

**COMBINED PROJECT INFORMATION DOCUMENTS / INTEGRATED
SAFEGUARDS DATA SHEET (PID/ISDS)
CONCEPT STAGE**

Report No.: PIDISDSC17964

Date Prepared/Updated: 18-Jul-2016

I. BASIC INFORMATION

A. Basic Project Data

Country:	India	Project ID:	P158522
		Parent Project ID (if any):	
Project Name:	Tamil Nadu Irrigated Agriculture Modernization Project (P158522)		
Region:	SOUTH ASIA		
Estimated Appraisal Date:	15-Feb-2017	Estimated Board Date:	15-Mar-2017
Practice Area (Lead):	Agriculture	Lending Instrument:	Investment Project Financing
Borrower(s):	Republic of India		
Implementing Agency:	Water Resources Organization, Public Works Department, GoTN		
Financing (in USD Million)			
Financing Source			Amount
Borrower			136.00
International Bank for Reconstruction and Development			318.00
Total Project Cost			454.00
Environmental Category:	A - Full Assessment		
Concept Review Decision:	Track II - The review did authorize the preparation to continue		
Is this a Repeater project?	No		
Other Decision (as needed):	The Decision Review Meeting discussed the risk ratings of the project and agreed to the proposed overall project risk rating of Moderate. The review meeting discussed project safeguard issues and agreed with the proposed classification as Category A in view of potential issues related to dam safety, increased pesticides and fertilizer usage. The safeguard responsibility will remain with RSA.		

B. Introduction and Context

Country Context

India in recent years witnessed impressive economic growth and poverty alleviation. During the past decade, India's Gross Domestic Product (GDP) grew at 7.6% annually and poverty incidence reduced on average by 1.5 percentage points per year during 2005-10. Also, improvements in key development indicators have been remarkable: life expectancy increased from 31 years in 1947 to 68 years in 2015 and adult literacy increased from 18% in 1951 to 71% in 2015.

Despite such impressive progress in economic growth, poverty alleviation, and improved human development indicators, India remains home to 263 million poor people (80% of whom reside in rural areas) living on less than US\$1.90/day and the country is still at the bottom of the group of middle-income countries. To address these challenges, the Government of India (GoI) through its 12th Five-Year Plan (FY2013-17) put forward an ambitious goal for economic growth, poverty reduction, job creation, and environmental management. The plan foresees during this period an annual GDP growth of 8.2%, a reduction in poverty rate by 10 percentage points, and 50 million of new jobs.

Sectoral and Institutional Context

Tamil Nadu is the second largest state economy in India with one of fastest growth rates: over the past three years its Gross State Domestic Product (GSDP) grew at 9.2% per annum. The average annual per capita income of the state is around INR 61,500 (at 2010/2011 constant prices), which is around 42% higher than the national average. Tamil Nadu is also the most urbanized state in India with around 48% of population living in cities.

Agriculture and allied sectors in Tamil Nadu account for 12% of the state's GSDP. About 40% of state's population is dependent on agriculture for their employment and more than two thirds of state's poor people live in rural areas and are engaged in predominately in agriculture activities. The majority of farmers are small and marginal with average family landholdings of 0.83 ha. The main crops are rice, maize, pulses, groundnut, sugar cane, vegetables, and banana. Rice dominates both consumption and agriculture production accounting for 34% of total gross cropped area and 60% of irrigated area. Due to seasonality and scarcity of water supply, cultivation is mostly limited to only one crop per plot per year.

Tamil Nadu is one of the driest and most water stressed states of India with average annual rainfall of 925 millimeters, which is well below the national average of 1,200 millimeters. Per capita availability of water in the state is around 900 cubic meters a year compared with the national average of 2,100 cubic meters. The agriculture sector in Tamil Nadu is highly exposed to climatic risks, especially droughts, floods, cyclones, and erratic rainfall, which have frequently affected the performance of agricultural sector in the past. The dry season lasts five months (January through May) even in good years, and droughts occur in three out of ten years. Climate change is likely to exacerbate the vulnerability of agricultural sector with increasing erratic weather patterns and climatic shifts. A clear example is the consequence of devastating floods that occurred in November-December 2015, which severely damaged irrigation infrastructures in three districts and affected Chennai, the capital city of Tamil Nadu as well.

The state is heavily dependent on irrigated agriculture and over the years an impressive inventory of irrigation and water infrastructure was built in the state. There are 89 major reservoirs, 39,000 tanks (traditional water harvesting structures) and 3 million wells. Irrigated agriculture is the

largest consumer of water in the State accounting for 75% of total water usage. About 3 million ha of land (54% of total crop land) is under irrigation with different sources of water: 30% of total irrigated area is under canal irrigation, 21% is under tank irrigation, and 49% is irrigated by wells.

In recent years the state's agriculture sector has grown modestly at less than 3% per annum compared with 6-9% growth of the state's economy. The productivity of major crops has largely stagnated: the current average yields of rice and maize are slightly higher than the national average, the average yields of vegetables, cotton, and pulses are lower than the national average. To unlock the full potential of agriculture sector growth, there is a strong need for policies and programs to focus on: (i) improvement of water use efficiency; (ii) intensification of cropping systems and diversification into high value crops; (iii) enhancement of post-harvest management and value addition; and (iv) improvement of the resilience of agriculture system in order to deal with increasing threats of climate change.

The Bank-supported Tamil Nadu Irrigated Agriculture Modernization and Water-Bodies Restoration and Management Project (TN IAMWARMP), which was concluded in 2015, has had a significant development impact in the state by modernizing irrigation infrastructure, improving water use efficiency, enhancing yields and productivity of agriculture, livestock and fisheries, and promoting diversification to high value crops. It also supported the introduction of participatory irrigation management in the state and the establishment of water users associations (WUAs). Under the project 5,300 tanks and irrigation supply canals were rehabilitated and modernized, and 2,800 WUAs were established resulting in increases of fully irrigated areas by 39% and water conveyance efficiency by more than 30%. The total area under high value crop was also doubled. Moreover, the project helped the state improve its water resource planning and implementation capacities. These achievements and lessons learned during implementation of TN IAMWARMP serve as a good base for further enhancing the performance of irrigated agriculture in the state through the proposed project.

Relationship to CAS/CPS/CPF

The proposed project is fully consistent with the India Country Partnership Strategy (CPS) for FY2013-17 to support poverty reduction and shared prosperity in India. In line with the pillar for Transformation, the project promotes inclusive rural growth, development and dissemination of new agricultural technologies, climate-resilient agriculture, enhanced market linkages for small and marginal farmers, and improved water and natural resource management. Further the proposed project will have a positive impact in terms of environmental protection, and reduced greenhouse gas emissions by disseminating high efficiency irrigation systems, and promoting diversification into high value crops, which significantly reduce water consumption.

The proposed project will contribute to the Inclusion pillar of CSP by enhancing the livelihoods of small and marginal farmers through crop diversification, enhanced market access, and also by improving disaster management abilities of GoTN and the local communities through the enhanced design and restoration of irrigation infrastructure with better flood protection features.

C. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

To enhance agriculture productivity, water use efficiency, climate resilience of irrigated agriculture and increase post-harvest value-addition for smallholder farmers and agro-entrepreneurs in Tamil Nadu.

The project beneficiaries are farmers, including small and marginal, water users associations, farmer producer organizations, and other entrepreneurs.

Key Results (From PCN)

The key project indicators (KPI) will be:

- (i) Increase in water use efficiency (resilience, water use efficiency);
- (ii) Increase in agricultural productivity (productivity);
- (iii) Increase in areas cultivated by non-paddy crops (diversification and value added);
- (iv) Adoption of resilient technologies and practices (resilience); and
- (v) Total number of project beneficiaries (including number of female beneficiaries).

D. Concept Description

The design of the proposed project will include innovative aspects that build on lessons learned from TN IAMWARMP and also reflect the evolving needs of the state when it comes to modernization of irrigated agriculture. These include improved designs of irrigation infrastructure, stronger focus on the demand-side of irrigation with aim to improve water-use efficiency, further advances in agricultural diversification, agri-entrepreneurship, and movement toward climate resilient agriculture with relevant agriculture-water related investments and substantial improvements of participatory irrigation management practices by beneficiaries. Improved resilience of agriculture production systems is expected to be achieved under the project through e.g. higher water use efficiency, increased adoption of sustainable technologies and practices, and enhanced diversification of production systems. Activities under the project will be duly complimented by use of innovative ICT and new media technologies for enhanced efficiencies and faster turnaround time for delivering services to project beneficiaries. As requested by GoTN, the project is also expected to finance on-retroactive basis, rehabilitation and modernization of tanks and other irrigation infrastructures damaged by the flooding of November/-December 2015 floods in three districts of Tamil Nadu.

The total project cost is expected to be around US\$454 million, of which the Bank will finance \$318 million (70% of total project cost) and the GoTN will finance US\$ 136 million (30% of total project cost). The project activities will cover the entire state of Tamil Nadu (its individual components will cover different geographic areas) and will be implemented over seven year period. The project activities would be grouped into three main components: (i) Agriculture Water Management; (ii) Agriculture Productivity Enhancement, Diversification, and Value Addition; and (iii) Project Management Support. The individual components are summarized below:

Component A: Irrigation and Water Management

This component addresses irrigation and water management in a holistic fashion by covering both supply and demand simultaneously. It consists of four inter-related sub-components, including: (i) institutional strengthening and capacity building of water management; (ii) irrigation systems modernization; (iii) participatory irrigation management; and (iv) converged service delivery at the grass-root level.

Sub-component A.1: Institutional Strengthening and Capacity Building of Water Management

This subcomponent aims to assist the GoTN in addressing the pressing water sector issues, including: (i) need for integrated water resources planning, bulk water allocations and management in a basin context, involving all water using sub-sectors to improve the efficiency and productivity of limited water resources; (ii) need to improve the knowledge base and instruments; (iii) need to improve the financial sustainability of water sector assets, and cost effective reliable service delivery; and (iv) need to promote participatory irrigation service management. These will be done through strengthening of capacities for enhancing policy analysis and implementation, knowledge base, analytical capacity, staff mobility, filling of subject matter specialists/experts gap, technology induction, office facilities, and related technical/logistical support.

Sub-component A.2: Irrigation Systems Modernization

This sub-component will modernize irrigation infrastructures, including tanks, and irrigation canals. The modernization of irrigation infrastructure will focus on improving the bulk water delivery to irrigation systems through rehabilitation and modernization of approximately 4,800 tanks, and 477 anicuts in 66 sub-basins out of total 127 sub-basins. Activities under this sub-component will be carried out based on individual sub-basin development plans specifically developed and tailored to local conditions, and will aim to revive traditional water bodies (tanks) that are either part of or outside the state's irrigation systems network. The sub-component will finance civil works, equipment, consultancies, training and incremental operational costs associated with modernization of the schemes, and the work will be carried out by WRD, and as required with direct involvements of WUAs.

Sub-component A.3: Participatory irrigation Management

This sub-component aims to integrate participatory irrigation management (PIM) practices into the operations of the Water Resource Department as a distinct unit within the Department in order to improve Operation and Maintenance (O&M) of modernized and rehabilitated irrigation infrastructures. The sub-component will assist in strengthening and establishing new water users associations (WUAs), including operationalizing WUAs to undertake O&M, water distribution, and asset rehabilitation works within their command areas.

Sub-component A.4: Converged Service Delivery at Grass-Root Level

For effective service delivery to farmers, all departments involved in the water sector need to collaborate. This convergence for service delivery will be promoted through establishing and strengthening Single Window Information and Knowledge Centers (SWIKCs), and facilitating Community Collaborative Water Management (CCWM) at village level. CCWM will sensitize local communities about the water situation and enable them to draw community level action plans for sustainable use of water in their villages for all water users.

The overall component will be supported by information and communication technology (ICT) Innovative ICT and new media solutions coupled with robust monitoring and evaluation systems for real time submission of information related to the project activities will be designed, developed and deployed under Component A in addition to leveraging on the existing ICT solutions developed during IAMWARM. In particular, specific ICT interventions to be undertaken under this components will be: (i) Operationalization and enhancement of Enterprise

Information Management System platform developed under IAMWARMP through retroactive financing and (ii) Implementation of Supervisory Control and Data Acquisition systems based upon sensors based inputs for automation of at least one canal network.

Component B: Agriculture Productivity Enhancement, Diversification, and Value Addition

The interventions of this component are aimed at increasing productivity, promoting diversification of agriculture production systems, and improving farmers' access to markets in project sub-basins. The component will adopt climate-resilient approaches that promote sustainable use of land and water resources. The component will consist of two sub-components: (i) sustainable intensification and diversification of agriculture production systems; and (ii) marketing, value-addition and post-harvest management.

Sub-component B.1: Sustainable intensification and diversification of agriculture production systems

Sustainable intensification and diversification of agriculture production systems will be achieved through a large scale program of awareness creation and on-farm demonstrations on new seeds and promising technologies, capacity building and training activities; and by leveraging private sector investments in water management and farm mechanization. Climate risk resilience will be built into crop and horticulture production systems by: (a) promoting cultivation of short duration, high yielding, drought-, pest- and disease-tolerant crops/varieties of pulses, maize, oilseeds, millets, vegetables and fruits; (b) installation of micro irrigation drip and fertigation systems; and (c) promoting water saving agronomic practices like the system of rice intensification and the sustainable sugarcane initiative. For linking production with market demand, farmers will be supported and trained to grow those crops and commodities for which significant market demand exists, including a shift from paddy to crops with low water consumption in which Tamil Nadu is deficient. ICT-based leveraged activities will be introduced like E-velanmai, Farmer Cropping Advisory.

Animal husbandry activities will aim at improving production potentials of livestock through adoption of sustainable and climate resilient animal husbandry practices (including fodder cultivation) technologies, strengthening of input, extension, and service delivery systems, establishing ICT based MIS and infrastructure strengthening and capacity building in breeding, disease surveillance and food safety.

Fisheries activities will aim at improving fish productivity mainly in reservoirs, tanks and ponds through demonstration of climate resilient modern technology packages such as: short production cycle models involving improved fast growing fish varieties; improved reservoir fisheries management; introduction of suitable formulated fish feed using locally available ingredients; promotion of innovative technologies such as cage fish culture and pen fish farming in an environmentally sustainable manner; and facilitation of suitable market linkages for better access to markets.

Related to above activities, the project will finance the incremental requirements of contractual subject matter experts and support staff, goods and equipment, consultancies, studies, trainings, civil works, and incremental operating costs. The Project will also support the GoTN in improving existing policies, regulations, and procedures to achieve a climate-resilient and

sustainable agriculture system by commissioning feasibility studies, preparing detailed action plans and implementation guidelines.

Sub-component B.2: Value Addition and Post-Harvest Management

This subcomponent will aim at enhancing farmers' linkages to markets by providing alternative marketing channels and improving farm level post-harvest management and value addition. The project will support the setting up of an Agribusiness Promotion Facility, development of farmer producer organizations/companies, integration of commercial value chains of agricultural commodities, and will facilitate public-private partnerships to enable direct buying arrangements. Support will also be provided for modernization and upgrading of selected Regulated Markets dealing with project produces and weekly farmers (markets/rural markets (Varashanthais) on cost sharing basis, innovative pilots, institutional strengthening and capacity building of Agriculture Marketing and Agribusiness Department. The GoTN is currently in the process of amending the Agriculture Produce Market Act of 1987, which would bring in substantial reforms, and among others, would create a conducive environment to development of more efficient markets with extensive usage of latest ICT technologies.

Component C: Project Management Support

The project will adopt the model of multi-departmental coordination and convergence, and will follow the general institutional structure of IAMWARM. The Multi-Disciplinary Project Unit (MDPU) established under the IAMWARM will also serve as the management and coordination unit for the proposed IAMP, with modifications as needed to be considered during project preparation. The MDPU will be responsible for ensuring support to preparation and implementation of overall project budget, sub-basin development plans, and implementation progress reports by the line departments. The MDPU will provide M&E, procurement and fiduciary support as needed to the project implementing agencies.

The activities to be undertaken under the component will also be supported by: i) implementation of mobile application and associated back-end software tools for Geo Tagging and remote sensing based monitoring of project outcomes and ii) Implementation of GIS based data acquisition and analysis system for studying emission of Methane and other Green House Gases (GHG) in project area. Citizen Engagement including Grievance Redressal is to be done by respective department as per agreed system.

II. SAFEGUARDS

A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

The project will be implemented in 66 sub-basins, including the areas experiencing droughts, floods and other climate/natural shocks, particularly in coastal areas. The project activities might influence a diverse set of habitats/ecosystems, including, coastal, plains, hilly, wetlands, rivers and sub-river basins as explain below.

B. Borrower's Institutional Capacity for Safeguard Policies

The primary implementing agency has developed some capacity in managing social and environmental impacts under IAMWARM Project, which is the first phase to this project but remain weak when it comes to monitoring and reporting of environmental and social management

aspects. Moreover, officials, particularly engineers, who were engaged in the previous project may move out due to transfers and this may require additional capacity building measures for the current staff. The implementing agency has some familiarity in preparing secondary data based environmental atlas for sub-basins, undertaking minor Social and Environmental Assessments, preparing Environmental Status Reports and contracting special studies of the river basins in the State. However, the second phase project will cover new sub-basins, a fresh full environmental and social assessment would be required for which the borrower will prepare and share with the Bank a detailed Terms of Reference. A multi-disciplinary project unit (including environmental and social experts) is being set up to facilitate the preparation and implementation of this project and based on experience of the previous project, will require additional support of external experts to facilitate the assessment both during preparation and then during operational phase for implementing the mitigation measures.

C. Environmental and Social Safeguards Specialists on the Team

Anupam Joshi (GEN06)

Samuel Thangaraj (GTC06)

D. POLICIES THAT MIGHT APPLY

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	Significant physical investments are expected under the project and although the nature of these investments would be largely rehabilitation of existing assets, improper construction could result in adverse impacts. An Environmental and Social Assessment will be undertaken and an Environmental and Social Management Plans would be developed for managing risks and maximize environmental and social opportunities. These will take into account earlier work and experiences of the TN WRCP project and consideration of new activities proposed in the TN IAMWARM project.
Natural Habitats OP/BP 4.04	Yes	This is triggered, as a large number of tanks will be rehabilitated, including carrier system, which may impact natural habitats, particularly wetlands. Careful mapping using remote sensing will be undertaken as part of conducting the environmental assessment.
Forests OP/BP 4.36	No	No impacts on forests are expected and the project will not affect existing forest management practices.
Pest Management OP 4.09	Yes	No pesticides and fertilizers are expected to be financed directly by the project; however, there may be induced impacts of increased fertilizer and pesticide use due to improved agricultural intensification and diversification. The project will support scaling-up state-wide Integrated Pest

		Management and Integrated Nutrient Management efforts and support for safer and organic food production and marketing. A pest management plan will be prepared as part of the EA.
Physical Cultural Resources OP/BP 4.11	TBD	No significant adverse impacts on cultural property expected, but this issue will be examined during the ESA (particularly in relation to proper management of any religious and other physical cultural property associated with tanks during rehabilitation).
Indigenous Peoples OP/BP 4.10	TBD	A Tribal Mapping of 66 sub-basins to identify areas in the sub-basins that are categorized as belonging to Schedule 5 areas where GoTN's Tribal Sub-Plans and where Forest Rights Act are implemented will be undertaken as part of Social Assessment to determine whether or not the OP/BP 4.10 is triggered.
Involuntary Resettlement OP/BP 4.12	Yes	Modernization of irrigation systems and rehabilitation and required civil works are likely to involve involuntary resettlement. Though efforts will be made to avoid this, necessary structures and processes to mitigate adverse impacts, if any will be put in place in the Social Management Plan.
Safety of Dams OP/BP 4.37	Yes	The dam safety policy is triggered as some tanks may have embankments higher than 15 m, though it will be confirmed once tanks are identified. The proposed project will draw technical resources from the ongoing World Bank funded Dam Rehabilitation and Improvement Project (DRIP) in the State of Tamil Nadu, including the participation of the Dam Safety Review Panel. During preparation, the specific needs for supporting safety of Dams and tank systems will be assessed comprehensively and interventions needed will be determined. This includes the necessary monitoring system.
Projects on International Waterways OP/BP 7.50	No	The project does not fall on any international waterways.
Projects in Disputed Areas OP/BP 7.60	No	The project is not in any disputed areas.

E. Safeguard Preparation Plan

1. Tentative target date for preparing the PAD Stage ISDS

29-Dec-2016

2. Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the PAD-stage ISDS.

An Environmental and Social Assessment (ESA) shall be completed by November 30, 2016, which

will be for the entire project period. A number of safeguards instruments are expected to be prepared. An Environment and Social Management Framework (ESMF) will be prepared, as all investments and their locations would not be known by appraisal. An Environment Management Plan (EMP) and a Social Management Plan (SMP) will be prepared by appraisal for at least one large infrastructure sub-project. In addition, a Pest Management Plan (PMP) will be prepared that will be applicable through the project period. Based on the assessment to trigger the policy on Indigenous Peoples, an Indigenous Peoples Framework may be prepared. Finally, A Resettlement Action Plan (RAP) will also be prepared.

III. Contact point

World Bank

Contact: Bayarsaikhan Tumurdavaa
Title: Senior Agriculture Economist

Contact: Kazuhiro Yoshida
Title: Senior Irrigation Specialist

Borrower/Client/Recipient

Name: Republic of India
Contact: Mr. Rishikesh Singh
Title: Director (MI), Ministry of Finance, GoI
Email: rishikesh.singh74@nic.in

Implementing Agencies

Name: Water Resources Organization, Public Works Department, GoTN
Contact: Vibhu Nayer
Title: Project Director
Email: mdpu@gmail.com

IV. 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
Web: <http://www.worldbank.org/infoshop>

V. Approval

Task Team Leader(s):	Name: Bayarsaikhan Tumurdavaa,Kazuhiro Yoshida	
<i>Approved By</i>		
Safeguards Advisor:	Name: Maged Mahmoud Hamed (SA)	Date: 19-Jul-2016
Practice Manager/ Manager:	Name: Dina Umali-Deininger (PMGR)	Date: 26-Jul-2016
Country Director:	Name: Genevieve Connors (CD)	Date: 05-Aug-2016

1 Reminder: The Bank's Disclosure Policy requires that safeguard-related documents be disclosed before appraisal (i) at the InfoShop and (ii) in country, at publicly accessible locations and in a form and language that are accessible to

potentially affected persons.