1. Country and Sector Background

Located on the south east coast, Andhra Pradesh (AP) is a middle income Indian state with average per capita income around the national average. The state accounts for 8.3% of India’s land mass, 7.3% of its population, and 7.1% of its GDP. As per official estimates about 16% of AP residents live below the poverty line compared to the national average of around 26%. AP is recognized as one of India’s leading reforming states, and in last few years has achieved significant development outcomes through a sustained policy and institutional reform program in which the World Bank has been an important development partner. Robust growth in services and a revival in the industrial sector has increased overall economic growth from 5.3% per annum during the 1990s to 6.4% per annum during 2000/01-2005/06.

Sector Issues. The recent performance of the agriculture sector, however, which accounts for about one-fourth of the state domestic product but employs over 62% of the work force, has been a cause of concern. Between 1999/00 and 2005/06, agriculture grew at 2.5% per annum with almost all of this growth coming from the livestock and fisheries sub-sectors while the crop sub-sector, which accounts for about 60% of state domestic product from agriculture, stagnated. Inadequate public investments in irrigation during the 1990s together with consecutive droughts from 2001 to 2003 are among the factors attributed to the poor agricultural performance. The consequences of stagnation in the crop sub-sector have been grimly underscored with a large number of farmer suicides in AP since 2003. This has prompted widespread concern and renewed emphasis in planning and policy circles on irrigation water resources management as a key instrument to improve rural livelihoods and enhance local capacities to cope with drought.
Of the net sown area of about 10.6 million hectares in AP, about 4 million hectares is presently irrigated through a combination of canals, wells, tanks, and other sources. Tank irrigation has historically played an important role with the state having the largest number of tanks (approximately 74,000) and the largest area irrigated by tanks in India.\(^1\) However, the area irrigated by tanks has declined significantly in the last decade and a half both in absolute and relative terms -- from about 1 million hectares in 1990 (24% of irrigated area at the time) to about 0.5 million hectares in 2004 (12% of irrigated area). This is mainly due to deficient maintenance and management of the tank system by government departments entrusted with the task, as a result of which most tanks are performing at well below capacity with the percentage of actual area irrigated to potential created varying between 35-55% depending on rainfall. The rapid spread of groundwater irrigation has been an additional contributing factor to the decline in tank irrigation, but this has also led to a serious depletion of groundwater resources across large parts of the state. Since most of the tanks are in rainfed areas with few possibilities of providing other systems of surface irrigation, their decline poses a serious threat to the fragile agricultural economy of these areas. Poorer farmers, often found at the tail-end of dilapidated tank systems and lacking resources to access groundwater irrigation amidst low and falling water tables, are particularly affected.

Government Actions. In response to the difficulties being faced by the agriculture sector, the Government of Andhra Pradesh (GoAP) has recently launched a massive irrigation development program with an estimated cost of over Rs. 700 billion over the next 5-10 year period. Once completed, this program is expected to more than double the current irrigated area in the state. The state has allocated 84% of its capital budget for 2006/07 for irrigation, up from an average of 36% between 2001/02-2003/04.

At the national level, the Government of India (GoI) too has increased emphasis on irrigation development in response to a general slowdown in national agricultural growth. The ‘Bharat Nirman’ program launched in 2005 seeks to increase irrigated area in the country by 10 million hectares. As part of this program, GoI has also included the restoration and renovation of tanks as a priority task for which a pilot scheme was launched in a number of states, including AP, in 2005. The 2006/07 GoI budget announced the government’s intention to seek additional funding from multilateral agencies for further scaling up this task. The proposed project is in response to this request.

Apart from increased public spending on irrigation, GoAP has also taken steps to strengthen participatory irrigation management in the state. AP was the first state in India to adopt state-wide participatory irrigation management following enactment of the Andhra Pradesh Farmers Management of Irrigation Systems (APFMIS) Act in 1997. Following this Act, water user associations (WUAs) were elected across the state, including in tank systems having a command area greater than 40 hectares. However, in the absence of rehabilitation of the tank infrastructure and inadequate attention to their capacity building and empowerment, most WUAs are yet to

\(^1\) Tanks are traditional water harvesting structures. A tank system includes the catchment area, the tank itself, and the irrigation channels in the tank command area. Some of the tanks existing in AP have survived for centuries, but most were commissioned between 50-100 years ago. About 63,000 of the existing tanks are considered small (irrigated command area less than 40 hectares each) while the remaining are relatively large with average command area of about 100 hectares.
play a meaningful role in the management of the tank systems. Political and legal commitment to the WUA approach, however, remains strong with a number of actions taken in recent times to improve the sustainability, inclusiveness and empowerment of WUAs. These include:

- The WUA management committee has been made a permanent elected body with a rotating membership whereby one-third of committee members retire at the end of two years, and each member serves a term of six years. This reform provides permanence and continuity to the WUA.
- Membership of WUAs has been expanded from the original provision of including only landholding farmers in the command area to now also allow: (i) co-option of other traditional water users such as fishermen, washermen, potters etc. as members of WUAs in tank systems; and (ii) two Panchayat members to be nominated by the Gram Panchayat (local government) as members of the managing committee of the WUA.
- WUAs have been legally empowered to maintain the feeder channels in the catchment area of minor irrigation tanks (all tanks proposed to be rehabilitated under the project fall in the minor irrigation category), thus ensuring jurisdiction over maintenance of the tank system.

2. Objectives

The proposed project development objective is: *Tank based producers improve agricultural productivity and water user associations manage tank systems effectively.*

Key performance indicators proposed to measure achievement of the PDO include: increase in area irrigated; improved water availability for tail-end farmers; increase in agricultural (includes livestock and fisheries) production and incomes from tank systems; resources raised and O&M expenditures incurred by user groups.

3. Rationale for Bank Involvement

The Bank has a long history in supporting irrigation development in AP, elsewhere in India, and beyond. Also, the Bank has experience with projects in India that have successfully promoted stakeholders involvement in rural infrastructure development, transferred improved agricultural technologies to farmers and helped in facilitating market linkages for farm products. As such, the Bank is well placed to assist AP with an integrated approach that strengthens community level institutions, rehabilitates tank infrastructure, and provides support services for improvement of agriculture based livelihoods. There is also strong GoI interest in Bank involvement with tanks rehabilitation projects in India. A ‘National Framework for State Projects to be posed for World Bank Assistance for Renovation of Water Bodies’ was prepared in January 2006 which outlined the basic design principles for preparing tank rehabilitation projects for Bank consideration. A decision was also taken to finance 25% of the cost of state projects posed for World Bank assistance by a grant from GoI to the recipient states. Finally, with GoAP laying a great deal of emphasis on irrigation development in the state, a Bank financed project can add value by helping mainstream policies that promote cost-sharing, effective beneficiary participation and a multi-disciplinary approach into state-wide irrigation development efforts.
4. Project Description

The project has four components:

Component A: Institutional Strengthening (Base Cost US$ 16.1 million)

The objective of this component is to enable community-based institutions assume greater responsibility for tank system management and for improvement of tank-based livelihoods. Activities to be financed under this component include: (i) capacity building to promote self-management by community-based institutions; (ii) technical assistance for preparation, implementation and monitoring of Tank Improvement and Management Plans (TIMP); (iii) services of non-government Support Organizations (SOs) to assist with community mobilization and capacity building; (iv) facilitation support to lead farmers of WUAs; and (iv) workshops, training and capacity building for SO and project staff and other relevant functionaries.

The component will also support WUA training and capacity building in key areas such as: planning and implementation of tank system rehabilitation works; preparation and implementation of operations and maintenance (O&M) plans; assessment and collection of water charges; maintenance of records and accounts; improved water-sharing and utilization; and participatory monitoring, learning and evaluation. It will further assist in mobilization and training of various production and commodity marketing groups.

Component B: Minor Irrigation Systems Improvements (Base Cost US$ 148.7 million)

The objective of this component is to enhance the efficiency of water use in tank areas selected under the project. Activities to be undertaken fall under two sub-components.

(i) Sub-Component B.1: Tank Systems Improvements (US$ 139.7 million): The objectives of this sub-component are to: (i) improve the physical and operational performance of selected tank systems (which includes the feeder channels above the tank reservoir, the tank itself, and the irrigation channels in the command area) through a range of interventions identified and executed in partnership with tank WUAs; (ii) secure the safety of the tank structure; and (iii) improve on-farm water management and water use efficiency. The sub-component would support the physical rehabilitation/modernization of tank systems with culturable command area (CCA) of between 40-2000 hectares. About 3000 tanks with an estimated CCA of about 250,000 hectares, spread across 21 districts of the state, are proposed to be rehabilitated under the project. The rehabilitation works would be undertaken in three batches of approximately 500, 1000 and 1500 tanks respectively. In general, the physical works are likely to include: (a) feeder channel improvement; (b) limited tank bed desiltation where deemed necessary; (c) repair/strengthening of bunds to secure tank safety; (d) repair or replacement of sluices; (e) repairs of surplus weirs; (f) essential construction/repairs of canal and drainage systems; and (g) installation of water measuring devices.

The sub-component will also support: (i) district level engineering support consultants to ensure that the rehabilitation works are carried out to acceptable construction quality standards; (ii) contractual staff to bridge the gap, where necessary, between technical staff required and presently available in District Project Units (DPUs); (iii) procurement of quality control
equipment for district level quality control laboratories; (iv) consultants for third party quality assurance; and (v) creation of a statewide minor irrigation database.

**Sub-Component B.2: Participatory Groundwater Management (US$ 9 million):** The focus of this sub-component is to improve, through measurement and analysis, understanding of the groundwater situation in areas suffering severe groundwater stress, and to use this to promote more effective sharing and utilization of groundwater amongst its users. The rationale for the sub-component lies in the fact that (restored) tank systems are an important source of groundwater recharge, and promoting efficient integrated use of surface and groundwater in the tanks’ influence zone will improve overall efficiency of water use from the tank-related investments. The sub-component will be implemented in those tanks selected under the project which fall in critical and over-exploited groundwater assessment units of the state. Activities to be financed under this component include: (i) piezometers and automatic water level recorders for groundwater assessment; (ii) participatory hydrological monitoring by groundwater user groups; (iii) water distribution pipes; (iv) training and support for better water-sharing and utilization through crop water budgeting and planning; and (v) upgrading analytical capacity of the state groundwater department.

**Component C: Agricultural Livelihoods Support Services (Base Cost US$ 24.9 million)**

The objective of this component is to enhance tank-based livelihoods by increasing production, productivity and profitability of agriculture, horticulture, fisheries, livestock and other significant productive activities. This would be done through improvements in production technologies and management practices, better input and output market linkages, more efficient and effective delivery of key support services, and augmentation of community-level productive capacities as well as infrastructure. The outputs are expected to be higher productivity in agriculture, livestock and fisheries; better alignment of farm-based productive activities with water availability; and diversification into more market-oriented agriculture and livestock production. Overall, the component is expected to increase net incomes and reduce economic vulnerability in the tank communities. The activities to be financed under this component fall into five groups:

(i) **Sub-Component C.1: Agriculture and Horticulture (US$ 8.7 million):** The focus of this sub-component is on increasing production and productivity of field, horticultural and fodder crops/trees in tank command areas. Activities to be financed within this sub-component include: (i) upgrading technology and production practices – through field-level demonstrations, and training of farmers and farmer groups; (ii) investments (involving beneficiary contribution) in group/community implements that enhance on- and off-farm incomes; and (iii) training, capacity building and exposure visits for farmer groups and staff from implementing agencies.

(ii) **Sub-Component C.2: Livestock (US$ 2.4 million):** The focus of this sub-component is on increasing the production and productivity of milk, meat and related animal products. The activities to be financed include: (i) upgradation of breed quality by strengthening the coverage and effectiveness of the artificial insemination program; (ii) improvements in animal nutrition and health management; (iii) ram-lamb rearing on a small-scale basis; and (iv) training and capacity building of livestock producers and line department staff.

(iii) **Sub-Component C.3: Fisheries (US$ 1.6 million):** The focus of this sub-component is on improving production and productivity of tank fisheries. Activities to be financed include: (i)
upgrading production practices through improved stocking; (ii) improved feeding, management and harvesting techniques; (iii) intensive fish and prawn cultivation in selected “demonstration tanks”; and (iv) training, capacity building and exposure visits of FCS and line department staff.

(iv) **Sub-Component C.4: Foreshore Plantation (US $ 4.2 million)**: The focus of this sub-component is on effective utilization of tank foreshore areas in selected locations. Activities to be financed include: (i) site preparation; (ii) nursery raising and plantation; and (iii) training for maintenance and cultural operations. These activities, apart from reducing silt inflow into the tank, are also expected to create an additional, sustainable income source for the tank community.

(v) **Sub-Component C.5: Agri-Business and Marketing (US $ 8.0 million)**: The focus of this sub-component is on increasing profitability and promoting product diversification and greater market orientation of production. Activities to be financed include: (i) promotion of new agri-businesses; (ii) promoting greater market awareness – in form of both knowledge of marketing opportunities and market-oriented production planning - among producers; (iii) strengthening producer linkages with input and output markets; (iv) post-harvest management of perishable produce; and (v) training, capacity building and exposure visits for producers and relevant project staff.

**Component D: Project Management (Base Cost US$ 11.6 million)**

The objective of this component is to ensure smooth implementation of project activities as well as monitoring of and learning from project processes and outputs. Activities to be financed include: (i) setting up and supporting project management units at the state and district levels; (ii) project monitoring, evaluation and learning activities; (iii) services of an external M&E agency to be engaged as consultants for the duration of the project; (iv) providing support for emerging needs and innovations during implementation; (v) liaising with project partner organizations, support organizations, external professional agencies and the World Bank; and (vi) documentation of project experience and its dissemination in the wider development community.

5. **Financing**

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6. **Implementation**

The project would be implemented over a period of five years. The overall responsibility for project implementation and coordination would rest with the Command Area Development Authority (CADA) in the Irrigation and Command Area Development (I&CAD) Department of GoAP. Implementation support, required primarily at the district level, would be provided by the Departments of Agriculture, Horticulture, Animal Husbandry, Fisheries, Forestry, Rural
Development, Groundwater, and various support organizations and private service providers.

The Commissioner CADA and Secretary I&CAD Department will be the overall Project Coordinator. The project would be managed through a Project Management Unit (PMU) established in CADA. The PMU will be headed by a full-time Project Director of the rank of a Commissioner/Special Commissioner and would house a multi-disciplinary team dedicated to the project. Corresponding District Project Units (DPUs) would be established at the district level with smaller multi-disciplinary dedicated teams. The PMU will be responsible for project planning and scheduling; project-wide budget control and financial management; quality assurance and control; monitoring of the project input/output/outcome/process/impacts; and providing timely and quality resources as well as technical assistance to DPUs. The DPUs will be responsible for the implementation of district programs; achievement of physical & financial milestones; quality and assurance; and working closely with communities to achieve the project development objectives.

The PMU would report to a Project Steering Committee (PSC) chaired by the Chief Secretary and comprising Secretaries of Finance, Irrigation, Agriculture, Animal Husbandry and Fisheries, and Rural Development with the Commissioner CADA as Convener of the PSC. The PSC will review project progress every six months and provide strategic directions, guidance on policy matters and resolve conflicts, if any, amongst the implementing agencies. At the district level, the project would be reviewed at least once every quarter by a District Level Implementation Committee (DLIC) chaired by the District Collector and including representatives from non-government Support Organizations, WUAs, senior district level staff from the Departments of Agriculture, Horticulture, Animal Husbandry, Fisheries, Rural Development, Groundwater, and the Chief Executive Officer, Zilla Parishad. The DLIC will be the main forum for district level coordination of project activities with other ongoing government programs (particularly watershed development in tank catchment areas), approval of annual action plans, monitoring of project progress, and resolution of conflicts, if any, amongst the implementing partners.

At the tank level, the focal point for organization and implementation will be the Water Users Association (WUA), constituted under the APFMIS Act 1997, to which all command area farmers and other eligible tank users such as fishermen will belong. The WUA will be expected to play a key role in the planning, implementation and supervision of subprojects, procurement of goods/works/services, operation and maintenance of tank systems, and self-monitoring of cost effectiveness and sustainability. Non-government support organizations (SOs), recruited by the project, will facilitate community mobilization, participation, and institutional strengthening of the community based institutions.

The project would be implemented according to norms, rules and procedures outlined in the Project Implementation Plan and Operational Manual. These documents lay out roles and responsibilities of different stakeholders and provide details of project processes and project cycle. They incorporate experiences gained through implementation of other community projects in AP as well as the outcomes of various preparatory workshops, studies and analyses that were carried out as part of project preparation. The Project Implementation Plan and Operational Manual will be subject to periodic reviews conducted jointly by GoI, GoAP and IBRD/IDA with
stakeholder participation to address any constraints to the successful implementation of the project.

The project will adopt a disclosure policy in compliance with the Right to Information Act both for on demand information and suo moto disclosure. This would include development of a project website, information management system, and a document management system. To the extent possible all project related information will be electronically disseminated through the project website. The project would also develop an effective complaints handling system.

Beneficiary and civil society oversight would be developed through social audits and public display of information at the district and village levels.

7. Sustainability

Sustainability is a core project principle and has been factored into project design:

Institutional Sustainability: WUAs would assume post-implementation O&M responsibility; WUA membership has been expanded to include important stakeholders like the fishing community; WUA management committee has been made a permanent elected body with a rotating membership; WUAs have been linked with Panchayat institutions by making two Panchayat members part of WUA management committee; transparent tank selection criteria and cost sharing arrangements would help ensure participating communities are committed to the project; as far as practicable line department staff would provide extension services thus facilitating farmers’ linkages with institutions that would remain beyond project closing; formal/informal contract marketing arrangements between FIGs and private sector would be facilitated.

Financial Sustainability: WUAs would receive 90% of the water charges collected for O&M purposes and their involvement in assessment and collection of water charges would be strengthened; WUAs would receive 50% of rental income from lease/auction of fishing rights to tanks; project interventions that enhance tank-based livelihoods would raise water productivity and hence strengthen incentive to pay water charges; training would be provided to WUAs on financial management; project M&E indicators would monitor WUA maintenance of financial records; bank accounts for FIGs would be opened.

Technical Sustainability: Training of WUA works sub-committee to carry out routine O&M; TIMP would list out activities to be carried out as part of routine O&M; MOU would be signed between WUA and government prior to undertaking tank rehabilitation work which would commit government to providing technical support services to enable WUAs to carry out routine O&M and in force majeure situations government would share in rehabilitation cost.

Social and Environmental Sustainability: Selected project activities (e.g., fisheries, livestock, foreshore plantations, employment opportunities from civil works, marketing and agri-business fund) would also be targeted to women, tribals, landless and other vulnerable groups (operationalized through the Gender Action Plan and Tribal Development Plan); safeguard action plans would reduce potential tension over negative project impacts; social development indicators would be embedded in project MLE system; participatory groundwater management
would promote more effective sharing and utilization of groundwater in over-exploited and critical regions of the state.

8. Lessons Learned from Past Operations in the Country/Sector

*WUA membership expanded to include multiple tank users.* As per recent changes to the Andhra Pradesh Farmers Management of Irrigation Systems (APFMIS) Act, representatives of the Gram Panchayat, fishermen, washermen and other such traditional tank users can now be co-opted into the WUAs thus providing for a more inclusive tank user representation.

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

*Concurrent and independent evaluation, and a built-in exit strategy, enhances project impact.* This lesson has been incorporated through provision for an external M&E agency that would concurrently monitor and report on field level project performance and also carry out periodic impact evaluations during the life of the project. The built-in exit strategy is for the WUA to take over operations and maintenance (O&M) of the tank after the rehabilitation is complete.

9. Safeguard Policies (including public consultation)

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10. List of Factual Technical Documents

Integrated Social and Environment Assessment
Hydrological Assessment

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

Contact: Deepak Ahluwalia
Title: Senior Economist
Tel: 5785+149
Fax: 91-11-24632275
Email: Dahluwalia@worldbank.org
Location: New Delhi, India (IBRD)

For more information contact:
  The InfoShop
  The World Bank
  1818 H Street, NW
  Washington, D.C. 20433
  Telephone: (202) 458-4500
  Fax: (202) 522-1500
  Email: pic@worldbank.org
  Web: http://www.worldbank.org/infoshop