



# Project Information Document (PID)

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Concept Stage | Date Prepared/Updated: 24-Oct-2019 | Report No: PIDC27910

**BASIC INFORMATION****A. Basic Project Data**

Country India	Project ID P172187	Parent Project ID (if any)	Project Name Rejuvenating Watersheds for Agricultural Resilience through Innovative Development (P172187)
Region SOUTH ASIA	Estimated Appraisal Date Apr 15, 2020	Estimated Board Date Aug 27, 2020	Practice Area (Lead) Agriculture and Food
Financing Instrument Investment Project Financing	Borrower(s) Department of Economic Affairs, Ministry of Finance, Government of India	Implementing Agency Department of Land Resources, Karnataka Department of of Agriculture	

**Proposed Development Objective(s)**

The Project Development Objective (PDO) is to: improve land and water conservation and climate resilience in selected watersheds, and strengthen capacities of national and state institutions to deliver more effective science-based watershed development programs.

**PROJECT FINANCING DATA (US\$, Millions)****SUMMARY**

<b>Total Project Cost</b>	250.00
<b>Total Financing</b>	250.00
<b>of which IBRD/IDA</b>	178.50
<b>Financing Gap</b>	0.00

**DETAILS****World Bank Group Financing**

International Development Association (IDA)	178.50
IDA Credit	178.50

**Non-World Bank Group Financing**



Counterpart Funding	71.50
Borrower/Recipient	71.50

Environmental and Social Risk Classification

Moderate

Concept Review Decision

Track I-The review did authorize the preparation to continue

## B. Introduction and Context

- While still high by global standards, India’s growth rate has decelerated in the past two years.** After peaking at 8.2 percent in FY16/17, economic growth has been lower in FY17/18 (to 7.2 percent) and FY18/19 (to 6.8 percent). Estimates for the first quarter of FY19/20 suggest that growth is likely to be soft by Indian standards at around 6.4 percent for the full fiscal year (assuming the external environment remains benign). In addition to relatively low levels of private investment over the past several years, the latest data shows a broadening of the slowdown across all categories of aggregate demand. Although the current account deficit widened to 2.1 percent of GDP in FY18/19, robust capital inflows during the second half of the year allowed for a build-up of international reserves to US\$ 411.9 billion at the end of the fiscal year (equivalent to 10 months of imports). Going forward, subdued import growth and benign oil prices are expected to contain the current account balance to some extent. On the fiscal side, the general government deficit is estimated to have widened to 5.9 percent of GDP in FY18/19 but is expected to consolidate to 5.7 percent in FY19/20.
- Since the 2000s, India has made remarkable progress in reducing absolute poverty.** Between FY11/12 and 2015, poverty declined from 21.6 to an estimated 13.4 percent at the international poverty line (2011 PPP US\$ 1.90 per person per day), continuing the earlier trend of fast poverty reduction. Thanks to robust economic growth, more than 90 million people escaped extreme poverty and improved their living standards during this period. Despite this success, poverty remains widespread. In 2015, 176 million Indians were living in extreme poverty, while 659 million - half the population- were below the higher poverty line commonly used for lower middle-income countries (2011 PPP US\$ 3.20 per person per day). Implementation challenges of indirect tax reforms, stress in the rural economy and a high youth unemployment rate in urban areas, may have moderated the pace of poverty reduction since 2015.
- Agriculture plays a vital role in India’s economy and is central to policies aimed at alleviating poverty.** As the Indian economy has diversified and grown, agriculture's contribution to Gross Value Added (GVA) has slowly declined from 18.6 percent in 2013-14 to 17.4 per cent in 2016-17. The annual agriculture growth rate was around 3.0 percent to 3.5 percent in the 1990s and 2000s and dropped below 2 percent per annum during 2013-15 due to low productivity, growing water and land scarcity, rising labor costs, declining commodity



prices, and climatic uncertainties. Productivity is well-below potential; yields for selected crops in India are between 30 percent and 60 percent of the optimal yields in other countries, particularly in rainfed areas due to poor availability of water for irrigation, inadequate knowledge of site conditions and crop suitability, poor targeting of inputs such as fertilizer, low resilience to climate change, etc. These factors have led to an agrarian crisis and a growing realization on the importance of improving the ecological sustainability of the natural resource base and the socio-economic potential of the sector to increase farmer welfare and rural growth opportunities<sup>1</sup>. Agriculture and allied sectors are still the primary source of food and livelihoods for 58 percent of rural households. Approximately 82 percent of farmers are small and marginal producers (FAO 2019)<sup>2</sup>.

4. **National water resources are becoming critically stretched.** While India comprises 18 percent of the world's population, it has only four percent of global freshwater resources. The water situation in India needs to forge a much more resource-efficient growth pattern. Most of India's 25 water basins are water stressed due to increased population, urbanization, industrialization, increased domestic use, and rising agricultural needs. This will only become more acute with a changing climate. India's budget for FY19-20 has emphasized water conservation as a high priority agenda of the Government of India (GoI).

#### Sectoral and Institutional Context

5. **Rainfed agriculture represents a major share of the agricultural sector and is facing significant challenges.** Of the 127 agro-climatic zones in India, 73 are rainfed, with 13 states<sup>3</sup> accounting for about three-quarters of the total rainfed area. Generally, these rainfed areas receive less than 750 mm of rainfall annually and have less than 30 percent of cropland under irrigation (from both surface and ground water). From the total area under agricultural production in India of 141 million hectares, approximately 55 percent of the gross cropped area is under rainfed cultivation, mostly in arid and semi-arid areas. Rainfed agriculture supports an estimated 480 million people. Dry, rainfed regions are more susceptible to drought and soil degradation that reduces fertility and increases downstream sedimentation. To meet national nutritional needs under moderate forecasts of population growth, an additional 102 million tons of food grains need to be produced annually by 2020. While perhaps two-thirds of this food could come from increasing the area under irrigation in plains and delta regions and improving irrigation productivity, the balance must come from either rainfed lands or imports.

6. **Rainfed agriculture is highly vulnerable to climate change; increased investment in climate smart agriculture measures to reduce vulnerability are essential to maintain growth in the sector.** India's rapid economic growth has increased its prominence on the global stage and drawn attention to its climate mitigation and adaptation efforts. Increased climatic variability is likely to exacerbate current pressures on surface and ground water resources availability across time and space. Yields of major crops such as rice, wheat, maize or sorghum yields could come under severe pressure; for example, by 2030, rice and wheat could see an average of six to ten percent decreases in yields<sup>4</sup>. The GoI included agriculture as a priority sector for climate change

<sup>1</sup> Annual Report, 2017-18. Department of Agriculture, Cooperation & Farmers Welfare, Government of India

<sup>2</sup> FAO 2019. FAO in India – India at a glance. <http://www.fao.org/india/fao-in-india/india-at-a-glance/en/>

<sup>3</sup> These include: Maharashtra (14.49 million ha), Madhya Pradesh (9.31 million ha), Rajasthan (12.15 million ha), Karnataka (7.46 million ha), Uttar Pradesh (4.42 million ha), Andhra Pradesh (6.48 million ha), Gujarat (6.58 million ha) and West Bengal (2.54 million ha).

<sup>4</sup> Goswami, S. 2017. Climate change impact leads to 1.5 percent loss of in India's GDP. Down to Earth. May 18, 2017. Delhi



adaptation in its Nationally Determined Contribution (NDC)<sup>5</sup> to the UNFCCC under the Paris Agreement and consequently, through the National Rainfed Area Authority (NRAA), which prioritized 150 rainfed districts in India based on the climate vulnerability characteristics and risks.

7. **Agriculture is also a major contributor to rapidly growing greenhouse gas (GHG) emissions in India.** In absolute terms, India remains one of the largest GHG emitters, with the agriculture sector being the second largest contributor (around 18 percent of the country's total GHG emissions). In its NDCs, the GoI referenced the National Agroforestry Policy (NAP)<sup>6</sup> as a key instrument for a more "climate smart" agriculture sector and committed to create an additional carbon sink of 2.5 to 3.0 billion tonnes of Co2 equivalent through additional forest and tree cover by 2030.

8. **The Government of India (GoI) has recognized the need to improve agricultural performance.** The GoI has launched several programs, policies, and reform initiatives under the overarching vision of doubling farmer incomes and improving water efficiency and soil health. The Ministry of Agriculture and Farmer's Welfare (MoAFW) currently delivers several national schemes including: basic soil health cards based on surface micro-nutrients; a) National Mission for Sustainable Agriculture (NMSA), which is addressing rainfed area development, soil health management, agro-forestry;; b) the NRAA for policy and analytical work, organic farming and fertilizer control; c) the agriculture component of PMKSY; and d) the Micro-Irrigation Fund (MIF). The total budget allocation for the MoAFW increased from INR86,602 Crores (USD12.7 billion) in 2018-19 to INR151,518 Crores (USD22.3 billion) in 2019-20.

9. **Integrated watershed management is urgently needed** to help address land degradation, agricultural performance, water conservation, and climate change in rainfed areas. Watershed management is the integrated use of land, vegetation, and water in a specific drainage area with the primary objective of conserving hydrologic services and reducing or avoiding negative downstream impacts<sup>7</sup>. By addressing issues facing land and water resources in an integrated manner, integrated watershed<sup>8</sup> management can provide a constructive framework to deal with the challenges facing rainfed farmers in rural India, for example by offering a significant improvement in sustained water resource development through recharging local aquifers and improving downstream water flows; increasing more effective water demand practices; decreasing soil erosion and loss of fertility; increasing agricultural productivity and income; helping farmers adapt to climate change; and improving rural livelihoods.

10. **Current government schemes have allocated significant budgets to address many aspects of integrated watershed management.** The Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) scheme amalgamated three ongoing national schemes: a) *Accelerated Irrigation Benefit Program (AIBP)* of the Jal Shakti Ministry ; b) the *IWMP* of Department of Land Resources (DoLR); and c) the *On-Farm Water Management (OFWM)* of

<sup>5</sup> <https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf>

<sup>6</sup> <http://www.indiaenvironmentportal.org.in/files/file/Agroforestry%20policy%202014.pdf>

<sup>7</sup> Smyle, J., Milne, G., and Halla Qaddumi 2009. Rural watershed management – the power of integration. Water Sector Board P-Note, February 2009, World Bank.

<sup>8</sup> A watershed is an area defined by topographic ridgelines that supplies water by surface or subsurface flow to a drainage system or body of water. Watersheds can vary from small areas of a few hectares to a few hundred hectares (often termed micro-watersheds) to thousands of square kilometers (basins or sub-basins).



Department of Agriculture and Cooperation (DAC). For 2019-20, an outlay of INR3,500 Crore (USD 515 million), was allocated to the three components of PMKSY with the watershed component accounting for approximately 61 percent. Over the past five years, the budget outlay for watershed programs under DoLR has slowly increased from INR1,576 Crore (USD 239 million) to INR2,227 Crore (USD 314 million). In addition, the *Mahatma Gandhi National Rural Employment Guarantee Act* (MGNREGA), implemented through local Self-Government Bodies (Gram Panchayats) has a budget in FY 2019-20 of 60,000 Crore (USD8.8 billion), with more than 50 percent of total expenditures for soil and water conservation measures. The *Rashtriya Krishi Vikas Yojana* (RKVY) includes preparation of District Agriculture Plans (DAPs) and State Agriculture Plan (SAP) based on agro-climatic conditions, availability of appropriate technology and natural resources to ensure accommodation of local needs, cropping pattern, priorities etc. Finally, the *Jal Shakti Abhiyan* scheme in the Department of Drinking Water and Sanitation Ministry is focusing integrated approaches for improved water conservation in water-stressed districts until November 2019, when the current Phase II ends.

11. **National watershed schemes have had modest successes.** Under IWMP and PMKSY, 8,214 watershed development projects were sanctioned from 2009 to 2015 in 28 States covering 39 million ha and financed by INR33,642 Crore (USD5 billion) as the Central share at a 60-40 cost sharing ratio. So far, INR17,623 Crore (USD2.6 billion) Central Share has been released to States. Of the 8,214 projects sanctioned across states, 3,578 remain to be implemented. Approximately 600,000 water harvesting structures have been created and an estimated 1.3 million ha of rainfed lands brought under protective irrigation. More than 2.6 million farmers have



benefited from watershed treatments. Moving forward, DoLR intends to take up a new generation of projects to cover an additional 20 million ha by 2024, subject to approval of scheme by the GoI.

**12. Given adequate budget allocations, national programs addressing watershed management outcomes may further be amplified with technical inputs, better planning and management, to make them comparable with results from smaller Bank and bi-lateral supported projects.**

Box 1 summarizes key issues in Indian watershed management programs that are constraining better results, identified in a World Bank-supported 2013 study, and augmented from more recent field experience in ongoing operations. The challenges are significant and point to a pressing need for new approaches to generate increased benefits from allocated budgets.

**13. Change must come primarily from States implementing national programs and they need to be guided by successful models and innovations.**

The World Bank and DoLR are proposing a new multi-state integrated watershed project to address the key issues in Box 1 and demonstrate at scale how to achieve better performance across variable agro-ecological zones. The proposed project has its genesis in the learnings from the Neeranchal Project. Second, the success of the Karnataka Watershed Development Project-II (closing December 31, 2019) has raised interest in the GoI and states to replicate the development and application of more effective, science-based watershed planning, and use improved site data to help farmers make better crop selection and management decisions and guide planning and convergence with other schemes<sup>9</sup>.

**Box 1. Key issues with Indian watershed programs**

- a) **Limited availability of site-specific scientific knowledge.** Site data is often limited or fairly coarse in scale and cannot guide more intensive planning in watersheds or help farmers and other stakeholders make better decisions to improve agricultural resiliency, productivity, resource use, and profitability.
- b) **Lack of desired level of integrated and long-term planning and programming and partial solutions.** Given their variable ecological characteristics, developing rain-fed areas requires an integrated watershed approach. However, different watershed, agricultural, and water schemes are often implemented in departmental silos without unified mechanisms for better coordination and convergence of schemes.
- c) **Weak execution of projects on site.** Soil and water conservation investments are sub-optimal due to plans based on weak data and science, inadequate budgets for investments, poor targeting of treatments, insufficient community participation, and inadequate monitoring and evaluation.
- d) **Lack of desired attention to climate change.** Current watershed programs address climate change through standard soil and water conservation, but fail to provide additional solutions such as climate smart agriculture, etc.
- e) **Weak institutional and technical capacities.** Central and state agencies implementing programs in watersheds need broader skills in program planning, management and monitoring. At the same time, relevant state and national agencies need better access to networks of scientific and technical institutions to support applications of innovation and best practices.
- f) **Inadequate mechanisms for technology transfer.** There are inadequate mechanisms to create and disseminate applied research and development, knowledge and lessons from India and other regions that can guide program planning and implementation, and actions on the ground by watershed planners, farmers, and other stakeholders.

<sup>9</sup> Video of Karnataka Watershed-II project: <https://www.youtube.com/watch?v=5Toph3llqC4&t=731s>



14. **Moving forward.** Meetings with DoLR and former Neeranchal states from July 2019 have confirmed a strong interest to participate in a new project along the lines of the Karnataka model and with an implementation model that is more state focused. The proposed project would address the problems outlined in Box 1 in selected states by building on lessons learned and adopting a lighthouse approach (see Box 2). The project would also support the development of a new national watershed scheme being proposed by DoLR to begin in 2024 and address the Prime Minister’s commitment in the COP 14 to rejuvenate 26 million ha by 2030.

Relationship to CPF

15. **The World Bank Group’s Country Partnership Framework (CPF)** juxtaposed: a) India’s development priorities as outlined in its FY2017-19 action agenda as well as national missions and programs; b) the assessment of India’s challenges in sustaining progress towards the twin goals as set out in the Bank’s Strategic Country Diagnostic (SCD); c) the WBG’s comparative advantage in the country; and d) lessons derived from decades of WBG engagement in India. The CPF identified three substantive priority areas: a) promoting resource efficient growth; b) enhancing competitiveness and enabling job creation, and c) investing in human capital. In addition to these focus areas, the CPF also set out four operating modalities. These are: a) leveraging the private sector; b) strengthening public sector institutions; c) engaging a Federal India; and d) promoting a “Lighthouse India” that connects practical know-how for the benefit of India and the wider world.

**Box 2. Karnataka as the lighthouse state.**

Karnataka is well positioned to be the lighthouse state given its experience implementing a project that would be replicated in REWARD. The state has engaged a consortium of 14 scientific and technical partners who collaborate on the LRI work, hydrological assessment and monitoring, portal and DSS tool development, and monitoring and evaluation. The state Watershed Development Department and the partners are now highly experienced in delivering this project model and have already worked with other states to share knowledge and lessons learned.

The project effectively addresses issues in Box 1. It is providing high-quality scientific site level data and tools for more effective watershed planning in a shorter time, more efficient targeting of soil and water conservation investments that are also building improved climate resiliency, supporting better convergence with other agencies and programs who are using the same data, strengthening capacities of the government and communities through support from the partners, and sharing knowledge and experience within India and beyond through media, study tours, technical support to other states, etc.

16. **The proposed project is consistent with key elements of the CPF** by promoting resource efficient growth in selected watersheds, investing in human capital at state and national levels, and developing networks of scientific and technical partners. The project will enhance productivity and net income of farmers and contribute significantly to Lighthouse India by implementing new science and data-driven approaches for climate resilient watershed management, land-use planning, and precision farming in a range of agro-ecological conditions in participating states.

17. **The proposed project also supports Government’s Inclusive Growth Strategy:** The project will directly address key strategic actions around Agriculture and Rural Development, including doubling farmers’ incomes, more crop per drop, water to every plot, soil health, and promotion of entrepreneurship.

18. **The proposed project also addresses the World Bank Agriculture and Food Global Practice pillars** of enabling inclusive growth of rural people; promoting agriculture and climate change triple wins (productivity,





resilience, mitigation); increasing agriculture growth and income; and encouraging healthier and safer food and better nutrition.

### C. Proposed Development Objective(s)

The Project Development Objective (PDO) is to: improve land conservation, and agriculture, water and farm climate resiliency outcomes in selected watersheds, and strengthen capacities of national and state institutions and technical networks to deliver more effective science-based watershed development programs.

#### Key Results (From PCN)

PDO Element	Potential PDO Indicator(s)
Improved land conservation outcomes in demonstration sites	<ul style="list-style-type: none"> <li>Percentage of targeted watershed area showing an increase in Normalized Difference Vegetation Index (NDVI)<sup>10</sup> correcting for climate effects<sup>11</sup>;</li> </ul>
Improved agricultural outcomes in demonstration sites	<ul style="list-style-type: none"> <li>Incremental change in agriculture/horticulture productivity and income for selected crops</li> </ul>
Improved water outcomes in demonstration sites	<ul style="list-style-type: none"> <li>Percentage of targeted landscape area showing an increase in Land Surface Water Index (LSWI)<sup>12</sup> correcting for climate effects;</li> </ul>
Improved climate resiliency outcomes in demonstration sites	<ul style="list-style-type: none"> <li>Changes in resilience index composed of a set of variables covering exposure, sensitivity to climate events and adaptive capacity<sup>13</sup></li> </ul>
Strengthened capacities of watershed development institutions	<ul style="list-style-type: none"> <li>Functional networks of scientific partners in project states</li> </ul>
Revised policies for watershed programs	<ul style="list-style-type: none"> <li>Revised National Watershed Guidelines informed by project experiences and lessons learned that will guide new national watershed programs</li> </ul>

### D. Concept Description

19. The proposed operation would deliver six main clusters of activities:

- a) Develop stronger government institutions and enduring networks of scientific and technical agencies to deliver more impactful and climate resilient watershed management in rainfed areas;

<sup>10</sup> NDVI uses the visible and near-infrared bands of the electromagnetic spectrum to analyze remote sensing measurements (based on satellite imagery data) to determine the extent to which a target contains live green vegetation.

<sup>11</sup> For NDVI and LSWI, a baseline remote sensing and GIS study including a geotechnical survey that will set the context for the change detection analysis will be required before the commencement of project intervention.

<sup>12</sup> LSWI uses the shortwave infrared and near-infrared bands of the electromagnetic spectrum to analyze remote sensing measurements (based on satellite imagery data) to determine the amount of water in vegetation and soil.

<sup>13</sup> The index will enable the tracking of the evolution of beneficiaries’ resilience over time through a composite score of variables covering exposure (e.g. ha under cultivation of climate vulnerable crops), sensitivity (e.g. ha under more climate resilient CSA practices such as agroforestry) and adaptive capacity (e.g. the number of watersheds with a completed Land Resource Inventory Atlas and Detailed Project Report that includes climate resilient interventions)



- b) Develop comprehensive data bases and tools in participating states for better outcomes in watersheds;
- c) Apply improved data bases and tools for better agricultural outcomes;
- d) Establish demonstration watersheds that will show the value of these technical innovations;
- e) Improve integration of climate change into watershed management; and
- f) Adopt a Lighthouse model to build sustainable systems for research and development, and technology transfer

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

The Environment and Social risks are Moderate. Implementation capacity for environmental and social safeguards is weak for DoLR and some of the states. Overall, implementation capacity will be strengthened for the project to generate intended outcomes, particularly for those States that have limited experience with World Bank supported watershed projects. An Environmental and Social Assessment (ESA) will be undertaken to identify the potential risks and impacts (refer section B.1 ESS1 for details) identified through study in representative States during project preparation. Given that project locations are not known today, an Environmental and Social Management Framework (ESMF) will be developed based on the findings of ESA. This may also include RPF, IPPF and plans for labor management, stakeholder engagement, citizen’s engagement and gender actions. The ESA will involve focused assessment of key gender gaps, and opportunities, in watershed sector, based on consultations with selected agencies, including women’s collectives, CSOs and technical partners. ESMF will summarize practical strategies and processes for planning, design and implementation stages of the project. Mechanisms to mitigate planning, construction/operational stage and institutional risks will be presented in the ESMF. In addition, measures to integrate environmental enhancement opportunities will also be included in the ESMF. Stakeholder Engagement Plan will also be prepared early in the project. The higher order actions for implementation of ESMF will be recorded in ESCP.



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