FRAMEWORK FINANCING AGREEMENT
(IND: Orissa Integrated Irrigated Agriculture and Water Management Investment Program)

Parties

This Framework Financing Agreement (FFA) dated 8 August 2008 is between India and the Asian Development Bank (ADB).

Background

India has requested, on behalf of the State of Orissa (the State), ADB to finance the Orissa Integrated Irrigated Agriculture and Water Management Investment Program (OIIAWMIP or Investment Program) following the Roadmap and Investment Program described in Schedule 1 hereto.

Roadmap and Investment Program

Context

Despite India's rapid economic growth, development in agriculture and related rural non-farm sectors has been slow, and the sector is making a slow transformation to more intensive and high-value production and processing systems. Bottlenecks in both rural and urban water resources are also increasingly seen as a major constraint to economic growth. In this context, irrigation is drawing major attention because of its high share (84%) of total water use, as well as its crucial importance for agriculture and rural growth. A significant part of the existing irrigation infrastructure remains underutilized with low water use efficiency and insufficient operation and maintenance (O&M). The Government of India is promoting state-level sector reforms through its National Water Policy (NWP) 1987 and 2002, which advocates participatory irrigation management (PIM) and integrated water resources management (IWRM) to promote and sustain more efficient water use.

Orissa is one of the poorest states in India. Despite recent acceleration of its annual economic growth rates at 7%, the disparity against national average is still widening. Agriculture is the backbone of the economy and the central focus of the strategy of the State to reduce rural poverty. In this context, the low performance of existing irrigation infrastructure seriously constrains agricultural productivity and diversification. While 45% of agriculture land is equipped with irrigation facilities, over 30% within this area hardly receives irrigation and the rest suffers from irregular water supply, due to poor system design, inefficient operation, lack of field channels, limited accountability in system management to farmers, and insufficient maintenance. Following the NWP, the State is prioritizing the improved performance of existing infrastructure in partnership with water user associations (WUAs), as the fastest and most cost-effective way to expand reliable irrigation and serve as a pathway to intensified, high value agriculture.

To support the process, the State has progressively developed the policy, planning and institutional basis for the irrigation and water resources sector since the late 1990s. Specific steps taken include (i) promulgation of the State Water Policy and State Water Plan adopting PIM and IWRM principles, (ii) establishment of a legal framework for WUAs, (iii) substantial increase in the water tariff and O&M financing, and (iv) capacity strengthening of the Department of Water Resources

(DOWR). In line with this, the State initiated formation of WUAs, renovation of irrigation infrastructure, and progressive transfer of O&M responsibility to WUAs. So far, this has reached 40% of the total command areas under public irrigation systems. The overall impacts of the process are positive, particularly where WUAs are sufficiently strengthened and provided with functioning infrastructure, although capacity development of WUAs and DOWR requires long-term support and partnership.

The State initiated comprehensive economic reforms in the early 2000s aiming at holistic and inclusive growth with stronger public sector accountability, and community and private sector participation. Within this context, the State is keen to further advance PIM in the remaining schemes, while incorporating the lessons learned so far, as well as the best practices from other Indian states and Asian countries. An investment plan to this end has been included as a core program of DOWR in the State's 11th Five-year Plan.

Accordingly, the Roadmap and Investment Program provide the steps to effectively proceed with the above initiative of the State. The Roadmap incorporates, building on the DOWR proposals, the further progressive improvement of the existing policy, planning, and institutional frameworks. They include (i) adopting and operationalizing the revised State Water Policy 2007; (ii) establishing a specialized multidisciplinary directorate for PIM in DOWR, with reforms at the Water and Land Management Institute, a state research and training institute for PIM and IWRM, for greater autonomy and stronger leadership; (iii) other actions to improve the business processes of DOWR as a service-oriented agency; (iv) enhancing O&M revenue, fund allocation and management systems; (v) refinement of the WUA legal framework; and (vi) initiating consultative processes and steps towards establishing appropriate IWRM functions and institutions. These provide a basis for the investments in renovating existing irrigation infrastructure while effectively operationalizing PIM systems.

Multitranche Financing Facility Investment Program

India will cause the State to implement the Roadmap and Investment Program described in Schedule 1 hereto. The Roadmap and Investment Program aims to enhance the productivity and sustainability of irrigated agriculture in Orissa through (i) improved policy and institutional basis to support PIM in particular and IWRM as well, and (ii) investments in renovating and extending existing irrigation infrastructure and establishment of participatory management systems with WUAs.

The total cost of the State's investment plan for renovation and extension of the existing irrigation schemes with PIM is estimated to be $660 million equivalent, over the period of 2008 to 2018. The total cost of the Roadmap and Investment Program supported by ADB's facility, from 2008 through mid-2017 is expected to be $270 million equivalent.

Multitranche Financing Facility

The Multitranche Financing Facility (the Facility) is intended to finance the State's transactions under the Investment Program described in Schedule 1, subject to the subproject implementation framework set out in Schedule 3, selection criteria set out in Schedule 4, safeguard requirements and social development actions set out in Schedule 5, and compliance with the understandings set out in this FFA.

The Investment Program will enhance the productivity and sustainability of the selected existing major, medium, and community-based minor lift irrigation schemes in the four northern river basins and a part of the Mahanadi delta. The selected schemes are suffering from low performance in irrigated areas due to system deterioration, inefficient operation, and limited integration with agriculture support services and marketing systems. The investment will include WUA strengthening and empowerment; renovation and extension of irrigation and associated infrastructure including command area development, drainage, and rural infrastructure; provision of agriculture and other support services including livelihood enhancement of the poor; and support for establishing self-sustaining O&M systems with WUAs.

The Facility will also include the strengthening of DOWR and its affiliated organizations, line departments, WUAs, and private providers including nongovernment organizations (NGOs) for improved irrigation service delivery, water resources management, and Investment Program management. The investments will include the necessary hardware and software, including civil works, vehicles and equipment, training and its systems, knowledge and information base, consultants, and incremental operational costs.

This Framework Financing Agreement

This FFA does not constitute a legal obligation on the part of ADB to commit any financing. ADB has the right to deny any financing request made by India, cancel the uncommitted portion of the Facility, and withdraw India's right to request any financing tranche under the Facility. Financing tranches may be made available by ADB provided matters continue to be in accordance with the general understandings and expectations on which the Facility is based and which are laid out in this FFA.

This FFA does not constitute a legal obligation on the part of India to request any financing. India has the right not to request any financing under the Facility. India also has the right at any time to cancel any uncommitted portion of the Facility.

India and ADB may exercise their respective rights to cancel the Facility or any uncommitted portion thereof, and ADB may exercise its right to refuse a financing request, by giving written notice to such effect to the other party. The written notice will provide an explanation for the cancellation or refusal and, in the case of a cancellation, specify the date on which the cancellation takes effect. Notices under this paragraph would be only with adequate consultations between ADB and India.

Financing Plan

The Financing Plan for the Investment Program is summarized below. Details are set out in Schedule 1 hereto.

($ million)

Source	Total	Share (%)
ADB	188.2	70
Orissa State	73.4	27
Beneficiaries [*a]	7.2	3
Total	**268.8**	**100**

[*a]: Contribution in cash or kind.

Financing Terms

ADB will provide loans to finance subprojects and components under the Roadmap and Investment Program, as and when they are ready for financing, and India is in compliance with the understandings hereunder, the subprojects and components are in line with those same understandings and a related request is made under a periodic financing request. Each loan will constitute a tranche.

Each tranche may be financed under terms different from the financing terms of previous or subsequent tranches. The choice of financing terms will depend on the project, capital market conditions, and ADB's financing policies, all prevailing at the time the tranche is documented in a legal agreement. Tranches may be provided in sequence or simultaneously, and some may overlap in time with each other.

Commitment charges are not payable on the Facility. They are payable only on financing actually committed by ADB as a loan. ADB rules on commitment charges, which are in effect when the legal agreements are signed for a tranche, will apply with respect to such tranche.

Amount

The maximum financing amount available under the Facility is one hundred eighty-eight million two hundred thousand dollars ($188,200,000). It will be provided in individual loans from ADB's Ordinary Capital Resources.[1]

Availability Period

The last date on which any disbursement under any tranche may be made will be 30 September 2017. The last financing tranche is expected to be executed no later than 31 March 2015. The Facility will expire if the first loan agreement is not signed within 12 months from the date the Facility is approved by ADB.

Terms and Conditions

India will cause the proceeds of each tranche to be applied to the

[1] Provisions of the Ordinary Operations Loan Regulations applicable to LIBOR-Based Loans Made from ADB's Ordinary Capital Resources, dated 1 July 2001, would apply to each loan, subject to modifications, if any, that may be included under any Loan Agreement (said Ordinary Operations Loan Regulations as so modified, if any, being hereinafter called the Loan Regulations).

financing of expenditures of the Roadmap and Investment Program, in accordance with conditions set forth in this FFA and the legal agreements for each tranche.

Each loan will be used to finance (i) a range of subprojects that have been appraised and approved for financing by ADB for each loan, and (ii) institutional strengthening and project management support including consultancy services. The subproject eligibility and approval criteria are set out in Schedule 4 of this FFA.

Execution

The Executing Agency for the Facility will be DOWR of the State. The DOWR will implement the Facility under the Roadmap and Investment Program in accordance with the principles set forth in Schedule 1 of this FFA, and as supplemented with more details in the legal agreements for each tranche.

The Facility will be implemented over an 8-year period. Implementation is proposed in four (or more if needed) tranches over the implementation period. The subprojects and components under tranche one comprise mainly consulting services, civil works, and equipment purchased for (i) two major irrigation schemes (excluding civil works for one major irrigation scheme); (ii) three medium irrigation schemes, and (iii) about 650 minor lift irrigation schemes. These subprojects were selected on the basis of readiness of implementation and their representative character of the overall Investment Program components. The institutional strengthening and project management support will continue over the entire period of implementation, and a strong emphasis is placed on this component to achieve the progressive reform milestones as set forth in Schedule 1 of this FFA.

Periodic Financing Requests (PFRs)

India may request, and ADB may agree, to provide loans under the Facility to finance the Investment Program and its related subprojects and components upon the submission of a PFR. Each PFR should be submitted by India. India will make available to the State the proceeds of the loan in accordance with the related PFR, and the legal agreements for the loan.

The first loan will be for an amount of $47.2 million equivalent and each subsequent PFR (except for the last PFR) will be for an amount of no less than the equivalent of $40 million. ADB will review the PFR, and if found satisfactory will prepare the related legal agreements.

Subprojects under PFRs for financing will be subject to subproject selection criteria set out in Schedule 4 hereto, satisfactory due diligence, preparation of relevant safeguards and fiduciary frameworks and other documents, including performance assessment of previous loans and incorporation of lessons into the requested loan. ADB, India and the State will agree on a Facility Administration Memorandum and a schedule to initiate these activities as soon as possible after the date of this FFA and within no later than 3 months of Facility approval by ADB.

Until notice is otherwise given by India, [the Secretary, Additional Secretary, Joint Secretary, Director, or Deputy Secretary in the Department of Economic Affairs of the Ministry of Finance] of the Government of India is designated as authorized representative of India for the purpose of executing PFRs.

General Implementation Framework

The Facility will be implemented in accordance with the general framework set out in Schedule 3 hereto.

Procedures

Tranches to be provided under the Facility will be subject to the following procedures and undertakings:

(a) India will have notified ADB of a forthcoming PFR in advance of the submission of the PFR.

(b) India will have submitted a PFR in the format agreed with ADB.

(c) ADB may decline to authorize the negotiation and execution of any legal agreement for a tranche.

(d) If ADB confirms acceptance of the PFR, the legal agreements will be negotiated and executed by the parties.

PFR Information

The PFR will substantially be in the form attached hereto, and will contain the following details:

(i) Loan amount
(ii) Description of subproject/components to be financed
(iii) Cost estimates and financing plan;
(iv) Implementation arrangements specific to the subprojects or components;
(v) Confirmation of the continuing validity of and adherence to the understandings in this FFA;
(vi) Confirmation of compliance with the provisions under previous Loan Agreement(s) as appropriate; and
(vii) Other information as may be required under the Facility Administration Memorandum, or reasonably requested by ADB.

Safeguards

Included in Schedule 5 are references to the Safeguard Frameworks that will be complied with during implementation of the Facility. ADB's safeguard policies in effect as of the approval of a financing tranche will be applied with respect to the subprojects financed under such tranche.

Procurement and Consulting Services

All goods and services to be financed under the Facility will be procured in accordance with ADB's Procurement Guidelines (2007, as amended from time to time).

All consulting services to be financed under the Facility will be procured in accordance with ADB's Guidelines on the Use of Consultants (2007, as amended from time to time).

Advance Contracting and

Under each tranche, ADB may, subject to its policies and procedures, allow on request (a) advance contracting of civil works, equipment and

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materials, and consulting services and (b) retroactive financing of eligible expenditures for civil works, equipment and materials and consulting services up to 20% of the proposed individual loan, incurred prior to loan effectiveness but not earlier than 12 months before signing of the related loan agreement. ADB has advised and India and the State understand that any approval of advance contracting and/or retroactive financing will not constitute a commitment by ADB to finance the related subprojects and components.

Disbursement

Disbursement will be in accordance with ADB's Loan Disbursement Handbook (2007, as amended from time to time). Each loan under the Facility will have its own imprest account in the Reserve Bank of India. The State through DOWR may establish a second-generation imprest account (SGIA) for each loan in a non-interest bearing current account with a commercial bank acceptable to ADB. The DOWR will be responsible for administering and managing the imprest account and the SGIA, which will have an initial deposited amount not exceeding the lower of the estimated expenditure for the first 6 months of project implementation, or 10% of the relevant loan amount. Individual payments under the statement of expenditures procedures (SOE) will be capped at $100,000.

Monitoring, Evaluation, and Reporting Arrangements

The DOWR will establish an Investment Program and Roadmap performance monitoring system (IPRPMS) for the Facility, acceptable to ADB within 3 months of effectiveness of the first loan. The IPRPMS will first select a set of performance monitoring indicators relating to physical implementation, institutional development, and socio-economic and other conditions, including those in Schedule 2 (Design and Monitoring Framework). The DOWR will establish baseline data for each of the selected indicators and will conduct annual surveys with the assistance of the consultants, and update the State and ADB on the progress against each indicator. The DOWR will also provide India and ADB with quarterly progress reports in the format to be attached with the Facility Administration Memorandum, within 45 days of the end of each quarter. The monitoring report will also be used for shaping the subprojects to be developed for succeeding PFRs and loan tranches. Quarterly reviews will be completed by the tripartite project review meetings chaired by the State and attended by DOWR and ADB.

The project accounts will be audited annually and submitted for review by the Government] of India and ADB. In addition to the regular and midterm review missions for each tranche, a midterm review mission for the Facility will be conducted in January 2013. The reviews will include a summary of contract awards and disbursement, implementation progress including progress against institutional development and capacity development milestones. The midterm reviews will also identify problems or weaknesses in implementation arrangements, and agree on changes needed. Within 3 months of physical completion of any Loan under the Facility, DOWR will under intimation to the Government of India submit to ADB an individual project completion report. Within 3 months of the completion of the Facility, DOWR will under intimation to

Government of India submit to ADB a Facility completion report.

Undertakings India and the State will undertake the following actions:

Sector Road Map. India will ensure that the Facility funds are utilized effectively and efficiently to implement the Investment Program and achieve its objectives. The State will ensure compliance with the institutional development actions in the Sector Road Map, which are identified in Table 2 of Schedule 1, including actions to implement State Water Policy 2007 and State Water Plan 2004; organizational reforms and strengthening of DOWR and associated institutions; reforms in the WUA systems; progress in irrigation management transfer; sustainable O&M; and steps towards operationalizing IWRM.

Fiduciary Oversight. India and the State will ensure that each Project account will be audited by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB and the audit reports will be submitted to ADB within 9 months of the end of the relevant fiscal years. The State will further ensure the compliance with the specific governance risk mitigation measures set out in Schedule 3 of this FFA.

Counterpart Funds. The State will ensure that sufficient counterpart funds are available from its budget for each fiscal year, in a timely manner, for the efficient implementation of the Projects under the Facility, provided that in the case of implementation of centrally assisted command area development (CAD) works in the Facility subproject areas, the State will ensure that it will not utilize ADB financing for its share of counterpart funding.

Subproject Selection. India and the State will ensure that all subprojects meet, to the satisfaction of ADB, the criteria described in Schedule 4 of this FFA,

Safeguards. India and the State will ensure that subprojects under the Facility will be carried out in accordance with applicable laws and regulation of India and the State, the safeguard policies of ADB, and the Indigenous Peoples Development Framework, Resettlement Framework, and Environmental Assessment and Review Framework applicable to the Facility and referred to in Schedule 5 of this FFA.

INDIA

By /sgd/ ANURADHA THAKUR
Authorized Representative

ASIAN DEVELOPMENT BANK

By /sgd/ TADASHI KONDO
Country Director
India Resident Mission

SCHEDULE 1
ROADMAP, POLICY FRAMEWORK, AND INVESTMENT PROGRAM FOR INTEGRATED IRRIGATED AGRICULTURE AND WATER MANAGEMENT IN ORISSA

A. Introduction

1. The Orissa Integrated Irrigated Agriculture and Water Management Investment Program (OIIAWMIP) aims to implement an investment plan of the State of Orissa (the State) to enhance the productivity and sustainability of existing public irrigation schemes. This will involve renovating irrigation infrastructure, installing PIM systems with water user associations (WUAs), and empowering WUAs as a cohesive platform for irrigation O&M and agriculture development. As a part of the state-wide investment plan, the OIIAWMIP will renovate and/or extend the existing major, medium, and minor (lift) irrigation schemes in the four northern river basins and a part of the Mahanadi delta, which are suffering from low performance in irrigated areas due to system deterioration and inefficient operation.

2. The State's "Vision 2020" and 11th Five-year Plan (2008–12) envisage accelerating annual growth rate to 9% and reducing poverty by 15% during the 5-year period, and sets out key strategic pillars comprising: (i) improving agriculture productivity and market orientation forming farmer groups and promoting participatory irrigation; (ii) expanding rural non-farm business opportunities; (iii) enabling broad-based industrial growth, and (iv) reforming fiscal and financial management, improving public sector accountability, and strengthening the private investment climate. The State revised the State Water Policy in 2007, and declared its resolve to expedite the transfer of O&M of all irrigation schemes to WUAs in a time-bound manner.[2] Thus, the OIIAWMIP and associated investment plan form an important pillar of the DOWR programs in the State's draft 11th Five-year Plan (2008-12).

B. Current Sector Performance and Impediments

3. **Rural Economy and Agriculture.** Orissa remains one of the poorest states in India, with a per capita income of Rs16,300 (70% of the national average) in 2004/05, and about 46% of the population (about 39 million) was below the poverty line. Poverty is predominantly a rural phenomenon with nearly 90% of the state's poor living in rural areas. Agriculture is the backbone of the economy, accounting for 33% of the state domestic product and employing over 60% of total and 80% of the rural work force. While the agriculture sector showed accelerated annual growth of 5.6% between 2001/02 to 2003/04, its productivity remains low. Average value of agriculture output per ha is about 78% of the national average. This is the result of lower yield levels and lower cropping intensities (about 150%). Diversification is also lagging, with food crops accounting for 75% of the cropped area against the national average of 67%. Key constraints include (i) limited physical capital, including irrigation and other rural infrastructure; (ii) limited access to and use of inputs and financial services; (iii) low technology base; (iv) small and fragmented land holdings (averaging 1.3 ha in size); (v) lack of effective local institutions and value chains providing backward and forward linkages from input delivery to output marketing; and (vi) limited effectiveness of public research and extension systems.

4. **Irrigation and Water Resources.** Orissa is endowed with relatively high rainfall, averaging 1,500mm annually. Yet irrigation is a critical input for agriculture throughout the year

[2] The State water policy expresses a vision to "ensure equitable and judicious use of water for survival of life, welfare of human beings and sustained as well as balanced growth of Orissa."

since rainfall is highly erratic: 80% of the annual rainfall occurs between June and September.[3] The State has a net sown area of 6.0 million ha, of which 5.9 million ha can be irrigated. So far, 2.69 million ha of net irrigation potential has been created, comprising 2.22 million ha in public major, medium and minor schemes, and 0.57 million ha in other modalities, including tanks and private groundwater irrigation. An additional 0.47 million ha potential is being created through ongoing projects. However, the actual area with assured irrigation remains at most 70% of the designed area under existing irrigation schemes. This is associated with (i) infrastructure deterioration due to chronic insufficient maintenance; (ii) lack of water control structures, inefficient system operation, and lack of accountability of facility operators to farmers, all leading to high levels of water loss; (iii) lack of farmer participation in O&M; and (iv) lack of field channels to distribute water across farm plots. Productivity in irrigated agriculture is also constrained due to limited integration with input delivery, agriculture support services, and output marketing, with limited coordination between DOWR and other departments concerned.

5. As to overall water resources management, competition between irrigation demand, bulk water use for water supply and industry, and environmental requirements within river basins is gradually becoming an issue, despite overall abundance of water for most of the year. In Orissa, irrigation accounts for 93% of total surface water use, followed by domestic use (4%) and industry (3%). With large foreign direct investments in the industrial sector in recent years, intersectoral allocation and coordination in water use is increasingly drawing public attention, in particular the potential adverse impacts on irrigation water availability and the rural economy, as well as on the environment.

6. **Institutional Setup.** The key public institutions associated with irrigated agriculture include (i) DOWR; (ii) the Departments of Agriculture (DOA), Horticulture (DOH), and Fisheries and Animal Husbandry (DOFAH); and (iii) local government institutions at village, sub-district and district levels. The State has established the State Water Resources Board chaired by Chief Secretary as the apex body for policy formulation, intersectoral water planning and allocation, to which the Water Planning Organization of DOWR serves as secretariat. In general, the concerned the State departments have requisite technical capacities, but are constrained by (i) limited operational finance due to high overhead costs (particularly staff); (ii) insufficient incentives and capacity to implement irrigated agriculture works using participatory processes; (iii) need for better coordination among line departments, local government institutions, and WUAs in delivering support services and forming organizational linkages; (iv) deficient O&M due to shortage of O&M funds; and (v) need for greater accountability to service recipients.

C. Sector Development Strategies and Partnership Opportunities

7. **Policy Framework.** In the State's overall development strategy reflected in its draft "Vision 2020," development and sound management of irrigation infrastructure in partnership with WUAs is recognized as a pathway to productive and high value agriculture, and poverty reduction in rural areas. Accordingly, since the 1990s the State has progressively improved the policy and institutional framework for irrigation service delivery and IWRM. Specifically, the State Water Policy was promulgated in 1994 and the new Policy was announced in March 2007, adopting the principles of PIM and IWRM, progressive transfer of O&M roles to WUAs, and cost recovery from users with periodic adjustments of water rates. The 2007 Policy also called for expeditious implementation and completion of WUA formation and transfer of O&M to the WUAs at minor canal levels. It further sets out specific tasks towards operationalizing IWRM.

[3] There is a marked difference between the yield level of major crops between rain fed and irrigated areas. Average yield level of rain fed paddy is less than 1.0 t/ha whereas irrigated areas produce at least 2-3 t/ha.

8. **State Water Plan.** The State completed the State Water Plan in 2004. It provides a basic framework to pursue the necessary interventions to meet the needs of diverse water users while maintaining the integrity of the environment, with broad basin plans prepared with a time horizon of up to 2051. Key priorities include (i) reviving the investments in irrigation in particular improved efficiency of existing infrastructure; (ii) ensuring safe drinking water and waste disposal in rural and urban areas giving financial autonomy to local urban bodies; (iii) reducing the gaps between environmental regulations and practices; and (iv) reducing water use subsidies through imposition of reasonable water charges.[4] Overall, the Plan provides a solid initial basis to pursue integrated water sector planning and investment at the river basin level. Yet it largely remains a qualitative strategic framework, calling for quantitative and analytical investment planning with stakeholder participation starting at the level of individual basins, which needs to be integrated with the State's five-year and annual planning processes.

9. **Legal Framework of PIM.** The State enacted the Pani Panchayat Act in 2002 and framed its operational Pani Panchayat Rules in 2003. The Act and Rules provide the legal basis for the progressive transfer of O&M responsibilities to WUAs by empowering and delegating minor facilities to them. It outlines arrangements whereby the WUAs would undertake necessary works using grant funds received from DOWR and/or from collection of fees from their members.[5] While the Act and Rules provide a satisfactory overall framework to promote PIM, initial operation of WUAs under this framework has led to the recognition that several areas of improvement are needed. The present 3-year tenure of elected representatives is too short for institution building and continuity, and could be extended with tenure overlap. In addition, better representation is needed of head, middle, and tail-end users among WUA office bearers. Finally, there is a need for stronger WUA involvement in planning and implementation of higher canal maintenance, and stronger participation of women and other vulnerable groups.

10. **Agriculture Sector Policy and Strategic Framework.** In line with its market oriented economic reform principles, the State amended the Agriculture Produce Marketing Act in 2006. This opened opportunities for private investment in storage and marketing facilities, and contract farming. The State has also drafted a state agriculture policy for finalization in 2007. It aims at more commercially oriented agriculture, and promotes participatory comprehensive planning at local government levels to be implemented with the private sector and NGOs.

11. However, despite improving the policy environment agricultural intensity and productivity remain low with farmers are beginning to respond to the new policies but are facing some constraints. Key among these constraints are: (i) low use of fertilizer (30% of the recommended level) and imbalanced nutrient applications despite the recent deregulation of private distribution; (ii) limited availability and use of improved seeds (seed replacement of only 6% against the 25% recommended); (iii) limited outreach of rural credit (40% of farm households have no access to formal credit, calling for other solutions such as group-based approaches); (iv) limited effectiveness of extension (calling for improved accountability of field extension workers and use of private providers); and (v) the fragmented marketing chain and information asymmetry. Nevertheless, local conditions vary considerably with some areas progressing in intensive paddy production and diversification, particularly where they have irrigation and ready

[4] These are supported by the stated principles of (i) sound institutional management with clear institutional roles and accountability mechanisms; (ii) environmental and ecosystem sustainability; (iii) stakeholder involvement including vulnerable groups; (iv) awareness creation through information dissemination and education; and (v) appropriate technology with balanced hardware and software.

[5] For the minor lift schemes (average size of 20 ha), the PP Act also exempts WUAs from water rates and authorizes them to undertake necessary O&M works by directly collecting fees from members, whereas in other schemes, water rates are collected by the Revenue Department and WUAs are provided with grant-in-aid from DOWR.

access to markets. Strategically, these conditions call for careful planning of the most suitable production systems for the locality. This requires concerted efforts to facilitate delivery of inputs and marketing of outputs, as well as strategic provision of critical support services. Farmer capacities and local leadership also need strengthening so that farmers can collectively drive the process. The WUAs could provide a stable platform to this end.

12. **WUA Formation and O&M Transfer.** In the late 1990s, with assistance from the World Bank (for major and medium schemes),[6] the European Union (for minor tank schemes),[7] and DFID and KFW (for minor lift schemes),[8] the process of forming WUAs was initiated, irrigation infrastructure renovated, and O&M of minor canals and structures transferred in accordance with the foregoing policy and institutional framework. Following completion of these projects, the State has continued the process of forming WUAs building on the prior experience. As of July 2007, WUAs have been formed for 1.25 million ha of net irrigated area,[9] and O&M has been transferred to WUAs in 0.92 million ha.[10] This process has received strong political support and is further buttressed by the State's comprehensive economic reform programs which include the necessary irrigation sector reforms that in turn empower WUAs.

13. The overall response and impacts of the process are positive, with strong support and enthusiasm by WUAs, particularly where sufficient motivation and facilitation was provided along with sound irrigation infrastructure. However, recent progress has been slower mainly because continuous institutional development support could not be provided to the WUAs. In general, experience in PIM in India suggests that long-term support is needed for WUAs to become a vibrant institution with financial, administrative, and institutional sustainability. Moreover, much of the irrigation infrastructure is in a deteriorated condition, and cannot function as designed or desired by WUAs, posing significant difficulties in orderly scheduled water distribution. Other lessons include: (i) WUAs need to be developed upfront in the project cycle, with full participation in the decision making process and with monitorable targets that demonstrate that they are functioning; (ii) critical attention is needed to deliver quality infrastructure and then sound operational rules that include test runs, operation monitoring, and system adjustments need to be agreed to with the WUAs; (iii) limited attention has been provided to field channel networks, which should be pursued as an integral part of planning and implementation to support efficient water use; (iv) WUAs are willing to expand their scope beyond irrigation to pursue collective agriculture development, which should be facilitated; (v) effective mechanisms of planning and delivering agriculture support systems are needed; and (vi) NGOs and private providers can be used for WUA development and support service delivery, but this requires developing the capacity of the providers. These lessons need to be reflected in the strategic framework for promoting sustainable and productive irrigated agriculture with PIM.

14. **DOWR.** In DOWR, there is significant organizational support for PIM and technical capacities to design and implement irrigation infrastructure. However, the capacity of DOWR to establish PIM systems needs further strengthening. Specifically, DOWR still remains an engineering agency with high establishment costs and an aging staff structure. At the field level, sound provider-recipient relationship between DOWR and WUAs that would support accountable service delivery by DOWR vis-à-vis the WUA water rate payments are still

[6] Orissa Water Resources Consolidation Project, approved in 1995 for $290 million and completed in 2004, covering 315,000 ha of net irrigated area.
[7] Orissa Minor Irrigation Project, implemented in 1995-2005 for 10.7 million Euros, covering 9,600 ha.
[8] DFID and KFW provided Rs385 million and Rs994 million, respectively, covering a total of about 60,000 ha.
[9] 3,334 WUAs for 1.00 million ha for gravity irrigation, and 11,547 WUAs for 0.25 million ha of minor lift schemes.
[10] 1,979 WUAs for 0.68 million ha for flow schemes, and 11,007 WUAs for 0.24 million ha of minor lift schemes.

developing. To this end, DOWR needs to enhance its service orientation with a clearer mission statement and performance management. There is also a need to enhance within DOWR multidisciplinary managerial skills, as well as staff attention to setting up and operating sound operational rules of irrigation infrastructure in agreement with WUAs. Support systems for PIM need strengthening to establish a more effective institutional setup and mechanisms need to be developed to establish viable WUAs while promoting productive agriculture. Finally, DOWR needs to strengthen its management information system (MIS) to monitor, plan, and implement O&M activities using a set of objective monitoring indicators and performance criteria.

15. **O&M Framework and Arrangements.** In support of the drive to foster PIM with WUAs, the State has taken progressive steps to move towards sustainable O&M for the irrigation schemes. Specifically, the State has been allocating O&M funds following the Government's Finance Commission Reports (FCRs), and increased allocation from Rs450/ha to Rs600/ha (applied to net irrigated area) for major and medium schemes in 2005/06 following the 12th FCR. Within this amount, a grant in aid of Rs100/ha is provided to the WUAs that have taken over the O&M responsibility of minor facilities. On the revenue side, the State also increased irrigation water tariff by 150% in 2002 (to a level at par with a national average, i.e., Rs250/ha and Rs400/ha for monsoon and dry season paddy, respectively) to recover the O&M cost, and is presently in the process of raising industrial water tariff to meet the recent rise in allocation.

16. Nevertheless, O&M sustainability is constrained due to the higher establishment cost of DOWR (Rs260/ha in 2005/06 as compared with FCR norm of Rs120/ha). Cost recovery still remains low at about 40% in 2005/06, due to the large gap (about 40%) between the utilized irrigated areas claimed by DOWR and the irrigated areas certified by Revenue Department (RD) and underachievement of defined collection targets (by about 20% for irrigation and about 40% for industries). Concerted efforts are needed to reduce the gaps between the utilized and certified irrigation areas by (i) improving the reliability of irrigation water supply with better system performance, and (ii) motivating farmers for due certification of irrigated areas and payment of the defined water tariff. The present system of collecting the water tariff by RD (based on revenue blocks) and allocation of O&M funds by DOWR (based on irrigation schemes and WUAs) with no linkage between the two also poses a constraint that must be addressed.

17. **IWRM.** In parallel with pursuing productive and sustainable irrigated agriculture through PIM, the State will also take steps towards further operationalizing IWRM. To this end, the specific agendas have been set out under the State Water Policy 2007 that include (i) preparing multi-sector river basin plans with participatory river basin organizations; (ii) strengthening database; (iii) preparing legislation for and monitoring groundwater use; (iv) establishing a regulatory authority to set water rates; and (v) protecting riparian and traditional rights of local communities, among others. These initiatives are timely, and need to be transformed into actions that lead to establishing institutional mechanisms and then to operationalize these.

D. Sector Road Map and Investment Program

18. The road map and investment program for the OIIAWMIP have been prepared with a primary focus on supporting the State in completing the establishment of WUAs, renovating infrastructure, and transferring the O&M of minor facilities. In general, critical actions are to be taken upfront, and these followed by incremental steps during the program period. The road map also envisages supporting further progressive steps for management transfer of higher-level facilities while putting IWRM into operation. The road map is predominantly built on initiatives that the State's has proposed or already taken, and on consultations held during the

program preparatory stage. OIIAWMIP will cover a part of the State's investment plan for irrigation, but it provides a common framework for implementing the entire plan.

19. **Vision, Goals and Principles.** Following the policy framework and development priorities of the Government and the State, the road map and investment program envision improving irrigation service delivery with WUA empowerment to enhance the productivity and sustainability of irrigated agriculture, thereby contributing to rural poverty reduction. Specific goals include (i) enhancing productivity and incomes by realizing full development potential of the irrigation infrastructure, (ii) improving livelihoods of the poor, (iii) establishing sustainable irrigation systems, and (iv) operationalizing effective PIM processes and mechanisms based on a sound policy and institutional framework. Implementation will be guided by the principles of (i) informed participatory decision making by stakeholders; (ii) coordinated and integrated organizational linkages at all stages; (iii) accountability and transparency; (iv) effectiveness to be monitored based on clearly defined result targets; (v) efficiency pursued with sound step-by-step process management; and (vi) a knowledge driven approach with flexibility for adjustments.

20. **Institutional Strengthening of DOWR.** The roles and capacities of DOWR are most critical for the effective implementation of the investment program. In this regard, five key actions are being undertaken:

(i) DOWR has proposed and established in December 2007 a permanent directorate for PIM and CAD with three functional divisions for (a) WUA institutional support, (b) O&M of transferred facilities, and (c) CAD. The leadership of this Directorate has been appointed from qualified multidisciplinary administrative staff. The existing technical setup of the DOWR has also been realigned into directorates for IWRM and for irrigation infrastructure planning, development and management.[11]

(ii) To reduce the establishment costs over time, DOWR has adopted the rationalization of its non-technical field staff (work charge, master roll, and wage) through natural attrition without new recruitment. In the meantime, field staff will be trained as facility operators or facilitators, and placed under the WUAs to ensure their accountability to WUAs.

(iii) To ensure that PIM-based accountable irrigation service delivery systems are firmly embedded in the organization, DOWR has initiated a change management process to formulate an institutional development vision, strategy, and action plan for staff management. This will be reflected in staff instructions on effective working relations with WUAs and associated performance evaluation systems. A capacity development plan will be improved building on the existing training modules and will include upgrading of technical skills for sound O&M systems that are readily manageable with WUA support.

(iv) DOWR will strengthen its quality control systems with the establishment of (i) a work process to engage WUAs for construction quality monitoring of DOWR-engaged contractors and for executing minor works, and (ii) an independent quality control cell to undertake third party testing and internal technical auditing.

(v) Finally, to enhance the effectiveness of Water and Land Management Institute (WALMI) as an autonomous training and research institute under DOWR, WALMI has been reorganized with improved representation of relevant institutions and stakeholders, and stronger autonomy.[12]

[11] The IWRM directorate will include circles and divisions concerned with multisectoral planning (Orissa Water Planning Organization), hydrology, water services (in charge of water allocation and water rates), and groundwater.

[12] Measures include: (i) reorganization of board of governors to include institutions outside the State and representatives of WUA; (ii) appointment of its director from the open market; (iii) full autonomy to the director for

21. **Legal Framework of PIM.** To address the present constraint in WUA establishment and management, the State will soon revise the PP Act 2002, PP Rules 2003 with specific improvements, including (i) longer tenure of elected WUA members (6 years) with overlapping of two separate terms at 3-year intervals; (ii) equal representation of head, middle, and tail-end users as office bearers; and (iii) promotion of women's participation (with a target of 33% representation in the executive and other (sub-)committees. The State will also issue an order to instruct tahsildars to (a) submit a copy of water demand notices to WUAs, (b) report village- and WUA-wise collection abstract to WUAs and DOWR.[13]

22. In the context of OIIAWMIP, the State will also (i) establish and operationalize clear operational rules that are developed with the WUAs specifying the WUA's seasonal water entitlements, (ii) set up and operate district level development and coordination committees headed by district collectors to meet the WUAs' development concerns (iii) promote livelihood enhancement of scheduled castes and scheduled tribes in the committees, (iv) promote livelihood enhancement of sharecroppers and landless by establishing organizational linkages. Upon sound demonstration, they would be further reflected in the legal framework.

23. **Sustainable O&M Financing.**[14] The roadmap includes several short- to medium-term measures to ensure sustainable O&M. For overall macro planning, the State will (i) maintain the policy of providing O&M funds following the Government's successive FCRs (completed in 2005/06 following the 12th FCR by increasing the O&M allocation to Rs600/ha); and (ii) maintain the full O&M cost recovery policy by revising irrigation, industrial, and other water tariffs following the changes in the O&M allocation (being completed within 2008/09 for 12th FCR). Over the medium term, the State will establish a regulatory authority or committee to suggest appropriate water tariff levels, following the State Water Policy 2007. To reduce the burden of establishment costs in the allocated O&M fund (para. 16), DOWR is to maintain the present natural attrition of its field non-technical staff.

24. For the purpose of reducing the shortfall between O&M allocation and revenue collection, the State will (i) strengthen its scheme asset inventory and MIS for O&M performance monitoring and planning; (ii) reduce the gap between irrigated areas recorded by DOWR and those certified by the Revenue Department through joint verification by DOWR and RD using the improved MIS; and (iii) prepare and use clear guidelines for O&M fund allocation at the scheme level, introducing performance-based criteria (i.e., a direct linkage between the revenue collected by RD and funds allocated by DOWR). To enhance WUA-level revenue collection, the State will, over the medium term, (i) improve the revenue record database to specify the WUA name for individual plots and monitor WUA-wise performance; and (ii) introduce a performance bonus or penalty in the allocation of grant-in-aid to the WUAs. To ensure the sufficient allocation for, and implementation of, O&M at the scheme level, DOWR will introduce a system of (i) jointly deciding on the annual and revised O&M plan with WUAs (including the establishment costs, clearly presenting the required and allocated funds); (ii) providing additional available funds to

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faculty selection; (iv) establishment of core competency in PIM, IWRM, and irrigation system design with action-oriented research; and (v) substantial upgrading of training programs focused on the staff and training of trainers.

[13] On the basis of this, the State will also consider changes in Irrigation Rules to (a) revise demand notice forms to include the WUA name and village-wise abstract form to include the WUA name of the land plots and to (b) instruct tahsildar to report the abstracts to WUAs and DOWR. In the medium term, the State may also assess the possibility of holding WUA elections in a confirmed date in every 3 years across the date, since it would promote stronger farmer awareness and support for the election process, and ensures that the higher level executive committees (such as outlet committees) can be readily established. Likewise, assignment of district collectors as the election authority might also be considered.

[14] These measures are applicable to major and medium schemes. For minor schemes, all responsibility for O&M, including fund collection and work execution, is envisaged to be transferred to the WUAs

WUAs (grant-in-aid) for the minor canals requiring higher maintenance; and (iii) encouraging WUAs to undertake all required maintenance by mobilizing their own resources from the members in case grant-in-aid funds cannot meet the requirements.

25. **Irrigation Management Transfer.** The State is in the process of establishing WUAs for all public irrigation schemes. To strengthen state-wide awareness and support for PIM, DOWR is preparing an information, education, and communication strategy, and will put the strategy into operation in 2008. As the first step, 2008 has been declared as Irrigation Year. The WUA establishment process is accompanied by the transfer of the responsibility for minor facility O&M to WUAs with necessary infrastructure renovation for ready O&M management by WUAs. Completion of this is envisaged at the end of the OIIAWMIP. For minor flow and lift schemes, all O&M responsibilities, including fee collection from beneficiaries, will be transferred during the process. For major and medium schemes, further transfer of O&M responsibility of higher-level canal systems at distributary and main canal levels is also envisaged in the longer term.

26. **IWRM.** Along with pursuing the progressive advancement of the enabling policy and institutional basis for irrigation service delivery through PIM and WUA development, the roadmap envisages a step-by-step progress in introducing and operationalizing IWRM within the state, following the actions stipulated in the State Water Policy 2007. Specifically, the State will (i) assess and define appropriate IWRM functions and institutional arrangements for setting up an authority or commission for fixing water tariffs and other regulatory functions including water allocation and entitlement, and environmental management, and establish and put into operation the ensuing organizational setup and IWRM functions, (ii) prepare multi-sector river basin plans with the establishment of participatory river basin organizations starting with the Baitarani River basin, and (iii) strengthen the database and decision support systems for the concerned river basins. In proceeding with these steps, the existing State Water Resources Board, the apex body of the sector, will guide and manage the process.

27. **State's Investment Plan and the Investment Program.** The State Water Policy 2007 and State Water Plan 2004 prioritize improving the efficiency and sustainability of existing underutilized irrigation infrastructure based on PIM and WUA development. This is the critical first step for attaining sustainable water resource management in the state. A specific investment plan to this end, as summarized below, has been prepared and included by DOWR and the State as a priority program for the 11th Five-year Plan (2008-12).

28. In consultation with the State, OIIAWMIP has been formulated to implement the foregoing investment plan for participatory modernization of existing irrigation infrastructure, covering major, medium, and minor lift schemes in the four northern basins, and priority major schemes in the Mahanadi delta. The remaining schemes are to be implemented with the support of the Government and external financiers. The OIIAWMIP aims to intensify and diversify high value agriculture by supporting participatory renovation of existing schemes, while empowering WUAs as a cohesive platform for irrigation O&M, input delivery, modernization of production systems, and output marketing. Necessary institutional development and program management support are also included. As an effort to meet the larger challenges of irrigation and water resources development in a long-term partnership, OIIAWMIP will also support participatory and integrated basin planning for the northern river basins and relevant institutional development, following the framework of the State Water Policy and Plan.

Table 1. Investment Plan for Irrigation Infrastructure in Orissa

Item	Region/Basin			Total
	Northern	Mahanadi	Southern	
Number of basins	4	1	6	11
Geographical area	43,800 km^2	65,600 km^2	41,013 km^2	150,400 km^2
Net Irrigated Area (NIA: '000 ha)	481.0	940.1	417.3	1838.4
Modernization Requirement				
NIA for Major & Medium ('000ha)	200.2	114.2	121.6	436.0
NIA for Minor (lift: '000ha)	30.0	50.0	20.0	100.0
NIA for Minor (flow: '000ha)	50.6			
Investment Need (except minor flow)	$270 million	$185 million	$86 million	$541 million
Investment Need (minor flow)	$123 million			
Total Investment Need	$664 million			
Ongoing New Schemes				
NIA ('000ha)	233.9	145.4	141.2	520.5
Investment Requirement	$718 million	$284 million	$76 million	$1,078 million
Proposed Schemes				
NIA ('000ha)	198	578	220	996

= OIIAWMIP, including priority scheme modernization in the Mahanadi delta

29. The overall sector roadmap, investment plan, and their timeframe are synthesized in Table 2.

Table 2. Sector Roadmap

Key Issues and Actions	Actions by	Timeframe	Performance Indicators
A. Overall Policy and Plan Framework			
1. State Water Policy			
a. Finalize the Policy (revising the policy adopted in 1994)	OSG	[Mar. 2007]	Policy adopted in Mar. 2007.
b. SWRB activated to initiate and guide the actions specified in the Policy to put the Policy principles into operation	OSG	[Mar. 2008]	Actions specified in the Policy initiated
2. State Water Plan			
Expand the state plan with the river basin plans, building on the state plan approved in 2004	DOWR	Dec. 2012	Basin plans for the four river basins prepared in consultation with stakeholders
B. Participatory Irrigation Management (PIM)			
1. Organizations ***1a. Department of Water Resources***			
a. Establish multidisciplinary PIM/CAD directorate headed by Additional Secretary level staff on a permanent basis	OSG	[Dec. 2007]	Directorate established (with O&M, PIM, CAD, and training divisions) and staff assigned
b. Realign the DOWR setup into directorates of irrigation and of IWRM	OSG DOWR	[Dec. 2007]	DOWR offices realigned (IWRM to include water planning, tariff, hydrology, and groundwater)
c. Initiate organizational change management process (with TA support) to formulate institutional vision and strategy	DOWR	[Started in Mar 2008]	Vision and strategy adopted by mid 2009; Institutional change momentum gained to meet the Policy principles
d. Issue staff instructions on the client orientation to WUAs, and reflect it in the staff performance evaluation system	DOWR	Dec. 2008	Staff attitudes on working relations improved to take WUAs partners
e. Start implementing a capacity development plan for PIM including design skills for structures and O&M arrangements	DOWR	Dec. 2008	Capacity development plan adopted, training started and capacity improved
f-1. Rationalize field level non-technical staff with natural attrition and non-recruitment policy.	DOWR	Ongoing	Field level staff to reduce by 50% by 2017
f-2. Train existing non-technical staff as canal operators and WUA support staff, and deploy them to work closely with WUAs		Starting Oct. 2008	Canal operations improved with deploy-ment of DOWR workers in WUAs
g. Establish improved MIS for scheme-wise O&M performance monitoring and planning	DOWR	2009 (framework); 2011 (operation)	Data collection and entry systems in place and reports produced and distributed to managers.
h-1. Establish quality control cell to engage third party consultants and initiate third party testing and internal technical auditing	OSG DOWR	[Mar 2008: OSG clearance]	Quality control cell established, and made operational with operational rules; construction quality improved
h-2. Improve field quality monitoring by operationalizing the work process to engage WUAs as participants in monitoring	DOWR	Starting Apr. 2009	Construction quality ensured with the WUA participation in quality monitoring
h-3. Implement annual full financial audit of all offices through internal audit wing of DOWR inspecting all transaction records	DOWR	Starting Apr. 2009	Efficiency of internal financial management enhanced with reduced audit observations

Key Issues and Actions	Actions by	Timeframe	Performance Indicators
in relation to the Investment Program			
1b. Water and Land Management Institute (WALMI)			
a. To remodel WALMI on the following accounts, as a center of excellence on PIM, IWRM, and irrigation technology: - Reorganization of board of governors to include institutions outside OSG and WUA representatives - Appointment of qualified director, with greater autonomy	OSG DOWR	[Dec. 2007: Board approved]; [April 2008: Director assigned]	A full functioning and revitalized Board in place that has established a clear operating mandate. Day-to-day leadership provided by well qualified director. Faculty in place who are qualified and dedicated.
b. Upgrade and update training programs, with focuses on staff training, and WUA trainer training	WALMI	Dec. 2010	Well defined programs defined and made operational
2. PP Act 2002 and PP Rules 2003			
a. To refine the PP Act 2002 and Rules 2003 on following:	OSG	[Feb. 2008: Cabinet approved] Dec. 2008 (PP Act); June 2009 (PP Rules and Irrigation Rules)	
- Extending tenure of elected members to 6 years, with overlapping of two terms in 3-year intervals			Improved functioning of WUAs doing O&M on an on-going basis
- Equal representation of head, middle, and tail reaches in the executive committee and office bearers			WUA EC and office bearers represent the equal mix of head, middle, and tails
- Promote greater women's participation and increased representation in the executive and other committees			Percentage of women in WUA committees increased to 33%
b. To implement the following in OIIAWMIP:	DOWR	Apr. 2009 (to start)	
- Participation of WUA and higher level committees in the decision making of maintenance planning and implementation			Planning and implementation recognizes WUA inputs
- Promote participation of vulnerable groups as formal and informal groups to work with WUAs			WUAs establishes capacities to deal with the interest of vulnerable people
- Promote gender actions 20% women in NGO support teams for WUAs, 33% women representation in WUA committees, agriculture and livelihoods program delivery to women groups, and gender disaggregated baseline survey and monitoring.			Gender action plan implemented to enhance women membership in WUA committees and livelihood enhancement of women groups in OIIAWMIP subprojects
3. Progress in PIM and Irrigation Management Transfer			
a. Establish information, communication, and education strategy and plan, and start its implementation	DOWR	[June 2008]	Strategy prepared and implementation started, resulting in enhanced awareness
b. Advance WUA formation in public irrigation schemes	DOWR	Ongoing	Process of WUA formation completed except for schemes with poor infrastructure
c. WUAs to introduce rules and actions to enhance water use efficiency (plan of actions to reduce loss and waste, special levy for water high water using crops, rule enforcement, etc.)	DOWR	Starting Jan 2010 (in OIIAWMIP schemes)	WUA's water distribution improved with increased irrigated area, cropping of high value low water duty crops, etc.
d. Extend the irrigation management transfer to distributary canal levels with good WUA performance	DOWR	Dec 2012	O&M of distributary canals of advanced WUAs transferred and managed well

Key Issues and Actions	Actions by	Timeframe	Performance Indicators
4. Sustainable O&M			
4a. O&M Fund Allocation and Revenue Targets			
a. To allocate O&M fund following the Finance Commission (FC)	OSG/FD	[2005/06: 12th FC completed]	Annual allocation reflecting the level recommended by FC
b. To revise water tariff levels to meet the O&M fund allocation: to increase industrial water tariff following 2005/06 increase	OSG	Mar 2009	Water tariff levels set to fully recover the O&M fund allocation
c. Undertake institutional assessment and establish a regulatory authority or commission for water tariff fixation	OSG/ DOWR	Dec 2010	Regulatory organization set up, and water rates defined with a set of standards and guidelines
4b. Reducing O&M Revenue Gaps			
a. Strengthen MIS for scheme performance monitoring	(See B.1a.d above)		(See B.1a.d above)
b. Joint verification of irrigated areas by DOWR and RD to reduce the present wide gaps, using the MIS	DOWR/ Revenue Department (RD)	Starting 2009 (OSG order)	Reduced gap (40% at present) in irrigated area assessed by DOWR and certified by RD
c. Prepare and operationalize guidelines for scheme-wise O&M fund allocation with performance-based criteria	DOWR	Dec 2010	Improved water rate collection through performance based fund allocation
d. Improve revenue data base to specify WUA-wise water rate submission performance			
- Water tariff collectors to submit the abstract of WUA-wise water rate demand and collection to WUAs and DOWR - Change in Irrigation Rules as necessary to effectuate the above with the instruction to the tariff collectors to this end	RD/ DOWR	Dec 2010	RD to provide data to introduce the system of allocating irrigation water and O&M fund with direct linkage to the water rate collected
e. Introduce performance bonus or penalty in DOWR's grant-in-aid system to WUAs	OSG/ DOWR	Dec 2010	Performance based provision of grant-in-aide operational, and water rate collection improved
4c. Reducing Scheme-wise Shortfalls in Allocated Fund			
a. Reduce the DOWR overheads through natural attrition	(See B.1a.c-1 above)		Overhead cost reduced to FC norm (Rs120/ha)
b. Joint decision making on scheme-wise O&M plan with WUAs, with providing fund to top up grant-in-aide to WUAs and local resource mobilization by WUAs	DOWR	Starting Jan 2009	Decision making on O&M that substantially reflects WUA views
C. Integrated Water Resources Management			
a. Assess appropriate IWRM functions and institutions (e.g., an authority or commission) including water tariff fixation, allocation, entitlements, and other regulatory functions	DOWR/ SWRB	Dec 2010	Improved planning, regulation, and coordination mechanisms for water resources management operational
b. Put into operation river basin organizations (RBOs) initially with pilot, to be replicated after successful demonstration	DOWR	Jun 2009 (pilot to start)	Improved planning, coordination, and conflict resolution, and management within basins
c. Undertake studies to pursue appropriate environmental	DOWR and	Jun 2009 (start)	Improved regulation that maintains the chemical

Key Issues and Actions	Actions by	Timeframe	Performance Indicators
regulation, and prepare an action plan	DOE		and biological integrity of water resources
d. Strengthen data base and decision support systems (DSS)	DOWR	Jun 2009 (start)	Improved data base and DSS contributing to objective river basin water management

E. Investment Program – Program Description

1. Impact and Outcome

30. The impact of the OIIAWMIP will be enhanced rural economic growth and reduced poverty in the selected river basins/geographical areas, and institutionalization of effective mechanisms to put into operation PIM-based agriculture growth.[15] The outcome will be enhanced productivity and sustainability of irrigated agriculture in the selected existing schemes in the river basins, and improved performance of irrigation service delivery and water resources management.[16] The program design and monitoring framework is shown in Schedule 2.

2. Outputs

31. The outputs of OIIAWMIP are (i) productive and sustainable irrigated agriculture management systems, and (ii) strengthened capacities of the institutions in delivering services and sustaining irrigation schemes with WUAs.

Part A: Productive and Sustainable Irrigated Agriculture Management Systems

32. This component will establish productive and sustainable irrigation systems through WUA strengthening, renovation of irrigation and associated infrastructure, agriculture and livelihood support services, and O&M support. It covers 6 major and 6 medium existing irrigation schemes (having a designed net irrigated area [NIA] of 185,000 ha, including 6,000ha of extension in a major scheme), and up to about 1,400 existing minor lift irrigation schemes (having NIA of 30,000 ha) in the OIIAWMIP area. The component will also include (i) other major and medium schemes in the same geographical area which are functional but requires WUA strengthening and minor refinement of the existing infrastructure, and (ii) minor creek irrigation schemes to be undertaken as a pilot. The following subcomponents are provided, and aligned with the step-by-step implementation procedure. In principle, substantial WUA institutional strengthening and participatory planning will be pursued upfront with performance targets, after achievement of which infrastructure[17] and other services are provided.

i. Participatory Planning and WUA Strengthening

33. **Participatory Scheme Planning.** Following the selection criteria (Schedule 4) and the planning documents prepared for the tranche-1 schemes, the OIIAWMIP will support participatory feasibility studies and preparation of subproject implementation plans (SIPs) for the concerned major, medium, and minor lift schemes in close consultation with the concerned WUAs. The SIP will stipulate specific programs and output targets for WUA strengthening, irrigation and associated infrastructure, agricultural development and livelihood enhancement for the poor, and system O&M plans including a strategy for efficient water use. All schemes will

[15] This will be measured through reduced poverty incidence, incremental incomes and social indicators of farmers and vulnerable people, and application/replication of the said institutional mechanisms across the state.

[16] Productivity will be measured through increased irrigated area (from 170,000ha [including partially irrigated area] to 221,000ha for monsoon and from 77,000ha to 155,000ha for dry season), crop production (focusing on crop intensification [monsoon] and diversification into high value crops [dry season]), efficiency in water use (production value per unit of water, etc.), and employment created including allied activities. Sustainability will be measured in individual schemes (at both scheme and individual WUA levels) achieving targets for water distribution, tariff collection and O&M fund allocation, and DOWR and associated agencies delivering the set institutional functions.

[17] Excluding main and key distributary facilities that will be implemented in parallel to WUA strengthening, to ensure the timely delivery of water when branch and minor canal systems (for WUA management) are renovated.

be fully appraised by the State, the Government, and ADB and included in the periodic financing request (PFR) of the subsequent tranche before starting their implementation. For minor lift schemes, subprojects are appraised on a sample basis for inclusion in the PFRs, and subsequent subprojects are identified, appraised, approved by ADB, and implemented following a process-type approach.

34. **WUA-level Micro-Planning.** For major and medium schemes, the planning process has two tiers: scheme-level framework planning (completed prior to PRF), and WUA-level micro-planning. The former will provide an overall framework for the scheme at large to initiate the implementation of the main infrastructure facilities. Upon approval of the PRF, WUA micro-planning will be initiated with the concerned WUA, the WUA support team (including NGO staff and locally identified and trained facilitators in WUA strengthening, agriculture, and water management), and DOWR field engineers. The process will prepare WUA level implementation plans (WUAIP), comprising the plans for minor infrastructure improvement, CAD, agriculture, livelihood, and O&M. The O&M plan will specify the seasonal water allocation/entitlement of the WUA, to be monitored by the WUA with a measuring device provided at their water intake.

35. **WUA Strengthening and Empowerment.** The Project will strengthen WUAs through WUA support teams to manage planning, construction, and post-construction activities as equal partner to DOWR. WUAs will play effective organizational, operational, resource mobilization, and networking functions as stable platform to promote irrigated agriculture development, including the formation of linkages to input delivery and output marketing. Specific targets would be set out and achieved including membership enrollment; election and formation of executive committees and subcommittees, and implementing routine O&M on their own (building on the grant in aid provided by the DOWR) and other collective actions. Upon achievement of the targets, an implementation agreement will be signed by WUA and DOWR to start the implementation of the defined WUAIP activities. For major and medium schemes, higher tier committees (project and distributary committees) will also be established during this process.

ii. Irrigation Infrastructure including Command Area Development

36. **Irrigation and Associated Infrastructure.** The OIIAWMIP will provide renovation and extension of necessary infrastructure, including reservoir facilities (minor repair), head and cross regulators, canal systems, canal crossing bridges, inspection roads, cross drainages, and minor drainage works to address immediate local drainage problems,[18] along with minor lift irrigation infrastructure. As to major and medium schemes, main and upper distributary facilities are implemented following the scheme-level planning and approval of PRF, whereas lower distributary and minor systems will follow the achievement of WUA strengthening targets. Necessary equipment, facilities, and communication systems will also be provided to support sound O&M. Construction quality monitoring will involve the concerned WUAs and their higher committees, along with third party quality monitoring and inspection system. WUAs will also be involved in the implementation of the minor canal works within their own constituencies.

37. **CAD and Conjunctive Use.** The OIIAWMIP will place significant emphasis on installing field channel systems as essential conditions to attain high water user efficiency, and crop intensification and diversification. Specific plans will be laid out at the WUAIP. The CAD investment will be primarily implemented through extending centrally-assisted programs with

[18] A study will be included to assess the long-term sustainability of addressing the chronic drainage problems in the low-lying areas of irrigation schemes in the Brahmani river basin following up on the drainage master plan, along with pilot works within the irrigation command areas. [19] Please see institutional reform actions in Appendix 2.

state own counterpart contribution, whereas provision under OIIAWMIP will also be provided to implement CAD for subprojects where central program support is not readily available. The concerned WUAs will implement the minor CAD facilities. With the utilization of CAD field channel systems, the OIIAWMIP will also promote conjunctive use of groundwater for rabi cropping, by providing groundwater survey, monitoring and information campaigns for private investments, and provision of pilot wells targeted to marginal farmer groups in the tail end areas.

38. For WUA-level infrastructure works of major and medium schemes, WUA will collect and deposit 5% of the cost of WUA-level infrastructure in a joint account with DOWR, which will be utilized for their future maintenance works within the WUA. As to CAD and minor lift schemes, WUAs will contribute 10% and 20% of the cost of the infrastructure, respectively. With an agreement that WUAs will meet all major and minor repairs and replacement of assts, minor lift WUAs will also deposit the specified amount of reserve fund in their accounts to meet this end.

iii. Agriculture and Allied Sector Support, and Livelihood Enhancement

39. **WUA Agriculture and Horticulture Development.** The OIIAWMIP will provide support to this end to supplement the existing Government and the State programs in the sector, upon signing of the implementation agreement by the WUA. WUA capacity will be developed as a platform to plan, coordinate, and arrange for the program implementation. Specific programs will be prepared in conformity with the district and block level agriculture extension plans (pursued under the Agriculture Technology Management Agencies [ATMA] where available) and stipulated in the WUAIPs. At this stage, key opportunities and constraints from input supply, production systems, and output marketing will be identified, and necessary programs to overcome the constraints will be defined. The agriculture and horticulture subcomponent will cover (i) production systems including farmer field schools for crop intensification and diversification, soil nutrient management, seed multiplication, and integrated pest management, and (ii) organizational linkage of WUAs with input suppliers and marketing chains with market intelligence including catalogues for existing organizations and programs. New technologies and approaches, e.g., system of rice intensification (SRI), participatory variety selection (PVS), and farmer producer companies will also be introduced and expanded upon effective demonstration. Participatory technology development of other innovative technologies (e.g., aerobic rice, integrated nutrient management, rice-fish integrated farming) will also be implemented in partnership with local research agencies.

40. These services will be delivered through existing state projects (sought through the district level coordination committees) or OIIAWMIP funding in case of the former's unavailability, by the resource persons of the line departments or other agents (including private experts and NGOs) arranged through the OIIAWMIP. WUAs will sustain activities through assigning and training in-house extension workers who will form regular links with the existing institutions within the subproject areas. Demonstration works will be undertaken with a focus on the land plots of marginal farmers. WUAs will recover the cost of input materials from the service recipients as revolving fund to continue the activities.

41. **WUA Livelihood Enhancement Support.** The OIIAWMIP will also support the formation of linkages between the vulnerable groups within the WUA area and the existing programs for poverty reduction, such as forming self help groups and facilitating delivery of credit and training for income generation activities. While primary efforts will be made to deliver the above agriculture and horticulture support services to these vulnerable groups, provisions targeted for these groups are also included in the OIIAWMIP, such as backyard planting of vegetables, development of fodder along the water channels and support for livestock

development; production of inputs such as organic fertilizers through composting and through other means, processing of production where feasible, group cultivation through leasing in of land, fisheries in public water bodies (reservoirs, ponds, and drainage channels), and community-based participatory watershed management identified by the WUAs. A separate program for WUA capacity development and service delivery is also prepared for potential funding by Japan Fund for Poverty Reduction (JFPR), with a provisional amount of $1.5 million.

iv. Sustainable O&M System

42. **Minor Facilities.** The OIIAWMIP will institutionalize sustainable O&M for the concerned irrigation schemes with the involvement of WUAs. At present, the facilities are classified into those managed jointly by DOWR and WUAs (WUA project committees at main canal level, and distributary committee at secondary/ distributary canal level), and minor facilities of which O&M is transferred to WUAs. As to the latter, the OIIAWMIP will establish WUA capacities to manage sustainable O&M. This will be attained through formation of water management and works subcommittees and preparation of O&M plans during the WUAIP stage, and training and engaging them in implementing minor canal and related works while monitoring contractor's works during the implementation stage. Upon completion of the civil works, on-the-job training will be provided to (i) prepare and implement operational plans; and (ii) undertake inspections through a joint walk-through to identify and plan maintenance works. For major and medium schemes, WUAs are facilitated to implement the maintenance plan with the grant-in-aid (Rs100/ha at present) by the DOWR. In the event of insufficiency of the grant-in-aid, WUAs will seek additional fund to DOWR through distributary and project committees, and/or mobilize necessary funding from among its members. As to the minor lift schemes where the power and responsibility of O&M and financing has been transferred to WUAs, the concerned WUA will generate the necessary fund from its members to implement the O&M plan.

43. **Main and Secondary Facilities.** At the individual scheme and distributary levels (of major and medium schemes), the OIIAWMIP will establish participatory joint management systems between DOWR and the counterpart WUA committees, and pursue further O&M transfer during the latter part of the implementation period. Under joint management, DOWR and the WUA higher-tier committees will prepare and implement system operational plans on a seasonal basis. Regarding maintenance, they will also identify maintenance requirements through joint walk-throughs and performance measurements (e.g., actual canal flow against the design figure) of the facilities and demands submitted from lower-tier committees and WUAs, and jointly decide on and implement the scheme-wide maintenance plan allocating necessary funding from DOWR. Guidelines for O&M performance monitoring and planning, to be developed as state-wide MIS, will be prepared to guide and support the process.

Part B: Institutional Strengthening and Project Management

44. This component comprises (i) institutional strengthening for PIM and IWRM; and (ii) project management for OIIAWMIP. Necessary hardware and software (civil works for office refurbishment and extension, vehicles and equipment, consultants, and incremental operational costs) will be provided to support these ends.

i. Institutional Strengthening

45. **PIM.** This subcomponent will establish self-sustaining mechanism to deliver accountable irrigation services while developing the capacities of the concerned institutions. Specific works will include (i) capacity strengthening and operationalizing the functions of PIM/CAD directorate;

(ii) establishing updated O&M guidelines and MIS for irrigation scheme performance monitoring and O&M planning; (iii) operationalizing third party testing and internal technical auditing system through externally hired experts; (iv) developing training programs and delivering training for the OIIAWMIP and other staff of DOWR and line departments, service providers (NGOs and local experts), and WUAs, including exposure visits; (v) information, education, and communication campaigns for PIM; (vi) advisory support to implement the institutional actions in the roadmap; and (vii) support studies to pursue change management process of DOWR, and facilitate the definitions and implementation of specific actions in the management of human and financial resources, and business processes. The specific training subjects include skills for participatory planning, WUA development, design and construction management, quality control, PIM including O&M, resettlement, environmental management, and support services. WALMI will also be strengthened with remodeling, including (i) assignment of its qualified director from the market, (ii) upgrading of training programs, (iii) developing knowledge base on the best practices and lessons on PIM and IWRM; and (iv) twinning arrangement with a reputed international institute.

46. Within the above framework, WALMI will be strengthened to provide necessary technical and institutional backup and training support. Subject to the implementation of reform actions for higher autonomy and staff quality,[19] it will be entrusted to research and establish most up-to-date information, knowledge, and technology base in terms of hardware and software to support most efficient water use, best practices and lessons for PIM and IWRM, and monitoring and evaluation of scheme and WUA performance. Along with enhancing the knowledge and technology base, WALMI will upgrade its training modules and its capacity with the consultants, and provide training with a focus on the concerned project staff and trainers.[20]

47. **IWRM.** In accordance with the roadmap, this subcomponent will provide support for (i) studies to assess appropriate IWRM functions and institutional arrangements for setting up an authority or commission for water tariff fixation and other regulatory functions including water allocation and entitlement, and environmental management; (ii) studies for appropriate legislation of the above IWRM organizational setup and functions, and of groundwater management; (iii) preparation of multi-sectoral river basin plans with establishment of participatory river basin organizations; (iv) strengthening of hydrological database and decision support systems for the concerned river basins; and (v) staff training on IWRM, basin planning and associated analytical methodologies including hydraulic modeling, including foreign and local training. The OIIAWMIP will also provide support for establishing and operationalizing advisory council of proceeding with the above IWRM institutional development process.

ii. Project Management

48. This subcomponent will operate OIIAWMIP project management systems through multi-disciplinary project management unit (PMU) and subproject implementation offices (SIOs), with the State and outsourced experts, technical assistance (TA) consultants, and NGOs. The OIIAWMIP will operationalize participatory decision making system with WUAs and their higher tier committees at distributary and project levels. The latter are trained to jointly make individual decisions on the subproject planning, implementation, and O&M at the scheme, distributary, and WUA levels, based on which specific works will be implemented by the responsible organizations, with monitoring the WUAs. This will be supported by the project-specific MIS and quality control system that ensures due recording and reporting at SIO on institutional, physical,

[20] To sustain research and training programs by the strengthened WALMI after Program completion, the Program would provide a corpus fund in its latter tranche by establishing an arrangement acceptable to ADB.

financial and other progress against the specified targets and schedules specified in SIP and WUAIPs; and regular PMU-SIO review meetings. Along with these, this subcomponent will also support the consulting services for preparing and appraising the further schemes for inclusion in the subsequent tranches, along with the implementation performance review.

3. Cost Estimates, Financing, and Implementation

49. The total cost of the OIIAWMIP is estimated at $268.8 million. It is proposed that ADB will finance up to $188.2 million. The State is to finance up to $73.4 million including taxes and duties amounting to about $11.1 million, and the beneficiaries will finance $7.2 million. In addition, technical assistance will be provided by ADB from the Multi-donor Trust Fund under the Water Financing Partnership Facility (MTFWFPF) in an amount of $250,000 on a grant basis to support a part of the studies for IWRM (para. 47). The Investment Program will be implemented over a period of 8 years through 4 tranches (or more if required) of loans under a multi-tranche financing facility (MFF). The total investment cost and financing plan is summarized in Tables 3 and 4, respectively, and detailed in Table 5. Indicative implementation schedule and list of proposed major and medium schemes are shown in Tables 6 and 7, respectively.

Table 3. Cost Estimates

Project Components	Amount ($ million)
I. Base Cost [a]	
Part A. Irrigated Agriculture Management Systems	
a. Participatory Planning and WUA Strengthening	5.6
b. Irrigation Infrastructure	139.3
c. Agriculture and Livelihood Development	6.8
d. Sustainable O&M Systems	6.3
Part B. Institutional Strengthening & Project Management	34.8
Subtotal (A)	**192.8**
II. Contingencies [b]	56.7
Subtotal (B)	**249.5**
III. Financing Charges during Implementation	19.3
Total	**268.8**

[a] In mid 2007 prices.

[b] Physical contingencies computed at 10% of civil works, NGO and consultancy costs, and project management, totalling $12.4 million. Price contingencies are computed at 0.8% per annum for foreign exchange costs and 4.0-5.0% per annum for local currency cost

[c] Includes interest and commitment charges. Interest during construciton has been computed at the 5-year London interbank offered rate plus a spread of 0.2%.

Table 4. Financing Plan

Source of Financing	Total ($ million)	Percent
Asian Development Bank	188.2	70%
Government	73.4	27%
Beneficiaries [a]	7.2	3%
Total	**268.8**	**100%**

[a] To contribute 10% of the cost of command area development and conjunctive use, and 20% of the cost of minor lift schemes, either in cash or in kind, in paralell to the relevant civil works. Beneficiaries will also deposit an amount equivalent to 5% of the minor canal civil work cost in the WUA's bank account to support their O&M activities

Table 5.1. Cost Estimates and Financing Plan (Total Investment Program by Components and Tranches: US$ Million) [a]

Item	Tranche 1 (2009-12)				Tranche 2	Tranche 3	Tranche 4	Total
	ADB	State	WUAs	Subtotal	2011-13	2013-15	2015-16	
A. Irrigated Agriculture Management Systems								
A1. Planning and WUA Development								
i. WUA Mobilization through NGOs	0.7	0.0	0.0	0.7	1.7	1.9	0.7	5.0
ii. WUA Elections, buildings, etc.	0.0	0.2	0.0	0.2	0.2	0.1	0.1	0.6
A2. Irrigation and Associated Infrastructure								
i. Land Acquisition and Resettlement	0.0	3.6	0.0	3.6	1.1	0.0	0.0	4.7
ii. Infrastructure (Major & Medium schemes)	25.3	3.6	0.0	28.9	40.7	28.0	2.6	100.2
iii. Minor Lift Irrigation	4.9	0.7	1.4	7.0	0.0	5.3	2.7	15.0
iv. Command Area & Conjunctive Use	0.6	0.6	0.2	1.4	5.2	7.4	5.4	19.4
A3. Agriculture and Livelihoods Support	0.6	0.0	0.0	0.6	2.1	2.7	1.4	6.8
A4. Sustainable O&M	0.1	0.1	0.0	0.2	1.0	2.2	2.9	6.3
Subtotal	**32.2**	**8.8**	**1.6**	**42.6**	**52.0**	**47.6**	**15.8**	**158.0**
B. Institutional Development								
B1. Institutional Strengthening								
i. Department of Water Resources	2.2	0.3	0.0	2.5	2.4	0.6	0.4	5.9
ii. Traininig	0.6	0.0	0.0	0.6	0.7	0.7	0.4	2.4
iii. Consulting Services	3.1	0.4	0.0	3.5	2.9	1.2	0.6	8.2
B2. Project Management								
i. Project Management	0.9	2.8	0.0	3.7	4.9	4.3	3.0	15.9
ii. Minor Lift Implementation Services	0.6	0.0	0.0	0.6	0.7	0.8	0.3	2.4
Subtotal	**7.4**	**3.5**	**0.0**	**10.9**	**11.6**	**7.6**	**4.7**	**34.8**
Total (Base Cost)	**39.6**	**12.3**	**1.6**	**53.5**	**63.6**	**55.2**	**20.5**	**192.8**
Price and Physical Contingencies	7.6	1.7	0.2	9.5	18.4	20.4	8.4	56.7
Total Project Cost	**47.2**	**14.0**	**1.8**	**63.0**	**82.0**	**75.6**	**28.9**	**249.5**
Financing Charges	0.0	4.5	0.0	4.5	7.4	6.9	0.5	19.3
Total Cost Including Financing Charges	**47.2**	**18.5**	**1.8**	**67.5**	**89.4**	**82.5**	**29.4**	**268.8**
Indicative ADB Financing Amount	**47.2**				**62.7**	**57.8**	**20.5**	**188.2**

[a] In mid-2007 prices. Taxes and duties will be financed by the State.
[b] Physical contingencies computed at 10% for civil works, NGO and consultancy costs, and project management, totaling 12.7 million. Price contingencies are computed at 0.8% per annum for foreign exchange costs and 4.0-5.0% per annum for local currency costs.
[c] Includes interest and commitment charges. Interest during construction has been computed at the five-year forward London interbank-offered rate plus 0.2% spread.
WUAs = water user associations

Table 5.2. Cost Estimates and Financing Plan (Total Investment Program by Expenditures: US$ Million) [a]

Item	ADB	State	WUAs	Total	Cost Sharing (average for all tranches) ADB	State	WUAs
A. Civil Works							
M&M Schemes (Main&Dist)	67.0	7.0	0.0	74.0	90.5%	9.5%	0.0%
M&M Schemes (Minor Canals)	22.0	2.3	0.0	24.3	90.5%	9.5%	0.0%
Command Area Development	7.0	9.5	1.8	18.3	38.3%	51.9%	9.8%
Minor Lift Schemes	8.4	1.2	2.4	12.0	70.0%	10.0%	20.0%
O&M Support	2.5	3.1	0.6	6.2	40.3%	50.0%	9.7%
Others	1.2	0.1	0.0	1.3	92.3%	7.7%	0.0%
Subtotal	**108.1**	**23.2**	**4.8**	**136.1**			
B. Land Acquisition and Resettlement	**0.0**	**4.7**	**0.0**	**4.7**	**0.0%**	**100.0%**	**0.0%**
C. Vehicles and Equipment							
Vehicles	0.1	0.0	0.0	0.1	100.0%	0.0%	0.0%
Equipment and Materials	2.8	0.3	0.2	3.3	84.8%	9.1%	6.1%
Minor Lift Equipment	2.1	0.3	0.6	3.0	70.0%	10.0%	20.0%
Subtotal	**5.0**	**0.6**	**0.8**	**6.4**			
D. Specialist Services							
NGO Social Mobilization	5.0	0.0	0.0	5.0	100.0%	0.0%	0.0%
Consulting Services	7.2	1.0	0.0	8.2	87.8%	12.2%	0.0%
Minor Lift Implementation	2.4	0.0	0.0	2.4	100.0%	0.0%	0.0%
RP Implementation	0.3	0.0	0.0	0.3	100.0%	0.0%	0.0%
Studies	1.4	0.2	0.0	1.6	87.5%	12.5%	0.0%
Subtotal	**16.3**	**1.2**	**0.0**	**17.5**			
E. Survey and Investigation	**1.4**	**0.6**	**0.0**	**2.0**	**70.0%**	**30.0%**	**0.0%**
F. Training							
Irrigation Management	2.4	0.0	0.0	2.4	100.0%	0.0%	0.0%
Agriculture and Livelihood	6.8	0.0	0.0	6.8	100.0%	0.0%	0.0%
Subtotal	**9.2**	**0.0**	**0.0**	**9.2**			
G. Operational Costs	4.0	12.8	0.1	16.9	**23.7%**	**75.7%**	**0.6%**
Total (Base Cost)	**144.0**	**43.1**	**5.7**	**192.8**			
Physical Contingencies	11.0	1.3	0.0	12.3	89.4%	10.6%	0.0%
Price Contingencies	33.2	9.7	1.5	44.4	74.8%	21.8%	3.4%
Total Project Cost	**188.2**	**54.1**	**7.2**	**249.5**			
Financing Charges	0.0	19.3	0.0	19.3	0.0%	100.0%	0.0%
Total Cost Including Financing Charges	**188.2**	**73.4**	**7.2**	**268.8**			

[a] In mid-2007 prices. All taxes and duties will be financed by the State.
WUAs = water user associations

Table 4. Indicative Implementation Schedule

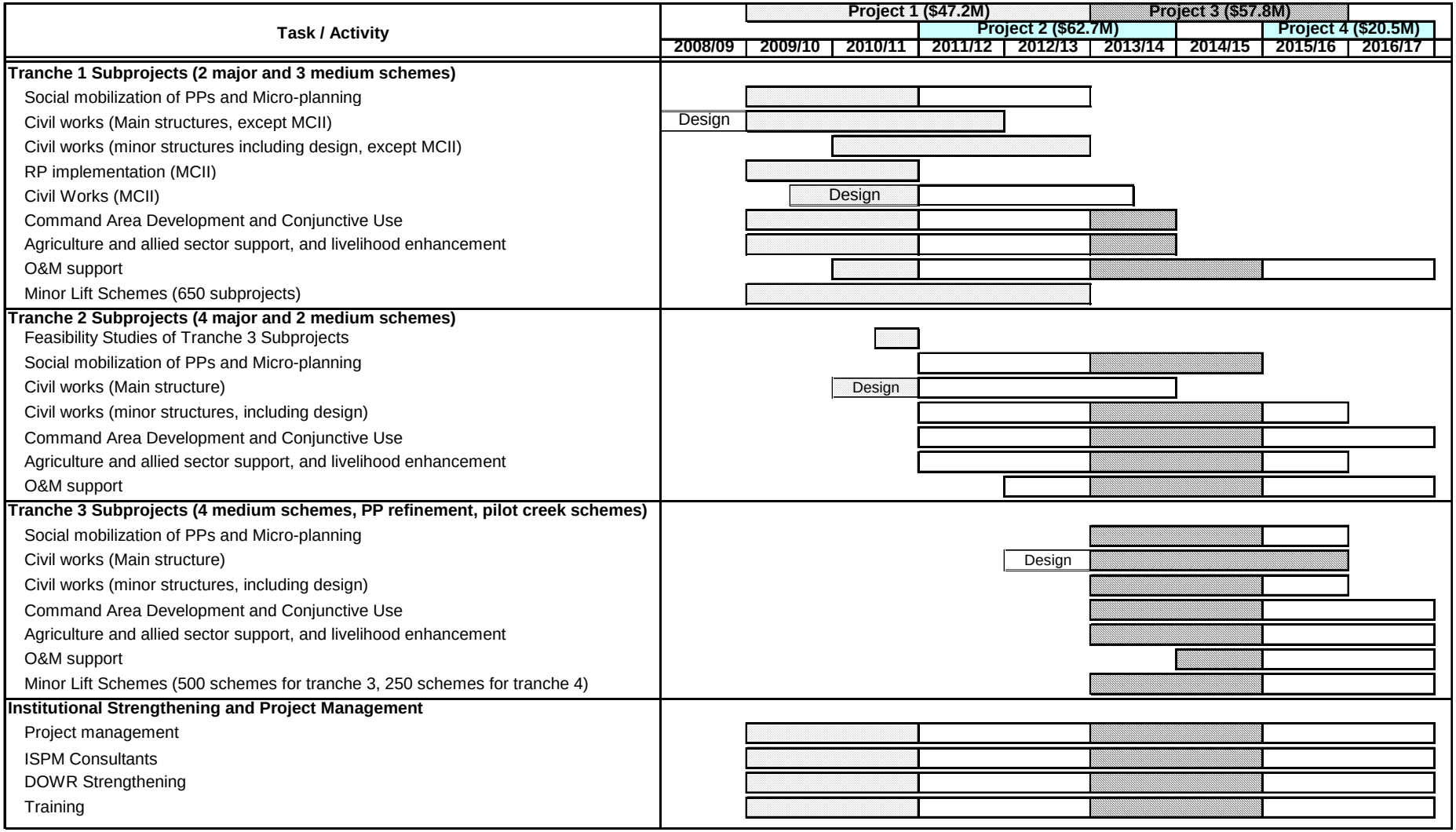


Table 5. Indicative List of Schemes

No.	Scheme Name	Basin	Net Irrigated Area (design) ha	Notes
	Major Schemes		ha	
1	Taladanda	Mahanadi Delta	32,680	Tranche-1
2	Mahanadi Chitropala Island (MCI)	ibid	13,260	Tranche-1 (pre-construction), Extension for 6,000ha
3	Machhagaon	ibid	34,870	Tranche-2
4	Pattamundai	ibid	23,030	Tranche-2
5	HLC Range-I	Brahmani	14,700	Tranche-3
6	Jajpur Canal	Brahmani	13,100	Tranche-2
	Subtotal		**131,640**	
	Medium Schemes			
1	Gohira	Brahmani	8,100	Tranche-1
2	Remal	Baitarani	4,300	Tranche-1
3	Sunei	Budharabalanga	10,000	Tranche-1
4	Kansbahal	Brahmani	4,610	Tranche-2
5	Ramiala	Brahmani	9,600	Tranche-2
6	Kanjhari	Baitarani	9,300	Tranche-2
7	Bankabal	Subernerekha	6,840	Tranche-3
8	Khadkai	ibid	8,460	Tranche-3
9	Nesa	ibid	1,200	Tranche-3
	Subtotal		**62,410**	
	Minor Lift Schemes			
	1,400 schemes	4 basins	**30,000**	Tranche-1, 3 and 4
	Scheme Refinement and WUA Strengthening			
1	Sapua Badjor	Brahmani	2,469	Tranche-3
2	Jambhira	Budharabalanga	3,550	Tranche-3
3	Haldia	Budharabalanga	2,270	Tranche-3
	Subtotal		**8,289**	
	Creek Irrigation			
1	Bada Mahara	Baitarani	420	Tranche-3
2	Pada Mahara	Baitarani	403	Tranche-3
3	Samudrapasa	Baitarani	486	Tranche-3
4	Natiajore	Baitarani	1,560	Tranche-3
	Subtotal		**2,869**	

SCHEDULE 2
DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
Impact 1. Enhanced economic growth and reduced poverty in the selected river (sub-)basins in Orissa with direct benefit to 1.7 million population in the subproject area 2. Institutionalization of effective mechanisms to put into operation PIM-based agriculture growth	• Incremental farm (by 60% on average) and allied incomes • Livelihoods of the poor improved with better incomes (by 40% from agriculture for landless and marginal farmers) and HDI • Replication of the institutional mechanisms across the state and the country	• State and district statistics on agriculture, incomes, and HDIs • Baseline data and follow on BME reports • Annual report of MOWR and DOWR	**Assumptions** • Stable political and local security conditions • Damage from natural calamities are rehabilitated and managed **Risks** • International terms of trade of agriculture products turns adverse
Outcome 1. Enhanced productivity, water use efficiency, and sustainability of irrigated agriculture in the selected existing schemes in the river basins having 235,000ha designed command area	• Increased irrigated area (40%) crop intensity (20%) including high valued crops (10%) • Increased crop production (50%), and values per ha land • Improved efficiency in water use (area [30%] and production [50%] per unit of water) • Increased on-farm and allied activity employment (40 days per ha of land) (Specific targets will be shown in each SIP of each scheme.)	• State and district statistics • Project progress and completion reports • Project MIS comprising baseline, targets (benefits, disaggregated into gender, ethnicity, and land operational sizes), and process/management indicators	**Assumptions** • Political support to sustain and proceed with reforms • Sound fiscal conditions to sustain O&M revenue and expenditure management • Project institutions including WUAs sustains their performance targets **Risks** • Extraordinary climates such as droughts and cyclones
2. Improved institutional performance of irrigation service delivery (with PIM) and water resources management (with IWRM)	• DOWR and WUAs sustains irrigation facilities while fully achieving annual targets in irrigation and production • Majority of WUA members satisfied with irrigation delivery and with DOWR service • OSG maintains full maintenance fund allocation policy while fixing necessary tariff levels for cost recovery • WUAs substantially submitting the set water tariff • Appropriate institutional setup and functions are introduced to operate IWRM	• Baseline data and BME reports • Project progress and completion reports • Project MIS comprising baseline, targets, and process indicators • DOWR's MIS for monitoring and planning irrigation scheme O&M • DOWR's annual reports	**Assumptions** • (Same as above) • Beneficiary willingness to pay for set water tariffs **Risks** • Local or internal conflicts threatening WUA performance
Outputs **A. Productive and Sustainable Irrigated Agriculture Management Systems** 1. Participatory Planning and WUA strengthening (i) Participatory scheme planning with feasibility studies and subproject implementation plan (SIP) (ii) WUA-level micro plans	• 16 major and medium, and 1,400 MLI subprojects appraised with SIPs with clear output targets and programs. • For major and medium schemes WUA level micro-plans prepared and endorsed.	• Prepared appraisal reports • Project progress reports • Consultants' reports • ADB review missions	**Assumptions** • Participatory process is duly followed by all. • Capacity strengthening and quality control are effective with qualified consultants engaged. • Beneficiaries support collective action.

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
(iii) Strengthened WUAs: Viable WUAs set up to become effective community organization ready to receive investment support and to enhance agriculture production	• 450 WUAs for major and medium, and 1,400 WUAs for MLI are strengthened with: - Over 75% farmers enrolled, 33% women - Elections held, committees set up and functional - Farmer contribution agreed - Target number of women and vulnerable group enrolled • WMAs endorse design • Implementation agreements are signed	• Project MIS • Project progress and completion reports • Consultants' reports • ADB review missions • WUA constitution and its rules • Signed implementation agreements	**Assumptions** • (Same as above) • WUAs comply with beneficiary contribution requirements
2. Irrigation and Associated Infrastructure including command area development (CAD): Good quality infrastructure designed and constructed, following appraised plan and WUA micro plans	• Infrastructure provided to 235,000 ha of area with WUA monitoring and satisfaction • CAD and conjunctive use extended to 60% and 10% of area following WUA requests • RPs have been implemented prior to civil works	• Project MIS • Project progress and completion reports • Consultants' reports • ADB review missions • Third party inspectors' report	**Assumptions** • (Same as above) • WUA are willing to extend CAD and conjunctive use with beneficiary contribution
3. Agriculture Development and Livelihood Enhance-ment: Stipulated services in SIPs and micro plans provided, and targets set therein are achieved	• WUAs achieve plan targets in cropping pattern and intensity, inputs, yield levels, etc. • WUAs establish linkages for collective input delivery, ex-tension and product marketing • Livelihood targets as set out in micro plans are achieved • Trained women groups account for 33% of total	• (Same as above)	**Assumptions** • (Same as above) • WUA members are willing to adopt modern agriculture practices **Risks** • Natural calamities • Volatile price reduction of agriculture products
4. Sustainable O&M Systems Established: Irrigation schemes operated and maintained on a sustainable basis	• Scheme-wise O&M rules, annual O&M plans are prepared and implemented • Water management practice is improved to achieve irrigation area targets for each WUA • DOWR/ WUA has sufficient fund to undertake the stipulated O&M activities • Regular annual WUA audit system is operational	• (Same as above) • Irrigation scheme O&M MIS (annual resource need, planned and actual mobilization at scheme and WUA levels) • Scheme performance and WUA performance audit reports	**Assumptions** • (Same as above) • Damages from natural calamities duly rehabilitated • DOWR staff pay due attention to O&M performance
B. Institutions Strengthened and Project Management Systems Operational 1. Policy, Planning, and Legal Framework (i) State Water Policy revised and implemented, with regular review by Water Resources Board (WRB) (ii) State Water Plan updated with development plans for the four northern river basins	• Revised Policy in March 2007 • Implementation status is annually reviewed and further actions taken guided by WRB • State water plan detailed in four basins with stakeholder participation (2012)	• Policy document • Policy review reports • Updated state water plans • Basin development plans • Refined WUA Act and Rules • Project progress reports • ADB review missions • DOWR annual report	**Assumptions** • Political support to sustain and proceed with reforms • Active stakeholder support and participation • Effective capacity development support through qualified consultants engaged

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
(iii) WUA Act and Rule refined for more sustainable and inclusive PIM	• WUA Act and Rule revised (2008) with stronger WUA institutional continuity and head-tail representation by • Refined act and rule made operational (2010)		
2. DOWR Institutional Setup, Structure, Skill Mix, and Business Processes Strengthened (i) Institutional development vision and strategy refined (ii) Permanent PIM directorate established (iii) Quality control cell established (iv) DOWR capacity development plan (CDP) refined (v) Water and Land Management Institute (WALMI) reforms with autonomy	• Vision and strategy document (2009) • PIM directorate set up, staff deployed, and made operational with training (2008) • QC cell set up, staff deployed, and made operational (2008) • CDP refined to meet with PIM and other requirements (2010) • WALMI reformed with stronger autonomy and new director recruited form market (2008)	• DOWR Institutional vision and strategy document • Revised service rules (job descriptions) • QC guidelines • CDP document and program lists • WALMI organizational rule • Project progress reports • ADB review missions • DOWR annual report	**Assumptions** • (Same as above) • DOWR leadership dynamic and support the change process • Staff level support for necessary reforms
3. Systems to Support Sustainable O&M (i) Fund allocation following Financial Commission (FC) (ii) Water rates revised to meet the allocation needs (iii) Collection improved with WUA involvement (iv) Land records improved providing WUA-specific data for collection/demand (v) Scheme MIS for O&M performance monitoring and planning (vi) DOWR establishes linkage between water rate collection and allocation (vii) Pilot delegation of water tariff collection and retention by WUAs	• Allocation to follow FC recommendations (2011 and 2016) • Water rates revised following the FC report (same as above) • Percentage of collection against the target improved • Improved data base to generate the required data • MIS developed with monitoring data (2010: tranche-1 schemes) • Fund allocation mechanisms improved, linked with WUA collection performance (2010) • WUA performance for pilot tariff collection effective (2011)	• FC reports • OSG annual budgets • Gazette notification of water rates • Finance Department data on water rates collection performance • Consultants reports and special study reports • Project progress reports • ADB review missions • DOWR annual report	**Assumptions** • (Same as above)
4. Progress of Actions towards Operationalizing IWRM (i) Appropriate IWRM functions and institutional arrangements defined (ii) Institutions established to operationalize IWRM (iii) Participatory RBO established with decision support systems (DSS)	• Institutional arrangements clarified for IWRM functions (2009) • Establishment of IWRM institutions (2012) • RBO set up and made operational with effective DSS (2012)	• IWRM action plan • State WRB reports • Consultants reports and special study reports • Project progress reports • Pilot RBO reports • ADB review missions • DOWR annual report	**Assumptions** • (Same as above)

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
5. Project Management System Established and Made Fully Operational - DOWR offices - Line agencies - Local governments - WUAs - NGOs - Private providers	• PMU, SIOs established, staffed, and trained (2008) • Project manuals prepared and fully operated (2008) • Consultants and NGOs engaged and provide effective support (2008) • Accountability measures for project institutions made operational (2009)	• Detailed operational guidelines • Consultants reports • Special study reports including the third party • Project progress reports • ADB review missions • DOWR annual report	**Assumptions** • Sufficient counterpart funding • Engagement of qualified consultants and NGOs
6. Training/Capacity Development: Capacities of project institutions are strengthened through training (for Project management, PIM, IWRM, & agriculture development)	• Capacity Development Plan (CDP) is prepared and implemented (2009) • Project institutions are fully operational through project management support (2009)	• CDP • CDP implementation report (by consultants) • Project progress reports • ADB review missions • DOWR annual report	**Assumptions** • Effectiveness of training and trainers • Retention of the developed capacities • Engagement of qualified consultants and NGOs
Activities with Milestones		**Inputs**	
1. By the Government/ OSG 1.1 Establishment of DOWR PIM Directorate, PMU and SIOs by 2007, recruitment of consultants and NGOs by 2008. 1.2 Preparation of all project-related guidelines and manuals including project implementation plan by mid 2008. 1.3 Finalize FS/SIP for all major medium schemes by 2011, and minor lift schemes by 2015. 1.4 Implementation of actions for policy and institutional development between 2008-16.		• Incremental staff, operating, and other implementation expenses • Training (through support organizations) • Mobilization of counterpart fund	
2. By Consultants and NGOs 2.1 Capacity development and project management activities until 2016. 2.2 Support for preparing FS/SIPs by 2011, operationalization of project arrangements and institutional actions by 2016. 2.3 Completion of training by 2016.		• International and national consultant support (158 person-months [p-m] of international and 1,818 p-m of national consultants) • Arrangements for project institution training	
3. By WUAs/ Beneficiaries 3.1 Information campaign, member enrollment, participation in FS/SIP preparation, and upfront cash contribution by 2014. 3.2 Participation in design, construction monitoring, and simple civil work implementation by 2015. 3.3 Self-sustain O&M of transferred facilities by 2016.		• Local resource mobilization for minor civil works, and for regular O&M including calamity fund and minor lift replacement fund • Implementing regular O&M	
4. By Support Organizations 4.1 FS/SIP preparation and NGO training by 2011. 4.2 Implement resettlement plans by 2011. 4.3 Detailed design and construction by 2014. 4.4 Provision of follow-up support by 2016.		• NGO/CO support to set up and strengthen 450 WUAs (about 810 person-year, 20% women) • Training and capacity building of support organizations • Monitoring and evaluation	
5. By ADB 5.1 Project approval in 2008. 5.2 Inception mission within 2008, mid-term review mission in 2012, and regular review missions		• Staff resources and staff consultants	
Project Cost		**Total: $268.8 million**	

ADB = Asian Development Bank, CAD = command area development, CO = community organizer, CDP = capacity development plan, DDS = decision support system, DOWR = Department of Water Resources, FC = Finance Commission, FS = feasibility studies; IWRM = integrated water resources management, HDI = human development index, MIS = management information system, MOWR = Ministry of Water Resources, NGO = nongovernment organization, OSG = Orissa state government, O&M = operation and maintenance, PIM = participatory irrigation management, PMU = project management unit, RBO = river basin organization, RP = resettlement plan, SIP = subproject implementation plan, QC = quality control, SIP = subproject implementation plan, SIO = subproject implementation office, WALMI = Water and Land Management Institute, WRB = Water Resources Board, WUA = water user association.

SCHEDULE 3
IMPLEMENTATION FRAMEWORK

1. Unless modified and amended in loan or project agreements under the Facility, the projects under the Facility will be implemented as follows.

A. Implementation Arrangements

Organizational Setup and Functions

2. The Orissa Department of Water Resources (DOWR) will be the Executing Agency (EA) for the individual projects under the Facility, and will be responsible for overall strategic guidance, supervision and quality assurance of works while ensuring compliance with loan covenants and Periodic Financing Request (PFR) provisions and due diligence.

3. A state-level Project Steering Committee (PSC) will provide policy guidance, inter-ministerial coordination, and will take decisions on matters related to the Facility and individual projects therein. The PSC will be chaired by the Agriculture Production Commissioner or an officer not below the level of Secretary of the State and the members will include secretaries, directors, and/or representatives of all relevant departments and agencies of the State.[21] Under the PSC, a project coordination working group (PCWG) chaired by Secretary of DOWR established will provide regular coordination with the nodal officers assigned by the concerned departments and agencies of the State.

4. A Project Management Unit (PMU) has been established in DOWR under the Command Area Development/Participatory Irrigation Management (CAD/PIM) Directorate, with the assignment of a full-time Project Director at the rank of chief engineer who is to report to Principal Secretary through the CAD/PIM Directorate. The PMU will have multi-disciplinary structure comprising staff from DOWR, staff on deputation from Command Area Development Authority (CADA), Orissa Lift Irrigation Corporation (OLIC), and from line departments or recruited from the market (see paragraph 5 below). In addition, a dedicated design cell for the Project will be established and made functional under Chief Engineer Design. Assistance will also be provided by a multidisciplinary team of consultants for institutional strengthening and project management (ISPM) for capacity development, quality control, and project management. The organizational charts are shown as Figure 1 at the end of this Schedule.

5. The PMU will be responsible for the identification, formulation, implementation, and operation and maintenance (O&M) of all subprojects including conformance with the State, national and ADB social and environmental safeguards policies. The specific tasks will primarily be undertaken through the existing, enhanced, or new functional establishments with the support of the PMU and the ISPM consultants. Senior staffs are assigned in the concerned establishments and/or PMU for the purpose of the Facility, including project planning and formulation, design, social mobilization, implementation, lift irrigation, O&M, quality control, training, monitoring and evaluation, agriculture or agribusiness, environment, resettlement and rehabilitation, and vulnerable groups including indigenous people.[22] The PMU will also have a dedicated accounts officer to look after the project(s) accounts and processing claims.

[21] The Project Steering Committee includes representation from the following: Departments of Water Resources, Agriculture, Child and Women's Affairs, Fisheries, Forest and Environment, Horticulture, Industries, Livestock, and Scheduled Caste and Scheduled Tribe. Also represented are the Departments of Planning, Finance, Rural Development, Panchayat Raj, and Revenue, and State Pollution Control Board.

[22] Senior staffs are assigned in PMU from the market for capacity development, on-farm water management, command area development, agriculture, and vulnerable people. A dedicated senior staff is assigned in

6. To meet its mandate of managing, guiding, and coordinating for the implementation of the Projects and the Facility, the PMU will for each project: (i) coordinate with other agencies concerned, (ii) prepare an overall implementation plan and annual project budget; (iii) guide the feasibility studies and endorse subproject appraisal reports including the safeguards documents, (iv) monitor and guide the activities of the Subproject Implementation Offices (SIOs) on subproject planning, implementation and O&M, (v) manage and guide safeguards action plans and implementation; (vi) establish and maintain a management information system (MIS), (vii) monitor overall project progress and evaluate project benefits and social and environmental impacts, (viii) arrange for necessary staff training programs; (ix) manage procurement, consulting and NGO services, and loan disbursement; (x) maintain financial accounts; and (xi) prepare periodic implementation progress reports. The Project Director will be responsible for overall management of the Facility and the Projects therein, and coordination with and reporting to the State Government, and ADB.

7. For major and medium schemes, under the PMU, six SIOs will be established for the six major subprojects and six SIOs will be established for the nine medium subprojects, building on the existing establishments at the field level. The SIOs will be comprised of technical, CAD, and water user association (WUA) support cells, constituted by staff from DOWR, CADA, and NGO engaged for WUA strengthening, PIM/CAD, and agriculture. The WUA support cell will also have a number of support service teams mobilized through an NGO comprising three persons with technical orientation in community mobilization, agriculture extension and agribusiness, and CAD and on-farm water management who work closely with the assigned WUA and its DOWR counterpart staff. [23] For each scheme there will be a subproject manager who is a superintending engineer or an executive engineer (for some medium schemes). A resettlement unit will be set up as required.

8. In SIOs, the subproject manager will manage its technical cell and monitor and guide CAD and WUA cells for effective integration of the subproject activities. Under the support and guidance of PMU and ISPM consultants provided through regular PMU-SIO meetings, the SIOs will (i) coordinate with the field staff of the concerned line departments; (ii) prepare an annual work plan for approval by PMU; (iii) implement the work plan; and (iv) establishing reporting systems to provide information on physical and institutional progress and impacts. For the purpose of interdepartmental coordination of each subproject, a district coordination committee headed by district collector with the participation of all line departments will be set up and meet regularly, in which the representatives of the WUAs will participate. The SIOs will closely work with WUAs and establish participatory decision making system through regular meetings at minor, distributary, and subproject levels. Within this framework, the specific tasks of the SIOs will include: (i) provide inputs to subproject planning and design process; (ii) undertake WUA strengthening and micro-planning including CAD; (iii) implement safeguards actions following the relevant plans; [24] (iv) execute civil works; (v) coordinate for and/or implement support services for agriculture and livelihoods; (vi) manage subproject O&M in collaboration with WUAs while ensuring the capacities and resources for the latter; (vii) arrange training programs for the staff including NGOs, and WUAs.

Resettlement and Rehabilitation wing of DOWR to manage involuntary resettlement issues. A staff from Department of Forest and Environment is also seconded to support the environmental issues.

[23] Existing non-technical staff of the field establishments will also be converted to facility operators, maintenance workers, and WUA facilitators and placed under the designated WUAs. Community organizers (two organizers per three WUAs) will also be mobilized under the NGO team to facilitate WUA strengthening and PIM/CAD activities.

[24] Deputy subproject manager will be assigned as chief officer for environmental management, resettlement, and vulnerable peoples to undertake the required tasks through the designated SIO staff.

9. For minor lift schemes, the PMU will have a lift irrigation cell comprising deputed engineer(s) from OLIC, two economists, one of whom will be the team coordinator, one monitoring and evaluation expert and three mobile teams comprising an engineer and an agriculture specialist. PMU will be assigned for central procurement, subproject planning including feasibility studies, and monitoring and evaluation. Under the PMU, up to four SIOs will be established to implement up to 300 ongoing schemes at a time in the project geographical areas, comprising WUA specialist (designated as subproject manager), on-farm water management/ agriculture specialist, work inspector, and a deputed engineer from OLIC. The PMU and SIO staff for minor lift schemes are primarily engaged through a local firm as minor lift irrigation implementation consultants, who will also be associated with local NGOs to mobilize field level community organizers cum coordinator to support institution building and program delivery of up to 20 WUAs for a two-year implementation period. The functions of SIOs remain the same as major and medium scheme SIOs, except that minor works (mostly carried out by WUAs) are supervised through field engineers of OLIC, with quality control by the SIO work inspectors.

10. In support of the implementation of the Facility, the State Government through the Water and Land Management Institute (WALMI) will provide necessary backup and training support, along with other organizations engaged for training purposes. Following the actions in Schedule 1 (Table 2) for stronger stakeholder representation and autonomy, WALMI will establish highest and up-to-date information, knowledge, and technology base, in the appropriate technologies for irrigation O&M most suitable for Orissa and India, best practices and lessons for participatory irrigation management (PIM) and integrated water resources management (IWRM), and monitoring and evaluation on these subjects. On the basis of its knowledge and technology base, WALMI will upgrade its training modules and provide training with a focus on the concerned project staff including private providers and NGOs, and trainers of WUA training.

Implementation Procedures and Arrangements

11. Individual subprojects are selected in accordance with the criteria as stipulated in Schedule 4, and will be implemented through the following procedures.

(i) Feasibility Studies: For each proposed major and medium scheme, PMU will form (a) a planning team comprising staff from DOWR project planning cell, and concerned DOWR divisions and line departments at the field level will be formed, and (b) a stakeholder group comprising WUA representatives (or local farmer representatives in the absence of WUAs) from upper, middle, and tail reaches of the distribution system. With the support of the ISPM consultants, the team will undertake a feasibility study including subproject implementation plan[25] and safeguards assessments. Upon concurrence with stakeholder group, subproject detailed project report is prepared and submitted to the State and the Government for approval. The appraisal report is also submitted to ADB for approval, based on which the periodic financing request (PFR) to finance the subproject is to be submitted by the Government.[26]

(ii) WUA Micro Planning: Upon approval of the subproject, the subproject SIO will be set up, and work with the individual WUAs to jointly prepare WUA micro plans, which comprises

[25] Including a strategy for efficient water use through field channels and reduction of high water consuming cropping such as resolution to restrict such crops with special levies, penalties for violation of water distribution rules, etc.

[26] For minor lift irrigation schemes, PMU lift irrigation cell will prepare feasibility studies in consultation with the WUAs that have submitted the request through OLIC, for approval by the State. The appraisal reports are included in the PFR except for the first tranche in which subprojects are approved and implemented during the tranche period.

WUA organizational development plan, infrastructure (including CAD and conjunctive use with groundwater) and O&M plan including seasonal water entitlements for the WUA, agriculture and allied sector development plan, and vulnerable groups livelihoods development plan, setting out specific output targets, programs and their delivery schedules.[27] The micro plan will be endorsed by WUA general assembly.

(iii) WUA Strengthening: In parallel to the micro planning process, the SIO and its support team mobilized through the NGO will undertake institutional building of the WUAs, including membership enrollment, holding of election, establishment of committees and sub-committees, adoption of by-laws and facility operational rules, substantial fulfillment of required water rate submission, book and account keeping with annual financial audit, and operationalization of the functions. After achieving the set institutional development targets (including membership enrollment, establishment and regular meetings of committees and subcommittees, and beneficiary contribution for the minor facility works including CAD) and WUA endorsement of the micro plan, an implementation agreement will be signed between the WUA and the SIO.

(iv) Detailed Design: Detailed design will be undertaken by the Project design cell upon approval of the subproject (and in parallel to WUA strengthening process) for the main and up to upper or large distributary canals (that need to be implemented early to ensure timely delivery of project benefits), and by the SIOs with the WUAs for the rest of the structures. Design process will involve the concerned WUAs and their higher tier committees, whose endorsement will be sought prior to design finalization and reflected in the implementation agreement. Where applicable, land acquisition and resettlement plan will be finalized at this stage, and will be implemented with the engagement of an implementation NGO.

(v) Tendering and Implementation of Civil Works: Upon approval of the detailed design and full completion of the land acquisition and resettlement process where applicable, the tendering process of the civil works will commence. For main and distributary facilities requiring early work completion for timely delivery of subproject benefits across the subproject areas, the tender process will be initiated in parallel to WUA strengthening process, whereas minor and lower level facilities will be implemented upon signing of the implementation agreements with the concerned WUAs. WUAs will be engaged for minor civil works under their command area, whereas they will be engaged as construction quality monitor for works undertaken by contractors, with training.[28]

(vi) Agriculture, Allied Sector, and Livelihood Enhancement Support: The SIOs will arrange for the delivery of the concerned programs following the schedules stipulated in the WUA micro plans, in coordination with the local line department representatives, private providers including NGOs, to be facilitated by SIO subject matter officers through NGO support team members.[29] The SIOs will ensure regular organization of district coordination committee meetings to support this end, and pursue that WUAs establish (a) sustaining linkages with existing organizations for input delivery, production systems support, and output marketing; and (b) in house capacities to disseminate information and technology while driving the process of agriculture development as s cohesive platform. The SIOs will also ensure that programs for livelihood enhancement are

[27] As a matter of principle, SIO will pursue mobilizing existing State programs for the delivery of services.

[28] WUAs and farmers are expected to provide beneficiary contribution (in cash or in kind) to the minor canal and lift irrigation works. The contribution will be provided in proportion to the progress of the project-assisted physical works, including the placement of field channels beyond the command are development (CAD) channel outlets, which are the sole responsibility of farmers.

[29] The activities will be initiated upon signing of the implementation agreement, although primarily provided upon operation of the improved canals.

delivered through the WUAs, and targeted to the most vulnerable group in the concerned subproject area.

(vii) Subproject O&M: During the process of subproject implementation, the SIO will put into operation the practice of annual and regular O&M planning and joint decision making with the concerned WUAs, including (a) technical requirements and planned actions for O&M, and (b) financial information on fund allocation and proposed expenditures for works and salaries, along with the water tariff submitted from the WUAs. The WUAs will also be provided with flow measurement opportunities against their water allocation in the canal operational plans. The WUAs will further be motivated to undertake the regular maintenance works for the higher tier structures managed by DOWR in collaboration with WUA higher tier committees.

(viii) The SIO through DOWR field engineer (competent authority) buttressed by the NGO support team will ensure that at least one full year's on-the-job training is provided to the WUAs for those facilities for which they will be given O&M responsibility, in terms of (a) regular inspection through joint walkthroughs and flow measurement; (b) preparation of annual O&M plan; and (c) its implementation. To support this end, the SIO will pursue that (a) the WUA will utilize grant-in-aid for the purpose of identified works; (b) the SIO will provide additional fund to implement the works that cannot be met by the grant-in-aid amount through the allocated fund as available; and (c) the WUA will seek additional funding from its members and/or seek funding from the existing programs of the panchayat institutions.

12. The EA will put into operation the specific arrangements to improve quality of implementation of the Investment Program, which are identified below:

(i) The EA will make joint decision making systems operational with their counterpart WUAs and their higher-tier committees regarding all planning and implementation matters as well as subproject O&M, through regular WUA-SIO meetings on progress review, annual and periodic work plans and schedules. The WUAs will also be assigned and trained to participate in monitoring of civil works contracted by the SIO.

(ii) The EA will post the physical and financial details and project progress in the department website, along with the tenders and contracts awarded. For individual subproject, the SIOs will post the abstract of all contracts executed, including the quantity of works and their associated costs.

(iii) The EA will ensure that the grievance reporting and redressal mechanisms are in place to assist stakeholders in resolving their complaints in a timely manner. To this end, the PMU and SIOs will organize awareness campaigns for WUAs and other stakeholders.

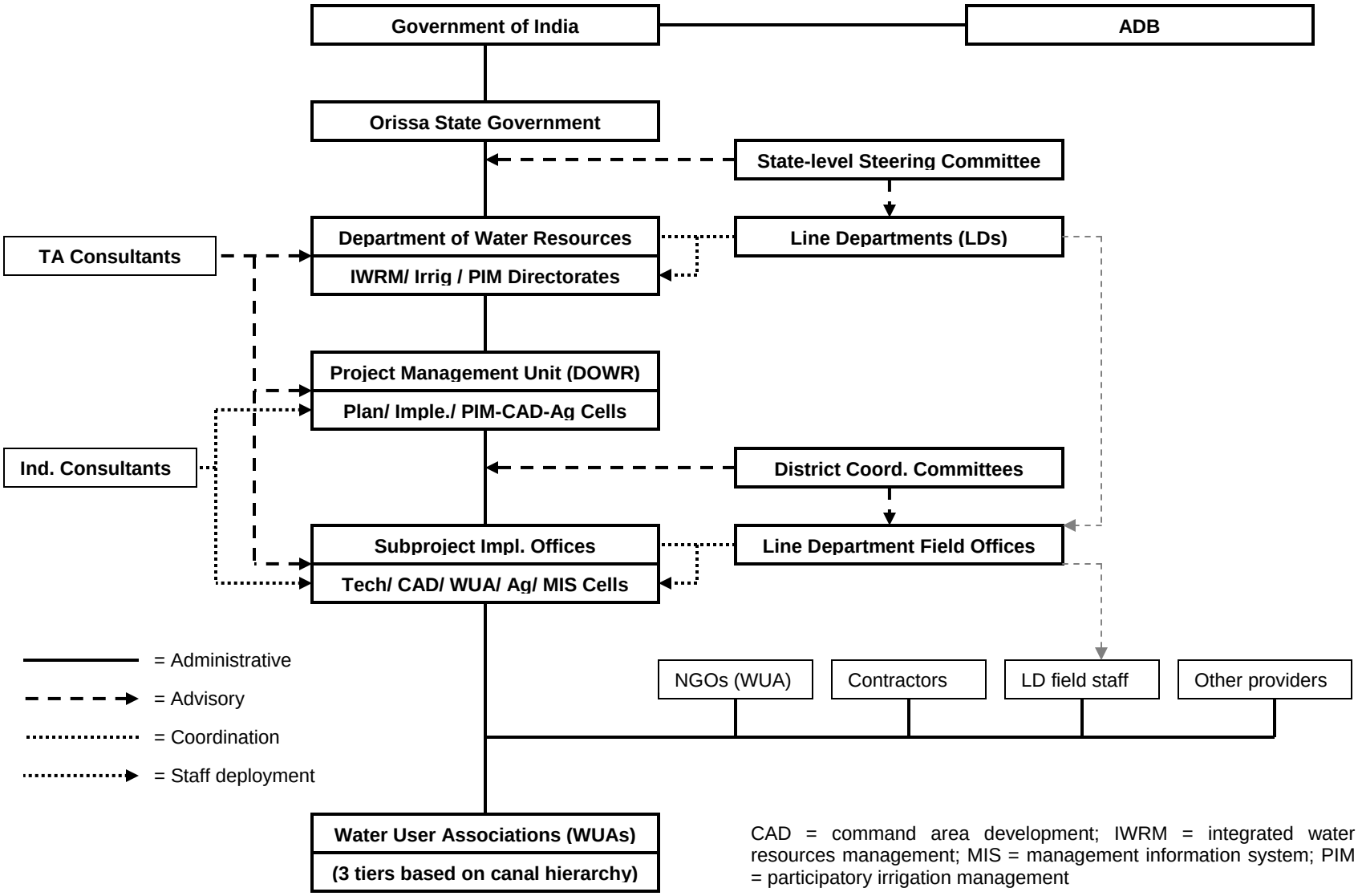
(iv) The EA, through its internal audit wing, will undertake annual financial audit for all SIOs and associated offices, which will include investigation of all financial records and transactions.

(v) The EA will strengthen its construction supervision, recording, and reporting system with the use of modern technologies, establish a quality control cell, and operationalize internal third party technical audit mechanism. Accordingly, all work contracts will include provisions for third party inspection for quality control. External monitoring, supervision, and technical audit consultants will also be mobilized under the ISPM consultant team.

(vi) All contracts financed by ADB for the project will include provisions stipulating ADB's right to audit and examine the records and accounts of the contractor.

(vii) The EA will carry out the subprojects under the Facility in manner consistent with the Poverty Reduction and Social Strategy, including the Gender Action Plan, dated 20 December 2007, prepared in relation to the Investment Program.

FIGURE 1A. ORGANIZATIONAL ARRANGEMENTS FOR PROGRAM IMPLEMENTATION



CAD = command area development; IWRM = integrated water resources management; MIS = management information system; PIM = participatory irrigation management

FIGURE 1B. ORGANIZATIONAL STRUCTURE OF PMU AND SIO

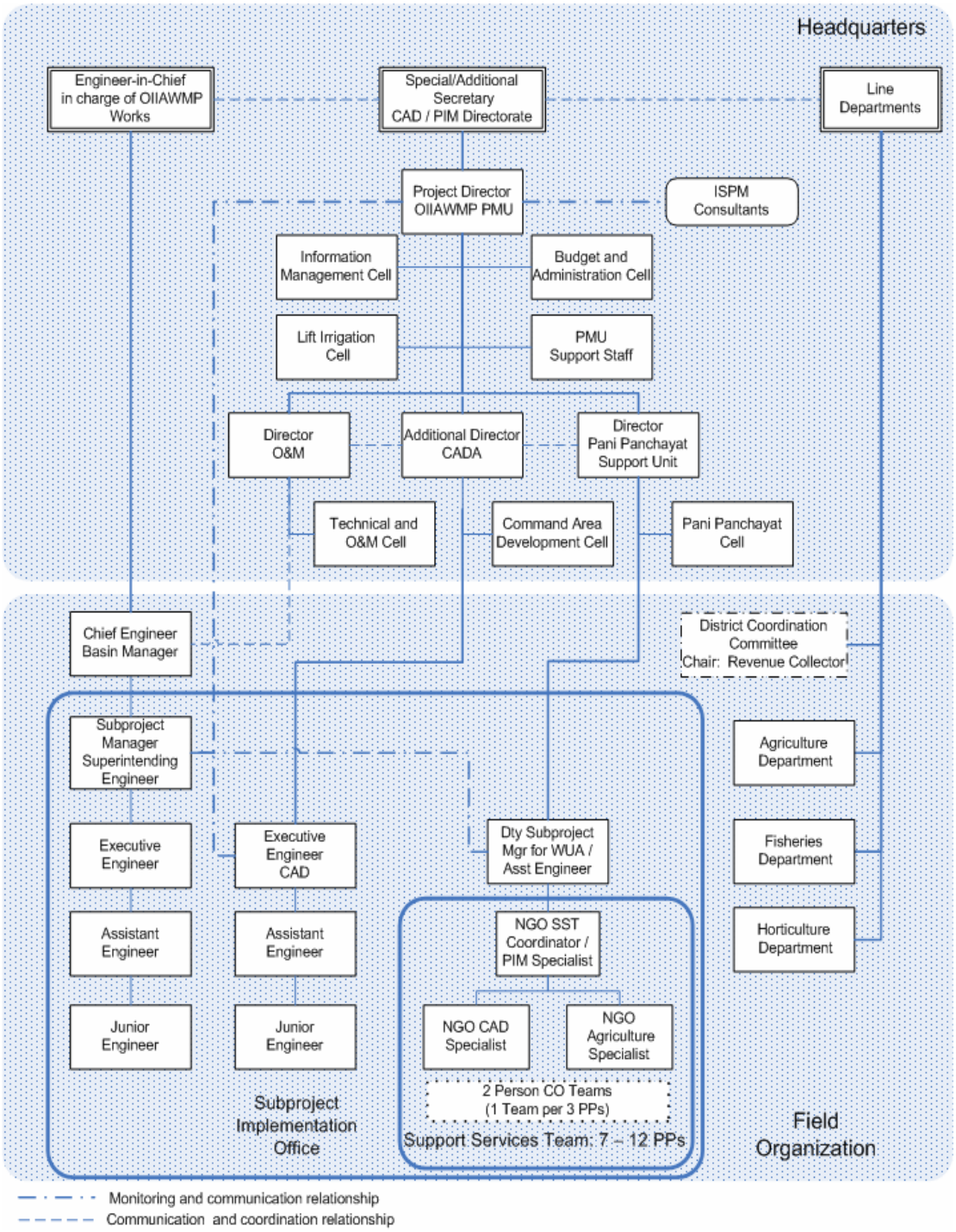
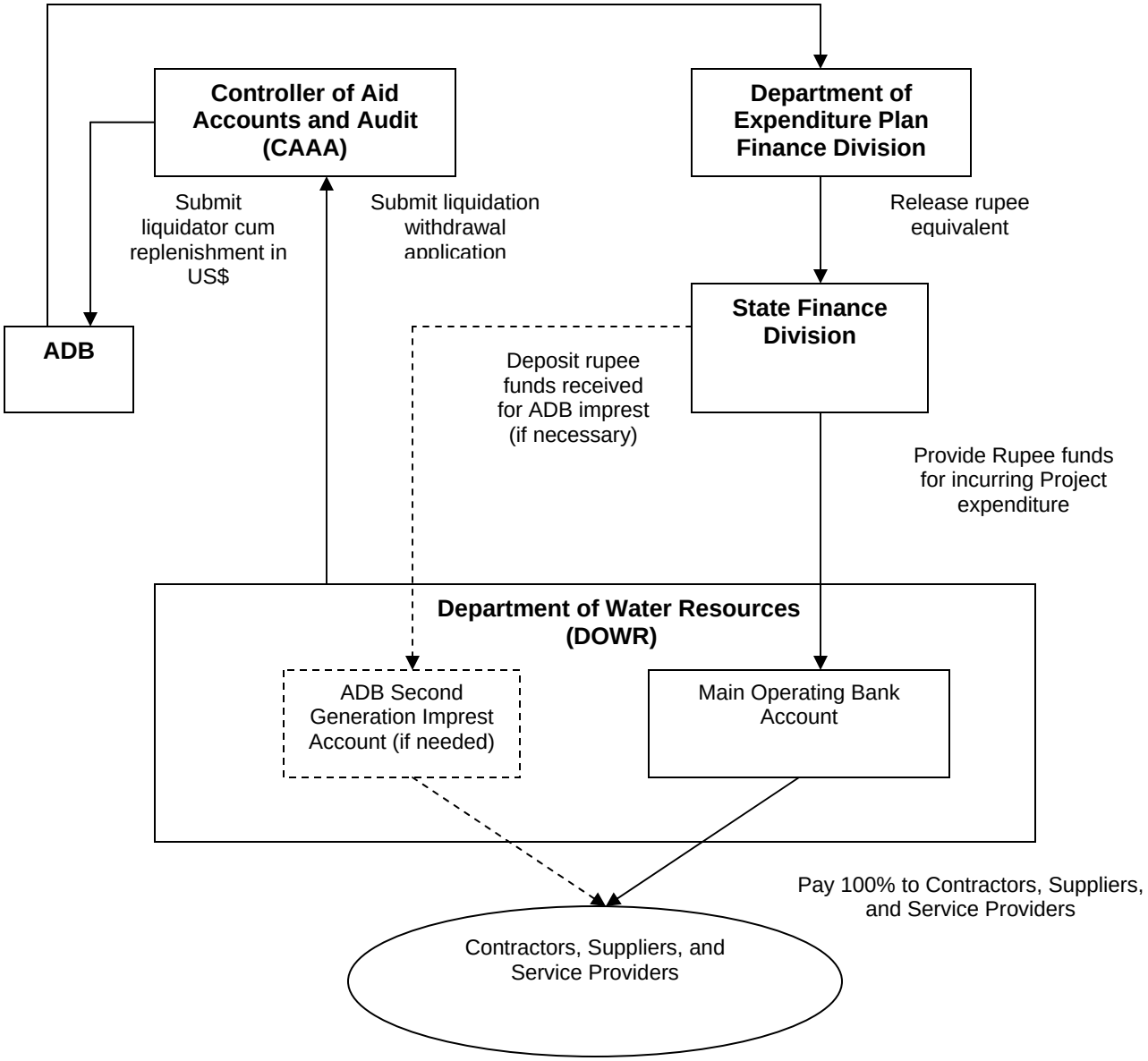


FIGURE 2. FUND FLOW MECHANISM



SCHEDULE 4
SELECTION CRITERIA AND APPROVAL PROCESS FOR SUBPROJECTS

1. **Components.** The Facility will support the rehabilitation, extension, and modernization of the existing major and medium irrigation schemes, and minor lift irrigation schemes. These schemes are located in the Brahmani, Baitarani, Burhabalanga, and Subernarekha River basins, and a part of the Mahanadi River delta areas. These programs together with institutional strengthening and project management have been amalgamated into the following parts and components.

Part A: Productive and Sustainable Irrigated Agriculture and Water Management Systems

- Component A: Participatory Planning and Water User Association Strengthening/Empowerment
- Component B: Irrigation and Associated Infrastructure Development
- Component C: Agriculture and Allied Sector Support and Livelihood Enhancement
- Component D: Sustainable O&M Systems

Part B: Institutional Strengthening and Project Management

- Component E: Institutional Strengthening
- Component F: Project Management (including subproject proposal preparation)

2. **Selection Criteria.** The following criteria will apply in selecting subprojects for financing under the Facility.

(i) The proposed subprojects will involve rehabilitation, extension, and modernization of the existing irrigation infrastructure and the associated infrastructure as appropriate, including command area development, minor drainage, and rural infrastructure. Subprojects will be major (having a command area of over 10,000ha), medium (between 1,000-10,000ha), or very minor lift (between 10-50ha) irrigation schemes.

(ii) For each subproject, a feasibility study and support due diligence will have been prepared. The feasibility study and due diligence will include the following aspects: (i) technical design; (ii) economic and financial viability; (iii) institutional arrangements; (iv) social assessments including social safeguards plans as applicable; (v) environmental analysis; (vi) implementation plan including monitoring and reporting; and (vii) procurement plan. These will follow a proper consultative process.

(iii) All necessary central and state government approvals will be in place.

(iv) Each proposed subproject will meet the safeguard requirements referred to in Schedule 5.

(v) For individual subproject feasibility assessments, the following criteria will apply.

a. The subproject is technically feasible, and does not pose technical risks in terms of its development or operation that would undermine efficacy, economic return, safety, or sustainability.

b. The subproject has reliable water availability and quality meeting irrigation water quality standards, and will not have significant negative impact on the other users of the same source or the ecosystem downstream.

c. The subproject area has soils suitable to surface irrigation and will not lead to drainage congestion, salinity intrusion, and soil erosion.

d. The subproject is financially and economically viable with an economic internal rate of return of over 12% based on the detailed economic and financial analysis. The subproject is robust under sensitivity and risk analysis. More than 20% of the population under the subproject is below the poverty line and 50% of the farmers are marginal (less than 1 ha) in principle;

e. The subproject planning and design minimizes involuntary resettlement or land acquisition if any, or has minimal impacts on any affected persons of land acquisition or their livelihoods.

f. The subproject is socially and environmentally sound, and does not have major negative impacts. The subproject also includes measures to mitigate social and environmental negative impacts, if any.

g. Each subproject will meet the safeguards requirements of the Governments of India and Orissa State and of ADB referred to in Schedule 5.

h. Design of subprojects is based on inputs from the concerned water user associations (WUAs). WUAs will have also supported the basic design of the subprojects, and concurred on their responsibilities in association with the subproject implementation, including the beneficiary contribution (in cash or in kind) for minor facilities (5%), command area development works (10% as applicable under the State's policy), and operation and maintenance (O&M) of the minor facilities within the WUA boundary, in case of major and medium subprojects. WUAs will also have supported a strategy for efficient water use, such as placement of field channels, and promotion of water saving crops and technologies, and introduction of management instruments to support this end.

(vi) For minor lift irrigation (MLI) schemes, the following criteria will also apply, in addition to the above:

a. The subprojects will involve rehabilitation of existing systems, with a priority to schemes that are being operative by WUAs or schemes that have stopped operation in the nearest past years due to the causes that are clearly addressed under the proposed rehabilitation investments.

b. The subprojects will not involve land acquisition or resettlement, or have any negative impacts on indigenous peoples. Negative environmental impacts, if any, will have to be insignificant.

c. The subprojects are technically, economically, and socially sound and sustainable. The specific conditions include favorable topography (slopes less than 5%), power availability (with less than 3km of dedicated power line), and unskewed land ownership (less than 70% of command area occupied by largest 20% of landowners). They are not located in the areas prone to river bank erosion, and/or flood prone areas vulnerable to the damages of sand casting.

d. The concerned WUA will have agreed that the WUA will assume full responsibility for operation and maintenance (O&M) of the facilities, including power supply, all major and medium repair, as well as future asset replacement. The general body agreement from the WUA on the expected level of O&M tariff will be in place. The WUA will also sign power agreement with the electricity distribution company for supply of power and payment of charges, with deposit to distribution company.

e. The concerned WUA will have developed and agreed on the investment and sound O&M plans, including the detailed field channel layouts beyond the pipe outlets and their placement by farmers' own contribution. Arrangements for security of electricity transmission line and equipment will also be in place.

f. The subprojects will not cost more than Rs18,000/ha for operating schemes for repair, and Rs36,000/ha for non-operative schemes for revival.

g. The concerned WUA will have agreed on (a) beneficiary contribution (in cash or in kind) equivalent to 20% of the required investment cost or as applicable under the State's policy and in consultation with ADB, and (b) deposit an additional amount of reserve fund required to meet the future depreciation and asset replacement requirements of the facilities.

3. The Investment Program will also accommodate a small number of minor (less than 1,000ha) creek irrigation schemes, which will also follow the same selection criteria as specified in (ii) – (v) above.

4. **Procedures**

(a) **Tranche 1 -** For the subprojects already prepared under ADB project preparatory technical assistance, including two major (Taladanda and Mahanadi Chitropala Island Irrigation) and three medium (Gohira, Remal, and Sunei), and two sample MLI schemes (Jhalda and Parimukundapur) schemes to be proposed for inclusion in the first tranche, the approval process stands completed.

For MLI schemes proposed for inclusion in tranche 1, the EA will conduct feasibility studies and prepare the appraisal reports following the selection criteria and sample appraisal reports, together with required safeguards assessments as applicable, and submit the same to ADB for approval. Once it has been established that the appraisal reports have achieved a desired level of quality, they will be submitted to ADB for information.

(b) **Subsequent tranches** - For all major and medium irrigation schemes and representatives of MLI schemes to be proposed for inclusion in the subsequent tranches, each subproject will be processed in accordance with the following procedures:

(i) Feasibility study will be conducted by the executing agency (EA) including its cost estimates. The EA will also prepare (i) an initial poverty and social assessment (IPSA) and fill out checklist for (ii) involuntary resettlement; (iii) indigenous peoples; and (iv) an environmental screening; and submit the same for ADB's review and categorization.

(ii) Based on the categorization and the feasibility studies, the EA will prepare the appraisal reports for all major and medium subprojects and representative MLI

subprojects to be considered under the respective tranches following the selection criteria, together with required attachments, i.e., draft resettlement plan (RP), draft indigenous peoples development plan (IPDP) and draft environmental assessment, as applicalble, and submit the same with the periodic financing request to ADB for approval. If any of the subprojects is categorized as environmental category A or B sensitive, compliance with the 120-day advance disclosure rule is required. The summary environmental impact assessment (SEIA) or summary initial environmental examination (SIEE) must be circulated to the ADB Board and made available to the general public 120 days before the respective PFR is submitted to ADB.

(iii) The EA will translate the RP in the local language and disclose it to the affected people and incorporate the results of the consultation, before ADB's approval. The final RP will also be disclosed on the ADB website and the website of EA.

(iv) ADB will review the summary appraisal report together with the required attachments. If ADB finds that a proposed subproject is not likely to satisfy the eligibility criteria and/or the agreed procedures, ADB will advise the EA either (a) to modify the subproject proposal in a manner that will make it eligible for approval or (b) that the subproject must be rejected.

(v) All necessary approvals of the Governments of India and of Orissa State will have been obtained prior to ADB approval of a subproject. The EA will be responsible for obtaining all such approvals and will provide ADB with a report showing that all approvals have been obtained prior to submission of subproject appraisal report.

(vi) For MLI schemes other than the representatives included in the PFR, the same procedures as applicable for Tranche 1 will apply.

SCHEDULE 5
SAFEGUARD REQUIREMENTS AND SOCIAL DEVELOPMENT ACTIONS

1. India will cause the State to ensure that all the requirements prescribed in this Schedule, and the following frameworks that have been prepared with respect to the Facility and of which ADB has been provided full copies, and which are deemed incorporated herein by reference, are complied with during the processing and implementation of the subprojects under the Facility.

(i) Environmental Assessment and Review Framework dated 20 December 2007,
(ii) Resettlement Framework dated 20 December 2007, and
(iii) Indigenous Peoples Development Framework dated 20 December 2007.

2. The frameworks above cover the Facility specific information and requirements in accordance with ADB's safeguard policies: (i) the general anticipated impacts of the subprojects likely to be financed under the MFF on the environment, involuntary resettlement, and indigenous peoples; (ii) the safeguard criteria that are to be used in selecting subprojects; (iii) the requirements and procedure that will be followed for screening and categorization, impact assessments, development of management plans, public consultation and information disclosure (including the 120-day disclosure rule, if required), and monitoring and reporting; (iv) the institutional arrangements (including budget and capacity requirements) and India's, the State's and ADB's responsibilities and authorities for the preparation, review and clearance of safeguard documents.

3. Prior to the preparation of each PFR, the applicability and relevance of each safeguard framework for environmental assessment, involuntary resettlement, and indigenous people will be reviewed and updated to ensure relevance and consistency with applicable country legal frameworks and ADB's safeguard policies, as amended from time to time.

4. In all cases, for each new PFR preparation, India will cause the State to review on-going subprojects to check on the status of compliance with the safeguard plans and frameworks, and submit the review reports to ADB, together with other required safeguard documents relevant to the subprojects included in the tranche being processed. In any case if major noncompliance is discovered in the course of the review of ongoing subprojects, a corrective action plan will be prepared and submitted to ADB.

5. In addition, all ADB safeguard policies in effect as of the date the financing of subprojects is approved under the Facility will apply to such subprojects.