The robust Goods and Services Tax (GST) revenues are expected to continue as the economic recovery gathers momentum.

As a signatory to the United Nations Convention for Combating Desertification (UNCCD), the Government of India (GoI) has committed to restore 26 million ha of degraded land by 2030.

The strategy for doubling farmer incomes recognizes that management of natural resources is a comprehensive and scientific approach to achieve sustainability and manage risk in agriculture.

Integrated watershed1 3 management provides a constructive framework to manage natural resources and build a resilient food system. Global experience and good examples from India have demonstrated that effective watershed management can help to comprehensively address land degradation, land use, water conservation, agricultural performance, livelihood security and climate change in rainfed areas, while building a more resilient food system. A resilient food system requires substantial investments in restoration of ecosystems to support precision farming, based on efficient use of natural resources and inputs, including water, land, fertiilzers and pesticides. In addition, integrated watershed management provides opportunities to support rural livelihoods in the short, intermediate and longer-term as part of strategies to address impacts from COVID-19. Interventions addressing both COVID-19 and climate change are well-reflected in integrated watershed activities, such as improved targeting for COVID-19 recovery activities, working under continued COVID-19 restrictions, interventions on improving agro-climatic resilience, strategic climate analytics for priority watersheds, improved weather monitoring and early alerts.

Watershed management programs in India have evolved over time in terms of their approach, strategy and operational scale.

From the late 1980s, programs began focusing on soil and water issues and productivity in resource-poor, poverty-stricken upstream areas. From the late 1990s, a new approach based on participatory watershed planning, implementation and management was pioneered in several states including Odisha (supported by UK Government) and Karnataka (supported by UK Government, DANIDA, World Bank).

Based on the size, the hydrological unit is termed as water resource region, basin, catchment, sub-catchment, watershed, sub-watershed and micro-watershed respectively.

The operational scale of watershed development also shifted over time from larger treatment areas to smaller micro-watersheds and then to a meso-scale focused on clusters of micro-watersheds covering contiguous areas

8. The Department of Land Resources (DoLR) of the Ministry of Rural Development (MoRD), GoI is the key national agency responsible for watershed development.

State Level Nodal Agencies (SLNAs) or State Watershed Departments (SWDs), housed in various agencies,[4] are responsible for delivering national watershed programs, including watershed planning, resource mobilization, monitoring, capacity building and coordination through their district and block level structures. To facilitate meaningful engagement of the community in planning, implementation and monitoring of watershed development, community level institutions and local government bodies are supported.

In the context of COVID-19, watershed management has the potential to provide rural employment to migrant workers in public works, livelihood protection for vulnerable households, productivity enhancement and value addition services to farmers.

Under the IWMP/WDC-PMKSY, 8,214 watershed development sub-projects (each covering about 5,000 ha) were approved, between 2009-10 and 2014-15 in 28 states, covering an area of about 39.07 million ha.

Based on the total of 96 million ha of rainfed lands in India and the area treated to date with government watershed programs (20.5 million ha), 75.5 million ha remain to be treated. Even with complete implementation of the remaining sub-projects, about 57.0 million ha of rainfed areas and wastelands remain to be developed. While these programs have treated significant land areas to date with basic soil and water conservation, the broader results have been below expectation in terms of: incorporating hydrology, water management and climate resiliency into plans and investments; supporting farmers to transition to climate resilient farming practices, more value addition and market access for increased productivity and incomes; and strengthening rural livelihood development to improve overall equity and opportunities for women. Weak institutional capacity, poor inter-departmental coordination, policy gaps in addressing operation and maintenance, and adhoc

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[4] Depending on the state, this could be the Department of Agriculture, Panchayat Raj Department, Forest Department, or in some cases a separate Watershed Development Department.

Current watershed programs need to adopt a stronger science-based approach by: applying modern tools and comprehensive site data for more efficient and integrated planning among the line departments; reducing time for sub-project planning and execution; and shifting monitoring systems from tracking physical and financial progress to an approach that also measures broader results and impacts. The institutional architecture of the national watershed program reaches down to communities, however inadequate technical capacities must be improved for better scientific planning, addressing climate change and helping farmers achieve higher incomes.

States need support to implement new national watershed guidelines. Drawing on guidance from the NRAA, the DoLR revised the Draft Guidelines for New Generation Watershed Development Projects 2020.

These approaches included: (i) the Land Resource Inventory (LRI) program that developed comprehensive databases at a micro-watershed and farm plot levels, covering biophysical and socio-economic data sets, particularly enhanced soil assessments; (ii) development of hydrological tools and models that could be integrated into LRI databases; (iii) creation of a functional web-based portal to promote easy access to data sets for multiple purposes in targeted watersheds and for external research; (iv) development of nine Decision Support System (DSS) tools to improve watershed planning, and targeting of soil and water conservation investments taking into account water budgets, farmer decision-making around crop selection, precision farming and fertilizers, among others; (v) building of a strong network of local and national technical partners to support scientific inputs in watershed management programs; and (vi) intensive third-party monitoring.

[17] Integrated Watershed Management Guidelines, 2011; GoI.

[20] Impact Study of Karnataka Watershed Development Project II (Sujala III), TERI; 2019.

Key lessons from watershed management programs financed by the Bank, from within India and outside the country, have informed the design of the proposed Rejuvenating Watersheds for Agricultural Resilience through Innovative Development (REWARD) Program.

The proposed operation will support the objective of promoting more resource-efficient, inclusive and diversified growth in the rural sector under Focus area 1 by contributing to increasing and diversifying income-generating opportunities, while improving efficiency in the use of water and land resources in agriculture. It will support climate resilience and improved natural resource management through investments in infrastructure, facilitating changes in agricultural practices, crop diversification and minimizing agriculture risks. The proposed Program will also contribute to Focus area 3 by building stronger technical and management capacities at different levels to improve the delivery of more science-based and data-driven watershed programs.

It will also contribute to improving disaster risk management through its contribution to mitigating drought risk in rainfed areas.

The Program will also establish strategic partnerships with selected states which will receive financing under the Program and foster the development of scientific networks in these states.

Drawing from recent Bank experiences in India with multi-state programs across different sectors the proposed financing instrument is a Program for Results (PforR) with a loan to India whose funds are allocated in part to the central DoLR and in part to the participating states. Direct Program Agreements will be entered into between the participating states and the Bank. A straight Investment Project Financing (IPF) model would not be suitable because it would not provide the incentives needed to stimulate action and foster institutional improvements, without which, longer-term

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[2] 2 Lessons in the watersheds sector are based on secondary literature reviews and technical consultations with civil society organizations, donor agencies (e.g IFAD, KFW), technical resource agencies and experts.

The PforR option has a number of specific advantages over an IPF approach including: (i) movin away from a business-as-usual approach and bringing a stronger results-orientation in implementation and strengthening of DoLR and state capacities for results-focused implementation; (ii) building on existing program systems while also providing scope for improvements, such as with monitoring and evaluation (M&E) and fiduciary and safeguards systems; (iii) reducing procurement transactional costs during implementation; and (iv) building on exisiting knowledge sharing systems to promote more effective cross-learning across states for adopting innovations and best practices in the design and implementation of watershed programs by the states. The option of an IPF with performance-based conditions was dropped in view of the comparatively greater strength of the PforR instrument in building long term institutional capacity for delivering results.

A Development Policy Operation (that was also evaluated) would not be suitable, as the program already provides a policy and programmatic underpinning for revitalizing rainfed areas with reasonably well-defined objectives. Further, the DoLR and NRAA have already developed new national watershed guidelines.

The DoLR provides national guidelines and funds to states through national watershed schemes for execution at the sub-project level.[24] The long-standing funding pattern of 90:10 (center:state) changed to 90:10 in hilly & North Eastern States, 100% for UTs without legislature, 90.:10 for UTs with legislature and 60:40 for other States from 2015-16. The actual fund release from DoLR to the states has ranged from USD 214 million in 2016-17 to USD 256 million in 2018-19.

DoLR aims to bring approximately 4.95 million ha of hitherto untreated land under watershed development. The current WDC-PMKSY national watershed scheme got an extension till March 2022

Through the 2020-21 fiscal year in the current WDC-PMKSY and the follow-on program, the DoLR plans to undertake watershed management on 4.95 million ha during 2021-2026. The cost-sharing with states is expected to continue at 60:40, inferring that the total cost of the new program will be USD 1.68 billion.

The old cost norms that were set in the 2008 National Common Guidelines for Watershed Development Projects remain unchanged. Due to inflation, the old cost norms were generally viewed as inadequate to finance effective watershed management. The new cost norms will apply to all State/UTs taking up the new national watershed program.

In addition, the two states and the DoLR are commting an additional amount of USD 52.71 million, as per DEA norms for IBRD supported projects. At the central level, the REWARD Program scope covers management, monitoring, communication and knowledge sharing functions of the DoLR.

All participating states have been working with DoLR to implement watershed programs.

Under various schemes and projects to date[28], about 6.7 million ha is treated. Of the remaining area, 5.4 million ha is available for treatment. Starting in 2019-20, the state also allocated INR 1,000 million/year (USD 13.7 million/year) for the next five years to watershed development in drought prone areas, guided by successful approaches and innovations in KWDP-II. It was among the first states to constitute a separate Watershed Development Department in 2000.

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[27] SWDs have selected technical partners to provide site-specific land resource information, remote sensing data/applications, and hydrological data for taking up science-based watershed management in the states. Karnataka: National Bureau of Soil Survey and Land Use planning (NBSS&LUP) Bangalore; Indian Institute of Science (IISc) Bangalore; University of Agriculture Science (UAS) Bangalore; UAS Dharwad; UAS Raichur; University of Agricultural and Horticultural Sciences Shivamogga; and KSNDMC; Odisha: Odisha University of Agricultural Technology, Indian Institute of Technology-Bhubaneshwar, Indian Institute of Social and Water Conservation; Indian Institute of Water Management (IIWM), NBSS&LUP (Kolkata Centre) and Odisha State Remote Application Center (OSRAC).

[28] In addition to implementing WDC-PMKSY, Karnataka has implemented several externally aided projects with support from UK Government, DANIDA, Swiss Development Corporation (SDC) and the World Bank (KWDP-I and KWDP-II).

A total of 9,152 micro-watersheds covering an area of about 4.7 million ha are yet to be treated. The WDC-PMKSY has been the main source of funding for watershed development in the state. The Odisha Mineral Bearing Area Development Corporation (OMBADC) set up by the Government of Odisha (GoO) in 2014 also provides funds to watershed development in the mining districts of the state. In 1977-78, the state created the Directorate of Soil Conservation, which is responsible for watershed development.

Additional financing may also be considered by the World Bank.

The Results Areas outline the broad interface between Bank contributions to the national watershed program at the central and state levels, and the key results that the REWARD Program will incentivize (Figure 1).

Results Area 1 will focus on strengthening the institutional capacity and policy environment for science-based, participatory watershed development in the participating states.

Supporting policy for watershed development, by developing: (i) data and lessons to support national technical standards on science-based watershed development; (ii) strong operation and maintenance policies for states for watershed management; and (iii) a pilot of science-based fertilizer demand and supply policies[29]

Strengthening monitoring and evaluation systems at national and state levels, by: (i) developing and deploying a GIS-enabled management information systems platform; and (ii) establishing a scientific assessment and evaluation system.

These guidelines would be complementary to the new national watershed guidelines, providing more detailed local guidance to WCs and GPS on their roles and responsibilities with watershed development programs

[30] The Performance Assessment Tool will have indicators and a scoring system. The indicators could include: handing over of treated watersheds to WCs/GPs completed; percent of Watershed Development Fund mobilized by the WCs/GPs; asset register maintained by WCs/GPs; training of WC/GP members on O&M of watersheds completed; multi-year O&M plan developed by WCs/GPs.

The scientific assessment and evaluation system will include an impact evaluation at the state level that encompasses the application of remote sensing and GIS technologies, process monitoring, and thematic studies for assessing change in specific parameters (such as groundwater level, sediment load, soil organic carbon) to evaluate the effectiveness of watershed investments.

Results Area 2: Science-based watershed development for climate resilience and enhanced livelihoods

36. Results Area 2 will concentrate on science-based watershed development and help demonstrate more efficient and effective planning and implementation of watershed sub-projects that contribute to climate resilience and livelihood enhancement. The emphasis on climate resilience is of critical importance in rainfed areas and the focus on livelihoods is necessary, especially in the context of COVID-19, as it will enable quicker local/community recovery and build longer-term resilience.

Developing and implementing science-based watershed development plans[3], by: (i) developing partnerships between SWDs and scientific and technical institutions in key areas[4]; (ii) developing land resource inventories and hydrology databases; (iii) developing decision support system tools; (iv) developing digital libraries and portals; and (v) developing detailed reporting for select micro-watersheds[5].

Empowering farmers with science-based and just-in-time agro-advisories, through information and communication technologies channels in partnership with agriculture extension systems, tailored to meet the requirements of small, marginal and women farmers.

Enhancing livelihood and COVID-19 recovery by the poorest households and women, by: (i) establishing or strengthening FPOs in select watershed clusters, including FPOs led by women; (ii) providing working capital to FPOs; (iii) establishing partnerships to enhance local and distant market linkages with farmers and FPOs; (iv) developing basic agri-processing infrastructure in the FPOs to reduce losses; and (v) providing inputs to farmers and women agriculture workers linked to FPOs; all with an emphasis on climate mitigation and adaptation opportunities along the value chain.

The SWDs may converge with the State Rural Livelihood

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[3] States have received cabinet approvals for LRI data collection in a wider area of 1.5 million ha (Karnataka 1.0 million; Odisha 0.50 million ha) in support of long-term institutional capacity building and watershed planning preparing for the future. Farmer outreach will primarily be done in a subset (0.8 million ha) of this larger area for each state (Karnataka 0.5 million ha; Odisha 0.3 million ha) with a possibility of extension beyond these geographies. Activity (v) will restricted to 200,000 ha area in the states of Karnataka and Odisha.

[4] Participating states will establish and maintain partnerships throughout the project period through formal arrangements such as contracts and memoranda of understanding (MoUs) on the following, at a minimum: remote sensing, land resource inventory and hydrology. These partnerships will help the states to do LRI data collection in a wider area of 1.5 million ha (Karnataka 1.0 million; Odisha 0.5 million ha) in support of long-term institutional capacity building and data-oriented watershed planning for which state cabinet clearances are in place.

[5] The selection of model watersheds will be based on criteria including climate change vulnerability, drought incidence, extent of rainfed area, groundwater status, socio-economic status, value chain opportunities, capacity of district watershed teams, performance on ongoing watershed sub-projects, availability of LRI and hydrology data from earlier assessments (e.g., in Karnataka), and exclusion of forest areas, urban areas and command areas.

The CIGs will utilize the grant as per the LEP for undertaking new or for up-scaling existing income generation activities.

The stated objective of the REWARD Program and its design are focused on generating climate adaptation benefits, and to a limited extent, mitigation benefits.

The Program design responds to local vulnerability by supporting and incentivizing implementation of science-based watershed development in the rainfed, degraded lands of Karnataka and Odisha.

Science-based watershed development is a landscape approach that integrates sustainable management of natural resources with livelihood considerations.[37] The Program includes several elements of Climate Smart Agriculture such as soil management (soil moisture management, erosion control, integrated soil fertility management); water management (ridge area treatment, drainage line treatment, rain water harvesting, efficient irrigation); provision of weather-based and LRI-based agro-advisories to farmers; appropriate crop selection (including horticulture and agro-forestry); and value-chain interventions that can reduce post-harvest losses and enhance incomes through better access to markets.

The Bank will provide implementation support to ensure that the REWARD Program remains in compliance with the agreed E&S requirements as well as the PforR policy.

PDO Indicators

a) Percentage of Watershed Committees (WC) and Gram Panchayats (GP) which demonstrate satisfactory watershed management as measured through a performance rating system
b) Land area treated with science-based watershed management technologies
c) Number of farmers who adopt resilient agriculture technologies and practices
d) Increase in climate-adjusted soil moisture in targeted watershed areas
e) Direct Program beneficiaries (number, disaggregated by gender and social group).

The primary beneficiaries of the REWARD Program are communities in rainfed areas that rely on sustainable land and water resources for livelihoods and ecosystem services. The sustainable development of watersheds based on better scientific inputs and technical capacities will lead to more effective conservation of soil, improved surface and groundwater availability and efficiency of use, and enhanced agricultural productivity and profitability, thereby generating sustainable improvement in incomes.

State Watershed Department/State Level Nodal Agency: Strengthen the exisiting SLNAs to manage the REWARD Program; sign MoUs with qualified scientific and technical partners for LRI and hydrology data collection and application of DSS tools and hosting the data on a digital library; develop standard protocols for using digital data for watershed planning and train district and block level staff in its use; strengthen the existing MIS, M&E and grievance redress mechanism (GRM) systems and adopt the same for the Program; follow an institutional staffing plan for strengthening district and block offices and implement the same; strengthen policy and guidelines for maintenance and monitoring of treated watersheds; develop policy and guidelines for performance incentives for WCs/GPs; monitor Program performance; develop quarterly, half yearly, annual progress reports; support state/district training institutions in delivering required trainings; develop IEC content and tools for communications with WCs/GPs and farmers; and manage finance flows and ensure regular audits.

Watershed Committee/Gram Panchayat: Form user groups and watershed committees with representation from all stakeholders; actively participate in preparing DPRs; implement plans in an effective manner; ensure effective O&M of treated watersheds; maintain all required records; and resolve all grievances.

It is based on technical inputs and participatory community planning. It includes details on the watershed, user groups, problem typology, management plan with proposed interventions, institutional mechanisms, capacity building plan, expected outcomes, phasing and budgeting, etc., supported by relevant maps. The management plan includes Soil and Water Conservation Plan, Productivity Improvement Plan for major agriculture and horticulture crops, Crop Plans, etc.

The World Bank report on Watershed Development in India (2014) underlined the importance of linking soil and water conservation efforts with livelihoods for greater sustainability.

As the REWARD Program aims to promote approaches based on better scientific planning, saturation in treatment coverage, and overlaying value chains, active collaboration between line departments and their own programs is essential.[41] The LRI data and DSS tools can also assist other line departments in planning interventions an targeting their resources in watersheds, hence providing them incentives to collaborate with SWDs.

The MSP in Karnataka,[42] supported by the 2030 Water Resources Group (WRG),[43] created a new workstream to support the REWARD Program

Karnataka will also establish a national CoE on watershed management in collaboration with nationally renowned technical organizations, to train professionals from across India and other regions on innovative approaches and technologies for improved watershed management.

The national MIS mainly tracks physical and financial progress at the state level.

The use of remote sensing (such as statellite and drone imagery) for tracking results (such as increase in soil moisture, change in vegetative cover, siting and number of soil and water conservation structures), is also envisaged.

The current focus of the MSP is on issues related to agriculture water, urban water and industrial wate

SWDs will develop and roll out an enhanced MIS to capture essential details of program management, field-level implementation details, Program results, fiduciary aspects, financial flows, grievances, post-implementation sustainability, among others, using a state-of-the-art IT platform for analytics and reports. A web-based architecture is proposed for the MIS, incorporating remote sensing and GIS-based monitoring, analytics and reporting. This would be done, however, with the overarching consideration of ensuring that the state MIS merges with the existing national MIS; such that, while the state MIS becomes broader in data coverage (i.e., goes beyond physical/financial performance), it does not supplant the structure of the national MIS which has a broader geographic coverage.

To ensure consistency, accountability and transparency in disbursing funds against DLIs, the DoLR and the two states contracted qualified and capacitated Independent Verfication Agencies (IVAs), following their own procurements processes The Terms of Reference (ToRs) for the IVAs were developed by the DoLR and the two states in consultation with the Bank.

The amount of World Bank financing under the Program will be equal to or less than the total underlying Program expenditures which is financed from government resources. Any unaccounted or unutilized funds disbursed by the World Bank at the close of the Program, will be refunded to the World Bank. This will be applied to DoLR and the two participating states in a disaggregated manner, that will ensure that the underlying expenditures for each of the implementing agencies are reconciled with the amount of the World Bank financing allocated therein.

Systems development and deployment: The Program will promote collaboration with national- and state-level scientific and technical agencies for: gathering LRI, hydrology and other data; coding and uploading the data to the digital library; and applying required DSS tools to DPR planning and execution. Similarly, the Program will support the development of an improved MIS system for tracking the key sub-project cycle components, site-level sub-project management (such as procurement, quality of construction/works, time taken, cost) and the O&M of treated watersheds.

Managing environmental and social risks: Capacity building on data-driven and science-based approaches for developing and implementing DPRs and monitoring, will help mitigate environmental risks related to hydrology, soil erosion, soil moisture and fertilizer use, among others. Also, capacity building related to the dissemination of LRI cards will help improve decision making by farmers on appropriate crop selection and agriculture practices. The Program will undertake appropriate trainings and capacity building measures on participatory watershed planning and implementation, adoption of gender and socially inclusive processes, governance and functioning of the WCs and GPs, grievance redressal and social accountability, design of SOPs for different sub-project cycles, social outreach and IEC activities to build awareness of target communities, and improving MIS systems to capture key data on social inclusion and sustainability issues.

Fiduciary capacity: The capacity for managing fiduciary and procurement issues will be strengthened through hiring and training required staff at the district and block levels, improving monitoring systems and capturing related data. The states will also adopt the Public Financial Management System (PFMS) and appropriate audit arrangements.

Based on the analysis, the following have been identified as key weaknesses in the sector: (i) weak institutional capacity, especially at the decentralized levels of district, block and GP for scientific planning, effective implementation and O&M; (ii) inadequate science and hydrology applications in the development of watershed plans (currently, they are largely based on community knowledge and demand physical surveys and inadequate data sets); (iii) little attention to demand-side water use and management; (iv) small size of hydrologic investments in sub-watersheds; (v) monitoring largely limited to physical and financial progress with no scientific impact assessments; (vi) inadequate mechanisms and incentives to promote local governance, innovations and ownership, and community participation is addressed as a one-time activity; (vii) ineffective policies and approaches to support O&M of treated watersheds; (viii) poor linkages to value chains and markets for farmer-income improvements; and (ix) poor inter-departmental coordination for integrated planning and resource utilization. However, the draft revised national watershed guidelines developed by the DoLR, advocates strengthening these areas and will be a solid basis for Program implementation.

LRI atlases also provide data for advisories to farmers on crop selection, crop water management and nutrient management.

[45] Includes the adoption of LRI and weather-based agro-advisories disseminated among farmers through information and communication technology (ICT) channels and the agriculture extension system.

[46] Includes the use of energy-efficient equipment and renewable energy in agri-processing, and development of climate risk resilient infrastructure where feasible. Synergy with agriculture value chains initiatives by the Bank as well as by other development partners will be explored including, for example, the Bank supported Odisha Integrated Irrigation Project for Climate Resilient Agriculture and value chains under the Karnataka Water Multi Stakeholder Platform (MSP), managed by the 2030 Water Resources Group in Karnataka.

On the institutional front, the Program is well designed to strengthen capacities of the DoLR, SWDs and also GPs and watershed committees through a mix of tools such as: partnerships with technical organizations, capacity building of all stakeholders, developing SOPs for key sub-project phases, instituting performance incentives for GPs and committees, and facilitating effective collaborations between related departments and programs.

Concrete and measurable benefits to the communities are ensured through: treatment of 200,000 ha benefitting about 72,000 farmers; about 20 percent increase in soil moisture status; promoting adoption of climate resilient technologies by about 43,200 farmers; strengthening/establishing about 30 farmer producer collectives with forward and backward value chain linkages; and reach about 115,200 farmers with LRI and weather based agro-advisory services to help improve productivity.

The incentives for key stakeholders are: (i) communities benefitting from improved productivity and livelihood opportunities; (ii) WCs/GPs having incentives and building capacities to improve their performance, which can also function as a good political incentive; (iii) district and block offices benefitting from improved team capacity and IT enabled tools (which contribute to reduced work load); (iv) SWDs benefitting from technical agency support, improved coordination with other line departments, and lessons from innovative pilots, all leading to more effective program management and enhanced results/impacts; and (v) generation of lessons that would help the DoLR to effectively implement the new national watershed program and achieve targets.

State government funding for watershed activities in Karnataka, and Odisha put them on a sound footing in terms of finances demonstrating strong commitment. All two states have the capability to manage a large number of watershed projects and are exploring technological applications to improve cost effectiveness.

Funds flow from the DoLR to the respective state treasuries under the WDC-PMKSY against a specific budget head in each state.[48] Expenditure is tracked at the treasury level only under this budget line and no further sub-heads are recorded.

This provides the basis for each state to allocate funds to each project and track expenditure through their respective financial systems and exercise budgetary controls. In addition, states draw funds from MNREGS to complement funds for taking up the watershed works component of the

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[47] Of the INR 197,000 million that DoLR disbursed under IWMP/WDC-PMKSY, Karnataka accounted for 10 percent and Odisha for 5.5 percent.

The share of IBRD loan in the total program budget of USD 410.96 million is 28 percent; with 34 percent, 26 percent and 31 percent respectively for DoLR, Karnataka, and Odisha.

Second, by establishing a scientific assessment and evaluation system including a rigorous impact evaluation at state level that includes the application of remote sensing and GIS technologies, process monitoring and thematic studies for assessing change in specific parameters (such as groundwater level, sediment load, soil organic carbon) to evaluate the effectiveness of watershed investments.

Watershed development is expected to contribute to improved agricultural performance in targeted watersheds. The REWARD Program will bring more area under cultivation, improve cropping patterns, intensity and management of fallow and degraded areas due to increased access to more stable water supplies.

Four different scenarios have been assumed to calculate Economic Internal Rate of Return (EIRR) over a 20-year period.

The EIRR of the project over a 20-year period for the base case, excluding benefits from GHG emission reduction, is 35.0 percent with a Net Present Value (NPV) of USD 285.4 million at a discount rate of 12 percent.

sheds (EIRR) over a 20-year period.
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[9] Estimated funding to be provided under WDC-PMKSY 2.0 to DoLR (USD 5.41 million), Karnataka (USD 148.65 million) and Odisha (USD 89.19 million) i.e., USD 243.25 million will be utilized for the implementation of watershed project activities as per the guidelines of WDC-PMKSY 2.0.

Placing a monetary value on the potential GHG mitigation benefits in terms of reductions in GHG emissions and increased carbon sequestration (estimated at 9.39 million tonnes CO_2eq over the project life of 20 years), the base case EIRR increases to 39.2 percent. This assumes a shadow price of carbon per tCO_2eq of USD 40 for 2021 and reaching USD 50 at the end of the 20-year period, as recommended by the World Bank. The analysis was also conducted for a high shadow price of carbon scenario as recommended by the World Bank, resulting in an EIRR of 43.0 percent.

Financial management. Financial management activities for the REWARD Program draw lessons from and are built upon existing arrangements for IWMP/WDC-PMKSY. Similar to PMKSY, the REWARD Program will be budgeted for as a separate line under the implementing departments/ministries and approved annually through the respective legislative processes. In Odisha, the budgets are drawn and transferred into the bank account(s) of SLNA and thereon into bank accounts at district/block and WC levels.

At the WC level, REWARD Program funds will be transferred into bank accounts.

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[1] The Value Chain benefit estimates have been estimated using similar World Bank funded projects in India (JOHAR, TNRTP, BTDP, NRETP). The benefits have been estimated to be an annum additional income of 13,232 per household engaged in value chain activities or a B/C ratio of 0.95.

[2] The Vulnerability Reduction benefit estimates have been estimated using similar World Bank funded projects in India (BRLP, TNPVP, NRLP) for simple and enhanced credit-based livelihood activities. The benefits have been estimated to be an annum additional income of 15,465 per household or a B/C ratio of 0.99.

This practice also does not lend itself to efficient cash management as unspent funds could be better utilized elsewhere. As mandated by the GoI, Odisha uses the PFMS[53] for fund management and expenditure processing using the Expenditure, Advance and Transfer (EAT) module.

As a mitigation measure, it has been agreed that Odisha and Karnataka will: (i) open separate single state level bank accounts with linked zero-balance bank accounts at the state, district, block and WDC levels; (ii) mandate the use of the PFMS platform for the Program, using the EAT module for all Program related expenditures; (iii) generate Program related financial reports on PFMS and strengthen the process followed for uploading data on financial progress on the DoLR IWMP MIS.

Based on the activities identified in the Program scope, the main procurable items are: (i) community procurement of works and supplies towards micro-watershed sub-projects; (ii) consultancy services such as the engagement of technical partners, capacity building, M&E, IVA, communication, knowledge management; and (iii) goods (such as laboratory equipment) and IT systems (such as development of a decision support system).

The Odisha SLNA will follow Odisha Financial Rules 2000 and various other notifications issued from time to time. The DoLR will follow the General Financial Rules 2017 and associated procurement manuals (goods/works/services) of the GoI. As mandated under their respective regulatory frameworks, each implementing entity will follow their respective e-tendering systems above thresholds defined in their regulations; and for the procurement of goods, the Government e-Marketplace (GeM) portal of the central government will be used by all implementing entities.

Activities such as needs assessment, DPR preparation, cost estimation for watershed projects, are governed by the Common Guidelines for Watershed Development Projects dated 2008 (revised 2011) of the GoI and will continue to be governed by new guidelines issued from time to time. Manpower for such works is sourced from the local community and paid at the wage rates notified by the GoI; supplies are sourced from local market at rates no more than those specified under Schedule of Rates (SoR) published by the respective state governments

Performance is found acceptable, with a scope for

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[53] Public Financial Management System [PFMS] developed by the Planning Commission and the Office of the Controller of Accounts, Ministry of Finance, GoI the objective of establishing a financial management platform for all plan schemes, a database of all recipient agencies, integration with core banking solution of banks handling plan funds, integration with state treasuries and efficient and effective tracking of fund flow to the lowest level of implementation for plan scheme of the Government.

An environmental and social systems assessment (ESSA) for the REWARD Program has been completed in line with the World Bank Guidance for conducting ESSAs for PforR financing operations, and separate reports have been prepared for the two participating states along with a consolidated summary report. The ESSA assesses the gaps in the existing institutional, operational and regulatory systems and capacities to manage E&S risks and priorities and recommends measures for strengthening them. The ESSA process involved desk review of relevant E&S plans/frameworks, implementation documents and other technical studies/reports related to national and state-supported watershed programs, including the World Bank supported watershed projects in Karnataka.

The overall E&S impacts of the REWARD Program are likely to be positive, owing to benefits such as increased groundwater level, improved soil condition and increase in crop productivity due to multi-cropping, increased rural incomes and reduced poverty.

While land acquisition and involuntary resettlement interventions are excluded from support under the Program,5 6 selected watershed interventions may need to be screened for any small scale, adverse social impacts.

The Program includes several elements of Climate Smart Agriculture including soil management, water management, provision of agro-advisories to farmers, appropriate crop selection which are clearly spelt out in Results Area 2 that supports climate change adaptation through incentivizing the adoption of just-in-time agro-advisories based on LRI and weather-based information. Also, the risk of extension of watershed interventions to forest, wetland and other environmental sensitive areas without initial screening at the DPR preparation stage is worth mentioning.

Other risks envisaged are: ignoring macro- and micro-level environmental issues (such as overall hydrology which includes water resource budget, conservation, flow) in the macro-watershed, change in groundwater table, change in water quality, water intensive crop selection and increase in pesticide use. However, these risks are designed to be mitigated through Results Areas 1 by strengthening M&E systems at national and state levels, and deployment of a GIS-enabled MIS platform that focuses on tracking activities, outputs and outcomes, and integrates tracking of process efficiency and quality. The Program will establish a scientific assessment and evaluation system, including an impact evaluation that encompasses the application of remote sensing and GIS technologies; process monitoring and thematic studies for assessing change in specific parameters (such as groundwater level, sediment load, soil organic carbon) and evaluate the effectiveness of watershed investments. During the course of the Program, value of ecosystem services (such as water budgeting) and their contribution to watershed development scoping will be explored.

Among the states, the institutional arrangements, staffing and operational processes for managing E&S measures systematically across the watershed planning and implementation phases is weak and shows considerable variation. Staffing for E&S management at district, block and PIA levels is either absent or unclea Clear operational guidance and mechanisms on E&S measures as well as the necessary technical and operational skills to manage E&S measures are not available. The current system lacks systematic screening for E&S risks for adverse effects on biodiversity, cultural resources, common property, trans-boundary impacts on downstream users and workers, as well as community health and safety issues There is no inter-departmental co-ordination mechanism in dealing with forests, wetlands and other environmentally sensitive areas in the watershed plan.

In addition, the LRI/DSS platform should display land use and land ownership data, as well as environmentally sensitive areas on the LRI map to avoid issues Crop and water use advisories by the government should include advisories on adverse impacts of overuse of insecticides, chemical fertilizers, water conservation and pesticide and fertilizer management plan to be prepared by the government. Opportunities for pilots will be explored to understand the cumulative aspects of valuation of ecosystem services and their contribution to watershed development through landscape approaches for integrated planning with other departments to conserve soil moisture, improve water yield, ground water, and reduce sediments in the long run towards environmental sustainability.

In states where the majority of the funds will be deployed, three tiers of the government need to work together to create an effective and sustainable watersheds program.

Nonetheless the risks that fiscal resources may be reallocated away from the supported programs and that insufficient counterpart funding might be provided are small. First the amounts required for counterpart funding (USD 295.96 million over five years and multiple states) are small relative to overall budgetary resources. Second counterpart funding from the states will largely be provided via Centrally Sponsored Schemes that are highly subsidized by the central government and for which, therefore, strong commitment is likely to exist.

The complex relationships between the state, district/block and local governments in watershed programs can slow planning and implementation, especially if accountabilities are weak.

A signal of increased stakeholder coordination is that the SWDs (Department of Agriculture in Karnataka and Odisha,) in the participating states are in the process of: (i) assessing the status and filling gaps in the human resource strength at the state, district and block levels, and (ii) finalizing MoUs with scientific and technical partners for their engagement in the REWARD Program.

These include lack of hydrologists and agribusiness specialists among the frontline staff at the district and block levels, weak O&M of treated watersheds, etc.

During implementation, the Program includes a considerable number of institutional capacity building measures such as: augmenting skill sets; training downstream staff on scientific approaches to watershed management; extensively using technical support partners who would build technical capacity; establishing a CoE to provide training support to all states on scientific approaches to watershed management; and providing incentives to GPs for post-Program sustainability.

However, these states will establish partnerships with technical and scientific agencies with experience in LRI.

Second, risks stemming from weak capacities of GPs and the WCs will be addressed by leveraging experience of the Panchayati Raj and Rural Development Departments for ICT-based capacity building, performance monitoring and course correction, and incentivizing good performance. Third, the risk of difficulties in promoting community collectives for marketing and value chain linkages will be addressed by starting interventions early during Program implementation, beginning in selected high-potential areas, facilitating technical support for PPPs in value chain development by the MSP under WRG 2030, and leveraging the experience of the departments of agriculture and horticulture in this area.

Limited capacity in terms of quantum of funds and level of operations handled by the PIAs, inadequate staffing, scattered rules and regulations, and the decentralized nature of the REWARD Program with implementation at the GP level poses challenges regarding consistency in application, compliance, efficiency and transparency.

Risk mitigation actions to address fiduciary risks have been included in the PAP.

The science-based planning approaches to be adopted by the Program reduce the risk of not capturing issues such as overall water budget in the macro-watershed, change in groundwater table, and change in water quality parameters with methods of soil, land and water conservation. Other risks related to over-use of chemical fertilizers and pesticides are expected to be mitigated through agro-advisories issued to farmers. The Program does not involve any activities that would result in land acquisition or any adverse impact on customary ownership/access to natural resources and cultural heritage of scheduled tribes and local communities.

and
The science-based planning approaches to be adopted by the Program reduce Other risks related to over-use
change in water quality parameters with methods of soil, land and water conservation.

However, the Program will ensure that water balance estimation becomes an integral part of the micro-watershed and sub-watershed plans. Further, farmer training on climate-resilient farming and provision of weather based agro-advisories will contribute to building resilience..

(Hectare(Ha))	■	0.00	500,000.00
Of Which, area in Odisha. (Hectare(Ha))	■	0.00	300,000.00
Farmers accessing agro-advisory information.			

Performance Assessment Tool (PAT) will contain indicators covering each phase of the watershed sub-project (preparatory phase, execution phase, and O&M phase).

Performance Assessment Tool (PAT) will contain indicators covering each phase of the watershed sub-project (preparatory phase, execution phase, and O&M phase).

Type of DLI	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Process	No	Text	5,985,000.00	5.00

Period	Value	Allocated Amount (USD)	Formula
Baseline	0.00		
Prior Results		0.00	
2022	Program Management Unit (PMU) established.		

Procedure for DLR 2.2: The IVA will verify the DPRs through desk review, and check that the DPR is generated by utilizing the LRI outputs with key environmental and social data/information and is approved by the Gram Sabha.

This will be verified through a comparison of the total number of parcels recommended for soil and water conservation and drainage line treatment in the micro-watershed and the number of treated parcels as reported in the PCRs.

The purpose of the field verification is to check if the soil and water conservation and drainage line works have been implemented. Compliance with Environmental and Social guidance, including the Excluded Activities List, will also be verified.

This criteria will be considered as met if 90% of the sampled soil and water conservation and drainage line works are found to be completed during the field verification.

This criterion will be considered as met if 90% of the sampled farmers are found to have adopted the recommended technologies/practices.

This indicator checks if a government directive on national technical standards on improved watershed management has been prepared in a participatory manner and formally disseminated to states by the DoLR.

Government directive on national technical standards for improved watershed development are formally disseminated to states.

.0 Program Description

The proposed USD 115 million International Bank for Reconstruction and Development (IBRD) allocation to the REWARD Program will support a subset of the new Watershed Development Component of the national Pradhan Mantri Krishi Sinchayee Yojana (WDC-PMKSY) program that has an outlay of USD 1.68 billion.[57] The duration of both operations is five years (2021-22 to 2025-26).

The Program will use a PforR lending model to improve performance incentives.

Each state will contribute the remaining counterpart share as per GoI norms (USD 0.58 billion) thus taking the total program budget to INR 124,048 miillion or USD 1.68 billion.

[58] Selected watersheds are expected to function as model waterhed sites for demonstration of good practices to aid future replication in other watersheds both in the participating states and other states with similar climate change vulnerabilities. The implementation of the model watershed will be on the basis of science-based watershed DPRs and will include interventions on: community engagement; engineering works including as relevant ridge area treatment, drainage line treatment, soil and moisture conservation, rainwater harvesting, etc. ; agriculture and horticulture including on-farm soil moisture conservation and water harvesting practices; treatment of common lands including pasture development, afforestation (forestry and agroforestry plantations in non-forest areas), etc.

The creation and management of a local watershed development fund for sustainability of the created assets and preparation of project completion reports will be emphasized.

The Program Expenditure Framework (PEF) for the proposed PforR operation is USD 410.96 million. This includes USD 115 million from IBRD and national and state program financing estimated at USD 295.96 million.[59] The financing will support: (i) USD 6 million for DoLR expenditures on consultancies and/or goods for activities including capacity building, knowledge exchange, development of national standards around integrated watershed management; and (ii) USD 109 million for the entire WDC-PMKSY operation in all two participating states based on USD 60 million for Karnataka, USD 49 million for Odisha. State level expenditures will be for works, consultancies, and/or goods for activities including development of science-based watershed plans, development of databases, digital library and decision support systems, implementation of selected model watershed sub-projects, capacity building programs, as well as M&E activities.

The Program at the state level will support the adoption and scaling up of several new approaches to implement community-led, science-based watershed sub-projects while the center, through the DoLR and the NRAA will distil lessons, refine national technical standards and institute a process to mainstream such approaches into national programs.

In addition, the Program aims to strengthen the policy environment through design and adoption of state specific human resource policy and O&M policy for treated watersheds.

The Program design incorporates national and international best practices and benchmarks for effective watershed programs that were identified in a 2015 portfolio review by the World Bank.[62]

In summary, the REWARD Program is designed to address key issues in the watershed sector (encompassing water, agriculture, and climate change), adopt best national and international practices, and capacitate relevant institutions at all levels to adopt a bottom-up institutional and implementation process backed by robust scientific planning and M&E processes.

In a typical micro-watershed project, the target GPs and Watershed Committees (WCs) can spend up to USD 148,50[63] for various small-scale watershed works, which is a substantial amount.

.2 Analysis of Institutional Arrangements

The institutional framework for implementing the Program is currently defined by the national WDC-PMKSY guidelines (2011) and no major changes are anticipated in the draft Guidelines for New Generation Watershed Development Projects (2021).

The DoLR, within the Ministry of Rural Development, is the national nodal agency for managing the government watershed program[64]

DoLR is supported by the NRAA, an autonomous agency under the Ministry of Agriculture and Farmers Welfare

These arrangements will be continued under the Program and strengthened through acquiring additional skills, collaboration with scientific and technical institutions, and improving training modules.

At the district level, a District Office[68] is responsible for overseeing the implementation of watershed programs. The district office is responsible for technical guidance to Project Implementing Agencies (PIAs), review and approval of DPRs and annual action plans, organizing necessary capacity building, and financia management.

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[63] As per new national guidelines the cost per hectare is about USD 297. An average microwatershed has an area of about 500 ha.Thus the average cost of treating a microwatershed is about USD 148,500.

[64] Guidelines for New Generation Watershed Development Projects.

[69] Lobo C. An institutional study on watershed services: Improving operational effectiveness and impact of the IWMP.

The Gram Panchayats (GPs) and the Watershed Committees (WCs) are responsible for community mobilization, providing inputs to DPRs, implementing micro-watershed sub-projects, record keeping, and maintenance of the treated watersheds, with support from the PIAs. Capacities of the GPs are weak and they do not alway have appropriate incentives for owning the sub-projects and maintaining them.

The Program will support the two states in strengthening capacity of GPs/WCs to undertake improved maintenance of soil and water conservation assets, establish better systems to monitor maintenance, monitor performance through performance monitoring tools and incentivize their performance.

.3 Borrower Capacity

Based on discussions with the clients and sector experts, the Technical Assessment identified institutional weaknesses in the following thematic areas; improved science-based planning, human resource management, program management, community engagement, coordination between sector related line departments, private sector participation, M&E, O&M and knowledge sharing.

.5 Accountability

The overall accountability framework for watershed management programs is reasonably sound at the higher national and state levels, but is weaker at district, block and GP levels.

The higher-level administrations have committed to adopt the PforR lending model, implement a more science-based and development-focused watershed management approach, adopt mechanisms to strengthen local governance, and are keen to demonstrate ultimate results linked to livelihoods and climate change resiliency. Both DoLR and the two states have agreed to provide the required financial outlays.

The current focus of the MSP is on issue related to Agriculture water, urban water and industrial w

Fund releases are highly dependent on requests from the states and the submission of a utilization certificate for at least 60 percent of the funds received previously.

Projections of expenditure under REWARD funds has been made keeping in mind the strained finances of governments of all two participating states due to the COVID-19 pandemic.

In addition, the participating states have also made budget allocations to watershed development activities, either as a stand-alone provision or as a fund that can be used in convergence mode, for the next few years. The GoK allocated of USD 13.5 million per year for a period of five years to carry out watershed activities in drought-prone districts of the state. The GoO has earmarked funding under the Odisha Mineral Bearing Areas Development Corporation (OMBADC). All the states also have a mechanism to use funds under the MNREGA for some watershed development activities.

The proposed REWARD expenditure also accounts for technical partners (for LRI, hydrology and remote sensing) and to set up laboratories in the first two years of the Program.

While the Program covers the entire WDC-PMKSY umbrella in all the two states, only the DoLR management cost of 0.5 percent 4 of the total projected grant to the two states in each year has been considered as the DoLR program. The same is tracked under budget head 2501- 11&12 in the Demand for Grants made annually by DoLR.

Under the new WDC-PMKSY 2.0 guidelines, with unit cost going up steeply, even at 1% more funds will be available to DoLR.

.2 Monitoring and evaluation

All the states use the current DoLR online MIS for internal M&E services, that mainly tracks physical and financial progress (inputs and outputs). However, to support a new science-based and integrated watershed program, the states will establish an enhanced MIS to capture key information related to activities, expenditure, results, grievance management, performance of GPs/WCs, O&M and sustainability.

Evaluation studies are envisaged to lead to the development of a standard methodology (sample size, critical indicators, measurement tools, basic analytics, report format) for impact evaluation of watersheds that can benefit the broader national program.

The main economic benefits are expected from: (i) increased efficiencies in watershed planning and implementation leading to shorter planning and implementation time; (ii) increases in the area under production and crop productivity through improved soil and water conservation practices and adoption of recommended agricultural practices; (iii) diversification from food grains into climate-adaptive, pulses and oilseeds based on improved advisory; (iv) improved post-harvest management, value addition and marketing; and (v) vulnerability reduction initiatives for the landless and marginalized communities within the watershed development areas. It is expected that facilitating value chain links will lead to increased incomes of beneficiaries due to: (i) higher prices for the agricultural produce through better aggregation, better market information, and new market channels; (ii) potentially reduced input costs such as fertilizers resulting from more detailed soil nutrient information; and (iii) increased employment and value addition from post-harvest activities, including aggregation, cleaning, grading, sorting and processing.

The EIRR of the project over a 20-year period for the base case, excluding benefits from GHG emission reduction, is 35.0 percent with a Net Present Value (NPV) of USD 285.4 million at a discount rate of 12 percent.

The benefits from the dissemination of agro-advisory services to improve farmers decisions and resilience improves the base case EIRR (excluding benefits from GHG emissions) to 31.8 perce[5] The benefits of the value chain activities increase the base case EIRR (excluding benefits from GHG emission) to 32.8 perce[6] and the benefits from vulnerability reduction activities (excluding benefits from GHG emission) further improve the EIRR to 35.0 percent.[7]

The EIRR calculations also assume a five percent operations and maintenance costs and a 15 percent tax rate on project costs (to account for transfer payments) over the 20-year period for which the EIRR has been calculatec Placing a monetary value on the potential GHG mitigation benefits in terms of reductions in GHG emissions and increased carbon sequestration (estimated at 9.39 million tonnes CC 2eq over the project life of 20 years), the base case EIRR increases to 39.2 perce This assumes a shadow price of carbon per tCC 2eq of USD 40 for 2021 and reaching USD 50 at the end of the 20-year period, as recommended by the World Bank. The analysis was also conducted for a high shadow price of carbon scenario as recommended by the World Bank, resulting in an EIRR of 43.0 percent.

To address this risk, both states have identified top-level technical and scientific partners with good experience in LRI data collection and application and have negotiated partnerships with them.

To mitigate this risk, all state watershed departments are working with the partners to evolve common technical specifications across the board, helping them with preparing tender documents and where needed even calling the tender on behalf of the partners.

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[6] The Value Chain benefit estimates have been estimated using similar World Bank funded projects in India (JOHAR, TNRTP, BTDP, NRETP). The benefits have been estimated to be an annum additional income of 13,232 per household engaged in value chain activities or a B/C rat of 0.95.

[7] The Vulnerability Reduction benefit estimates have been estimated using similar World Bank funded projects in India (BRLP, TNPVP, NRLP) for simple and enhanced credit-based livelihood activities. The benefits have been estimated to be an annum additional incom of 15,465 per household or a B/C ratio of 0.99

The budget outlays for the scheme at DoLR were estimated at INR 2,000 crores[78] and includes the grants to states.

Notwithstanding the above, provision of funds for the projects has been adequate and while past performance may not necessarily be a predictor for future allocations, there is a reasonable expectation that the required resources will be appropriated in the financial years when required.

Treasury computerization (Khajane/Karnataka, FMIS/Odisha and e-Lekha/GoI) of core budgeting, accounting and financial reporting has been operational for a decade or more.

The key risk with the fund flow arrangements in Odisha and Karnataka is that a significant proportion of project funds remain outside the state consolidated fund in external bank accounts [Odisha has approximately INR 98.7 crores unspent in bank accounts at state and district levels, including closing balances in WC bank accounts as on 02 March 2020). This practice also does not lend itself to efficient cash management as unspent funds could be better utilized elsewhere

To address the risk identified with large unspent balances in bank accounts at dispersed locations outside the state consolidated fund, WMD will set up single state level zero based linked bank accounts at district, PIA and WDC levels and use the EAT module of PFMS for all REWARD Program operations

A comprehensive web-based MIS[79] has been developed for PMKSY by DoLR, wherein physical and financial data is regularly uploaded by the states.

DoLR will put in place a team to undertake a business process review of the uploading of financial progress reports on the IWMP/WDC-PMKSY MIS portal, including reconciliation processes undertaken at the state/DoLR levels, and suggesting revised processes to ensure the reliability and correctness of MIS data [proposed DLI].

[78] About 98-99 percent of the budget outlays at DoLR level represents grants in aid to the states.

Based on the activities identified in the Program scope, the main procurable items are (i) community procurement of works and supplies towards watershed development, (ii) consultancy services like engagement of technical partners, capacity building, M&E, communication, knowledge sharing etc.

Multiple administrative instructions were issued from time to time to regulate / amend these governing documents including use of eProcurement platform.

It is observed that open tendering method was used for for these cases with adequate procurement cycle time; and while no cases for cost over-run and no complaints were received, there is room for improving bidder participation and avoid time extensions. The assessment concluded that the legal framework is adequate, but the implementing agency does not have dedicated staff to manage procurement activities and provide necessary guidance on procurement matters related to watershed committees.

DoLR, being a central government department, follows the General Financial Rules (GFR), 201

The assessment concluded that the legal framework is adequate, but the implementing agency does not have dedicated staff to manage procurement activities.

Community driven procurement procedures are followed for the works and supply of materials required in the development of watershed sub-projects. Activities such as needs assessment, DPR preparation, cost estimation for watershed projects, are governed by the Common Guidelines for Watershed Development Projects dated 2008 (revised 2011) of GoI.

Manpower for such works is sourced from the local community and paid at the wage rates notified by the government and supplies are sourced from local market at rates no more than those defined under Schedule of Rates published by respective governments.

An oversight on the community driven activities is maintained by respective watershed monitoring teams.

The ESSA assessed the adequacy of E&S systems including existing institutional, operational, and regulatory systems and capacities to manage E&S risks and priorities and recommends measures for strengthening them. The ESSA covered a comprehensive review of all relevant E&S plans/frameworks, implementation documents and other technical studies/reports related to national as well as state-supported watershed programs, including the World Bank supported watershed projects in Karnataka.

Key Findings of the ESSA

Potential Benefits: The overall E&S impact of the watershed Program is likely to be positive, owing to benefits such as increased ground water level, improved soil moisture and increase in green coverage, crop productivity due to multi-cropping and increase in rural incomes subsequently reducing poverty. Strengthening capacities of project authorities and functionaries, and both public and private specialized institutions to implement more science-based watershed projects will be beneficial for overall hydrological services and also environmental sustainability. Establishing high-level coordinating bodies in the state government on the lines of Multi Stakeholder Platforms, supported by the 2030 Water Resources Group, for convergence of watershed issues will benefit the environment with convergence of state specific goals on forest cover, agriculture and horticulture development for developing rainfed districts. The science-based planning approaches of REWARD program will reduce the risk of not capturing issues such as overall water budget in the macro-watershed, change in ground water table, change in water quality parameters with methods of soil, land and water conservation. Other risks related to over-use of chemical fertilizers and pesticides are expected to be mitigated through agro-advisories issued to farmers.

In addition, the program will also enhance local employment and livelihood opportunities for watershed populations including for marginal and small farmers, landless and wage laborers and lead to improvements in household incomes and general economic development in the program areas.

Environmental and Social Risks: Most of the E&S risks and impacts are mainly on account of gaps identified in existing implementation processes of the watershed program and these small scale, site specific, localized, predictable and reversible impacts are highly amenable to risk mitigation measures. The key social risk relates to weak community ownership and preparedness to participate in science-based watershed planning and DPR preparation, and inadequate inclusion of small and marginal farmers and landless/asset less households in watershed committees and among direct program beneficiaries, especially women, scheduled castes (SC), scheduled tribes (ST) and other socially vulnerable groups

The environmental risks are largely related to extension of watershed interventions to forest, wetlands and other environmentally sensitive areas; risk of change in cropping patterns to more water-intensive high-value crops leading to excessive withdrawal of ground water, and increased use of fertilizer and pesticides; risk of increase in salinity and sodicity due to excessive irrigation in some areas; risk of restricting surface flow at plot level thereby impacting water bodies in the downstream and overall hydrology.

The planned convergence of other programs of partner departments of agriculture, horticulture, forestry, and MNERGA to conserve soil moisture will contribute to effectively managing all such environmental risks.

While Karnataka has experience of watershed planning and implementing using comprehensive LRI-based approaches, Odisha is new to it and would require support during the transition phase.

to develop models for estimating water fractions (ET, soil moisture, run-off, groundwater) in collaboration with a hydrology partner, leading to water balance. At present, water budget and hydrological outputs are calculated with mathematical models with limited ground measurements which are normalized according to soil management units.

The hydrological data on groundwater storage, silt movement, surface water flow is collected periodically in model watersheds and benchmark sites for monitoring. The same database can be used for measuring mid-term and end-term impacts and will capture larger goals of protecting and conserving hydrologic services and/or managing negative downstream and groundwater impacts which otherwise remains unaddressed.

It clearly articulates the principles, processes, institutional responsibilities at different levels of program implementation right from national, state, district, block/PIA, GP and village levels for watershed planning and implementation. The process of watershed selection for treatment is based on a regional assessment of the environment especially soil health and water availability in the rainfed area.

The REWARD Program does not intend to do any land acquisition or resettlement as the proposed civil works are going to be small, local structures such as check dams, anicuts, tanks, ponds and trenches. Further analysis of other watershed projects in India and in the participating states suggests that there is no land acquisition and hence risk relating to acquiring land and resettlement is minimal or non-existent.

Early screening for identification of potential E&S risks during DPR preparation and FPO Business Plans for identification of potential environmental and social risks, including LRI and DSS platform, to show land use and environmental areas; and guidance on preparation of an environmental and social management plan (ESMP).

Addressing macro and micro-level environmental issues such as overall hydrology which includes water resource budget, conservation, flow, change in ground water table, change in water quality including salinity and sodicity in the macro watershed.

Existing GRM system to be further strengthened and streamlined for registering, screening and redressing, monitoring, reporting, and integrating them with the Program MIS.

Establishing a scientific assessment and evaluation system, including a rigorous impact evaluation that encompasses the application of remote sensing and GIS technologies; process monitoring, and thematic studies for assessing change in specific parameters (such as groundwater level, sediment load, soil organic carbon) to evaluate the effectiveness of watershed investments.

Adopting a system of valuation of ecosystem services like water budgeting and their contribution to watershed development scoping will be explored and landscape approach for integrating planned convergence of other programs (including with partner Departments of Agriculture, Horticulture, Forestry, and Rural Development) to conserve soil moisture to improve outcomes on water yield, ground water and sediments in the long run for environmental sustainability.

the behavior change pilot on fertilizer use); (ii) Recommendation on establishing a scientific assessment and evaluation system, including a rigorous impact evaluation that encompasses the application of remote sensing and GIS technologies; process monitoring, and thematic studies for assessing change in specific parameters (such as groundwater level, sediment load, soil organic carbon) to evaluate the effectiveness of watershed investments; (iii) Addressing macro and micro-level environmental issues such as overall hydrology which includes water resource budget, conservation, flow, etc., in the macro watershed, change in ground water table, change in water quality is addressed through Result Area 1; (iv) Recommendations on early Screening have been mainstreamed and made part of PDO Indicators #2 DLR 2.1 and procedure for DLR 2.1 & 2.2.

It is also proposed that REWARD program will explore opportunities to support the participating institutions in piloting tools to better understand the cumulative aspects of valuation of ecosystem services like water budgeting and their contribution to watershed development through landscape approach for integrating planned convergence of other programs (including with partner Departments of Agriculture, Horticulture, Forestry, and Rural Development) to conserve soil moisture to improve outcomes on water yield, ground water and sediments in the long run for environmental sustainability.

For Department of Land Resources (DoLR)

The REWARD program support to DoLR is mainly towards national capacity enhancement to support national program, promote learning from state level implementation.

The NPMU being established should also include nodal officials/experts responsible for coordinating, guiding, supervising, implementation of key Environmental and Social actions.

The national web portal proposed under the REWARD program shall also include socio-economic and environmental data (particularly sediments, water budget, forests, ground water, pesticides etc.).

The knowledge exchange events shall also include lessons and insights from implementation of environmental and social actions under the REWARD Implementation.

Capacity building on environmental and social risk management.

Similarly, Officials at district, block and PIA level will also be co-designated for environmental and social safeguards and trained for providing implementation support, monitoring and reporting of implementation of E&S activities in the participating states.

The Program would entail generation of co-benefits through incentivizing science-based watershed management including soil moisture conservation, water harvesting, weather-based agro-advisories, value chain development, etc.

Projections point towards an increase in summer monsoon precipitation and the year-to-year variability of monsoon rainfall will contribute to a greater frequency of floods and drought and lower recharge rates of groundwater reservoirs.

While watershed development programs have treated significant land areas with basic soil and water conservation, there have been gaps in terms of: incorporating hydrology, water management,

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[84] The climate co-benefit estimation in WB-financed projects is based on the Joint MDB methodology that has been developed by a group of multilateral development banks (MDBs), composed of the African Development Bank (AfDB), the Asian Development Bank (ADB), the Asian Infrastructure Investment Bank (AIIB), the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), the Inter-American Development Bank Group (IDBG), the Islamic Development Bank (IsDB), the New Development Bank (NDB) and the World Bank Group (WBG).

Adaptation co-benefits: The adaptation co-benefits in each of the results areas are listed below:

Results Area 1: Strengthened institutions and supportive policy for watershed development

Capacity building of community institutions and local government bodies engaged in watershed development through development of guidelines and procedures, training, performance grading and incentives, etc.

Capacity building of government institutions in watershed development through placement of staff with expertise in hydrology, agriculture, etc., and their training.

Development of a supportive policy for watershed development including the development of national technical standards and protocols that will cover, inter alia, development of a land resource inventory, hydrology assessment, preparation of a science-based and participatory watershed development plan that integrates climate resilience, etc.

Development of policies on operation and maintenance of watersheds for enhancing infrastructure resilience.

Development of strong monitoring and evaluation systems that includes focus on measuring outcomes and thematic studies for assessing change in specific parameters (such as groundwater levels, sediment load, soil organic carbon) to evaluate the effectiveness of watershed investments.

Pilot on science-based fertilizer demand and supply that involves aligning demand and supply of fertilizers through interventions such as building farmer awareness on soil nutrient status to improve productivity by addressing climate impact on soil quality.

Results Area 2: Science-based watershed development for climate resilience and enhanced livelihoods

Development of science-based watershed development plans based on Land Resource Inventory (LRI) and hydrology data and community participation.

.; agriculture and horticulture including on-farm soil moisture conservation and water harvesting practices; treatment of common lands including pasture development, afforestation (forestry and agroforestry plantations in non-forest lands), etc.;

Provision of agro-advisories to farmers based on LRI and weather data with timely information on land resources, soil status, weather events, etc., along with recommendations on crop selection and management practices.
Value chain interventions focusing on production enhancement, post harvest management, infrastructure development, and forward and backward linkages of producers to markets.

Mitigation co-benefits: The mitigation co-benefits in each of the results areas are listed below:

Results Area 1: Strengthened institutions and supportive policy for watershed development
Pilots on science-based fertilizer demand and supply that involves aligning soil fertility status, demand and supply of fertilizers through interventions such as building farmer awareness on soil nutrient status, training of extension workers and fertilizer retailers, tracking data on fertilizer purchases made by farmers. This will contribute to reducing inappropriate use and overuse of chemical fertilizers, will nudge farmers towards adoption of integrated soil fertility management and lead to potential increase in soil carbon.

During the course of the Program, value of ecosystem services (such as through water budgeting) and their contribution to watershed development, including scoping and measurement of soil organic carbon, will be explored.

The Economic and Financial Analysis undertaken during the Program preparation estimated that over a 20-year period it is expected that the Program supported activities will result in net GHG sequestration of 11.9 million tons CO2 eq. which is equivalent to a GHG sequestration of 0.59 million tons CO2 eq.

Value chain investments that integrate climate mitigation and adaptation opportunities (such as use of renewable energy in agri-processing, energy efficient agriculture infrastructure, climate risk resilient infrastructure development).

The Implementation Support Plan (ISP) outlines the approach the World Bank will take to support the DoLR and SWDs in the implementation of the REWARD Program, including reviewing implementation progress, reviewing achievement of Program results and DLIs, monitoring compliance with legal agreements, providing support on resolving emerging issues and in managing potential risks to achieving Program results.

The Implementation Support Plan reflects learnings from other Bank supported multi-state projects in the country.

In the initial years of Program implementation, the focus of the implementation support missions and the TA will be on ensuring critical human resource capacity in the implementing agencies; establishment and functioning of national and state level governance mechanisms; partnerships with scientific and technical agencies; implementation of PAP actions; establishment of MIS; establishment of impact evaluation and results verification systems; effective information flows between the national, state, district, block level implementing agencies; and mitigating any early risks that are identified.

The emphasis of Bank support in the initial years, and especially in case of states that are new to science-based watershed development, will be on capacity building of the state implementing agencies, through the TA as well as through facilitating the lighthouse approach. As implementation progresses, World Bank support will focus on ensuring that the DoLR, SWDs, district and block/sub-block levels have adequate support for carrying out Program activities and will include monitoring compliance to legal agreements, monitoring progress in achieving PAP actions, tracking results indicators through the MIS, and managing any emerging risks.