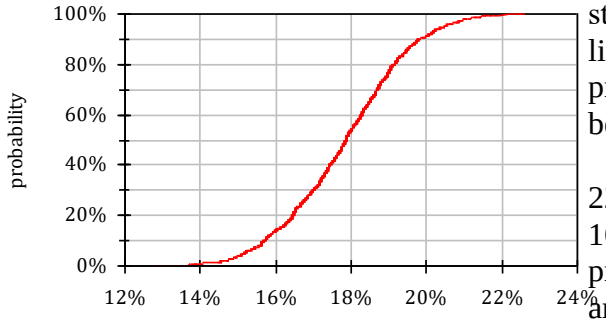


Fig. 1 Cumulative distribution of ERR

227. *Distributive impacts.* There are over 166,000 direct farmer beneficiaries in the project command area, about 92 percent of them are smallholders, owning an average holding size of 0.63 ha. As compared to large farms, cropping intensity and crop productivity are higher in the small farms, which will lead to increase in the incremental financial gross margin per ha for the small farms by 19 percent. About 153,000 small farm holders in the project area will receive 86 percent of the incremental financial gross margin of Rs 4,557 billion. On an average, financial gross margin for each small farm holder will increase by Rs 30,843 per ha, which is 19 percent higher than other large farm holdings.

T-8 Summary of Sensitivity Analysis

Scenarios for the project	ERR (%)	NPV-15 yr, 2010 prices, Rs Billion	FRR (%)	NPV-15 yr, 2010 prices, Rs Billion
Base Level	25.1%	5.4	21.6%	4.3
Escalation in costs				
Costs at 120% of the base level	19.8%	3.7	16.6%	2.3
Risks in irrigated area expansion				
Limited to 80% of the base level	20.9%	3.5	17.6%	2.4
Risks in diversification				
Limited to 75% of the base level	22.5%	4.2	19.3%	3.2
Institutional failures				
Benefit limited to 80% after yr-6	20.9%	3.3	17.5%	2.2
Delayed implementation				
Benefit lagged by two years	23.2%	3.9	19.5%	2.8
Switching values for costs and benefits independently				
Escalation in costs by 44%			12.0%	0.0
Fall in Benefits by 31%			12.0%	0.0
Escalation in costs by 62%	12.0%	0.0		
Fall in Benefits by 38%	12.0%	0.0		

228. *Poverty alleviation impacts.* Financial gross margin for the small farms is projected to increase by Rs 19,431 per farm. Based on the poverty cut-off level income for rural West Bengal (Rs 8,000 per capita per annum, 2010 prices), this incremental benefits will be able to support at least two of the family members of the small farm holder family above poverty line by the end of the project.

229. *Sustainability*. The analysis examined the impact of incremental MOM cost on incremental farm revenues. The exercise did not include the cost of future asset replacement. The incremental MOM cost as share of incremental gross margin is higher (12 percent) for ground water schemes which constitute about 60 percent of total project area (T-9). In case of surface irrigation schemes, the incremental MOM costs makes up around 10 percent of incremental gross margin per hectare. In average the incremental MOM cost would constitute around 11 percent of farm gross margin which is considered affordable. However, the incremental MOM cost constitutes a substantial part of the incremental gross margin for farmers operating pumped dug well (27.5 percent) and shallow tube well (16.2 percent) schemes.

T-8 Sustainability

Schemes	Incremental		Share of GM in Irrigation Cost (%)
	GM (Rs/ha)	Irrigation Cost (Rs/ha)	
RLI (MD)	41673	2909	7.0%
RLI (MN)	38186	4933	12.9%
WDS	92072	5975	6.5%
MDTW	42527	2226	5.2%
LDTW	42929	2102	4.9%
STW	35320	5706	16.2%
PDW	30159	8290	27.5%
SFMIS 30	153206	7004	4.6%
SFMIS 40	258667	9527	3.7%
SFMIS 50	182950	8089	4.4%
Surface Water Schemes	42477	4064	9.6%
Ground Water Schemes	37845	4541	12.0%
Project average	39704	4350	11%

Annex 10: Safeguard Policy Issues

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

230. As a part of project preparation, social and environmental assessments were conducted by consultants with the objective of identifying social and environmental issues associated with the proposed project activities and to design appropriate management measures for enhancing the positive impacts and mitigating potential negative impacts. These assessments included collection and collation of secondary data, primary surveys, and field studies in a sample of villages representing the various agro-climatic zones, analysis of policy and legal framework, and wide stakeholder consultations.

Environmental Assessment

231. *Project Location.* The project will construct and install 4,660 minor irrigation schemes in 333 blocks in 18 districts in the state of West Bengal. These blocks are dispersed over four agro-climatic zones of the state, viz., the Teesta-Terai zone, the Gangetic and Vindhyan alluvial zone, the undulated red lateritic zone, and the coastal saline zone. The hill district of Darjeeling and the coastal areas of Sundarban Islands are at the moment not included in the project. Locations of individual schemes are not pre-determined at this stage, but will be determined based on community demand for irrigation. Currently, a district-wise distribution is estimated, based on a preliminary estimate of community demand. The agriculture support services component of the project will also be implemented in the schemes in the 18 districts.

232. *Environment Assessment Process in the Project.* This is classified as a Category A operation under the World Bank environmental screening procedures specified in Operational Policy 4.01. The project triggers six of the ten World Bank safeguard policies and required partial environmental assessments. The environmental assessment (EA) was undertaken by independent consultants during 2008-2010. The environmental assessment included detailed field investigation and community consultations over a period of about a year (June 2008 – September 2009), which were conducted by the consultants in association with an NGO. The EA also borrowed from the Hydrological Assessment undertaken by another team of independent consultants, and the dam safety analysis and procedures prepared in-house by DWRID.

233. Schematic scheme designs were available during the project preparation period, but not the exact location, design feature, and size of each of the schemes, therefore the environmental assessment was based on a sample of similar schemes already constructed in the state, as well as a sample of villages proposed to be covered in the project. Overall, the EA covered:
(i) documentation of the environmental baseline of the blocks and districts included in the project area; (ii) documentation of the irrigation baseline of the project area; (iii) identification and analysis related to all potential environmental issues arising out of planning, construction, and operation of the schemes; (iv) an environmental management plan, including environmental screening criteria, environmental codes of practice, specimen environmental management plans demonstrating how the environmental codes of practice are to be transformed into scheme-specific environmental management plans, dam safety management plan, and a bio-village

program to accelerate a shift towards enhanced use of bio-pesticides; and (v) as a part of the EMP, adequate arrangements for implementation of the environmental management measures, routine monitoring, inspection and independent environmental audits, and a series of capacity building activities for DWRID for improved management of environmental issues including staffing and training.

234. Environmental impacts of the individual scheme interventions are expected to be low and limited. Therefore, the EA focused on assessing impacts of a group or all of the schemes taken together. Further, impacts vary as the environmental context varies, and direct and indirect impacts in different contexts of sensitive natural resources receptors had been analyzed. Overall, the assessment suggests that the project will not have any significant adverse and/or irreversible environmental impact.

235. *Policy and Regulatory Framework.* From the point of view of environmental assessment, neither the project nor any of the activities proposed in the project attract provisions of the Environment Impact Assessment Notification of 2006, and none require any prior environmental clearance either from the Union or from the State Government regulators. However, the project has been planned in accordance to the principles set out in the following: the National Environmental Policy (2006), the National Agricultural Policy (2002), the National Water Policy (2002), the National Farmers' Policy (2007), and the West Bengal Environmental Policy (1985). According to the prevailing procedures, schemes might require: (i) forestry clearances if any forest land is used in the schemes; and (ii) permission for ground water use from the State regulator, the State Water Investigation Directorate (SWID), for all schemes that will use ground water. The environmental screening criteria in the project will avoid any use of forest land and will require that each ground water scheme obtains necessary permissions for abstraction before being approved for financing.

236. *Key Safeguard Documents.* A detailed description of the project's baseline environmental conditions, probable adverse environmental impacts, and detailed environmental management plans including institutional responsibilities, implementation schedules, budget, and arrangements for monitoring and evaluation, are provided in the project's Environmental Assessment and Environmental Management Plan. Further, all documentation of the various consultations undertaken during the environmental assessment are contained in a stand-alone Stakeholder Consultation Report, which is accompanied by a video documentation of the consultation sessions. The other relevant supplementary documentations are: (i) Hydrological Assessment Report; (ii) Social Assessment Report; (iii) Indigenous People's (Tribal) Development Plan; and (iv) Dam Safety Procedures. An executive summary of the environmental assessment was also prepared.

237. *Public Consultation and Disclosure during EA.* As part of the EA, stakeholder consultations were organized at state and district levels. At both levels, participants at the consultation sessions included policy makers, representatives of the Zila Parishads, senior officers from line departments, relevant government corporations and autonomous agencies, non-government organizations, individual experts, and farmers. The important agreements coming out of these state and district level consultations were integrated in the design of the project.

238. Following the state and district level consultations, the EA consultants selected 30 sample blocks in consultation with DWRID for further investigation and consultations. These 30 blocks were selected from the four agro-climatic zones included in the project. Consultation sessions in each block were organized between October, 2008 and March, 2009. Between 21 and 70 persons including poor and marginal farmers, women, scheduled caste and scheduled tribe people, local government and DWRID officials, and elected members of the village panchayats participated in each of these 30 consultation sessions. Similar people were consulted during the field surveys. These consultations were supplemented by site visits (to existing minor irrigation infrastructure) and focus group discussion with select stakeholder groups.

239. A preliminary list of the perceived environmental impacts was prepared on the basis of secondary information, state, district, and block-level consultations, and reconnaissance visits prior to the field studies and the focus group discussions. The focus group discussions were initiated with leading discussions on pre-identified lists, but expanded to include the local community issues. All these stakeholder consultations were photographically and video documented. The consultations during the field surveys and the focus group discussions identified the following issues, including popular perceptions: (i) excessive and indiscriminate use of inorganic fertilizers and synthetic pesticides; (ii) excessive ground water extraction by unplanned sinking of deep or shallow tube wells; (iii) too much siltation in water detention structures; (iv) reduction of flow downstream of river lift irrigation schemes; (v) invasion of aquatic weeds on surface water channels; (vi) pollution from diesel-operated pumps; (vii) poor and inadequate agricultural extension services in many places; (viii) poor maintenance and theft of minor irrigation equipment; (ix) low water retention capacity of some of the surface flow schemes; (x) high evaporation of surface water in retention schemes; and (xi) use of surface water streams carrying untreated municipal sewage and highly toxic industrial effluent, especially in urban fringes.

240. In addition to the public and stakeholder consultations undertaken as part of the EA, the project has engaged stakeholders including the project-affected people to discuss different aspects of the project over the last three years. DWRID has organized community meetings, as well as meetings with village elders and elected leaders of the villages.

241. All environmental and social reports as well as the tribal development plan have been disclosed in the Project website [www.wbadmip.org] on December 9, 2010. The full EA and SA reports and their Executive Summary were disclosed at all 18 district headquarters in the State, where the project will be implemented. The availability of these documents and the location of the disclosure centers were advertized in local newspapers (leading English and Bengali dailies) between December 24 and 27, 2010. A complete set of the documents was also disclosed in the Bank's Info Shop in Washington DC on April 21, 2011. Finally, the summary reports have been distributed to the Bank's Board of Executive Directors on May 27, 2011.

242. *Analysis of Alternatives.* Overall, there is no feasible alternative to the project. The only possible alternative is large irrigation projects, which in a high population density state are likely to cause severe social and resettlement impacts. Owing to the finite nature and limited number of sites for feasible large irrigation projects it is unlikely that a gap created by not developing this minor irrigation project can be filled up by investing in any other agriculture intensification

activity. In the absence of water for minimum assured irrigation, it is likely that use of chemical fertilizers and pesticides will increase, and the resulting environmental impacts will be higher than the project itself. The "no project" alternative is therefore not a desirable option.

243. At the level of selection of schemes, there are several options. Most prominent among these is the choice between the use of surface water or ground water. For each site this selection will be done carefully, and surface water schemes will be chosen wherever feasible over ground water, provided that small storage schemes will be undertaken only when there is no acquisition of private land. There will be several cases where there will be alternative sites within the same locality, and final sites will be chosen in consultation with local communities, and depending on the environmental and hydrological characteristics. These procedures have been fully incorporated in the environmental screening criteria, which include: (i) proximity of sensitive areas including reserved forests and protected natural habitats; (ii) degree of arsenic and fluoride contamination in ground water; (iii) availability of ground water; (iv) availability of water suitable for irrigation, as per standards promoted by the Central Pollution Control Board; (v) degree of impact on riparian vegetation; (vi) proximity to historical and cultural sites; and (vii) availability of electricity supply grid. These criteria will also determine, by relative scoring and evaluation, further need for limited environmental assessment of a scheme, as well as for its exclusion from the project in the worst case.

244. Additional analysis of alternatives in the project included an analysis of construction materials. Even if the initial procurement cost of asbestos cement pipes is the cheapest, a life cycle analysis including the costs of transportation, installation, high maintenance, and eventual disposal of asbestos containing materials determined that such pipes are expensive and should not be used in the project. DWRID agreed in writing not to use asbestos cement pipes for project schemes.

245. *Forests, Natural Habitats and Wildlife.* West Bengal is a small state but because of an interspersion of variety of agro-climatic zones, topographical features, altitudinal variation from the sea level to about 3,600 m in the Himalayas, the floral and faunal resources of the state are diverse. Eight forest types[1] spread all over the state account for 13.4 percent of its geographical area, mainly in the six districts of Darjeeling, Jalpaiguri, Purulia, Bankura, Paschim Medinipur, and South 24-Parganas, but also in patches of three other districts, namely Barddhaman, Birbhum, and Coochbehar. The protected area network in the state covers different bio-geographic regions, and includes five National Parks, 15 Wildlife Sanctuaries, and two Tiger Reserves[2]. Further, the state has 54 natural and 9 manmade wetlands of area larger than 100 ha, in total accounting for 344,527 ha (a substantial area constituting 8.5 percent of the total wetland area in India), which support substantial floral and faunal diversity. Sacred groves are more abundant in forested districts where the forest tract is interspersed with traditional tribal settlements. There are many in the four southwestern districts of Bankura, West Medinipur, Purulia, and Jalpaiguri, and a few in Darjeeling. In contrast, sacred groves are conspicuously absent in the alluvial districts either side of the Ganga.

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[1] As per standard classification defined by Champion and Seth.

[2] The two Tiger Reserves are within the combined boundaries of National Parks and Wildlife Sanctuaries.

246. Sample survey conducted in 30 sites did not point out that any natural habitat, large wetland, reserved forests, sacred groves, or any other protected area will possibly be affected by the project. The schemes included in the project will have command area less than 50 ha which will all be areas that are currently under rainfed agriculture with private land holding. No intervention is proposed in the catchment of the schemes. The actual construction and installation footprint of the schemes will be small, and can be flexibly sited. The environmental exclusion criteria adopted in the project will ensure that no direct or indirect impact occurs, and these criteria include: (a) that no scheme will be located within any natural habitat, protected or not, such as wetlands, elephant corridors, mangroves, or community forests; and (b) no scheme will be located within or within one km of any protected natural habitats, such as reserved forests, national parks, or wildlife sanctuaries. Further, the environmental screening of the schemes will ensure that (a) the traditional common property resources or ponds (which may contain niche habitats of wetland birds or rare, endemic, or threatened flora and fauna) will be identified and absolutely avoided; and (b) any scheme, particularly river lift irrigation schemes will be avoided if the relevant river/rivulet enters a downstream protected natural habitat within 2 km of its abstraction point, so as not to disturb flow of water into the protected natural habitat.

247. *Incremental Water Use.* West Bengal is relatively rich in water resources among the major Indian states. However, use of surface water is rather low as the state has created very little storage, and the potential to create major storage is limited given that the population density is very high, and creation of storage by displacing people is not feasible, and topography is not favorable for large dams. The state is also relatively richer compared to other major Indian states in terms of ground water, with assessed ground water resources in the state of 27,460 million cubic meter. Among the 25 sub-basins, prominent ground water resources are available in the Bhagirathi (2,408 million cubic meter), the Mahananda (1,425), the Torsa (1,295), the Jalangi (964), the Damodar (877), the Jaldhaka (822), the Ajoy (810), the Mayurakshi (798), and the Silabati (709) sub-basins. From the total annual net replenishment of ground water, the state currently uses about 42 percent (11,650 million cubic meter). The project will use a maximum incremental volume of 740 million cubic meter of surface water, and 910 million cubic meter of ground water, which are 1.7 and 2.7 percent of the annual replenishment, respectively. In sum therefore, the incremental water use in the project for the state as a whole is not particularly significant.

248. The availability of water and its annual replenishment is not homogeneous across the state. As far as variation in surface water is concerned, the project has no significant incremental impact, as the schemes will be planned only based on the potential to capture seasonal flood flow. However, in terms of ground water, there is an issue of potential over-extraction. This was specifically studied by the Hydrological Assessment. Overall, the districts of Murshidabad and Nadia have very little scope for further ground water abstraction, while such abstraction needs to be dealt with carefully in the districts of Malda, North 24 Parganas, Bardhaman, North Dinajpur, and South Dinajpur. Some 37 blocks in the state, mostly in the aforesaid districts, are considered critical or semi-critical from the ground water extraction point of view, and no more ground water schemes will be undertaken in these blocks, unless specifically permitted by the regulators. Further, the Hydrological Assessment has examined the maximum number of shallow tube wells or equivalent that can be dug within safe limits in each block and district.

The total number of schemes that can potentially be installed within safe limits of ground water abstraction is an additional 1.2 million shallow tube wells (equivalent to about 263,000 medium duty tube wells or about 130,000 heavy duty tube wells) over and above the currently installed tube wells. The incremental number of ground water abstracting schemes in the project is therefore small compared to this large potential within the safe limit.

249. The project is designed to avoid rise in water table due to surface water schemes by ensuring conveyance by suitable constructed underground pipes, operating the river lifts by trained personnel, by implementing extension services to improve the on-field water management practices, and through the training of the water user associations to improve irrigation efficiency.

250. *Instream Flow and Downstream Water Use*. The potential issues of maintaining ecological flows in-stream, reduction in downstream flows, and disruption to the right of the downstream water users have been studied by the EA. The surface water schemes will be constructed on seasonal rivers or rivulets, which do not appear to have significant biodiversity values. The environmental screening process, as described with regard to the natural habitat issues, will ensure that no additional impact is there on aquatic fauna or flora from the schemes to be constructed. The surface water schemes that only use the flood flows, and where the dead storage will be subject to a ceiling of 20 percent, will not modify the downstream flow in the lean season. These schemes with small retention structures will, in-effect, be beneficial to the downstream communities as inundation and erosion due to flood flow will reduce somewhat. However, substantial impacts might occur downstream of the river lift schemes, all of which will be located on minor rivers and rivulets. Typically, the river lift schemes will operate more in the lean season to provide irrigation, which in turn means that downstream villages may experience a reduced flow regime in these minor rivers or rivulets. It is also possible to have a cascade of river lift schemes on a small rivulet, where village settlements are continuous on either flank, and the villages on the downstream end of the cascade of river lift schemes might have a very substantial impact. Based on this concern, the project will ensure that each individual river lift scheme will be designed to use only up to 50 percent of the net incoming lean season flow of the minor river or rivulet, guarantying that a flow equal to at least 50 percent of the incoming lean season flow or about 10 percent of incoming average annual flow, whichever is more, will be maintained in the river/rivulet downstream of the installation point at all times.

251. The case of ground water abstraction and its effects on water use of communities around the schemes were examined by the EA. The drawdown at different distances from the pumping well was computed and the cones of depression were estimated. Using these, the EA recommended: (a) that the shallow, medium-duty, or the heavy-duty tube wells in the project will not be installed within a distance of 200 m, 600 m, and 1 km, respectively, of any existing ground water abstraction structure; (b) that the shallow, medium, or the heavy-duty tube wells will have non-overlapping command areas of 6 ha, 20 ha, and 40 ha, as minimum; and (c) that in the cases of the semi-critical blocks, if any ground water abstraction is authorized on an exceptional basis, the minimum distance in any direction between two shallow tube wells should be 250 m (600 m for medium duty tube wells and 1,200 m for heavy-duty tube wells). These are conservative and safe estimates to ensure that downstream (or neighboring) users of ground water are not impacted. The actual drawdown will be much lower as the tube wells are installed

tapping the coarser zones (where the drawdown could be negligible), especially in the northern districts of the state.

252. *International waterways.* Other than the Ganga, there are eight sub-basins that can be classified as international waterways shared between Bangladesh and India. These are the northern rivers of the Teesta, the Sankosh, the Raidak, the Torsa, Jadhaka, the Punarbhanda, and the Atrai, and the coastal estuary of the Matla. The northern rivers spring either in Sikkim or Bhutan, and flow into the Padma-Jamuna in Bangladesh. The estuary Matla forms the boundary between Bangladesh and India, and is predominantly tidal. While the project will have no impact in terms of flow or quality in Bhutan, potential impacts on Bangladesh were studied by the EA.

253. Water sharing on the Ganga between Bangladesh and India is covered by a specific treaty, and the project will have no effect on the provisions of the treaty. For the remaining eight rivers (including their tributaries), the annual and monthly river flows with a probability of occurrence of 75 percent (i.e. guaranteed flow in three out of four years on average) have been calculated. The total incremental water abstraction as percentage of the total annual river flow is low, ranging from 0.06 percent for the Teesta sub-basin to 1.96 percent for the Atrai sub-basin.

254. Further, possible seasonal impacts were studied. The minimum percentage of incremental abstraction (0.01 percent in Teesta, 0.3 percent in Sankosh, and 0.42 percent in Atrai sub-basin) occurs in July when the river flows tend to be highest and the irrigation requirements are low. The maximum incremental abstraction will normally happen in February during the lean season flow of the rivers, when the irrigation requirements tend to be at the highest. Even then, for all but two sub-basins, the maximum incremental abstraction during the lean month will not exceed 4.5 percent (ranging from 0.6 percent for the Teesta to 4.5 percent for the Jaldhaka river basin). The exceptional cases are the Atrai and the Sankosh sub-basins, where the incremental abstraction due to the project during the lean season could be as high as 20.4 and 14.6 percent, respectively. As this scale of incremental abstraction could potentially have negative impacts on the downstream population in Bangladesh, the Government of West Bengal will cap the total number of schemes in these two sub-basins such that the total incremental abstraction during the peak irrigation month is kept lower that 5 percent.

255. By letters dated September 23, 2010, the Bank carried out the riparian notifications on behalf of India, to the riparian countries of Bangladesh, Bhutan, and Myanmar. The notifications included information on the potentially affected rivers, based on information obtained from the GoWB Department of Water Resources Investigation and Development, including their total monthly and annual discharge at 75 percent probability, the incremental abstraction expected under the project, based on the estimated numbers, and the abstraction as percentage of monthly and annual discharge.

256. The notifications stated that for the eight rivers the incremental abstraction for the proposed schemes is negligible compared to the available flow, with the exception of two river systems (Atrai and Sankosh). The agreement to cap the number of schemes in these sub-basins was explained in the notification letters. Further, no schemes will be taken up in any of the 48 small local rivers or rivulets flowing directly into Bangladesh. This was agreed as substantial

local impacts cannot be ruled out on the villages located downstream along these 48 local streams in Bangladesh, even if the overall sub-basin level impacts are not very significant.

257. The Bank received from Bangladesh a response to the riparian notification, requesting water sharing treaties for the rivers. The task team, however, concluded that the incremental water abstraction caused by the project will be a small percentage of the available river volume and the proposed investments are not expected to adversely affect either the quality or quantity of any of the water flows or otherwise result in appreciable harm to Bangladesh or any of the riparians. As per BP 7.50 concurrence from the RVP was sought to proceed with the project as designed, as Bangladesh's response was not of a technical nature nor would any appreciable harm result. RVP's approval was received on July 21, 2011.

258. The EA studied the aquifers in the state, both confined and unconfined. The aquifers in the areas adjoining the Bangladesh-India border are in an iso-lithologic state. The estimate of annual utilizable ground water in West Bengal (from which the project uses a part) is based on the annual fluctuations without affecting the flow of unconfined ground water from the Ganga plain to the sea. It was determined that the project will have no impact overall on the aquifers. However, local impact in downstream areas across the border is possible, depending on the estimates of drawdown and the cone of depression for groundwater-based sub-projects. As mentioned above, to avoid any chance of such local impacts, the project will not install any shallow, medium-duty or heavy-duty tube well within 600 m, 800 m, and 1,000 m, respectively, of the India-Bangladesh border.

259. *Water Quality*. The major issue relates to arsenic and fluoride contamination of ground water. These issues have received a lot of attention in the state and numerous studies have been carried out or are in progress. Ground water in 147 of the 171 blocks in eight districts is contaminated (more than 10µg/l), of which 68 are severely contaminated (more than 50µg/l) with arsenic. As per studies by various State agencies, 46-49 blocks in seven districts are severely contaminated with fluoride (more than 150µg/l). While arsenic and fluoride contamination had traditionally been seen as issues related to drinking water supply, some evidences are emerging in respect to the effect of such contamination in agriculture. A 2007 study in the state showed that various parts of plants irrigated with arsenic contaminated water bio-accumulate arsenic. The concentrations in edible plant parts (such as in rice grain, 0.11-0.90 mg/kg) is lower than the WHO limit of 1mg/kg, but in other parts (such as in rice straw, 0.58-2.68 mg/kg) is high. Studies by the Central Groundwater Board showed presence of arsenic in cereals (wheat 0.4-1.25 mg/kg, rice 0.3 mg/kg when dry and 0.3-0.8 mg/kg when cooked with arsenic contaminated water). Studies by the National Institute of Nutrition, India Council of Medical Research showed high fluoride levels in rice and edible parts of vegetables, when irrigated with fluoride-contaminated water. Based on these findings, the project will not include any ground water-based schemes in blocks of known arsenic and fluoride contamination. In these blocks, surface water schemes will be priority. If surface water irrigation in parts of these blocks is found uneconomic, distinctly identified safe (arsenic and fluoride free) aquifers will be used selectively. Lastly, in blocks in coastal areas of excessive salinity, the project will assist to popularize salinity-resistant crops through the agricultural extension services sub-component.

260. With regard to surface water irrigation, analyses of the historical data and the primary surveys by the EA showed that water quality in most of the rivers/rivulets and local streams are within the norms for irrigation. In peri-urban areas (many shifting primarily to cultivation of vegetables) mixing of industrial effluent in irrigation channels is a concern that was studies by the EA. While BOD, DO, oil, grease, arsenic, and nitrogen compounds were found to be within safe limits, heavy metals such as chromium remain a concern. The environmental screening criteria will ensure that for any surface water scheme water quality tests will be undertaken, and schemes will be approved only when the water quality is within the Central Pollution Control Board (CPCB) prescribed standards for irrigation (including that the test should not show any trace of heavy metals). As the water quality data is not collected on the smaller streams systematically, the project will invest in implementing a water quality testing and monitoring program, complementing the planned program of the State Water Investigation Directorate.

261. Augmenting minor irrigation in the state may potentially increase the use of chemical fertilizers (and pesticides), in turn affecting water quality at large. The rate of use of fertilizers in the state is below the national average and the recommended maximum doze (450 kg per ha). The ratio of NPK in fertilizer use in the state is balanced (2.3 : 1.3 : 1). Given these baseline scenarios, incremental fertilizer use induced by the project is not expected to have any significant impact. However, as a positive environmental enhancement measure, the project will support increased use of bio-fertilizer, organic manure, and vermin-compost through awareness campaigns, improved agriculture extension services and training, and through the 'bio-village" activities identified in the EMP.

262. *Pest Management.* As expected in a state dependent on small farms, pest management is the primary concern of the farmers. Although the state's use of synthetic pesticides, on the average, is less than the country's average (which is approximately 500g per ha per year), six districts use pesticides at significantly higher level than the national average. Evidences suggest that the farmers use 221 different types/brands of synthetic pesticides, all of which are in the 'permissible' list of the State Department of Agriculture. These 221 types/brands of 'permissible' pesticides include 10 and 39 brands classified as Class 1B and Class 2, respectively, by the WHO.

263. The State Pollution Control Board undertakes monitoring of pesticides at 22 locations in nine districts. The monitoring has detected γ-BHC (at 4 sites), DDT (2 sites), malathion (1 site), and traces of aldrin in a few places. Endosulfan, methyl parathion, chlorpyriphos, and anilophos were not detected by this monitoring. A State Department of Environment study undertaken by the Institute of Environmental Studies and Wetland Management in Jalpaiguri District concluded that the soils of the Terai Region, near the tea gardens, have accumulated high concentration of chloropyriphos, ethion, heptachlor, dicofol, beta-endosulphan, endosulphan sulphate, and cypermethrin. High levels of chloropyriphos, dicofol, heptachlor, and ethion were detected in the rivers and canals of the Terai and the Dooars areas. Primary surveys undertaken as part of the EA also detected alpha-BHC, gamma-BHC, and endosulphan, albeit the concentration levels were below permissible limits.

264. The project will not use or promote any chemical or synthetic pesticide, and to that end there will be no direct impact from the project. However, given that the additional irrigation

capacity created by the project can induce substantial increment in the use of pesticides, the EMP includes several management measures, as below:

a. The Department of Agriculture has been requested to delete the 49 pesticides classified as WHO Class 1B and Class 2 pesticides from the list of 'permissible' pesticides, and thereafter undertake awareness programs targeting the staff of the Department's agriculture extension services, so as to be able to discourage use of these harmful pesticides in the state;

b. Capacity and awareness building as part of the Agricultural Support Services Component of the project. This will include training of farmer groups on judicious pest management with emphasis on predisposing factors for occurrence of pest and diseases, and use of proper integrated pest management;

c. As part of the EMP, a mass publicity campaign on integrated pest management, effect of indiscriminate use of chemical pesticides, information about unsafe pesticides and their alternatives, safety measures for handling pesticides, use of bio-pesticides;

d. Specific workshops with 5-10 farmer groups in each *block* included in the project on best practices on pest management; and

e. Bio-Village Program. (A) Undertaking required studies on intensification of the production of bio-pesticides in the state, including identification of barriers to the local entrepreneurs who have set up bio-pesticide production units, and piloting quality control testing to be able to ensure quality of the bio-pesticides produced in the State. These studies and piloting will be undertaken by a non-government institution, *Neempith Ramakrishna Ashram*, who has the necessary professional competency and laboratory facilities. (B) Implementation of the Bio-Village Program in up to 50 villages in the various agro-climatic zones in the state. In each village the targets will include: (i) converting at least 10 ha of agricultural land to exclusive organic farms; (ii) promoting integrated organic farming practices covering agriculture, horticulture, animal husbandry, and aquaculture; (iii) ensuring supply of bio-fertilizers and bio-pesticides through additional support to local entrepreneurs; and (iv) ensuring tie-up and market linkages to the farmers shifting to organic farming. This program will also prepare competence-based training manuals and curriculum for wider use, particularly related to adoption of advanced but appropriate bio-technology applications. Compared to usual awareness and training programs, this bio-village program will incubate and support application of appropriate technology for 3-4 years to make the changes sustainable.

265. *Dam Safety*. The surface water schemes in three districts will include construction of minor dams (height classes of 4-6 m and 6-8 m) and earthen embankments (height less than 5 m, with length up to 400 m). For most such impoundments the water storage will vary between 65,000 and 120,000 cubic meters. These surface water schemes will attract the required due diligence to ensure safety of the dams (given the height of the structures upward from foundation level, length of the low-height embankments, and the area of storage). All structures in the project will be engineered, based on typical design standards and guideline design (related to tension, overturning, and sliding). The guidance design is based on all required safety parameters, including the need to withstand flood flows of 100 year return interval, and adequate

ground acceleration factors to withstand earthquakes predicted for the seismic zones of III and IV in which the schemes will be located. Suitability of dam foundations will be decided through geological investigation and density or gradation tests. All structures will be designed by identified competent graduate or post-graduate engineers, and the design of each such scheme will be certified by the concerned Executive Engineer, and checked and field verified by the SPMU technical unit, comprising of a senior engineer experienced in implementing safety norms in the design and construction of dam and embankment structures. Quality control procedures during construction will include regular supervision of the dams and appurtenances adequately recorded by site and DPMU engineers, and periodic inspection and reviews by SPMU engineers. The competent Executive Engineer or other competent expert as the case may be will issue completion certificates only after verification that safety norms have been appropriately implemented by contractors.

266. *Physical Cultural Resources.* The state is dotted with archaeological and historical sites, with higher concentration of protected sites in the five districts of Bankura, Murshidabad, Malda, Medinipur, and Hoogly. No activity in the project is expected to be sited within proximity of the protected area boundaries of any such sites. The EA, nevertheless, studied the possibility of impacts on smaller, unprotected physical cultural resources. A sample survey of 30 sites did not identify any possibility of impacts on locally important cultural sites, such as sacred waters/ponds, temple ('debottar') land, or local community shrines. However, as such impacts cannot be absolutely ruled out in the numerous schemes yet to be identified, generic mitigation guidelines have been developed. The EMP includes a specific budget to be used by SPMU/DPMUs to mitigate or compensate any effects on physical cultural resources.

267. *Construction-Related Impacts.* Site related issues of construction waste handling and management, stagnant pools of water, lack of proper site drainage, etc., may potentially arise, but will not be of significance. These construction-related impacts will be addressed, mitigated and managed by the application of the EMP. The mitigation measures include ensuring that all equipments and vehicles carry valid "pollution under control" certificates at all times; haulage roads are sprinkled with water to suppress dust; construction materials are transported and stored properly to avoid littering and dust; and all diesel generation sets used during construction conform to the applicable norms set by the central/state pollution control boards.

268. *Environmental Management Plan.* The EMP includes, in addition to the mitigation and management measures described above: (i) the environmental screening criteria including environmental exclusion criteria and the description of the screening process; (ii) environmental codes of practice for the standardized schemes; and (iii) specimen environmental management plans for typical schemes.

269. Further, the EMP includes: (i) an environmental monitoring plan, specifying the parameters, frequency, and responsibilities for monitoring; (ii) a plan to conduct two independent environmental audits in the project, at the end of the second and the fourth year of implementation; (iii) an environmental capacity-building program, including plans for training and exposure visits for the departmental staff, contractors, and beneficiary groups; and (iv) investments in two additional laboratories and supporting water quality surveillance to augment the wider water quality monitoring in the state. Adequate budget provision has been

made for implementation of the EMP. This budget will primarily be managed by the Safeguard Management Unit of the SPMU.

Budget for Implementation of Environmental Management Plan

	Items Proposed in EMP	Base Cost (`lakh)	Budget (US$ M)
A10	EMP Implementation Cost: Investment cost and maintenance	56.95	0.13
A20	EMP Implementation Cost: Operational cost	652.60	1.45
B10	Environmental Capacity Building: Training programs	152.50	0.34
B20	Environmental Capacity Building: Workshops, Consultancies	493.20	1.11
C	Concurrent monitoring & evaluation of outcomes and impacts	90.00	0.21
D	Communication: Bio-village campaign; media, documentation	55.00	0.12
E10	Grants/Assistance: Intensification of bio-pesticide production	100.00	0.22
E21	Works: Bio-village program implementation	876.00	1.95
E22	Works: Relocation and restoration of cultural properties	80.00	0.18
E23	Works: Enhancement of water bodies	150.00	0.33
E31	Goods & Equipment: Water quality testing kits	30.00	0.07
E32	Goods & Equipment: Dam safety testing mobile vans	20.00	0.04
E33	Goods & Equipment: Additional WQ laboratories under SWID	400.00	0.89
	Total	**3156.25**	**7.04**

270. *Institutional Arrangements for implementation of the EMP*. At each DPMU, an Assistant Engineer or an Executive Engineer will be in-charge for implementing the EMP, with support from a full-time environmental specialist who will ensure that all environmental mitigation and management measures are fully implemented. At the SPMU, a distinct safeguard management unit will be formed with environmental (and social) specialists. The responsibility of the unit will be to: (i) review and inspect implementation of the EMP; (ii) review and verify the environmental screening of the candidate schemes, including sample field verification; (iii) implementation of the environmental capacity building and awareness activities; (iv) coordinating with relevant departments with respect to the larger state-wide issues of water quality including heavy metal, arsenic and fluoride contamination; water efficiency, reducing energy use in irrigation, promoting renewable energy in irrigation, integrated pesticide and nutrition management; and (v) managing the environmental audit process.

Social Assessment

271. The Social Assessment has provided an insight into the minor irrigation scenario in the state against the backdrop of a diverse socio-economic profile. It brings into the fore that the state is predominantly rural and that the inhabitants are quite poor with most of them being marginal or small farmers. As such the proposed project interventions are expected to improve their livelihoods. Key stakeholders have been identified and their expectations from, as well as concerns about the project have been assessed. The project essentially aims at mobilizing local

communities dependent on agriculture for their livelihood to participate in the development of irrigation schemes and subsequently their management, operation, and maintenance. The communities, however, are quite diverse in many ways – social (scheduled castes, others), economic (landless, small, marginal, and large farmers), ethnic (scheduled tribe, others), and occupational (farmers, fishermen, livestock owners). This diversity makes mobilization a challenging task, demanding multi-pronged support/interventions. Positive as well as negative impacts likely to occur as a result of the project interventions have been drawn, as have governance and operational arrangements as existing currently and their future road map. As such, issues of significance in the context of designing the project as well as measures to address the same are in place. The Social Assessment conducted as part of project preparation identified the following key social development issues/principles, which should underpin the project's strategy and implementation: (i) participation; (ii) inclusion and equity; (iii) decentralization; and (iv) human and institutional development. The assessment has also confirmed that there is no need to acquire lands involuntarily, and OP 4.12 need not be triggered. OP 4.10, Indigenous Peoples (Tribals) is triggered.

272. Two issues are given particular attention, namely land acquisition, even though the OP is not triggered, and tribal population, while gender issues are covered as well.

273. *Lands.* As almost all schemes are small the requirement for land is minimal. The SA study indicates that land requirement arises for three purposes: (i) source works, mainly headworks and pump houses; (ii) spouts, which are water outlets for regulating distribution; and (iii) distribution systems, mainly field channels for transmitting water to the plots. A spout is a small regulatory chamber requiring at the most an area of about 1.5 sq. m. Farmers actually prefer to have a spout in their plot as it provides them an advantage in securing water, and no lands need to be acquired for a spout as not only the requirement is too small, but also that it is demanded highly by the farmers. The extent of land required for source works depends on the type and size of the scheme, but at the maximum it will require about 150 sq. m. The requirement for field channels is small as well. In almost all instances it may thus not be necessary that land has to be acquired, as typically there will be enough flexibility available for the choice of land and cultivated land may not have to be used. Given that the requirement for land is normally very small, in those cases where private land is required it can be secured on a voluntary basis, through donations. Thus, there is no need for involuntary land acquisition under the project. In order to make the process of voluntary land donations transparent, a number of rules will be adopted, while there will be documentation of the process. The following rules shall be adopted:

(i) Voluntariness shall be ascertained by DWRID and duly documented. The land user will not be subjected to any pressure, directly or indirectly, to part with the land;
(ii) The department shall ensure that there shall be no significant adverse impacts on the livelihood of the household donating the land. Preferably, the voluntary donation should not be more than 10 percent of the area of any holding by the land owner;
(iii) This should not result in any physical relocation;
(iv) The land in question must be free of encroachers, share cropping, or other claims or encumbrances;

(v) The department shall facilitate the prospective water users in arriving at extending 'gratitude' to the land donor in lieu of the 'contribution' s/he has made. Traditionally, the prospective water users do express their thanks to the donor with some gratuity. This may entail some cash, waving off of (part of) the irrigation service fees, location of spout, or employment. The same shall be documented and monitored for compliance;
(vi) land transfers will be complete, land title will be vested in the Government; and
(vii) provision will be made for redressal of grievances, if any.

274. *Tribal Population.* West Bengal has a significant tribal population, and about 6 percent of the total population, or about 4.5 million people, are categorized as Scheduled Tribes (ST). There are 38 notified STs in the state, including the Santal that represents more than half of the total ST population of the state. Other significant ST populations include Oraon (14 percent), Munda (7.8 percent), Bhumij (7.6 percent), and Kora (3.2 percent). The districts having significant tribal population in the state are: (i) West Medinapur; (ii) Purulia; (iii) Dakshin Dinajpur; (iv) Malda; (v) Jalpaiguri; (vi) Birbhum; and (vii) Burdwan. They live predominantly in the rural areas and their social, cultural, economic, political, and historical characteristics induce not only vulnerability, but also often renders them 'excluded' from development interventions.

275. While the project interventions will not adversely affect the tribals, these groups do require special attention from the viewpoint of ensuring inclusion and equity. Hence, to ensure their inclusion, specific targeting is essential. Against this context, and in accordance with the Bank's OP 4.10, a Tribal Development Plan (TDP) was prepared with the following objectives: (i) ensuring inclusion through selective targeting/prioritization; and (ii) establishing anew/strengthening the existing tribal institutions to undertake irrigated agriculture. The key elements underpinning a tribal development plan (TDP) relate to: (i) discriminatory targeting – to ensure inclusion and equity; and (ii) capacity support/building – to enable tribals to participate and derive full benefits. Separate budget provision has been made for implementing the TDP.

276. As a part of the Tribal Development Plan, a block-wise list of tribal concentrated villages for the all the districts of the State was prepared, which is an original piece of work that is expected to be of immense use in future for tribal development by both national and state governments.

277. It is customary in West Bengal for every department to set aside six percent of the budget for tribal development. For this project, government has agreed to set aside up to 13 percent of the total financial outlay (US$40 million) for the TDP. With this allocation, it is likely that the project will be able to cover a large number of the total tribal villages that have no irrigation facilities at the moment.

278. *Gender*. It is recognized that rural women are involved in and contribute to over 60 percent of the farming operations in irrigated agriculture. The Social Assessment study has recommended that interventions be designed to increase women's participation in decision making. For this, specific roles, tasks, and functions of women have been identified, including

operating and maintaining irrigation systems. The same needs to be expanded and built into the SDMPs. The following measures will be adopted:

- Efforts will be made at developing a cadre of women extension workers from among the local farming communities;
- Capacity building of self help groups and NGOs will be undertaken to be able to conduct gender analysis and identify opportunities for enhanced interventions; and
- All governance and executive bodies of the project will aim at having a quarter or more of the members as women.

279. A gender audit will be undertaken during the MTR in order to evince a feedback and chalk out mid-course corrections, as appropriate.

280. *Institutional Arrangements.* A full time Social Development Specialist will work in the SPMU. This specialist will ensure that social management plans are in conformity with the project's overall social management framework, and that necessary guidance and budget is provided to implement these plans. At the district level, DPMUs will ensure that the scheme development and management plans will include social management plans, as needed, in conformity with the Environment Management Plan and Tribal Development Plan. The district level social specialists will ensure proper planning, implementation, and monitoring of these activities, and also coordinate with the SPMU on these issues.

281. At the scheme level, the focal point will be the WUA to which all command area farmers and other eligible users such as fishermen will belong. The WUA will be expected to play an active role in the planning and management, operation, and maintenance of schemes. Each WUA will have an Executive Committee and provisions exist to constitute specific sub-committees for e.g. finance, works, and water management.

282. Support organizations, to be recruited by the project as per selection criteria agreed with the Bank, will facilitate community mobilization, participation, and institutional strengthening of the community based institutions. Each SO team will include staff with expertise in community mobilization, and will be assigned a cluster of schemes in a district with the responsibility for building capacities of WUAs.

283. *Monitoring and Audit.* The monitoring of EMP and TDP implementation will be integrated with the system for regular monitoring, except that environmental screening will be an additional step that will be undertaken by the district engineer and reviewed and verified by the safeguards management unit of the state SPMU. Similarly, precautionary screening will be undertaken for each scheme involving dams. Inspections by the SPMU will take place at least twice in each district on a sample basis. Before the end of the second and the fourth year of implementation, independent environmental audits will be undertaken, which will cover all the districts where the project activities are implemented. Results of these independent audits will be used to improve the implementation of the project (including at the mid-term review), and to modify the EMP and TDP as required.

284. *Reporting.* The semi-annual progress reports of the project that will be prepared by the SPMU will include a section on implementation of the environmental and social management

plans and identified issues. Reports of the independent environmental and social audits will be submitted to Bank within three months of completion of the second and the fourth year of the implementation period.

Annex 11: Governance & Accountability Action Plan

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285. Governance and accountability arrangements have been developed for the project to ensure that funds are used effectively and efficiently and key stakeholders are enabled to give feedback and their grievances are addressed in a responsive and accountable manner. There is increasing recognition of the importance of governance as an integral part of any development effort to reduce poverty and promote growth. Weak governance and corruption lead to leakage of resources away from intended purposes and beneficiaries, risk poor outcomes, and ultimately lead to unsustainable development impacts. Beyond the "development dividend" that is obtained, both donors and recipients have a direct interest in ensuring good governance and controlling corrupt practices. The Bank has fiduciary obligations, enshrined in its Articles of Agreement, to ensure that Bank funds are used only for their intended purposes.

286. The project will put in place elements for a governance and accountability framework so as to improve project governance and implementation and reduce the risk of corruption. This involves institutionalizing monitoring and feedback, and holistic disclosure of project information that encourages greater participation in project oversight. It also involves enhancing fiduciary controls. A risk assessment analysis has been undertaken to identify corruption and implementation risks.

287. The potential key governance risks for the project relate to the following:

- The project processes may not detect and address problems related to transparency and accountability and may not facilitate full information flow (compliant with India's Right to Information (RTI) Act);
- Lack of adequate safeguards may cause violation of norms and/or corruption;
- Weak or ineffective complaint and grievance handling mechanism may affect transparency and contribute to corrupt and manipulative practices;
- Weaknesses in procurement management system and financial management system could result in mismanagement of bidding and spending of funds; and
- Weak implementation arrangements, including but not necessarily limited to insufficient allocation of budgetary resources for supervision, and operation and maintenance activities (a governance risk common across all infrastructure related projects) may adversely affect project processes and results.

288. Failure in these areas can compromise project outcomes by weakening and/or undermining: (a) project targeting and the delivery of intended benefits; (b) the quality of goods and services delivered; and (c) project sustainability.

289. The project response to these perceived risks is to prepare a comprehensive strategy to address governance and accountability issues, which rests on four pillars explained below. The strategy will be operationalized in the form of a Governance and Accountability Action Plan (GAAP) to ensure that funds are used effectively and efficiently under the project, while key

stakeholders are enabled to give feedback and any grievances are addressed in a responsive and accountable manner. The GAAP lists the steps to be taken in a time-bound manner in this regard. Overall, the expected results from the project's governance and accountability strategy and its action plan are that: (a) the roles and responsibilities of key stakeholders are clearly defined; (b) there is adequate oversight of project processes and decision-making mechanisms; (c) the appropriate allocation and use of funds by project functionaries and contractors are clearly outlined along with sanctions for misuse; and (d) key stakeholders, especially beneficiaries, can easily report problems and have grievances addressed in a timely and appropriate manner.

290. The project's governance and accountability strategy is built on four pillars:

1. **Communication, Consultation, and Information Disclosure.**
   i. *Suo moto* disclosure of general information in compliance with Right to Information, according to the RTI Act;
   ii. Communication of additional information on demand;
   iii. Building up "demand side" of governance through communication, consultation, and awareness building.
2. **Enhanced Monitoring.** Independent monitoring and evaluation by external, third-party M&E agencies.
3. **Grievance Redressal System.** An effective system to respond to issues of mismanagement, corruption, and other problems that may be identified during implementation.
4. **Risk and Vulnerability Mapping and Mitigation.** Assessing each project process with regard to key categories of risks and design of suitable mitigation measures.

Pillar 1: Communication, Consultation, and Information Disclosure

291. Stakeholders will be provided with the requisite information on the basis of which they can ask questions, identify problems, and recommend and/or demand remedies. Information disclosure arrangements are founded on ensuring compliance with India's Right to Information Act, which establishes the citizens' "right to know". Such arrangements lay the foundation for appropriate communication, consultation and/or information disclosure regarding project activities, thereby enabling citizens and stakeholders to potentially influence project problems and/or remedies regarding near term project implementation and long term sustainability.

292. **RTI Act and *Suo Moto* Disclosure of Information**. *Suo moto* literally means 'on its own motion' or without external prompting or explicit demand, and India's Right to Information Act calls for this level of proactive information sharing on the part of the public sector. The Act guarantees citizens the right to secure information controlled by public authorities to promote transparency and accountability within the public sector. Under the Act, public authorities are bound to respond to information requests within a stipulated time.

293. The project will publicly display information on its website related to the allocation of funds, release of funds, expenditures, and progress on financial and physical aspects of project implementation and other relevant aspects. At specific scheme sites, information related to

contracts and progress with their implementation will be available in the DPMU and WUA offices, and will be displayed through notice boards and wall paintings.

294. **Disclosure of Information on Demand**. In addition to the proactive disclosure of information, the project has designed a mechanism for disclosure of information on demand via internet, in-person service, and post/fax/telephone:

- **Internet**. The project website will feature a user-friendly, automated system to register requests for information. Alternatively, requesters can send emails to the Project Director at the SPMU. The system will assign a query number and indicate the tentative timeframe for response, so that information seekers can track their queries.
- **In-person through front office.** Any person seeking information about the project can go to the DPMU offices and submit his/her query or request for information through an input form (bi-lingual) that will be simple for common people to understand. The input form will also contain a clear timeframe for receiving a response from the project. The input form will be completed in duplicate so that the information seeker can retain a copy.
- **Post/Fax/Telephone (toll-free state number).** Information requests can also be submitted by post or fax, which are directed to the DPMU or SPMU offices. Communications by phone will be recorded through an automated system. Recipients will receive an acknowledgment of their request via the same technology with a query number and expected response time.

295. The SPMU will be responsible for the disclosure on demand system. The project director will assign a request to the appropriate team expert.

296. **Document Management and Dissemination System.** To manage both proactive and on-demand responses to requests for information, the project will manage a document management and dissemination system that will ensure quality standards for accuracy and presentation are met on each document. This will be coordinated by the SPMU.

297. All queries and responses will be classified according to task and/or project components and appended to a Frequently Asked Questions (FAQ) file which will be readily available to project functionaries and also online in the project website. Documentation of queries and responses will help in promptly replying to queries in future. Such a mechanism will also educate all project functionaries about the apprehensions and queries which the general public may have about the project.

298. **Building the Demand Side of Governance**. The proposed arrangements for obtaining information from the project (the Information Disclosure System above) and registering complaints (the Grievance Redress System below) will be widely publicized through print and electronic media and posters. The main objective is to clearly outline the roles and responsibilities of the project, its staff, and WUAs, and to encourage the public to demand information.

299. A State Information Commission has been constituted to enforce the RTI Act. If a public authority does not provide the requested information or provides incomplete information within the stipulated time, the information seeker can approach the Commission for issuance of directives to the concerned authority to provide the information.

Pillar 2: Enhanced Monitoring

300. Institutional strengthening to enhance technical capacity, quality assurance, and proper oversight of project decision-making and implementation at state and district level is essential to the effectiveness and efficiency of the project. For timely and qualitative implementation, the project will have an internal monitoring and management system so that all project activities can be reviewed at regular intervals. The project will also have independent organizations to do monitoring and evaluation of project activities. External M&E to be carried out by consultants will concentrate on generating an unbiased view of project performance in terms of achieving established milestones and adhering to the recommended processes and quality parameters within the purview of the overall project scope and objective. The proposed external M&E system will focus mainly on two broad activities, namely concurrent implementation monitoring and impact evaluation.

301. **Procurement and Implementation.** A number of steps are proposed to enhance transparency and improve efficiency of the procurement decision making process and implementation arrangements including:

- Disclosure of contract opportunities and bid documents on the project website;
- To ensure transparency and consistent treatment of bidders, bids will be accepted by post as well as by hand within the given time frame. Bids will be opened on the last day of bid submission and a comparative statement of bids received will be prepared and signed by all tender committee members on same day. Tender committee to finalize selection within 10 working days. WUAs will be provided a copy of the tender meeting minutes and decision on final selection;
- Measurement of works executed by contractors will be done in the presence of WUA representatives;
- An external third-party construction supervision and quality assurance consultant will be engaged to monitor quality of works procured under the project; and
- Time lines will be established within which payments will be processed following receipt of bills from consultants, contractors, and suppliers.

Pillar 3: Grievance Redressal System

302. The project will have a dedicated grievance redressal system, which will be closely linked to an information disclosure system, to allow for feedback and complaints to reach senior project officials via dedicated phone number, fax number, self-addressed stamped postcards, and the internet. The grievance system goes beyond information disclosure in that it is not limited to requests for information, but also will respond to allegations of mismanagement, corruption, and other problems that can emerge during implementation. The crucial links between the grievance

system and the information disclosure system are the communication channels that the grievance system uses and the service standards to which it adheres.

303. Grievance handling will be at three levels: (i) scheme level; (ii) district level; and (iii) state level. At the scheme level, any disputes or differences between WUA members shall be settled by the Executive Committee of the WUA. Documentation of all decisions reached in this regard and maintenance of records shall be the responsibility of the Executive Committee. Disputes that cannot be resolved by the Executive Committee of WUA shall be referred to DWRID for redressal. At the district level, the DPMU shall be vested with maximum responsibility for addressing grievances under the project and ensuring timely redressal of issues and complaints. The DPD (Administration) shall have a grievance focal point in the DPMU, headed by one of the unit heads, and the DPD shall also regularly review registered grievances and progress on redressal of issues.

304. At the state level, the SPMU shall primarily have a supervisory role in the process of grievance redressal. Grievances will be addressed by the SPMU if it refers to an issue related to the management of a DPMU. Depending on the nature and severity of complaint, a team of inquiry will be constituted by the project director to look into the matter. On the basis of the report of the inquiry team, necessary action will be taken, including the notification of legal authorities, if required, and the same will be communicated to the complainant.

Pillar 4: Risk and Vulnerability Mapping and Mitigation

305. During the design of the project, various project processes have been assessed with respect to major categories of risks and vulnerabilities. Monitoring will be through the project's MIS, the external monitoring agencies, and auditors.

306. During implementation review missions, the Bank Task Team along with project management will jointly agree on the governance-related issues that need further analysis and then initiate independent evaluations, if needed and mutually agreed. This will be done on a regular basis depending on the gravity of issues, and the frequency of these external evaluations will be decided accordingly.

307. In order to implement the above strategy, the GAAP matrix below summarizes potential issues and constraints to be addressed, key actions to be taken, the date by which they are expected to be taken, and the authority responsible for taking the action.

308. It is important to note that the GAAP is a "living" action plan which will be monitored and reviewed periodically. Based on the implementation stages of the project, different action points may be included in the GAAP later, in consultation with project management.

GAAP Matrix

Anticipated Problem	Action To Be Taken	Deadline for Action	Responsible Party
1. Designing project processes to support better accountability and transparency			
The project processes will not detect and address problems related to transparency and accountability and will not facilitate compliance with Indian regulations on right to information.	Ensure that project business processes are in line with RTI Act roles and responsibilities for public authorities, including establishing a disclosure policy that specifies channels for information queries and roles and responsibilities of staff at central and state levels.	Three months after project effectiveness.	SPMU
	Develop systems and procedures to implement right to information aspects, including websites, newsletters, and transparency boards.	Within 6 months of project effectiveness.	SPMU and DWRID
	Conduct training on RTI for project staff (DPMUs, SPMU, DWRID).	By 6 months following effectiveness with refresher knowledge sharing and training for new staff as needed at regular intervals.	SPMU
	Disclose regularly updated information as prescribed by the RTI Act.	Continuously during project implementation.	DPMU/ SPMU
	Maintain proper case database at project level and use it to enhance public disclosure progressively bringing down caseload.	Continuously during project implementation.	DPMU/ SPMU
2. Strengthening preventive actions against corruption			
Lack of adequate safeguards may cause violation of norms and corruption.	Encourage project staff, WUAs and beneficiaries to report instances of corruption by clearly describing channels for reporting responsibilities of the project to address allegations of corruptions, and by clearly communicating project's "zero tolerance policy" for corruption at any level.	3 months after project effectiveness.	SPMU
	Clearly communicate project activities, rules, and potential benefits through multi-channel communications campaigns.	Within 3 months upon project effectiveness.	DPMUs/ SPMU
	Commission third-party monitoring studies to track implementation progress and identify areas of deviation missed by standard project monitoring.	MTR stage and intermittently during project implementation.	SPMU
3. Strengthening complaint and grievance handling system at the project level			
A weak complaint and grievance handling mechanism may affect	Finalize and test computerized system for registering, tracking, and monitoring of complaints.	Within 6 months of project effectiveness.	SPMU
	Devise criteria to segregate complains in order of gravity and disposal in specified timeframe by designated authorities.	Within 4 months of project effectiveness.	SPMU

Anticipated Problem	Action To Be Taken	Deadline for Action	Responsible Party
transparency and contribute to corrupt and manipulative practices.	Formulate and communicate a transparent policy to initiate and complete proceedings against accused ensuring action in specified timeframe.	Within 3 months of project effectiveness.	SPMU
	Maintain an updated database on complaints received and action taken for *suo moto* public disclosure or in reference to application received under RTI Act.	Continuously during project implementation.	DPMUs/ SPMU
4. Strengthening Project Procurement Management System			
Weak procurement management system could result in mis-management of bidding and in spending of funds.	Project will have a transparent procurement policy based on established best practices and strict compliance with agreed Bank procedures.	Upon project effectiveness.	SPMU
	Procurement plans and policies and bidding documents posted on project website.	From project effectiveness onwards.	SPMU
	Clear eligibility criteria for bidders and product quality needs will be standardized.	Bidding documents as per model Bank documents from effectiveness onwards.	SPMU
	Clearly outline the criteria and process for disqualification of bidders who engage in misrepresentation or other fraudulent and corrupt practices.	Within 6 months of project effectiveness.	SPMU
5. Strengthening Project Financial Management System			
Weak transparency and accountability in financial transactions in the absence of a comprehensive financial management plan.	The financial management manual will describe clearly the procedures to ensure that funds are used only for the intended purposes in an efficient and economical way as per budget approvals.	Upon project effectiveness.	SPMU
	Enforce financial management safeguards and generate financial progress reports in the prescribed format, capturing relevant parameters as laid down in the project implementation plan.	Throughout project implementation.	SPMU
	Regular financial (and procurement) audits to be conducted and deviations from established plan/procedures, if any, should be explained in stipulated timeframe.	Quarterly internal audit and annually external audit starting 6 months after project effectiveness.	SPMU
	Project review missions to review FM progress and inquire about any identified instances of corruption and how they have been addressed.	Twice yearly during implementation review missions.	SPMU, World Bank
	Besides statistics on funds spent, financial reports shall reflect efficiency and economy achieved in the process.	Quarterly starting 3 months after effectiveness.	SPMU
6. Strengthening Systems and Processes for Project Management			
Weak implementation arrangements may adversely	Finalize and approve Project Implementation Plan.	By effectiveness.	SPMU, World Bank
	Finalize recruitment and training plan for both	By effectiveness.	SPMU

Anticipated Problem	Action To Be Taken	Deadline for Action	Responsible Party
affect project processes and results.	deputation and contractual staff. Each position shall have clearly defined job description and performance indicators.		
	Regular monitoring and evaluation activities to inform state government and the Bank on implementation progress in such a manner that project managers can reflect and improve on performance and that senior officials, both in governments and the Bank, are alerted to actual or potential implementation problems, which will in turn allow for timely adjustments to improve project implementation and to achieve agreed project outputs and outcomes.	Within 6 months of effectiveness. Comprehensive at MTR stage.	SPMU
	Develop a Management Information System, to be linked to M&E activities and online reporting arrangements for quick review and follow-up action.	Fully operational within one year of project effectiveness. Review performance at MTR stage.	SPMU
7. Quality Assurance and Sustainability			
The project-funded works do not lead to technically and financially sustainable structures that can be easily maintained.	Put major focus on construction supervision and quality control by developing bidding documents with clear and detailed specifications, engaging adequate number of site supervisors, and by engaging consulting teams for third-party quality assurance.	Continuously during project implementation. Review effectiveness at MTR stage.	DPMUs/ SPMU
8. WUA Implementation Environment			
Lack of inclusion and representation, especially with regard to women and marginalized communities.	WUAs will be encouraged to implement the provisions of irrigation regulation. Capacity support will be provided to women and other marginalized communities through training programs to achieve meaningful participation.	Continuously during project implementation.	SPMU/ DPMU, with assistance from private service providers.

Annex 12: Supervision Strategy

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309. **Bank Supervision Strategy:** The supervision strategy for the proposed project is developed based on: (i) the lessons learned from the India Health Sector DIR, which identified, among other things, weaknesses in Bank's supervision strategy, lack of field and independent verification of project activities, and reliance on borrower supplied information to conducted supervision; (ii) the inputs from the Bank-financed studies on Value Engineer and Construction Industry in India (these studies highlighted weakness in quality and capacity for cost-effective construction and contract management); and (iii) the key project risks identified for the project with the mitigation measures laid out in the Governance and Accountability Action Plan and other documents. The overall aim of the supervision strategy is to ensure the effective and timely implementation of mitigation measures to deter chances of corruption and fraud and ensure cost-effective project implementation and achievement of the project's development outcomes.

310. Given the geographical coverage of the project – about 4,660 small schemes scattered over 18 of the 19 districts of West Bengal – and a large number of civil works packages comprising construction of river lift schemes, deep and shallow tube wells, surface flow schemes, etc. to benefit an irrigation command of about 139,000 hectares, it will of course be impossible for the Bank staff to physically visit all of the project sites during implementation of the project. Therefore, the Bank's supervision strategy will be based on a combination of selective site visits and proactively obtaining and following-up on relevant information from multiple sources. The guiding principle will be to keep 'eyes and ears open' and follow up on issues that are identified.

- ***Visits to Project works sites.*** Bank supervision missions will visit selected works sites to assess and physically verify works financed under the project. These site visits will include in-depth interaction with concerned project level officials of the GoWB, WUAs, farmer interest groups, and support organizations assisting WUAs in community mobilization and capacity building. The works sites to be selected for such visits will be based on a combination of the following criteria: (i) random selection from the ongoing works supported under the project; (ii) special emphasis on works sites identified by grievance handling system; and (iii) works sites involving critical contracts. Repeat visits will be made to the sites where serious problems are identified in order to ensure that those have been satisfactorily addressed.

- ***Relying on multiple sources of information during supervision missions.***

  (i) Each Bank mission will supplement the information gathered from visits to various sites by feedback obtained from a larger set of project beneficiaries through meetings with a cross-section of WUAs/community members being supported under the project, field level project officers, and external Quality Assurance consultants. Support Organizations working with the WUAs and other civil society members in the project area will also be consulted to gain additional independent perspectives. Works sites will be covered by rotation during supervision missions

with priority accorded to: (i) critical packages; and (ii) 'problem' packages as identified by the grievance monitoring system and other information sources.

(ii) At the state level, apart from review of overall project performance based on borrower progress reports, the Bank team will convene presentations from consultants undertaking: (i) third party quality assurance; and (ii) external M&E. This will provide Bank staff an opportunity to also interact directly with these consultants.

- ***Regular feedback on project performance*** will be obtained through borrower progress reports as well as the regular monitoring reports to be produced by consultants, and quarterly monitoring reports to be produced by the M&E consultants. Key issues identified in these reports will be followed up, including through short additional visits to the state, as necessary.

- ***Fiduciary reviews*** during supervision missions will include post-reviews of a random sample of contracts and spot checks of accounting records and financial reporting systems at the state and at SPMU levels. Reports of the project's internal auditors will be reviewed and meetings held with them to gain additional perspective. Issues identified will be recorded in aide memoires and followed up post-mission. In addition, the team will also ensure that the project implements a comprehensive complaints and grievance handling mechanism and the Bank is duly kept updated about resolution of complaints. During post review, contracts with history of complaints shall be included in the samples for review.

311. **Supervision Methodology.** The project supervision will be based on: (i) physical verification by Bank task teams and Bank-hired consultants; (ii) sample cross-checking and verification of reports provided by the client and client-hired third party (a) quality assurance consultants, and (b) project M&E consultants; (iii) increased coverage of post-review contracts; (iv) close scrutiny of audit reports and financial management reports; and (v) close follow up with the client on key issues highlighted from the various supervision activities.

312. **Frequency of Bank Supervision Missions.** At least two formal supervision missions in a year, supplemented by short visits by individual team members, as may be needed, will be undertaken.

313. **Composition of Bank Supervision Team.** The typical mission composition will include project management, M&E, procurement, finance, safeguards and technical (irrigation design and construction and WUA development) specialists, supplemented by expert staff on governance and anti-corruption.

314. **Supervision Budget:** US$150,000 per year to cover Bank staff, consultants, and travel expenses.

315. **Supervision Activities Sampling and Expected Outcome.** The main supervision activities to be covered by the Bank and the client are provided in the Table below, which also highlights the proposed sampling framework and expected outcome from the supervision efforts.

Supervision Strategy Matrix

Client's role	Bank's role	Expected outcomes
TECHNICAL AND QUALITY ASPECTS		
- Supervision to be carried out on ongoing basis (i) by DWRID internally through SPMU and concerned DPMUs; and (ii) by the external third-party construction supervision and quality assurance consultants, and project Monitoring and evaluation consultants. - DWRID engineers to oversee the works of contractors in the field on a day to day basis, supplemented with regular visits by DPMU engineers.	- Visual inspection of works by the Bank supervision team and Bank hired consultants. - Review of regular reports on construction quality prepared by the consultants hired by the GoWB.	- Contractors fully deployed on time and have the required capacity. - Satisfactory implementation of the contracts. - Construction quality meets design specification fully. - Implementation issues and disputes resolved in time.
PROCUREMENT		
- GoWB approved clearance process to be followed for all works, goods, and consultancy contracts, including clearances by DWRID and Finance Department, as appropriate, following procurement procedures agreed with the Bank. - In addition to the contracts over prior review threshold, contracts below prior review threshold shall also be reviewed and cleared by SPMU before award, to ensure compliance of agreed procurement procedures under the project. - SPMU to use agreed updated NCB model document. - DWRID to create, maintain, and update regularly a database on contractors' performance. - Develop, implement and monitor training plan for training on Bank financed procurement. - SPMU and DPMU staff to attend training courses on (i) Bank procurement procedures, and (ii) contract administration. - SPMU staff to regularly enhance their exposure and refresh their procurement capacity on an ongoing basis. - Conduct procurement post review by hiring an external firm on an annual basis. - Conduct internal and concurrent audit at department and SPMU levels. - Develop, maintain and keep updated, a comprehensive complaints and grievance	- Identified civil works will be subject to prior review as per the agreed threshold for prior review contracts. - The Bank team will review sample contracts in the field for compliance with procedures as part of post review requirements. - Bank team will also, either as part of mission or separately, carry out asset verification where possible to ensure that funds are utilized for intended purposes. - Bank team will conduct workshops on a periodic basis to resolve doubts of teams in the field to build their procurement capacity.	- Good public procurement consistent with Bank procurement guidelines. - Open and transparent competitive procurement achieved. - Database on contractors' performance maintained and updated regularly and used for future. decision making process - A robust and reliable contract administration establishment.

Client's role	Bank's role	Expected outcomes
handling mechanism.		
FINANCIAL MANAGEMENT		
- Reconciliation of expenditure with the Treasury and Accountant General (AG) to be used as an essential control mechanism in the project and to be regularly followed up with the implementing departments. - SPMU to maintain commitment/payments register centrally, tracking all contracts (works, consultant services, goods, materials, other services, etc.). This will provide the project with information required on pending payments and help track project progress. - The CAG of India through its offices in West Bengal to conduct an annual audit of the operations of the project; the audit report to be submitted to the Bank within 6 months of the close of each FY. - FM unit of SPMU to scrutinize all claims of suppliers, contracts, consultants received from the field engineers, make payments, keep all the accounting records as per DWRID system of accounting as per PWD Code, submit monthly accounts to AG, West Bengal and submit financial reports to GoWB.	- Focus on the adequacy of the financial reporting arrangements, including timeliness and completeness of the Treasury financial reports, as the basis for disbursements from the Credit/Loan. - Desk reviews of external and performance audit reports. - To review commitment tracking system. - To review quarterly FM reports and audit reports and follow-up actions taken on such reports. - Participate in site visits as needed to review internal control procedures and practices.	- Compliance with (i) all FM covenants, and (ii) State Financial Rules & Regulations. - Audit comments taken into consideration. - Financial progress closely following physical progress.
SOCIAL SAFEGUARDS		
- Supervision to be carried out by the concerned Executive Engineers of the DPMUs. - Supervision to be carried out by the Social and Environmental Unit of the SPMU. - Monitoring by the concerned District Magistrate through the District Level Implementation Committee. -an external agency (client hired) will undertake social and environmental audits.	- Supervision to be carried out by the Bank staff as part of supervision missions. - Random sample check on implementation of RAP, and consultation with PAPs.	- 100 % compliance, where ever applicable, with Bank's social and environmental safeguards. – 100 % implementation of the project's R&R framework and RAP. - 100 % resolution of any complaints submitted through the redressal mechanism.
ENVIRONMENTAL SAFEGUARDS		
-Supervision to be carried out by the concerned Executive Engineers of DPMU. -Regular monitoring and supervision to be carried out by the Environment and Social Unit of the SPMU. - An external agency (client hired) will undertake social and environmental audits.	- Supervision to be carried out by the Bank staff as part of regular supervision missions. -random sample check on implementation of EMP.	- 100% of regulatory clearances (wherever required) will be obtained by DPMU and contractors - 100% compliance with the project's environmental measures envisaged under EMP.

Annex 13: Project Preparation and Supervision

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

	Planned	Actual
PCN review	06/26/2007	06/26/2007
Initial PID to PIC		07/17/2007
Initial ISDS to PIC		07/17/2007
Appraisal	06/25/2010	04/18/2011
Negotiations	08/23/2011	08/25/2011
Board/RVP approval	10/04/2011	
Planned date of effectiveness	01/01/2012	
Planned date of mid-term review	03/01/2014	
Planned closing date	12/31/2017	

Key institutions responsible for preparation of the project:

(i) Department of Water Resources Investigation and Development, Government of West Bengal, together with various line agencies, including Departments of Agriculture, Food Processing Industries & Horticulture, and Fisheries.

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Joop Stoutjesdijk	Task Team Leader and Lead Irrigation Engineer	SASDA
Musa S.C. Asad	Co Task Team Leader and Sr. Institutional Development Specialist	SASDA
Paul Singh Sidhu	Sr. Agricultural Specialist	SASDA
R.R. Mohan	Sr. Social Development Specialist	SASDI
S. Satish	Sr. Social Development Specialist	SASDI
Tapas Paul	Sr. Environmental Specialist	SASDI
Debabrata Chakraborti	Sr. Procurement Specialist	SARPS
Manvinder Mamak	Sr. Financial Management Specialist	SARFM
Juan Carlos Alvarez	Sr. Counsel	LEGES
Jacqueline Julian	Program Analyst (Costab)	SASDO
Jai Mansukhani	Program Assistant	SASDO
Lilac Thomas	Program Assistant	SASDO
Prabir Joardar	Consultant – Engineer	SASDA
S. Selvarajan	Consultant – Economist	FAO
Kunduz Masylkanova	Economist	FAO

Bank funds expended to date on project preparation:
Bank resources: US$496,000

Estimated Annual Supervision costs: US$150,000

Annex 14: Document in the Project File

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

1. Project Concept Note.
2. Environmental Assessment.
3. Social Assessment.
4. Tribal Development Framework.
5. Hydrological Studies.
6. Various Manuals
    - Financial Management
    - Procurement
    - Engineering Design and Supervision
7. Various preparation reports prepared by DWRID.
    - Technical
    - Institutional
    - Agriculture
    - Horticulture
    - Fisheries
8. Various Manuals
    - Financial Management
    - Procurement
    - Engineering Design and Supervision

9.

Annex 15: Statement of Loans and Credits

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

			Original Amount in US$ Millions						Difference between expected and actual disbursements	
Project ID	FY	Purpose	IBRD	IDA	SF	GEF	Cancel.	Undisb.	Orig.	Frm. Rev'd
P099979	2012	IN: CBldg for Urban Development	0.00	60.00	0.00	0.00	0.00	59.08	0.00	0.00
P104164	2012	IN: National Rural Livelihoods Project	0.00	1,000.00	0.00	0.00	0.00	1,021.66	0.00	0.00
P102329	2011	IN: Rajasthan Rural Livelihoods Project	0.00	162.70	0.00	0.00	0.00	157.57	-11.85	0.00
P102624	2011	IN:Kerala Local Govt. & Service Delivery	0.00	200.00	0.00	0.00	0.00	204.12	0.00	0.00
P088520	2011	IN: Biodiver Cons & Rural Livelihood	0.00	15.36	0.00	0.00	0.00	15.53	0.00	0.00
P107649	2011	IN:Karnataka State Highway Improv Pro II	350.00	0.00	0.00	0.00	0.00	339.13	-10.00	0.00
P108258	2011	IN: E-Delivery of Public Services	150.00	0.00	0.00	0.00	0.00	149.63	0.00	0.00
P114338	2011	IN: Eastern Dedicated Freight Corridor-I	975.00	0.00	0.00	0.00	0.00	975.00	0.00	0.00
P120836	2011	IN: Maharashtra Agric. Competitiveness	0.00	100.00	0.00	0.00	0.00	99.67	-4.48	0.00
P121515	2011	IN: NHAI Technical Assistance Project	45.00	0.00	0.00	0.00	0.00	40.39	-4.50	0.00
P124639	2011	IN: PMGSY Rural Roads Project	500.00	1,000.00	0.00	0.00	0.00	1,360.61	-150.00	0.00
P119085	2011	IN: National Ganga River Basin Project	801.00	199.00	0.00	0.00	0.00	996.10	0.00	0.00
P122096	2011	IN: Bihar Kosi Flood Recovery Project	0.00	220.00	0.00	0.00	0.00	215.50	3.46	0.00
P089985	2010	IN: Dam Rehabilitation & Improvement	175.00	175.00	0.00	0.00	0.00	361.24	12.67	0.00
P102771	2010	IN: IIFCL - India Infras Finance Co Ltd	1,195.00	0.00	0.00	0.00	0.00	1,175.44	463.66	0.00
P091031	2010	IN: CBldg for Indus Poll Mgt	25.21	38.94	0.00	0.00	0.00	60.46	-3.14	0.00
P092217	2010	IN:National Cyclone Risk Mitigation Proj	0.00	255.00	0.00	0.00	0.00	262.20	-0.31	0.00
P102549	2010	IN: Tech Engr Educ Qual Improvement II	0.00	300.00	0.00	0.00	0.00	286.72	7.20	0.00
P096021	2010	IN: AP Road Sector Project	320.00	0.00	0.00	0.00	0.00	291.78	39.91	0.00
P097985	2010	IN: Integrated Coastal Zone Mgmt Project	0.00	221.97	0.00	0.00	0.00	220.27	13.52	-1.98
P100954	2010	IN: AP Water Sector Improvement Proj	450.60	0.00	0.00	0.00	0.00	403.65	-23.32	0.00
P101650	2010	IN: A. P. RWSS	0.00	150.00	0.00	0.00	0.00	132.09	16.50	0.00
P115566	2010	IN: POWERGRID V	1,000.00	0.00	0.00	0.00	0.00	924.07	102.74	0.00
P119043	2010	IN: Microf-Scaling Up Sustnble & Resp	200.00	100.00	0.00	0.00	0.00	205.44	-21.96	0.00
P113028	2010	IN: Mumbai Urban Transport Project-2A	430.00	0.00	0.00	0.00	0.00	427.28	-1.64	0.00
P105990	2010	IN: West Bengal PRI	0.00	200.00	0.00	0.00	0.00	187.52	-13.41	0.00
P071250	2010	IN: Andhra Pradesh Municipal Development	300.00	0.00	0.00	0.00	0.00	277.77	2.86	0.00

Project ID	FY	Purpose	Original Amount in US$ Millions				Cancel.	Undisb.	Difference between expected and actual disbursements	
			IBRD	IDA	SF	GEF			Orig.	Frm. Rev'd
P110051	2010	IN: Haryana Power System Improv Project	330.00	0.00	0.00	0.00	0.00	229.63	118.48	-99.54
P110371	2010	IN: Sustainable Urban Transport Project	105.23	0.00	0.00	0.00	0.00	94.92	37.46	0.00
P093478	2009	IN: Orissa Rural Livelihoods Project	0.00	82.40	0.00	0.00	0.00	75.20	20.18	0.00
P100735	2009	IN:Orissa Community Tank Management Proj	56.00	56.00	0.00	0.00	35.06	69.19	17.85	0.00
P112033	2009	IN: UP Sodic III	0.00	197.00	0.00	0.00	0.00	178.40	-6.93	0.00
P100101	2009	IN: Coal-Fired Generation Rehabilitation	180.00	0.00	0.00	0.00	0.00	179.55	52.17	0.00
P094360	2009	IN: Ntnl VBD Control&Polio Eradication	0.00	521.00	0.00	0.00	0.00	396.47	206.79	0.00
P102331	2009	IN: MPDPIP-II	0.00	100.00	0.00	0.00	0.00	86.29	31.87	0.00
P096023	2009	IN: Orissa State Roads	250.00	0.00	0.00	0.00	0.00	229.93	66.72	0.00
P101653	2008	IN: Power System Development Project IV	1,000.00	0.00	0.00	0.00	0.00	229.35	-197.32	140.10
P095114	2008	IN: Rampur Hydropower Project	400.00	0.00	0.00	0.00	0.00	202.59	81.09	0.00
P102547	2008	IN: Elementary Education (SSA II)	0.00	1,350.00	0.00	0.00	0.00	510.55	-243.64	152.14
P102768	2007	IN: Stren India's Rural Credit Coops	300.00	300.00	0.00	0.00	0.00	220.18	188.04	0.00
P083187	2007	IN: Uttaranchal RWSS	0.00	120.00	0.00	0.00	0.00	70.58	55.72	44.56
P090585	2007	IN: Punjab State Roads Project	250.00	0.00	0.00	0.00	0.00	115.62	72.35	0.00
P090592	2007	IN: Punjab Rural Water Supply&Sanitation	0.00	154.00	0.00	0.00	0.23	111.89	93.53	-3.81
P090764	2007	IN: Bihar Rural Livelihoods Project	0.00	63.00	0.00	0.00	0.00	25.48	-31.51	6.18
P090768	2007	IN: TN IAM WARM	335.00	150.00	0.00	0.00	0.00	295.99	177.13	0.00
P078539	2007	IN: TB II	0.00	170.00	0.00	0.00	0.00	41.12	-8.27	0.00
P078538	2007	IN: Third National HIV/AIDS Control Proj	0.00	250.00	0.00	0.00	0.07	122.21	107.77	0.00
P075060	2007	IN: RCH II	0.00	360.00	0.00	0.00	0.00	180.54	161.28	0.00
P096019	2007	IN: HP State Roads Project	220.00	0.00	0.00	0.00	0.00	144.93	82.14	0.00
P071160	2007	IN: Karnataka Health Systems	0.00	141.83	0.00	0.00	0.00	41.23	10.21	0.00
P099047	2007	IN: Vocational Training	0.00	280.00	0.00	0.00	0.00	146.02	34.51	0.00
P100789	2007	IN: AP Community Tank Management Proj	94.50	94.50	0.00	0.00	0.00	138.27	89.93	0.00
P078832	2006	IN: Karnataka Panchayats Strengthening	0.00	120.00	0.00	0.00	0.00	36.38	-38.24	0.00
P079675	2006	IN: Karn Municipal Reform	216.00	0.00	0.00	0.00	0.00	134.88	134.88	1.02
P079708	2006	IN: TN Empwr & Pov Reduction	0.00	274.00	0.00	0.00	0.00	163.96	-3.39	-2.72
P083780	2006	IN: TN Urban III	300.00	0.00	0.00	0.00	0.64	105.30	105.94	42.01
P092735	2006	IN: NAIP	0.00	200.00	0.00	0.00	0.00	80.23	27.43	-3.92
P093720	2006	IN: Mid-Himalayan (HP) Watersheds	0.00	60.00	0.00	0.00	0.00	14.21	6.97	0.00
P073370	2005	IN: Madhya Pradesh Water Sector Restruct	394.02	0.00	0.00	0.00	6.62	216.08	222.70	0.00
P073651	2005	IN: Disease Surveillance	0.00	68.00	0.00	0.00	8.31	38.18	41.08	8.99
P075058	2005	IN: TN Health Systems	0.00	228.53	0.00	0.00	20.06	92.85	-12.73	-14.17
P094513	2005	IN: Tsunami ERC	0.00	465.00	0.00	0.00	68.99	262.28	315.26	153.09
P077856	2005	IN: Lucknow-Muzaffarpur National Highway	620.00	0.00	0.00	0.00	0.00	12.55	12.55	0.00

Project ID	FY	Purpose	Original Amount in US$ Millions IBRD	IDA	SF	GEF	Cancel.	Undisb.	Difference between expected and actual disbursements Orig.	Frm. Rev'd
P077977	2005	IN: Rural Roads Project	99.50	300.00	0.00	0.00	0.00	8.20	-0.34	0.00
P086518	2005	IN: SME Financing & Development	520.00	0.00	0.00	0.00	0.00	76.84	-322.16	77.84
P084792	2005	IN: Assam Agric Competitiveness	0.00	154.00	0.00	0.00	0.00	35.09	25.98	19.22
P084790	2005	IN: MAHAR WSIP	325.00	0.00	0.00	0.00	0.00	115.47	108.81	0.00
P084632	2005	IN: Hydrology II	104.98	0.00	0.00	0.00	0.00	62.92	62.92	54.89
P078550	2004	IN: Uttar Wtrshed	0.00	77.60	0.00	0.00	0.00	12.16	-4.03	0.00
P050655	2004	IN: Rajasthan Health Systems Dev	0.00	89.00	0.00	0.00	0.00	20.74	15.63	9.48
P050649	2003	IN: TN ROADS	398.70	0.00	0.00	0.00	0.00	26.21	-24.36	0.00
P071272	2003	AP RURAL POV REDUCTION	0.00	315.03	0.00	0.00	0.00	28.07	-156.57	13.06
P071033	2002	IN: KARN Tank Mgmt	32.00	130.90	0.00	0.00	25.07	91.59	29.14	28.26
P040610	2002	IN: RAJ WSRP	0.00	159.00	0.00	0.00	25.84	48.44	15.23	-14.90
P050653	2002	IN: KARNATAKA RWSS II	0.00	301.60	0.00	0.00	16.40	148.95	-19.70	5.37
P050647	2002	IN: UP WSRP	0.00	149.20	0.00	0.00	40.11	21.76	32.71	-7.45
		Total:	13,447.74	11,879.56	0.00	0.00	247.40	16,839.39	2,211.17	607.72

INDIA
STATEMENT OF IFC's
Held and Disbursed Portfolio
In Millions of US Dollars

		Committed				**Disbursed**			
		IFC				**IFC**			
FY Approval	**Company**	**Loan**	**Equity**	**Quasi**	**Partic.**	**Loan**	**Equity**	**Quasi**	**Partic.**
2005	ADPCL	39.50	7.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	AHEL	0.00	5.08	0.00	0.00	0.00	5.08	0.00	0.00
2005	AP Paper Mills	35.00	5.00	0.00	0.00	25.00	5.00	0.00	0.00
2005	APIDC Biotech	0.00	4.00	0.00	0.00	0.00	2.01	0.00	0.00
2002	ATL	13.81	0.00	0.00	9.36	13.81	0.00	0.00	9.36
2003	ATL	1.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00
2005	ATL	9.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	Atul Ltd	16.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	BHF	10.30	0.00	10.30	0.00	10.30	0.00	10.30	0.00
2004	BILT	0.00	0.00	15.00	0.00	0.00	0.00	15.00	0.00
2001	BTVL	0.43	3.98	0.00	0.00	0.43	3.98	0.00	0.00
2003	Balrampur	10.52	0.00	0.00	0.00	10.52	0.00	0.00	0.00
2001	Basix Ltd.	0.00	0.98	0.00	0.00	0.00	0.98	0.00	0.00
2005	Bharat Biotech	0.00	0.00	4.50	0.00	0.00	0.00	3.30	0.00
1984	Bihar Sponge	5.70	0.00	0.00	0.00	5.70	0.00	0.00	0.00
2003	CCIL	1.50	0.00	0.00	0.00	0.59	0.00	0.00	0.00
2006	CCIL	7.00	2.00	0.00	12.40	7.00	2.00	0.00	12.40
1990	CESC	4.61	0.00	0.00	0.00	4.61	0.00	0.00	0.00
1992	CESC	6.55	0.00	0.00	14.59	6.55	0.00	0.00	14.59

		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
2004	CGL	14.38	0.00	0.00	0.00	7.38	0.00	0.00	0.00
2004	CMScomputers	0.00	10.00	2.50	0.00	0.00	0.00	0.00	0.00
2002	COSMO	2.50	0.00	0.00	0.00	2.50	0.00	0.00	0.00
2005	COSMO	0.00	3.73	0.00	0.00	0.00	3.73	0.00	0.00
2006	Chennai Water	24.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	DQEL	0.00	1.50	1.50	0.00	0.00	1.50	1.50	0.00
2005	DSCL	30.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
2006	DSCL	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2005	Dabur	0.00	14.09	0.00	0.00	0.00	14.09	0.00	0.00
2003	Dewan	8.68	0.00	0.00	0.00	8.68	0.00	0.00	0.00
2006	Federal Bank	0.00	28.06	0.00	0.00	0.00	23.99	0.00	0.00
2001	GTF Fact	0.00	1.20	0.00	0.00	0.00	1.20	0.00	0.00
2006	GTF Fact	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
1994	GVK	0.00	4.83	0.00	0.00	0.00	4.83	0.00	0.00
2003	HDFC	100.00	0.00	0.00	100.00	100.00	0.00	0.00	100.00
1998	IAAF	0.00	0.47	0.00	0.00	0.00	0.30	0.00	0.00
2006	IAL	0.00	9.79	0.00	0.00	0.00	7.70	0.00	0.00
1998	IDFC	0.00	10.82	0.00	0.00	0.00	10.82	0.00	0.00
2005	IDFC	50.00	0.00	0.00	100.00	50.00	0.00	0.00	100.00
	IHDC	6.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	IHDC	7.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	Indecomm	0.00	2.57	0.00	0.00	0.00	2.57	0.00	0.00
1996	India Direct Fnd	0.00	1.10	0.00	0.00	0.00	0.66	0.00	0.00
2001	Indian Seamless	6.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
2006	JK Paper	15.00	7.62	0.00	0.00	0.00	7.38	0.00	0.00
2005	K Mahindra INDIA	22.00	0.00	0.00	0.00	22.00	0.00	0.00	0.00
2005	KPIT	11.00	2.50	0.00	0.00	8.00	2.50	0.00	0.00
2003	L&T	50.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00
2006	LGB	14.21	4.82	0.00	0.00	0.00	4.82	0.00	0.00
2006	Lok Fund	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	MMFSL	7.89	0.00	7.51	0.00	7.89	0.00	7.51	0.00
2003	MSSL	0.00	2.29	0.00	0.00	0.00	2.20	0.00	0.00
2001	MahInfra	0.00	10.00	0.00	0.00	0.00	0.79	0.00	0.00
	Montalvo	0.00	3.00	0.00	0.00	0.00	1.08	0.00	0.00
1996	Moser Baer	0.00	0.82	0.00	0.00	0.00	0.82	0.00	0.00
1999	Moser Baer	0.00	8.74	0.00	0.00	0.00	8.74	0.00	0.00
2000	Moser Baer	12.75	10.54	0.00	0.00	12.75	10.54	0.00	0.00
	Nevis	0.00	4.00	0.00	0.00	0.00	4.00	0.00	0.00
2003	NewPath	0.00	9.31	0.00	0.00	0.00	8.31	0.00	0.00
2004	NewPath	0.00	2.79	0.00	0.00	0.00	2.49	0.00	0.00
2003	Niko Resources	24.44	0.00	0.00	0.00	24.44	0.00	0.00	0.00
2001	Orchid	0.00	0.73	0.00	0.00	0.00	0.73	0.00	0.00
1997	Owens Corning	5.92	0.00	0.00	0.00	5.92	0.00	0.00	0.00
2006	PSL Limited	15.00	4.74	0.00	0.00	0.00	4.54	0.00	0.00
2004	Powerlinks	72.98	0.00	0.00	0.00	64.16	0.00	0.00	0.00

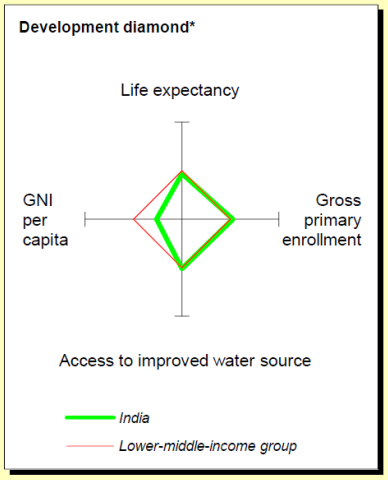
		Committed				Disbursed			
		IFC				IFC			
FY Approval	**Company**	**Loan**	**Equity**	**Quasi**	**Partic.**	**Loan**	**Equity**	**Quasi**	**Partic.**
2004	RAK India	20.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00
1995	Rain Calcining	0.00	2.29	0.00	0.00	0.00	2.29	0.00	0.00
2004	Rain Calcining	10.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
2005	Ramky	3.74	10.28	0.00	0.00	0.00	0.00	0.00	0.00
2005	Ruchi Soya	0.00	9.27	0.00	0.00	0.00	6.77	0.00	0.00
2001	SBI	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1997	SREI	3.21	0.00	0.00	0.00	3.21	0.00	0.00	0.00
2000	SREI	6.50	0.00	0.00	0.00	6.50	0.00	0.00	0.00
1995	Sara Fund	0.00	3.43	0.00	0.00	0.00	3.43	0.00	0.00
2004	SeaLion	4.40	0.00	0.00	0.00	4.40	0.00	0.00	0.00
2001	Spryance	0.00	1.86	0.00	0.00	0.00	1.86	0.00	0.00
2003	Spryance	0.00	0.93	0.00	0.00	0.00	0.93	0.00	0.00
2004	Sundaram Finance	42.93	0.00	0.00	0.00	42.93	0.00	0.00	0.00
2000	Sundaram Home	0.00	2.18	0.00	0.00	0.00	2.18	0.00	0.00
2002	Sundaram Home	6.71	0.00	0.00	0.00	6.71	0.00	0.00	0.00
1998	TCW/ICICI	0.00	0.80	0.00	0.00	0.00	0.80	0.00	0.00
2005	TISCO	100.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00
2004	UPL	15.45	0.00	0.00	0.00	15.45	0.00	0.00	0.00
1996	United Riceland	5.63	0.00	0.00	0.00	5.63	0.00	0.00	0.00
2005	United Riceland	8.50	0.00	0.00	0.00	5.00	0.00	0.00	0.00
2002	Usha Martin	0.00	0.72	0.00	0.00	0.00	0.72	0.00	0.00
2001	Vysya Bank	0.00	3.66	0.00	0.00	0.00	3.66	0.00	0.00
2005	Vysya Bank	0.00	3.51	0.00	0.00	0.00	3.51	0.00	0.00
1997	WIV	0.00	0.37	0.00	0.00	0.00	0.37	0.00	0.00
1997	Walden-Mgt India	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00
2006	iLabs Fund II	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total portfolio:	**956.52**	**249.41**	**42.30**	**536.35**	**604.74**	**175.91**	**38.60**	**236.35**

		Approvals Pending Commitment			
FY Approval	Company	Loan	Equity	Quasi	Partic.
2004	CGL	0.01	0.00	0.00	0.00
2000	APCL	0.01	0.00	0.00	0.00
2006	Atul Ltd	0.00	0.01	0.00	0.00
2001	Vysya Bank	0.00	0.00	0.00	0.00
2006	Federal Bank	0.01	0.00	0.00	0.00
2001	GI Wind Farms	0.01	0.00	0.00	0.00
2004	Ocean Sparkle	0.00	0.00	0.00	0.00
2005	Allain Duhangan	0.00	0.00	0.00	0.00
	Total pending commitment:	0.04	0.01	0.00	0.00

Annex 16: India at a Glance

INDIA: West Bengal Accelerated Development of Minor Irrigation Project

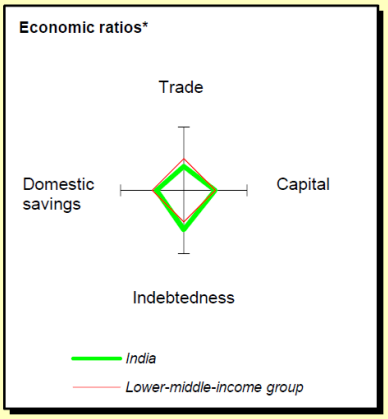
POVERTY and SOCIAL	India	South Asia	Lower-middle-income
2009			
Population, mid-year *(millions)*	1,155.3	1,568	3,811
GNI per capita *(Atlas method, US$)*	1,220	1,082	2,316
GNI *(Atlas method, US$ billions)*	1,405.7	1,697	8,825
Average annual growth, 2003-09			
Population *(%)*	1.4	1.5	1.2
Labor force *(%)*	2.0	2.2	1.5
Most recent estimate (latest year available, 2003-09)			
Poverty *(% of population below national poverty line)*	..	..	..
Urban population *(% of total population)*	30	30	41
Life expectancy at birth *(years)*	64	64	68
Infant mortality *(per 1,000 live births)*	50	55	43
Child malnutrition *(% of children under 5)*	44	41	25
Access to an improved water source *(% of population)*	88	87	87
Literacy *(% of population age 15+)*	63	61	80
Gross primary enrollment *(% of school-age population)*	113	108	107
Male	115	110	109
Female	111	105	105



KEY ECONOMIC RATIOS and LONG-TERM TRENDS

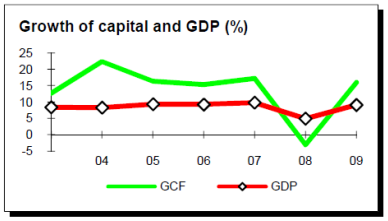
	1989	1999	2008	2009
GDP *(US$ billions)*	292.9	450.5	1,216.0	1,377.3
Gross capital formation/GDP	23.7	26.1	34.5	36.5
Exports of goods and services/GDP	7.1	11.7	23.5	19.6
Gross domestic savings/GDP	22.6	24.2	29.1	32.0
Gross national savings/GDP	22.2	26.1	32.1	34.9
Current account balance/GDP	-2.5	-1.1	-2.4	-2.8
Interest payments/GDP	1.4	0.8	0.6	0.4
Total debt/GDP	25.9	22.0	18.5	17.3
Total debt service/exports	29.4	15.2	8.9	4.2
Present value of debt/GDP	..	..	..	15.4
Present value of debt/exports	..	..	..	54.9

	1989-99	1999-09	2008	2009	2009-13
(average annual growth)					
GDP	5.7	7.5	4.9	9.1	8.7
GDP per capita	3.8	6.0	3.5	7.7	..
Exports of goods and services	11.8	15.9	19.3	-6.7	9.5

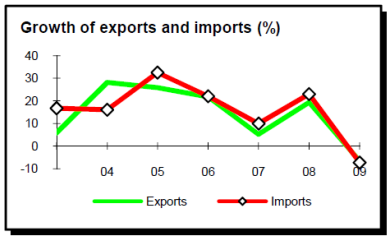


STRUCTURE of the ECONOMY

	1989	1999	2008	2009
(% of GDP)				
Agriculture	29.2	25.0	17.6	17.8
Industry	26.9	25.3	28.2	27.0
Manufacturing	17.0	14.8	15.5	14.8
Services	43.8	49.7	54.2	55.3
Household final consumption expenditure	65.5	62.9	59.9	56.0
General gov't final consumption expenditure	11.9	12.9	11.0	12.0
Imports of goods and services	8.2	13.6	28.9	24.0



	1989-99	1999-09	2008	2009
(average annual growth)				
Agriculture	3.3	2.7	-0.1	0.4
Industry	6.0	8.2	4.4	8.0
Manufacturing	6.5	8.3	4.2	8.8
Services	7.4	9.2	10.1	10.1
Household final consumption expenditure	5.7	6.0	12.4	1.7
General gov't final consumption expenditure	5.9	5.1	10.7	16.4
Gross capital formation	7.0	12.2	-3.1	16.0
Imports of goods and services	14.5	15.3	23.0	-7.3



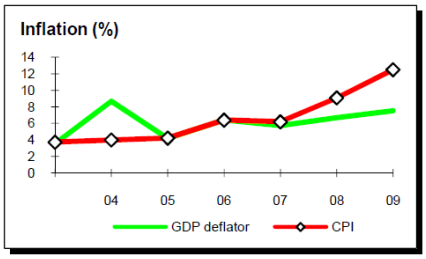
Note: 2009 data are preliminary estimates.

This table was produced from the Development Economics LDB database.

* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

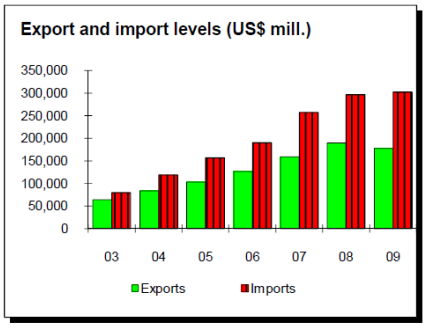
PRICES and GOVERNMENT FINANCE

	1989	1999	2008	2009
Domestic prices				
(% change)				
Consumer prices	4.7	3.4	9.1	12.5
Implicit GDP deflator	8.4	3.8	6.7	7.5
Government finance				
(% of GDP, includes current grants)				
Current revenue	19.2	17.3	19.9	17.4
Current budget balance	-3.6	-6.0	-7.4	-7.3
Overall surplus/deficit	..	-9.8	-8.8	-9.0



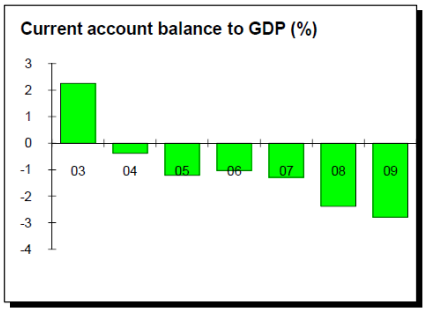
TRADE

	1989	1999	2008	2009
(US$ millions)				
Total exports (fob)	16,955	36,822	190,000	177,452
Tea	413	1,183	..	..
Iron	1,031	916	..	..
Manufactures	11,972	29,714	108,281	103,256
Total imports (cif)	24,411	55,383	296,614	303,113
Food	556	2,417	..	..
Fuel and energy	3,768	12,611	..	..
Capital goods	5,288	8,966	71,237	79,420
Export price index *(2000=100)*	..	81	161	165
Import price index *(2000=100)*	..	100	182	166
Terms of trade *(2000=100)*	..	81	89	99



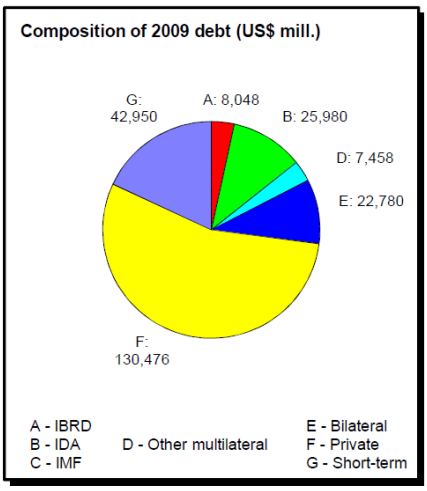
BALANCE of PAYMENTS

	1989	1999	2008	2009
(US$ millions)				
Exports of goods and services	21,201	53,251	290,679	275,955
Imports of goods and services	27,934	67,028	359,698	359,077
Resource balance	-6,733	-13,777	-69,019	-83,122
Net income	-2,928	-3,559	-4,507	-7,403
Net current transfers	2,820	12,638	44,799	52,114
Current account balance	-7,380	-5,080	-28,959	-38,469
Financing items (net)	6,640	11,222	8,880	51,910
Changes in net reserves	740	-6,142	20,079	-13,441
Memo:				
Reserves including gold *(US$ millions)*	3,962	38,036	351,259	375,970
Conversion rate *(DEC, local/US$)*	16.6	43.3	45.9	47.6



EXTERNAL DEBT and RESOURCE FLOWS

	1989	1999	2008	2009
(US$ millions)				
Total debt outstanding and disbursed	75,941	99,128	224,713	237,692
IBRD	6,615	7,815	7,429	8,048
IDA	12,568	18,930	25,365	25,980
Total debt service	6,961	10,098	30,936	16,150
IBRD	881	1,389	703	656
IDA	188	469	965	982
Composition of net resource flows				
Official grants	698	475	1,169	1,118
Official creditors	2,497	1,048	2,683	1,886
Private creditors	2,890	-1,499	11,217	10,165
Foreign direct investment (net inflows)	252	2,169	41,169	34,577
Portfolio equity (net inflows)	0	2,317	-15,030	21,111
World Bank program				
Commitments	2,987	999	1,200	6,866
Disbursements	2,011	1,460	2,083	2,378
Principal repayments	449	1,228	1,154	1,251
Net flows	1,562	232	928	1,127
Interest payments	619	630	513	386
Net transfers	942	-398	415	740



Note: This table was produced from the Development Economics LDB database. 2/25/11

Annex 17: MAP IBRD 38495

INDIA: West Bengal Accelerated Development of Minor Irrigation Project