

THE WORLD BANK

CONSOLIDATED

ENVIRONMENTAL AND SOCIAL SYSTEMS ASSESSMENT
(ESSA)

FOR THE

INDIA: REJUVENATING WATERSHEDS FOR
AGRICULTURAL RESILIENCE THROUGH INNOVATIVE
DEVELOPMENT (REWARD)

(P172187)

June 30, 2021

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LIST OF ACRONYMS

AIBP	Accelerated Irrigation Benefit Programme
APD	Additional Project Director
APRLP	Andhra Pradesh Rural Livelihood Project
APSAC	Andhra Pradesh Space Applications Centre
ATMA	Agriculture Technology and Management Agency
CCF	Chief Conservator of Forest
CEO	Chief Executive Officer
CFR	Community Forest Rights
CIG	Common Interest Group
CQCO	Chief Quality Control Officer
DAC	Department of Agriculture and Cooperation, Govt of India
DANIDA	Danish International Development Agency
DAY-NRLM	Deendayal Antyodaya Yojana - National Rural Livelihoods Mission
DDP	Desert Development Program
DFID	Department for International Development
DLRC	District Level Review Committee
DoA	Department of Agriculture
DAFE	Department of Agriculture and Farmers Empowerment
DoLR	Department of Land Resource, Government of India
DSC&WD	Directorate of Soil Conservation and Watershed Development
DPAP	Drought Prone Areas Programme
DPR	Detailed Project Report
DSS	Decision Support System
DWMA	District Water Management Agency
E&S	Environmental and Social
EC	Executive Committee
EFMS	Electronic Fund Management System
ESSA	Environmental and Social System Assessment
FPO	Farmers' Producer Organization
CGWB	Central Ground Water Board
GIS	Geographic Information System
GoI	Government of India
GoK	Government of Karnataka
GoAP	Government of Andhra Pradesh

GP	Gram Panchayat
GRM	Grievance Redressal Management
IBRD	International Bank for Reconstruction and Development
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFR	Individual Forest Rights
IISc	Indian Institute of Science
IISWC	Indian Institute of Soil and Water Conservation
IWDP	Integrated Wastelands Development Programme
IWMP	Integrated Watershed Management Programme
KWDP	Karnataka Watershed Development Program
LEP	Livelihood Enhancement Plan
LRI	Land Resource Inventory
LWE	Left-wing Extremism
MADA	Modified Area Development Agency
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MIS	Management Information System
MoAFW	Ministry of Agriculture and Farmers' Welfare
MoRD	Ministry of Rural Development
NBSS & LUP	National Bureau of Soil Survey and Land Use Planning
NGO	Non-Government Organization
NGT	National Green Tribunal
NRAA	National Rainfed Area Authority
NRLM	National Rural Livelihood Mission
O&M	Operation and Maintenance
OFWM	On Farm Water Management
PAP	Program Action Plan
PDO	Project Development Objective
PforR	Program for Results
PIA	Project Implementation Agency
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
PMU	Project Management Unit
PPP	Public-private partnership
PPP-IHD	Integrated Horticulture Development program through Public Private Partnership
PR&RD	Panchayati Raj and Rural Development
PVTG	Particularly Vulnerable Tribal Group

84908/2021/WM Division

REWARD	Rejuvenating Watersheds for Agriculture Resilience through Innovative Development
SC	Scheduled Caste
SDC	Swiss Development Cooperation
SHG	Shelf Help Group
SLNA	State Level Nodal Agency
SRDS	Society for Rural Development Services
SSAAT	Society for Social Audit, Accountability and Transparency
ST	Scheduled Tribe
SWD	State Watershed Department
TCB	Trench cum Bunding
TERI	The Energy and Resource Institute
TSP	Tribal Sub Plan
UG	User Group
WC	Watershed Committee
WC	Watershed Committee
WCDC	Watershed Cell and Documentation Centers
WDC	Watershed Development Component
WDD	Watershed Development Department, Govt of Karnataka
WDT	Watershed Development Team
WRG	Water Resource Group
WRIS	Water Resources Information System
ZP	Zilla Parishad

Environmental and Social Systems Assessment

1 INTRODUCTION

1. Government of India's Watershed Development Component – *Pradhan Mantri Krishi Sinchayee Yojana* (WDC-PMKSY) is the principal program and source of funds for watershed management in the country. The Department of Land Resources (DoLR) is the national focal point and implementing agency for the WDC-PMKSY that provides national guidelines and funds to states through national watershed schemes for execution at the sub-project level.¹ The current WDC-PMKSY national watershed scheme has ended in March 2021, and a follow-on program is being rolled out that aims to undertake watershed management on 10 million ha. Rejuvenating Watersheds for Agricultural Resilience through Innovative Development (REWARD) program will supporting the next phase of the WDC-PMKSY as a subset of the national program, with activities at the central level and in the participating states over the next five-year period. As the national focal point, DoLR will have key activities supported by the proposed REWARD Program. The Three states of Karnataka, Odisha and Andhra Pradesh will be part of the REWARD program, with provision for more states to join later.

2. The REWARD program will be financed under the Program for Result (PforR) financing instrument of the World Bank. The World Bank policy and directive on PforR financing requires the conduct of an Environmental and Social System Assessment (ESSA) of the program and the program implementing agencies. In line with the PforR policy, an ESSA was carried out to assess the adequacy of the existing environmental and social systems in assessing and mitigating the environment and social (E & S) risks and impacts associated with the REWARD program interventions. The ESSA exercise identified gaps and opportunities for further strengthening the existing institutional, operational, and regulatory systems and capacities pertaining to E&S issues in the REWARD Program. ESSA reports have been prepared for the states of Andhra Pradesh, Karnataka and Odisha. This document summarizes the key findings and recommendations detailed in the state ESSA reports, as well as the key ESSA recommendations for the Department of Land Resources (DoLR).

1.1 Program Background

3. Rainfed agriculture represents a major share of the country's agricultural sector and is facing significant challenges. Of the 127 agro-climatic zones in India, 73 are rainfed, with 13 states accounting for about three-quarters of the total rainfed area. A total of 66 districts of the country's poorest 100 districts are in rainfed areas. 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). India ranks first globally in terms of the area and value of produce from rainfed agriculture. Rainfed agriculture accounts for more than half of the net sown area in the country, mostly in arid and semi-arid areas, and supports an estimated 480 million people. Rainfed areas are home to 86 percent of the country's poor, produce 40 percent of the food grains, support two-thirds of the livestock population, and are thus critical to poverty alleviation and food security in the country. Dry, rainfed regions are susceptible to drought and soil degradation that reduces fertility and increases downstream sedimentation.

4. Watershed management programs in India have evolved over time in terms of their approach, strategy, and operational scale. In the late 1970s watershed management programs were mainly top-down engineering-focused soil and water conservation infrastructure development to protect large downstream water bodies (especially dams) from silting up. 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 Andhra Pradesh (supported by Department for

¹ The DoLR and SWDs use the term 'project' to refer to the watershed development activities covered by a single 'Detailed Project Report' and typically covering a sub-watershed or a micro-watershed. However, this document uses the term 'sub-project' to refer to the same, to avoid confusion with other national and state level projects.

International Development (DFID), Danish International Development Agency (DANIDA) and Karnataka (supported by DFID, DANIDA, World Bank). In 2009, the Integrated Watershed Management Programme (IWMP) was launched, which marked the consolidation of various watershed development schemes under an integrated program. In 2015-16, the IWMP became a component of the GoI's flagship program on extending irrigation coverage and improving water use efficiency – the *Pradhan Mantri Krishi Sinchayee Yojana* (PMKSY). Recently, watershed programs, such as the Karnataka Watershed Development Project (KWDP)-II (known locally as 'Sujala III') financed by the Bank, began emphasizing improved biophysical and socio-economic site data, more science-based watershed planning, and value-chain development through investments in farmer producer organizations (FPOs) and market linkages. The operational scale of watershed development has 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 areas².

5. A robust institutional architecture for watershed development exists in the country. The Department of Land Resources (DoLR) of the Ministry of Rural Development (MoRD), GoI is the key national agency responsible for watershed development. The National Rainfed Areas Authority (NRAA) of the Ministry of Agriculture and Farmers' Welfare (MoAFW) provides technical and policy support to the DoLR on watershed development. State Level Nodal Agencies (SLNAs)³, housed in various agencies⁴, 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. These include Watershed Development Committees (WDCs), farmer or water user groups, Self-Help Groups (SHGs), and the Gram Panchayats (GPs).

6. The WDC-PMKSY is a key source of funds for watershed management in the country. The DoLR provides national guidelines and funds in 60:40 cost sharing ratio to states through national watershed schemes/WDC-PMKSY for execution at the sub-project level⁵. DoLR aims to bring at least one-third of untreated land under watershed development. While these programs have treated significant land areas to date with basic soil and water conservation, the broader impacts have been below expectations 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.

7. The current WDC-PMKSY national watershed scheme is ending in March 2021, and a new follow-on program with an estimated outlay of USD3.6 billion (including central and state contributions) is being planned. The new, revised National Watershed Guidelines will govern the follow-on scheme starting in 2021. The new guidelines will address a number of key points including: land degradation neutrality and nutritional security; welfare of the watershed community and economic gains to the farmers; adaptation to climate change; biomass and livestock centric approach and emphasis on secondary agriculture; promoting land use and production systems in sync with climate and soil site-suitability of land resources; scientific planning based on technology inputs, spatial and non-spatial data, hydro-geologic and aquifer characteristics; institutional sustainability; and convergence of programs and resources. The thrust areas of the government program, specified in the new guidelines are decentralization, flexibility, transparency, equity, and community empowerment. The new national guidelines have been informed by the key elements and innovations from the successful Bank-supported Karnataka Watershed Development program - II (KWDP-II).

² Over time, watershed programs typically covered areas of 50,000 ha; from early 1990s to 2000s the programs moved to treating micro-watersheds of 500 ha; and from 2008 onwards the watershed programs focused on clusters of micro-watersheds covering contiguous areas of around 5,000 ha, emphasizing on a saturation approach of treating a high percentage of the site.

³ also referred to as State Watershed Departments (SWDs) in this document.

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.

⁵ The DoLR and SWDs use the term 'project' to refer to the watershed development activities covered by a single 'Detailed Project Report' and typically covering a sub-watershed or a micro-watershed. However, this document uses the term 'sub-project' to refer to the same, to avoid confusion with other national and state level projects.

2 THE REWARD PROGRAM

2.1 WDC-PMKSY and REWARD program⁶

8. The proposed, USD 134.6 million, REWARD PforR (Program for Results) will support the next phase of the WDC-PMKSY program over a five year period, and will be subset of the new WDC-PMKSY program at both the Central level and in the REWARD project states. The proposed financing of USD 134.6 million includes USD 128.6 million to be allocated across the three states and USD 6 million to the DoLR. At the Central level, the REWARD Program scope covers management, monitoring, communication, and knowledge sharing functions of the DoLR. In the states, the REWARD Program will be aligned with the scope of the revised WDC-PMKSY, and support implementation of key evidence-based watershed activities and value addition initiatives. The scope of WDC-PMKSY and REWARD program have been summarized in the Table 1 below.

Table 1: Program Scope

	WDC-PMKSY program	REWARD Program	
	Nation-wide program	National level	State level
Objective	To ensure sustainable improvement in productivity and livelihood/ income potential of land through development of rainfed and degraded areas including wastelands	Strengthen capacities of national and state institutions to adopt improved watershed management for increasing farmers' resilience and support value chains in selected watersheds of participating states	
Coverage	DoLR's national coordination role; Implementation by all states (except for the state of Goa)	DoLR's national coordination role	States of Karnataka, Odisha, Andhra Pradesh
Area (in hectares)	10.0 million ha to be treated by 2026	Not applicable	1.7 million ha
Financing	USD 3.6 billion (central share of USD 2.3 billion, state share of USD 1.3 billion)	USD 23.8 million (of which IBRD provided USD 6.0 million)	Karnataka: USD 304.8 million (of which IBRD provided USD 60 million)
			Odisha: USD 211.5 million (of which IBRD provided USD 49 million)
			Andhra Pradesh: USD 201.5 million (of which IBRD provided USD 19.6 million)
Duration	2021-22 to 2025-26		
Activities	<ul style="list-style-type: none"> Institutional arrangements at national, state, district, watershed sub-project 	<ul style="list-style-type: none"> Development of supportive policy on technical 	<ul style="list-style-type: none"> Strengthening community institutions in watershed management

⁶ The Government program is denoted by 'P' (big P) and the Bank financed program is denoted by 'p' (small p).

	WDC-PMKSY program	REWARD Program	
	Nation-wide program	National level	State level
	(community) levels <ul style="list-style-type: none"> • Watershed development sub-projects (entry point activities, DPR preparation, watershed works, value chain interventions, livelihood activities for asset-less persons) • Technology inputs (use of Geographic Information Systems and remote sensing) • Capacity building • Monitoring, evaluation, and learning 	standards at national level <ul style="list-style-type: none"> • National Center of Excellence on Watershed Management 	<ul style="list-style-type: none"> • Enhancing institutional capacity for watershed management • Science-based watershed development sub-projects (+LRI and hydrology-based DPR preparation, saturation mode of watershed works, value chain interventions, livelihood support for COVID-19 recovery) • Agro-advisories for farmers • Development of supportive policy at state level on O&M • Strengthening M&E

2.2 Project Development Objectives

9. The Project Development Objective (PDO) of the Program is to “*Strengthen capacities of national and state institutions to adopt improved watershed management for increasing farmers’ resilience and support value chains in selected watersheds of participating states*”. The PDO indicators include:

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

10. 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 ground water availability and efficiency of use, and enhanced agricultural productivity and profitability, thereby generating sustainable improvement in incomes. It will have positive impacts on women, small and marginal farmers, and agricultural laborers. The efforts to ensure social inclusion in watershed planning and management will enhance the benefits that accrue to the most vulnerable.

11. REWARD Results Areas **Under Results Area 1**, REWARD program will,

- a. **Strengthen the institutional capacity and policy environment for science-based, participatory watershed development** in the participating states through: (i) development of detailed guidelines for WCs and GPs⁷ for each phase of watershed development (preparatory phase, works phase, consolidation and O&M phase); (ii) development and delivery of training modules on inclusive participation (such as participatory planning) and governance systems (such as standard record maintenance) for WCs, GPs and other relevant users/common interest groups, with a special focus on the women representatives in these bodies; (iii) incentivizing development and roll-out of a performance assessment tool and incentive system

⁷ The guidelines will include provisions for mitigating risk of elite capture and exclusion of vulnerable groups including women. 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.

for WCs and GPs for effective planning, implementation and sustainable watershed management;⁸ and (iv) capturing of data on performance of WCs and GPs on the Performance Assessment Tool, through the state Management Information Systems (MIS).

- b. Support the following activities on women's representation in decision-making roles and empowerment: (i) systemic engagement of women as decision-makers in watershed committees, watershed development teams and water user groups and other common interest groups; (ii) integrating clearly defined roles for women in each of the four phases of watershed development; (iii) targeted leadership and technical training for women leaders on effective watershed management practices; (iv) structured consultations with women's groups as part of the baseline survey to be included in DPRs preparation/implementation and O&M phases; and (v) state-level MIS systems to adopt gender-disaggregated data collection in watershed planning.⁹
- c. Support for Institution Capacity building for WDC-PMKSY will be through: (i) development of an improved human resources policy for attracting and retaining adequate numbers of professionals, including better targeting of women professionals, with necessary skill sets at various levels; (ii) placement of critical human resources at the state, district, block/sub-block levels, especially to fill gaps in the areas of hydrology, agriculture, institution building, social inclusion and gender; (iii) design and delivery of core training modules on operationalizing women's consistent representation and decision-making in watershed committees, inclusion and social sustainability measures in watershed development at the state, district, block/sub-block levels; and (iv) equipping and training staff in IT and communication systems to improve planning and management.
- d. Establish a national center of excellence on watershed management: Karnataka has rich expertise in implementation of science-based watershed management including the application of LRI, hydrogeology, DSS to planning; and the use of remote sensing and Geographic Information Systems (GIS) for planning and monitoring. It will be supported under the REWARD Program to become the 'lighthouse' state for science-based watershed management. India will benefit from the creation of a specialized institution that focuses on dissemination of knowledge from Karnataka to all states, and whose existence outlasts the REWARD Program. Towards this, the REWARD Program will incentivize the: (i) establishment of a national center of excellence on watershed management in Karnataka, drawing on the expertise and experience of key technical partners involved in KWDP-II; (ii) development of the curriculum framework, teaching-learning modules and materials (such as training manuals, learner resources) on science based watershed management; (iii) roll out of trainings for national and state functionaries of participating states as well as other states; (iv) action research studies and demonstration pilots on thematic areas relevant to science-based watershed management (such as soil carbon, monitoring of ground and surface water resources); and (v) development and management of a knowledge portal on science-based watershed management.
- e. Incentivize the development and dissemination of supportive policies at the national and state levels. At the national level, the Program will generate data and lessons learned to support the development of new technical standards and operational protocols for science-based watershed development. These standards will be developed by the DoLR, based on implementation experience in the participating states, and will be disseminated to other states. At the state level, the Program will support the development of a strong O&M policy, and the piloting of science-based fertilizer demand and supply policies.¹⁰

⁸ 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.

⁹ Socio-economic/gender disaggregation in watershed committees, watershed user groups, beneficiary investments in common assets.

¹⁰ The pilot will involve: Training of RSK staff on farmer counseling for influencing the farmer's fertilizer purchase decisions (to align with the information on the LRI card); Tracking data on fertilizer purchases made by LRI farmers from

- f. Strengthen monitoring and evaluation systems at national and state levels. While M&E systems of watershed programs have been largely limited to a MIS in the past, the current emphasis is to move beyond mainly tracking inputs and outputs. The REWARD Program will support a transition to a state-of-the-art monitoring, evaluation, learning, and knowledge sharing system in two ways. First, by strengthening MIS on watershed management through the development and deployment of a GIS-enabled MIS platform that: focuses on tracking activities, outputs and outcomes; integrates tracking of process efficiency and quality (such as time taken for each phase in the watershed sub-project cycle); provides for real-time updating and analytics; and strengthens gender-disaggregated data systems to adequately capture the priorities of women. Second, the REWARD Program will establish 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.

12. **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 livelihood enhancement. The emphasis on livelihoods is considered critical in the context of COVID-19, as it will enable quicker local/community recovery and build longer-term resilience. The REWARD program under this Result Area will,

- a. Support science-based watershed development planning and implementation. Site-specific information on the status and variability in soil, hydrology, topography, land use, and objective decision-making based on this information, is a prerequisite for scientific planning of watershed development. However, due to lack of such scientific information and the capacity to use it, watershed treatment plans are often based on a general assessment. To address this, the REWARD Program will incentivize: (i) the development of partnerships between SWDs and scientific and technical institutions through formal arrangements such as contracts and memoranda of understanding (MoUs) in key areas;¹¹ (ii) development of LRI¹² and hydrology¹³ databases on the basis of field studies and remote sensing data; (iii) development of DSS tools covering soil and water conservation planning, crop planning, land capability grouping, nutrient management, run-off, farm pond and check dam planning, crop water requirements, soil moisture and water balance, water budgeting, among others; (iv) development of a digital library and portal for storage and dissemination of the LRI and hydrology databases and DSS. The digital portal will also link up with other relevant available data sets such as on weather conditions and forecasts, agri-market prices; and (v) development of detailed project reports (DPRs¹⁴) for selected model watersheds based on scientific information and community participation.¹⁵ Activities (i) through (iv) will be implemented across about 1.7 million ha, while activity (v) will target around 250,000 ha, across the three states.

RSKs for monitoring and impact evaluation; Aligning fertilizer distribution to the selected RSKs on the basis of the LRI information on soil fertility status.

¹¹ While the areas of partnership will vary from state to state, it is expected that all states will establish partnerships on the following, at a minimum: remote sensing, soil studies, hydrology, agriculture.

¹² Data on bio-physical, socio-economic and hydrological characteristics of smaller land parcels in a micro-watershed (500 ha) are systematically collected to make a LRI atlas for that micro-watershed. The LRI along with Hydrology database and DSS help to produce a watershed plan for a sub-watershed (5000 ha). The LRI atlases also serve the purpose of providing data for advisories to farmers on crop selection, crop water management and nutrient management. In addition, several Government schemes (e.g., 30 identified schemes in Karnataka) are expected to benefit from the data sets and tools generated.

¹³ Possibility of leveraging data available on the National Water Resources Information System (WRIS) will also be explored.

¹⁴ The DPR is the detailed plan document of the proposed watershed sub-project. It is based on technical inputs as well as participatory community planning. It includes details on: basic information 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.

¹⁵ Includes approval by the Gram Sabha, which is the General Body of the Gram Panchayat (local government).

- b. Support transparency, equity, gender and community empowerment in watershed development, the REWARD Program will incentivize implementation of participatory, inclusive, and science-based watershed development in selected model watersheds. The model watersheds are expected to function as sites for demonstration of good practices that can be replicated in other watersheds both in the participating states and in other states. The implementation of the model watershed will be based on the science-based watershed DPRs and will include interventions on community engagement,¹⁶ engineering works;¹⁷ agriculture, horticulture and forestry interventions;¹⁸ and livelihood support activities. These interventions are expected to improve climate resilience through improved soil moisture, enhanced water storage based on hydrological conditions, more efficient irrigation, more appropriate crop selection and management, increased tree cover, 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 selection of the model watersheds will be based on criteria including drought vulnerability, 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 (in Karnataka), and exclusion of forest areas, urban areas, command areas.
- c. Farmers empowered with science-based and just-in-time agro-advisories. A key element of building climate resilience in rainfed areas is empowering farmers with timely information on land resources, soil status, weather events, etc., along with recommendations on relevant crop selection and management practices (such as fertilizer selection and scheduling, irrigation management). The REWARD Program emphasizes the role of agro-advisories in supporting climate change adaptation through the adoption of LRI and weather-based agro-advisories disseminated among farmers through information and *communication technologies* (ICT) channels and the agriculture extension system. The Program will support multiple extension channels including trainings, exposure visits, field demonstrations, mobile solutions (interactive voice response (IVR), short messaging services (SMS), mobile apps), in partnership with agriculture extension institutions such as the district level Agriculture Technology and Management Agencies (ATMAs) and *Krishi Vigyan Kendras* (KVKs), block level *Rythu Sampark Kendras* in Karnataka, GP level Farmer Counseling Centers in Odisha, *Rythu Bharosa Centers* in Andhra Pradesh, etc. The delivery of the extension modules, exposure visits, field demonstrations, information education and communication (IEC) materials and ICT channels will be tailored to meet the requirements of small, marginal as well as women farmers.
- d. Livelihood enhancement and COVID-19 recovery: The REWARD Program incentivizes value-chain interventions and provides livelihood support for the poorest households and women. Value-chain interventions will focus on production enhancement, post-harvest management, infrastructure development, and forward and backward linkages of producers to markets. Program activities that support this result include: (i) establishment and/or strengthening of Farmer Producer Organizations (FPOs) in select watershed clusters, including FPOs led by women; (ii) support to FPOs for working capital, with special focus on women-led FPOs; (iii) establishment of PPPs for enhancing both local and distant market linkages of farmers/FPOs; (iv) development of basic agri-processing infrastructure in the FPOs to reduce distress sales and curtail losses during contingencies; and (v) input support to farmers and women agriculture workers linked to FPOs. These activities will integrate emphasis on climate mitigation and adaptation opportunities along the value chain (such as

¹⁶ Including: entry point activities, institution and capacity building activities such as formation and training of Watershed Committee, participatory planning of watershed investments, approval of DPR by Gram Sabha, participatory monitoring of watershed works, creation and management of Watershed Development Fund, preparation of Project Completion Report, etc.

¹⁷ Including, as relevant: ridge area treatment, drainage line treatment, soil and moisture conservation, rainwater harvesting, etc.

¹⁸ Including, as relevant: on-farm soil moisture conservation and water harvesting practices, nursery raising, afforestation, horticulture, pasture development, etc.

use of energy efficient equipment and renewable energy in agri-processing, climate risk resilient infrastructure development).

Watershed development has been focused largely on improving the quality of land resources through water and soil conservation measures – with the main livelihood impact being improvement to farm owner land and water retention assets such as bunding, farm ponds. The benefits to the poor and land-less are usually limited to temporary employment opportunities in watershed works, and the possibility of higher agricultural wage labor opportunities. To achieve a more equitable distribution of benefits, and to aid in the long-term rehabilitation of such vulnerable households, the REWARD Program will support: (i) social mobilization and institution-building of the poor through formation or identification of existing SHGs and Common Interest Groups (CIGs); (ii) development and implementation of Livelihood Enhancement Plans (LEPs) of SHGs and CIGs;¹⁹ (iii) sustenance support (such as kitchen gardens, multi-layer farming) to improve household food security; (iv) livestock and fisheries enhancement interventions; and (v) provision of wage employment for vulnerable households in watershed works. The SWDs may converge with the State Rural Livelihood Missions (SRLMs) or similar programs for efficient and effective outreach to vulnerable households.

2.3 Detailed Scope of Work

13. Department of Land Resources. The scope of DoLR at the central level covers management, monitoring, communication, and knowledge sharing functions. The key activities that the DoLR, supported by National Rainfed Area Authority (NRAA) need to carry out under the REWARD program includes: (a) Establish a PMU for REWARD program; (b) Mobilize financial resources for state Program implementation; (c) Functioning of the Secretary level national steering committee to improve convergence between agriculture, watershed, ground water and other related departments; (d) Establish a national technical committee (headed by NRAA) to develop, test and standardize scientific protocols and Decision Support System (DSS) tools and strengthen the national digital library; (e) Support implementation of the Program in REWARD states through coordination with national technical agencies, guidance and monitoring; (f) Organize national/international knowledge exchange events; (g) Develop/refine national guidelines for watershed development; and (h) Distil lessons from REWARD and mainstream these in revised national guidelines.

14. Karnataka. The REWARD program in Karnataka will be implemented in twenty-one rainfed districts of Karnataka using WDC-PMKSY scheme with IBRD contribution to the tune of USD 60 million over the five-year period. Under Sujala-III project, it covered a total of 2534 micro-watersheds (MWS) covering 14.06 lakh ha, of which 89 MWS was taken up in saturation mode covering 46.7 thousand ha and created LRI data base for another 2445 MWS covering 13.6 lakh ha across 11 districts of Karnataka viz. Bidar, Gulbarga, Yadgir, Koppal, Gadag, Davangere/ Bellary, Chamrajnagar, Bijapur, Chikkamangalur, Raichur and Tumkur. The REWARD program proposes to contribute to GoK in saturating the watershed development interventions in remaining MWSs in these 11 districts and creates Land Resource Inventory (LRI) data set for another 8-9 districts. It will also support value chain development towards livelihood development and building agriculture resilience through formation and strengthening of Farmer Producer Organizations (FPOs). The REWARD program plans to further strengthen WDD with policy and institutional capacity to enhance efficiency and effectiveness of the watershed program in Karnataka. In addition, under the REWARD program, Karnataka has also been identified to have an additional role as a ‘lighthouse’ state that will enable knowledge exchange and provide capacity building support to other states because of its experience in implementing science-based watershed planning and monitoring.

15. Odisha. The REWARD program in Odisha will be implemented in seven rainfed districts using WDC-PMKSY scheme with IBRD contribution to the tune of USD 50 million over the five-

¹⁹ Support will be in the form of grants to SHGs and CIGs. The SHGs will utilize this as a revolving fund for supporting individual or small group livelihood activities – that may include income generation activities, food security interventions such as food banks, drinking water supply augmentation, etc. The CIGs will utilize the grant as per the LEP for undertaking new or for up-scaling existing income generation activities. Skill development activities and emergency contingency fund will be supported as part of the LEP.

year period. The REWARD program in Odisha is planned to develop 17 Green field sites to establish model watersheds on saturation. For this purpose, 152 micro watersheds have been identified in five pilot districts (i.e., Nayagarh, Dhenkanal, Koraput, Sambalpur, Deogarh) for taking up intended interventions, covering a total geographical area of 1.15 lakh ha. Land Resources Inventory (LRI) activities will also be taken up in 5.26 lakh ha in seven districts (including five pilot districts and Nabrangpur and Sundargarh districts) to provide comprehensive site- specific cadastral level information useful for appropriate Natural Resources Management (NRM) planning at farm level and integrated development of the area. Also, it will support value chain development towards livelihood enhancement through formation and strengthening of Farmer Producer Organizations (FPOs)

16. **Andhra Pradesh.** The REWARD program in Andhra Pradesh will be implemented in six rainfed districts using WDC-PMKSY scheme with IBRD contribution to the tune of USD 19.6 million over the five-year period. Under REWARD, Land Resources Inventory (LRI) activities will also be taken up in 2 lakh ha spread over 52 sub watersheds across in six districts (Anantapur, Chittoor, Kadapa, Kurnool, Prakasam, and Visakhapatnam), and planned to establish model micro-watersheds on saturation mode covering 50,000 ha area using science-based watershed planning and implementation, along with demonstrating effective O&M system of watershed assets. It will also support value chain development towards livelihood development and building agriculture resilience through formation and strengthening of Farmer Producer Organizations (FPOs).

2.4 Institutional Arrangement for Program Implementation

17. The institutional framework for implementing the Program is currently defined by the national WDC-PMKSY guidelines (2011) and no major changes are anticipated in New Watershed Development guideline under preparation (2021). The prescribed guidelines are followed by participating states in spirit, while the actual institutional arrangements differ from state to state, defined by local needs and historic evolution of its public sector institutions. These institutions have been implementing watershed programs since the 1980s and the national and state leadership is very experienced. The sector management is decentralized with roles and responsibilities clearly defined for institutions at district, block and GP levels. The details are given below.

18. **National level arrangements.** The DoLR, within the Ministry of Rural Development, is the national nodal agency for managing the government watershed program²⁰. DoLR's main role is to develop national programs and guidelines to implement them, raise and manage finances (central share), monitor implementation, and promote knowledge sharing. DoLR is supported by the National Rainfed Areas Authority (NRAA), an autonomous agency under the Ministry of Agriculture and Farmers Welfare. The NRAA's key support to DoLR is in developing/updating national watershed guidelines, strategic plans, technical manuals, and standards, monitoring program impacts, conducting special studies, etc. The Program shall further strengthen DoLR's capacity through the establishment of a national Program Management Unit (PMU) and NRAA's technical oversight capacity, which could lead to issuing of new national technical standards, based on the Program's experiences.

19. **State level arrangements.** In the states the State Watershed Departments²¹ (SWDs) housed within the Panchayati Raj and Rural Development (PR&RD) Department in Andhra Pradesh, and Watershed Development Department in Karnataka and Directorate of Soil Conservation and Watershed Development (DSC&WD) under the Department of Agriculture & Farmers' Empowerment (DAFE) in Odisha, are the key state level implementing organizations. These are alternatively known as State Level Nodal Agencies (SLNAs). SLNAs will establish respective PMU for REWARD and will be further supported by qualified scientific and technical partners for LRI and hydrology data collection and application of DSS tools and hosting the data on a digital platform²²; Develop standard protocols for using digital data for watershed planning and train district and block level staff in their use; Strengthen the MIS/ M&E and GRM systems and adopt the same for the Program. The SWDs are responsible for overall program development, budget allocations, technical

²⁰ Guidelines for New Generation Watershed Development Projects. 2020. Government of India.

²¹ These units are designated as State Level Nodal Agency (SLNA), as per GoI guidelines

²² While the sector benefits from scientific data and planning, the scientific/ research organizations can also benefit by data for research, improving the curriculum of their courses etc.

approvals, knowledge sharing, HR management, monitoring, and coordination with other departments and stakeholders. All the three states have well-established training institutions at state²³ and district levels²⁴ to train program officers as well as GP and WC members. These arrangements will be continued under the Program and strengthened through acquiring additional skills, collaboration with scientific and technical institutions, and improving training modules.

20. **District and Block Levels.** At the district level, a District Office²⁵ 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 financial management. The actual planning, DPR preparation and implementation is carried out by the PIAs located either at the block level or sub-block levels. About 50 percent staffing vacancies exist in the District and Block level units and their capacity is often not up to desired levels.²⁶ The Program will support the states to develop HR policies for attracting, training and retaining requisite human resources at these levels.

21. **Program Implementation Agency (PIA)** (either a government unit or NGO): Develop DPRs for selected micro-/sub-watersheds using science-based site data, DSS tools, and with a saturation mode; Educate communities on the science-based approach, form user groups and watershed committees, and actively engage them in the sub-project cycle; Maintain and update all records in the MIS system; Support WC/GP in implementation and resolving any critical issues; Coordinate with block offices and other stakeholders.

22. **Village Level.** 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, maintenance of the treated watersheds and resolve all grievances with support from the PIAs. Capacities of the GPs are weak, and they do not always have appropriate incentives for owning the sub-projects and maintaining them. The O&M policy guidelines are not detailed enough and there is inadequate support from the block/district levels during the maintenance phase. The Program will support all the three 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.

²³ The state training institutions are Andhra Pradesh Academy for Rural Development (APARD) in Andhra Pradesh, Institute of Management and Advance Global Excellence (IMAGE) in Odisha, State Institute for Rural Development (SIRD) in Karnataka

²⁴ The district training centers are: District Agriculture Training Centers in Karnataka, District Livelihood Resource Centers in Andhra Pradesh, KVKs and NGOs in Odisha.

²⁵ While the District offices and PIAs in Odisha are dedicated for watershed works, in Karnataka they are under the Agriculture department and are responsible for both agriculture and watershed works. In Andhra Pradesh they are under PR&RD and are responsible for both watersheds and MNREGA works. In Karnataka and Odisha, they are called Watershed Cell cum Data Center (WCDC) and in AP they are District Water Management Agency (DWMA)

²⁶ Lobo C. An institutional study on watershed services: Improving operational effectiveness and impact of the IWMP.

3 THE ENVIRONMENTAL AND SOCIAL SYSTEMS ASSESSMENT

3.1 Objectives and Core Principles

23. The World Bank policy on PforR financing requires an environmental and social system assessment (ESSA) of the operations financed under the PforR instrument. Accordingly, an ESSA was carried out to assess the adequacy of the environmental and social systems at the state as well as the national level in context of the Program boundary in Karnataka, Andhra Pradesh, and Odisha, and the DOLR program, and suitable mitigation and strengthening measures were agreed.

24. The overall objectives of the ESSA are to: (a) identify potential environmental and social benefits, risks, and impacts applicable to the Program interventions; (b) review the policy and legal framework related to management of environmental and social impacts of the Program interventions; (c) assess institutional capacity for environmental and social management systems within the Program system; (d) assess Program performance with respect to the core ESSA principles of the PforR instrument and identify gaps, if any; and (e) describe recommendations and actions to address the gaps and include them suitably in the Program Action Plan (PAP), Program Manual as well as the Results Indicators. More specifically, the ESSA assesses the extent to which the Program's environmental and social management systems are adequate for and consistent with the six-core environmental and social principles listed below (hereafter, Core Principles).

- (a) **Core Principle 1: *Environmental and Social Management***: Environmental and social management procedures and processes are designed to: (a) promote environmental and social sustainability in Program design; (b) avoid, minimize, or mitigate against adverse impacts; and (c) promote informed decision making related to a Program's environmental and social effects.
- (b) **Core Principle 2: *Natural Habitats and Physical Cultural Resources***: Environmental and social management procedures and processes are designed to avoid, minimize, and mitigate any adverse effects (on natural habitats and physical and cultural resources) resulting from the Program.
- (c) **Core Principle 3: *Public and Worker Safety***: Program procedures ensure adequate measures to protect public and worker safety against the potential risks associated with: (a) construction and/or operations of facilities or other operational practices developed or promoted under the Program; and (b) exposure to toxic chemicals, hazardous wastes, and otherwise dangerous materials.
- (d) **Core Principle 4: *Land Acquisition and Involuntary Resettlement***: Land acquisition and loss of access to natural resources are managed in a way that avoids or minimizes displacement, and affected people are assisted in improving, or at least restoring, their livelihoods and living standards.
- (e) **Core Principle 5: *Indigenous Peoples and Vulnerable Groups***: Due consideration is given to cultural appropriateness of, and equitable access to, Program benefits, giving special attention to the rights and interests of indigenous peoples and to the needs or concerns of vulnerable groups.
- (f) **Core Principle 6: *Social Conflict***: Avoid exacerbating social conflict, especially in fragile states, post-conflict areas, or areas subject to territorial disputes.

3.2 ESSA Methodology

25. The Environmental and Social Systems Assessment (ESSA) was carried out in line with the World Bank policy and procedure for PforR financing for the REWARD Program. The ESSA covered a comprehensive review of all relevant E&S plans/frameworks, implementation documents and other technical studies/reports related to the National as well as State-supported watershed programs, including the World Bank supported watershed projects in Karnataka. And was complemented with consultations with key primary and secondary stakeholders including SLNA/ SWDs and the other line

departments in all three states, and discussions with DoLR; field visit to watersheds in Karnataka with face-to-face interactions with community groups including small and marginal farmers, women and women SHGs, landless households, user groups/ common interest groups, etc., and community institutions including Watershed Committees, PRIs, NGOs and government line departments and partner agencies.

26. In addition, following the Covid-19 pandemic, written feedback and information requested from the SLNAs/SWDs of the participating states based on checklist developed to get clarity on system and processes being followed on ground, and following that multiple round of virtual consultations were held with government counterparts, partners, and watershed community representatives in all the three participating states. The draft ESSA findings were also shared and discussed with participating states for their feedback and suggestions and revised thereafter.

27. The revised state specific ESSA reports were further presented to wide range of stakeholders for their comments and suggestion through multi-stakeholder consultation virtually organized with primary stakeholders and secondary stakeholders separately in all three states to seek their feedback and suggestions. The draft final ESSA was prepared after incorporating the feedback and suggestions from both the stakeholder workshops.

28. Separate state specific ESSA reports have been prepared for Andhra Pradesh, Karnataka and Odisha. The state ESSA reports form the basis for preparing this consolidated summary ESSA report.

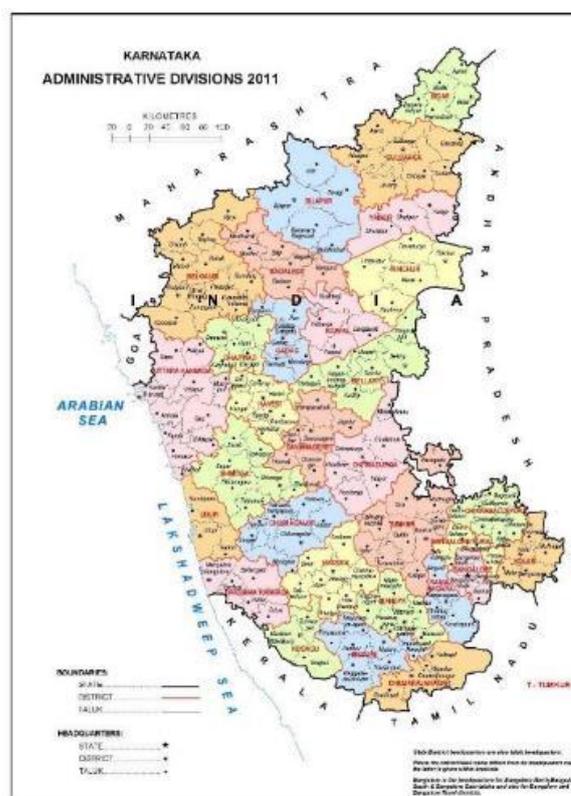
4 ENVIRONMENTAL AND SOCIAL OVERVIEW

29. An estimated 96 million hectares (ha), representing 30 percent of the total geographical area in India, is experiencing land degradation. Further, 85 percent of these degraded land are in dry, rainfed land areas,²⁷ and mainly in six states – Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha and Rajasthan, which also have high vulnerability of agriculture to climate change. Of the 140.13 million ha of net sown area in the country, about 51 percent (71.745 million ha) is rainfed and home to 86 percent of the country's poor. Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Andhra Pradesh account for more than three-quarters of the total rainfed area in India.²⁸ The clear implications are that a small number of states account for the bulk of rainfed agricultural lands, and that these lands are predominantly in a degraded state. Rainfed areas are characterized by low and erratic rainfall, high temperature, soil nutrient deficiencies, excessive runoff and high drought incidence. These concerns are likely to intensify, as climate change projections point to fewer wet days, more intense extreme events and an increase in the number of very hot days. Since rainfed areas contribute significantly to agricultural output (producing 44 percent of country's food grains, 80 percent of the pulses, 73 percent of oilseeds and 66 percent of livestock), conservation and sustainability of these lands and their natural capital becomes essential.

30. **Karnataka:** The state has a dynamic and erratic weather that changes from place to place within its territory. Due to its varying geographic and physiographic conditions, Karnataka experiences climatic variations that range from arid to semi-arid in the plateau region, sub-humid to humid tropical in the Western Ghats and humid tropical monsoon in the coastal plains. Karnataka has total geographical area of about 12.9 million ha. of which 5.2 million ha area is already treated and about 1.8 million ha is under treatment under various watershed programs. About 5.2 million ha rainfed watersheds yet to be treated on watershed approach.

31. About 61.3 percent of the state population lives in rural Karnataka (Census 2011) with agriculture being the main occupation and about 65 percent of the total geographical area of the state is utilized for agriculture. Scheduled castes (SC) account for about 17.1 percent of the population whereas the Scheduled Tribe (ST) account for about 6.95 percent of total population in Karnataka. According to 2010-11 Agriculture Census, 7.83million farm holdings are operating 12.16 million hectares of agriculture land in Karnataka. Small and marginal holdings account for 76.44 percent of total holdings and operate only 40.05 percent of the total operated area, while semi-medium, medium and large holdings account for 23.57 percent of the total holdings and their operational land holding is 59.95 percent out of the total operational area. Women play an important role in agriculture and women work participation ratio in rural Karnataka is 38.9 percent.

32. **Andhra Pradesh:** The state is geographically divided into three distinct regions, viz. the coastal plains, the Eastern Ghats and the western penneplains. Of which the coastal plain region found along the coast from southern end to northern, i.e., from Nellore district to Srikakulam district; Eastern Ghats, a non-continuous range of hills running for about 600 km from northeast to southwest

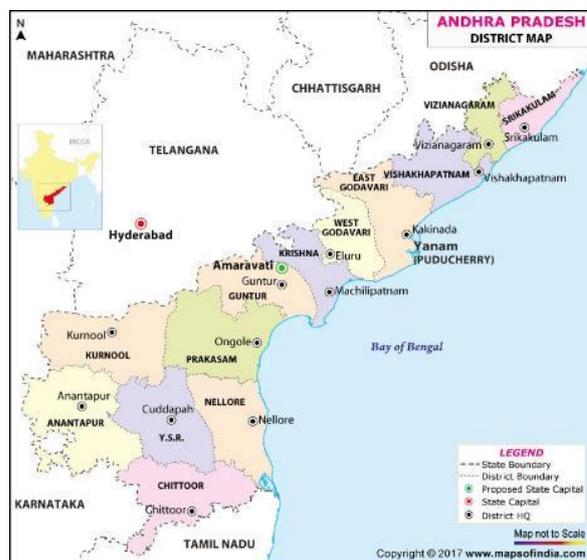


²⁷ Including arid, semi-arid and sub-humid regions.

²⁸ Maharashtra (14.49 million ha), Rajasthan (12.15 million ha), Madhya Pradesh (9.31 million ha), Karnataka (7.46 million ha), Andhra Pradesh (6.48 million ha), Gujarat (6.58 million ha).

along the coast with a width varying from 20 to 100 km, are dissected by many valleys, and elevation ranges from 600 to 1350 m; and the western peneplains are with scattered hillocks, and the interior plateau region with peneplains of 150–600 m elevation. Andhra Pradesh has a total geographical area of about 16.3 million ha. Of this, 12.6 million ha are treatable, and 3.44 million ha has been treated so far under different schemes. A total area of about 9.16 million ha is yet to be treated.

33. Andhra Pradesh (AP) is largely rural with 70.42 percent of the population living in rural areas. Of the total population Scheduled Castes (SC) constitute 17.10 percent and Scheduled Tribes (ST) 5.33 percent. Of the total scheduled tribes in Andhra Pradesh, approximately 50 percent reside in four districts Vishakhapatnam (23 percent), East Godavari (11 percent), Nellore (10 percent) and Vizianagaram (9 percent). The tribal dominated Scheduled-V areas in Andhra Pradesh are largely concentrated in East Godavari, West Godavari and Vishakhapatnam districts. In Andhra Pradesh, about 65.39 percent operational holdings belong to marginal farmers and they operate only 26.68 percent of area, small farmer holdings are about 20.88 percent and operating about 27.80 percent of the area. Whereas, semi medium to large farmers have 13.73 percent of operational holdings and operating about 41.76 percent of the area.



34. **Odisha:** Odisha topography consists of fertile coastal plains to the east bounded by Bay of Bengal. Mountainous highlands and plateau regions occupy the center of the state. Western and north-western portions of the state consist of rolling uplands. The state also has some major floodplains encompassing the river systems. Almost one-third of Odisha (37.34 percent) is covered by forests, and most are in southern and western Odisha. Odisha has a total geographical area of about 15.57 million ha, which is divided into 20,079 micro-watersheds. Of these, 16,873 are treatable and 7,721 have been taken up so far under different schemes. A total of 9,152 micro-watersheds covering an area of about 4.7 million ha is 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.



35. About 83.3 percent of the population live in rural Odisha with agriculture being the main occupation. Workers population account for 43.2 percent of the population in rural Odisha of which about 18.9 percent are agricultural laborers. During 2010-11 there were 4.7 million operational holdings in the state out of which marginal farmers account for 75 percent holding and 44 percent of land with average size of holding being 0.57 ha. The pattern is similar among tribal groups as about 69 percent of ST farmers have marginal holdings with average holding size being 0.6 ha. Odisha has the third largest concentration of tribal population in the country with 62 tribes, including 13 Particularly Vulnerable Tribal Groups (PVTGs), mostly residing in the hilly regions of the State. The Scheduled Tribe account for 22.8 percent of the total population. Odisha is having more than 44% of the area as scheduled area (under Schedule -V) and it covers about 67% of the tribal population in the state spread over 119 Blocks in 13 tribal Districts.

5 PROGRAM ENVIRONMENT AND SOCIAL EFFECTS

5.1 Potential Benefits and Effects

36. Watershed development activities tend to have significant positive impacts on improving the agricultural production, productivity and socio-economic status of the people who directly or indirectly depend on the watershed for their livelihood. The overall environmental and social impact of the REWARD 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. Strengthened capacities of project authorities and functionaries with support from both public and private specialized institutions to implement more science-based watershed projects will be beneficial for overall hydrological services and environmental sustainability. Establishing high-level coordinating bodies in the state government on the lines of Multi Stakeholder Platforms, supported by 2030 WRG, for convergence of watershed issues will benefit environment with convergence of state specific goal on forest cover, agriculture and horticulture development in terms of 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.

37. The key social benefit of the program emerges from strengthening the watershed committees, PRIs and other community institutions, building their capacities and institutionalizing gender- and socially inclusive watershed development planning and implementation. These interventions are expected to increase people's participation, equitable and inclusive benefit sharing, gender equality and citizen's engagement in the watershed sector in the participant states. 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. These interventions will also improve the climate resilience of vulnerable communities in rainfed areas. Strengthening state and national institutions to coordinate and provide appropriate policy and program guidance and learnings from best practices will have long-term positive impact.

5.2 E & S Risks and Impacts

38. E&S Effects: The E&S risks are assessed to be 'Moderate' as the program effects and impacts are expected to be small scale, localized, reversible and predictable, and can be effectively mitigated through the strengthening of the existing E&S management systems of the implementing agencies. Most of the E&S risks and impacts are mainly on account of gaps identified in existing implementation processes of watershed program and the small scale, site specific, reversible impacts are amenable to risk mitigation measures.

39. Social Risks: REWARD program does not involve land acquisition, and activities resulting in displacement and resettlement have been excluded from support under the Program²⁹. Large scale construction sites, labor camps and labor influx are also not anticipated under REWARD program. However, selected watershed interventions³⁰ may need to be screened to identify and mitigate any adverse social impacts.

40. The key social risks relate 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.

²⁹ Including activities included in the Exclusion List

³⁰ Especially especially those close to habitations, areas with squatters and encroachers, cropped areas etc.

41. Transition to a science-based approach may undermine the mechanisms and processes of community participation in watershed planning. LRI based approach could make the watershed planning process more 'top down' compared to the 'bottoms up' planning processes envisaged in IWMP and PMKSY-WDC.

42. Marginalization of women and vulnerable communities in watershed committees, and infrastructure and livelihood planning are also important social risks. Risk of excluding SC and ST communities, landless and wage dependent households, and women from program planning processes, inclusive benefit sharing, and grievance redress could increase.

43. Gaps in institutional responsibilities, operational guidelines, and implementation capacity for screening, mitigating, monitoring, and reporting of social risks adds to the risk profile. The systems risks associated with the Program include the lack of systematic E&S screening procedures which may lead to extension of interventions to environmental sensitive areas and improper identification of physical cultural resources, inadequacy in training systems on E&S aspects to frontline workers, and lack of clarity on institutional responsibilities for implementing and monitoring E&S activities.

44. Environmental Risks. The potential environmental risk comes from the large and varied geographical scope of the Program area spreading across rain fed areas of Karnataka, Andhra Pradesh and Orissa, with high variations in climate conditions specially rainfall, physical characteristics including terrain and cropping pattern across these states. 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 included low lying areas susceptible to inundation; risk of restricting surface flow at plot level thereby impacting water bodies in the downstream and overall hydrology. There are no specific measures instituted for management of E&S activities in the process of existing implementation. The science-based planning based on key attributes of hydrology, land, weather data and convergence of other programs of partner departments of agriculture, horticulture, forestry, and MNERGA to conserve soil moisture coupled with just in time advisories on crop, nutrient, water conservation, fertilizer use and pest control will contribute to effectively managing all such environmental risks. The REWARD Program's overall E&S risk rating is 'Moderate' and can be effectively mitigated by strengthening existing E&S management systems.

45. 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 Result 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. REWARD will utilize LRI based planning, with data available at land parcel level, that will screen out such risks at DPR preparation stage itself and would further be screened at WCs/GPs during DPR finalization stage.

46. The science-based planning approaches to be adopted by the REWARD program reduces the risk of ignoring overall hydrology and water resource budget in the macro-watershed, including changes in ground water table, water quality parameters, water intensive crop selection and increase in pesticide use. with methods of soil, land, and water conservation. However, these risks are designed to be mitigated through Result Areas-1(e). Strengthened monitoring and evaluation systems at national and state levels on First, by deployment of a GIS-enabled MIS platform that focuses on tracking activities, outputs and outcomes, and integrates tracking of process efficiency and quality. Other risks related to over-use of chemical fertilizers and pesticides leading to water pollution, excessive irrigation creating salinity and sodicity issue, will be mitigated through agro-advisories issued to farmers. The systems risks associated with the Program include the lack of systematic E&S screening procedures, which may lead to extension of interventions to environmental sensitive areas and improper identification of physical cultural resources, inadequacy in training systems on E&S aspects to frontline workers, and lack of clarity on institutional responsibilities for implementing and monitoring E&S activities. Gaps are there in institutional responsibilities, operational guidelines, and

implementation capacity for screening, mitigating, monitoring, and reporting of environmental and social risks. E&S risks as identified will be mitigated through strengthening of institutional capacity with well laid of E&S framework under Program Manual for baseline data, screening, mitigating, reporting, monitoring and institutional responsibility.

47. The Program will establish 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. During course of the project, value of ecosystem services like water budgeting and their contribution to watershed development scoping will be explored and also landscape approach for integrating planned convergence of other programs of the partner Departments of Agriculture, Horticulture, Forestry, MGNERGA with SWD's target to conserve soil moisture to improve outcomes on water yield, ground water and sediments in the long run for environmental sustainability can be seen in the project.

48. Indirect and Cumulative Impact: The watershed development activities generate significant positive externalities, which have a bearing on improving the agricultural production, productivity and socio-economic status of the people who directly or indirectly depend on the watershed for their livelihood. One of the most important cumulative impacts of the watershed development program has been the reduction in forced migration. Migration is one of the means of income generation for the poor. With improved soil and water conservation and ground water recharge, a lot of small and marginal farmers who were earlier dependent only on one crop, and may have migrated out for wage labor, have reduced/ stopped migrating. Hence, along with change in income, the changes in migration pattern need to be monitored as a significant impact of the project.

49. Science based watershed planning is better placed to incorporate recognized elements of environmental and social screening, assessment good practice, effects and of potentially induced, positive cumulative impact or generate significant positive externalities which have a bearing on improving the environmental indicators. This includes increase in water level in the wells, changes in irrigated area, duration of water availability, water table of wells, surface water storage capacity, differences in the number of wells, number of wells recharged, etc. and the treatment activities help in conservation, enhancement of water resources also reduces the risk of crop failures due to climatic extremities. Construction of watershed structures also reduces run-off, thus increasing the soil moisture retention capacity. A healthy watershed provides habitat for wildlife and plants due to water and soil conservation. The floral diversity and density of a treated area is found to be much improved.

6 ASSESSMENT OF ENVIRONMENTAL AND SOCIAL SYSTEMS AND CAPACITY

6.1 Applicable Environment and Social Legal and Regulatory Framework

50. ESSA reviewed the applicable Government of India and the state government laws, regulations, policies, programs and procedures relevant to managing the environmental and social effects of the proposed program and included environmental and social protection laws and policies also³¹. The legal framework for environmental and social systems are adequate and backed by set of comprehensive laws, regulations, technical guidelines, and standards, that apply nationwide and to participating states as well.

51. With regard to environment, the following relevant legal and regulatory frameworks were assessed: (i) Environment (Protection) Act of 1986 and associated Rules, Forest (Conservation) Act No. 69 of 1980 and amended in 1988, (ii) The Wildlife (Protection) Act 1972, Amendment 1991 (iii) Air (Prevention and Control of Pollution) Act 1981 and associated Rules, (iv) Water (Prevention and Control of Pollution) Act 1974 and associated Rules, (v) Noise Pollution (Regulation and Control) Rules 2000, (vi) Biological Diversity Act 2002 Biological Diversity Rules 2004, (vii) Solid Waste Management Rules, 2016, (viii) Bio-medical Waste Management Rules, 2016, (ix) Other Waste Management Rules; (x) The Ancient Monuments, Archaeological sites and Remains Act, 1958, (xi) National Green Tribunal (NGT) Orders. All the regulatory procedures are clear, streamlined and well established. Overall, there are no significant gaps in the legal and regulatory systems that need to be addressed under this Program. Gaps were observed in enforcement of the existing legal and regulatory frameworks and backing them with well-defined institutional mechanisms and operational procedures.

52. The existing legislative framework is adequate to ensure social sustainability and inclusion of marginalized and vulnerable population including the SC and ST population, but requires strengthening of institutional capacity for better compliance. It ensures the following: (a) inclusion of women, SC and ST population in watershed institutions as well as program beneficiaries, (b) adoption of special measures in line with traditional and customary laws of tribal community in Scheduled areas (c) non-discrimination based on religion, race, caste, and gender, (d) transparency with the right to information, (e) the right to fair compensation in case of land acquisition; f) access to grievance redressal mechanisms.

53. Over the last four decades, the watershed program has evolved with the IWMP/ WDC-PMKSY guidelines providing a comprehensive framework for watershed development in India, and that is generally consistent with the PforR. In the existing WDC-PMKSY program, involvement of primary stakeholders is at the center of planning of watershed projects. The Project Implementing Agency (PIA) provides necessary technical guidance to the Village level institutions - Watershed Committees (WCs), Self-Help Groups (SHGs) and User Groups (UGs) for preparation of DPR through a strong Participatory Rural Appraisal (PRA) exercise.

54. The core guiding principle of the IWMP/WDC-PMKSY program includes (a) Inclusion and equitable benefits to most marginalized sections of the communities including Scheduled Tribes, the Scheduled Castes, landless, women, small and marginal farmers living in the watershed villages; (b) participation of women in watershed institutions, consultations and livelihood benefits, and in accessing related opportunities and resources; (c) Building accountability by ensuring transparency at all levels and ensuring Gram Sabha's participation in planning and management along with mechanism of social audits; (d) Involvement of NGOs and/or facilitating agencies for social mobilization, building capacities of community, CBOs, SHGs and Gram Panchayats and to help support the process of planning and implementation, and (e) setting up effective monitoring and evaluation mechanism for program interventions. While the legislative and regulatory provisions on social aspects are adequate, their systematic implementation and monitoring requires strengthening.

³¹ Covering protection of rights and interests of backward, scheduled caste (SC) and scheduled tribe (ST) and other marginalized communities, citizen engagement, livelihoods, inclusion, gender, labor and other sector related laws and policies.

6.2 Environment and Social Management Systems

55. The most relevant ESSA core principles for the REWARD program are those dealing with implementation and management of E&S screening and mitigation measures, including natural habitat and physical and cultural resources, public and workers safety, rights and interests of indigenous people (or Scheduled Tribes). The core principles on land acquisition and involuntary resettlement are not applicable but may require screening for any potential adverse impacts in select cases. While the state ESSA Reports for Andhra Pradesh, Karnataka and Odisha present a detailed assessment of watershed development program and adoption of IWMP/ WDC-PMKSY guidelines, the common findings on E and S Systems are summarized below.

Core Principle 1: Program E&S management systems are designed to (a) promote E&S sustainability in the Program design;(b) avoid, minimize, or mitigate adverse impacts; and (c) promote informed decision-making relating to a Program's E&S effects.

56. The IWMP/WDC-PMKSY program guidelines clearly articulate the institutional responsibilities at different level of program implementation right from national, state, district, Block/ PIA, GP and village level, also spell out clear roles and responsibility, and the process to be adopted for watershed planning and implementation. REWARD participating states have adopted the same with minor variation based on the state specific institutional arrangements (as in which department the SLNA is housed and based on that department's institutional structure at district and block level), delegation of responsibilities and power, human resources deputed, systems and processes designed. While in Karnataka, Watershed Development Department (WDD) has been specially created for watershed development program implementation, in Andhra Pradesh it is the Department of Panchayati Raj and Rural Development (PR&RD) that is implementing watershed development programs. And in Odisha it is the Directorate of Soil Conservation and Watershed Development under the Department of Agriculture that is implementing the watershed development program. Each of these department/directorate has followed the IWMP guideline and adopted it within its own institutional structure, and hence has its own strengths as well as limitations.

57. The WDC-PMKSY guidelines spell out the institutional mechanism along with roles and responsibilities and guiding principles on Environment and Social Sustainability aspects in watershed development, which have been adapted by the states based on their institutional priorities and structures. The program guide articulates the institutional responsibilities at different levels of program implementation right from national, state, district, Block/ PIA, GP and village level. However, in the existing implementation set up, presence of nodal officers responsible for E&S performance is minimal, and there is need to strengthen institutional mechanisms for this with clear responsibilities at different levels.

58. LRI-DSS based DPR preparation integrates large numbers of data on land use, landform, terrain characteristics, infiltration, erosion, etc. to identify the most suitable technical alternative for all watershed interventions. Under Sujala III in Karnataka, LRI data sets were addressing the Environmental risk partially by eliminating forests or low lying or common property resources by taking it under a broad layer of non-arable land. And hence, no interventions were proposed on those areas. The current system of screening is by default based on consultation with community groups and has some E&S Assessment and management systems but not by design. For this baseline data format and screening checklist have been created for the Project and presented as part of state level ESSAs. Present LRI systems assess data at soil management unit basis and normalize it for micro-watersheds based on geology, terrain and soil quality primarily.

59. There are possibilities of farmers taking up intensive agriculture with improved high value crop growing conditions and increased availability of water as a result of the watershed treatment, and that may lead to risks of overuse of chemical fertilizers, pesticides, etc., thus leading to groundwater and soil contamination and risk of increase in salinity & sodicity due to excessive irrigation including in low lying areas susceptible to inundation; similarly, there is risk of restricting surface flow at plot level thereby impacting water bodies in the downstream and overall hydrology. These all are presently managed by agro-advisories and training done by Agriculture Department.

60. As part of LRI, the climate resilience is addressed with input of dynamic weather data of rainfall, relative humidity, temperature, etc. These datasets capture and address climate variations. Therefore, outputs so generated are accommodating climate issues and thus environmental sustainability effectively.

61. There is evidence of awareness trainings on integrated pest management (IPM), propagation of organic farming, multi-layer farming, water conservation techniques, discouraging water intensive crop being regularly done by WDD and Agriculture and Horticulture Department in Karnataka through LRI-DSS based agro-advisory systems. This is expected to be followed by Andhra Pradesh and Odisha as well. However, these activities are more mechanical and not demystified to user groups, thus creating a gap in understanding and documentation. These can be effectively monitored periodically with M&E parameters table prepared for the project.

62. The implementation chain identifies the need for close co-ordination among Forest, Revenue, Agriculture and other line Departments including the need for documentation and monitoring of advisories issued for crop selection, water conservation, fertilizer, pest control and nutrient management to ensure coherent messaging since many of these activities are presently being carried out by these departments and part of their core responsibilities.

63. In Karnataka since LRI data base are available, they are better placed to incorporate recognized elements of environmental and social screening, assessment good practice, effects and of potentially induced, positive cumulative impact or generate significant positive externalities which have a bearing on improving the environmental indicators. Andhra Pradesh have some experience of science-based work while doing water audit and with their technical partners they can catch-up with Karnataka since functionaries who were incorporation E&S aspects with the community have exposure to GIS, MIS platforms. However, Odisha will require this to incorporate into their implementation plan and capacity building measures.

64. With the potential change in the watershed planning process using LRI database and DSS system for preparing the early draft of watershed plan/ DPR, which was earlier being done through a detailed participative community consultative processes, it requires both institutional processes and capacity enhancement across the implementation chain to ensure community ownership of the watershed plan/ DPR. An initial process was developed under KWDP-II (Sujala-III) project in Karnataka, but it requires strengthening for practical adoption on the ground.

65. Social accountability is one of the guiding principles in the IWMP/ WDC-PMKSY guideline and different states have different mechanism for the same including mechanism for social audit. While different states have some mechanism of social audit by presenting physical and financial details in Gram Sabha, Andhra Pradesh has an elaborate system of social accountability in watershed planning and implementation through social audit using a well-laid process by Society for Social Audits Accountability and Transparency (SSAAT), an autonomous body, responsible for the conduct of social audits in the state. Every year the social audit is conducted by the SSAAT and observations are disclosed for further tracking at their website (<http://socialaudit.ap.gov.in/>).

Key Gaps

66. There is no written down system or procedure to address E&S screening, impact mitigation or monitoring and evaluation. In the existing watershed program implementation chain, there is no articulation of institutional responsibility for implementing the E&S activities and monitoring the same. Both participating states and DoLR need to take measures in addressing this in their states and mainstreaming at the national level.

67. The DPR preparation for watershed development using LRI data has brought a more accurate and scientific basis for planning watershed treatment activities for any land parcel in a reduced time. However, the major gaps identified are (a) lack of integration of E and S parameters in LRI approach, (b) consistent and clear system for E&S risk screening is absent, (c) possible risk of extension of interventions to forest land and other common property resources, (d) there is lack of inter-departmental co-ordination which lead to risks of negative impact on forest, wetland and other environmentally sensitive areas, (e) lack of mechanism to monitor or document advisories issued for crop selection and nutrient management which is key on addressing over exploitation of groundwater,

and (f) M&E process for mid-term and end term evaluation for E&S parameters including baseline database creation at DPR stage being absent. While the learning is largely from Karnataka, it needs to be addressed in other participating states as well. Ideally, for enhanced positive impact, based on experiences of implementation, these learning requires to be mainstreamed by DoLR at the national level.

68. The Government program does not consider trans-watershed boundary impact of existing structures, forests, upstream users, and impact on downstream users. Thus, there is increased chance of the interventions spreading into forest boundary and common property resources and reduction in the effectiveness of the program. Conflict among the users over common resources and encroaching degraded forestland may lead to issues in future. Also, Watershed Assistant is believed to be taking care of it in co-ordination with other line Departments. However, there are issues in co-ordination among Departments in absence for clear guidelines. Also, the lacks stakeholder engagement on induced, cumulative, and trans-watershed boundary impacts.

69. The current process of watershed plan preparation following IWMP/ WDC-PMKSY guidelines has a detailed process of community participation and consultation during the watershed plan preparation. The watershed plan preparation proposed using LRI data as proposed in REWARD program has brought in more accurate and efficient watershed treatment activities for any land parcel using the computer-based decision support system (DSS) in a scientific and more efficient manner and further reduces the watershed plan preparation time from 18-24 months to 4-6 months. This replaces the current community consultative processes for watershed plan preparation. And hence, it poses the risk of compromising the community consultative process and participation mainly from small and marginal farmers, women and other disadvantaged groups including SC, ST and landless. While this requires to be addressed in the participating states, given the new national watershed program guideline also talks about learning from Karnataka and moving towards scientific approaches, there is need for DoLR to address this by providing guidance on aspect of community consultation and community participation using new watershed guideline.

70. LRI-DSS offers huge opportunity in the project to achieve large scale goals of protecting and conserving hydrologic services and/or managing negative downstream and groundwater impacts if in-field captured data on infiltration and run-off is given as input data in hydrological models used for DPR preparation and issuing advisories to farmers. Hydrological data on ground water storage, silt movement, surface water flow is collected periodically in the model watersheds and benchmark sites. Model micro-watersheds are truly important to report baseline and record change in critical hydrological and environmental parameters to generate realistic representative data.

6.3 Natural Habitats and Physical and Cultural Resources

71. Core Principle -2: Program E&S management systems are designed to avoid, minimize, or mitigate adverse impacts on natural habitats and physical cultural resources resulting from the Program.

System and Capacity

72. At present in Watershed committees and user groups along with field level functionaries in the micro-watershed ensure identifying and protecting physical and cultural resources. However, it lacks clear guideline of conducting environmental and social screening for the same. There are potential risks of encroaching forest land or notified wetland or natural habitat areas, and the current mechanism to address them in the watershed works are provided below

73. The LRI data set captures each land parcel wise scientific details as well as ownership and social data to feed into decision support system (DSS) for preparation draft DPR/ watershed plan. This includes information on forests, land use, waterlogged areas etc., and thus provide opportunity to mainstream environmental screening using the LRI tools specially to exclude forest areas, water bodies and habitations etc. from treatment. The present LRI system, which is capturing the data on forest, wetland and other sensitive areas, but given that it is clubbed under one category therefore not being used for systematic screening and can be un-clubbed to address screening of E&S risks. With this the interventions to be taken up under the project would not convert or degrade natural habitats.

Presently these areas are getting avoided by virtue of public consultation at WDC and GP levels while finalizing DPR but not by design.

74. Activities/ treatments which involve encroachment of forest land requires permission of the Forest & Environment Department. Provision for approval and sanction of community forest rights (CFR) and individual forest rights (IFR) under the FRA support watershed treatments in forest lands.

75. Presently Inter-departmental coordination from Forest Department, Wildlife Department, Revenue Department is the way by which natural habitats are being protected or screened out in absence of any clear guidelines. Whereas there is coordination issue, which is major, gap in addressing the project impact not to extent to these areas.

76. At present, many of the CPR land are encroached by the neighboring farmers. Also, if any land is vacant, with prior permission from the revenue department, the work can be taken up like gully control and SMC etc. in the revenue hillocks and streams, and block/ bund plantation can be taken up in open land, and plantation in Barren hillocks.

Key Gaps

77. At present, there is no formal system and procedural guidance for conducting E&S screening for natural habitats and physical and cultural resources. The present system of screening getting done by default during the process of consultation during DPR preparation may also change with LRI-DSS based draft DPR preparation, and hence poses risk to physical and cultural resources. Also, there is no proper system of documenting ecological sensitive areas, natural habitat, and archeological areas within the proposed watershed. While participating states will address this through REWARD program, DoLR needs to mainstream it up at national level with providing additional procedural guidance.

78. Inter-departmental co-ordination especially with forest departments and revenue departments were major gap in protection and conservation of natural habitats.

6.4 Public and Workers Safety

79. **Core Principle -3: Program E&S management systems are designed to protect public and worker safety against the potential risks associated with (a) the construction and/or operation of facilities or other operational practices under the Program; (b) exposure to toxic chemicals, hazardous wastes, and otherwise dangerous materials under the Program; and (c) reconstruction or rehabilitation of infrastructure located in areas prone to natural hazards.**

System and Capacity

80. Most of the watershed works involves local community or local labor and does not include any large-scale construction contracts or construction sites and camps. And hence, no large-scale labor influx is anticipated. Also, child labor and/bonded labor is strictly prohibited by national and state laws, and the risks of their being involved in any activities associated with watershed development are very low. Soil and conservation works do not pose any risks related to toxic chemicals, hazardous wastes, and otherwise dangerous materials under the Program.

81. Watershed development is also being done using Mahatma Gandhi National. Rural Employment Guarantee Act (MGNREGA) scheme, however, it remains in the ambit of MGNREGA provisions and processes. In addition, the legislative and regulatory provisions under various acts such as RTI Act 2005; Minimum Wages Act 1948 (with amendments); Child Labor (prohibition and regulation) Act 1986, 2015; and other national workers safety and health related legislations, and provision under the constitution and Fifth schedule areas are applicable as the case maybe and provide for larger umbrella of guidance and framework.

82. There is also existing inbuilt system of Pest Management and Advisories on regulated use of chemical fertilizer and no use of hazardous material but those need to be brought under E&S Management Framework. Presently advisories are provided by Agriculture Department for restricted use of pesticides and fertilizers. The Implementation Authority recognizes need of guidelines or records available with the authorities that such advisories are issued.

Key Gaps

83. The construction guidelines for watershed structures lack clear and consistent public and worker safety measures, especially in instances when construction is close to human habitation and/or poses risks to workers, neighboring communities and animals.

84. With intensive agriculture with high value crops due to improved crop growing conditions and increased availability of water, it may lead to risks of overuse of chemical fertilizers, pesticides, etc., thus leading to groundwater and soil contamination and intern effects human health or health of ecology.

6.5 Land Acquisition and Loss of Access to Natural Resources

85. Core Principle -4: Program E&S systems manage land acquisition and loss of access to natural resources in a way that avoids or minimizes displacement and assists affected people in improving, or at the minimum restoring, their livelihoods and living standards.

86. The national legal and regulatory framework on land acquisition and involuntary resettlement is adequate, especially for land title holders.

87. Review of watershed development experience across states shows that watershed development activities do not involve any land acquisition and the risk of involuntary resettlement impacts is minimal or non-existent. The REWARD program does not involve any land acquisition and physical displacement, and any activities causing involuntary resettlement impacts and relocation are excluded from support. No activities under the watershed project components are taken-up if it involves physical displacement of local people, either from their residences and/or commercial places.

88. E and S Screening would need to document the risk for resettlement and relocation for land titleholders, squatters and encroachers as well as loss of access to natural resources and common property resources, and any adverse impacts would need to be mitigated with suitable local action.

6.6 Indigenous Peoples and Vulnerable Groups

89. Core Principle -5: Program E&S systems give due consideration to the cultural appropriateness of, and equitable access to, Program benefits, giving special attention to the rights and interests of Indigenous Peoples and to the needs or concerns of vulnerable groups.

System and Capacity

90. Under IWMP/WDC-PMKSY guidelines, as part of DPR preparation and socioeconomic data collection, a participatory and consultative process using PRA methods is followed to facilitate the inclusion of marginal farmers, landless, women, tribal, and other vulnerable groups, and for prioritizing interventions for them. However, this process does not get adequate attention or could get marginalized under the LRI-DSS based DPR preparation approach.

91. In the Watershed Committee (WC) in all three states, participation of members from scheduled caste (SC), scheduled tribe (ST) and women is prioritized, and in some states like Andhra Pradesh and Odisha also have formal guidance for minimum number of SC, ST and women members to be there is the WC to ensure interests and priorities of women, SCs, STs are addressed in the DPR.

92. The watershed development program in tribal dominated Schedule-V areas is generally implemented by Intensive Tribal Development Agency (ITDA) or in coordination with Tribal Welfare Department to have good convergence of schemes. Tribal population living outside Schedule-V areas are supported through special programs, including under the Tribal Sub-Plan (TSP) program of the Tribal Development Department. These programs are implemented in convergence with other departments to promote livelihood, art and culture and other tribal welfare schemes.

93. One of the guiding principles of the WDC-PMKSY program is to build equity and promote gender sensitivity. The program capitalizes on the existing base of women SHGs that were set up under other programs in its operational area. In participating states, it is ensured that SHGs participate in the Watershed Committee. Promoting women SHGs is an important means to their participation,

empowerment, and building stake in decision making. In Andhra Pradesh the Village Organization (VO) which is the federation of SHGs take lead in implementing the income generation activities of the watershed program.

94. Guidelines on Value Chain Development and promotion of Farmer Producer Organizations (FPO) do include provisions for inclusion of women producers as well as small and marginal farmers from SC and ST households. The proposed program plans to further support farmers and including women in the value chain interventions, which plans to focus on production enhancement, post-harvest management, infrastructure development, and forward and backward linkages of producers to markets. This will also support establishment and/or strengthening of Farmer Producer Collectives (FPCs) in select watershed clusters, including FPCs led by women.

Key Gaps

95. Review of Sujala-III in Karnataka shows that scientific planning methods need to balance with strong mechanisms of community planning and consultation with farmers and marginalized groups. There is need for development of SOP/detailed guideline on community participation and consultation process. As mentioned under core principle #1, while this requires to be addressed by the participating states, DoLR would need to mainstream these aspects by strengthening the mechanisms and processes of community consultation and community participation under the new national watershed guidelines.

96. The program lacks strong MIS and monitoring system to capture and report on inclusion of socially disadvantaged groups including SC, ST, and women among Watershed Committees, Trainees, and direct beneficiaries. Lack of socially and gender disaggregated data limits the social tracking of the program interventions and impacts. Baseline data needs to be gender disaggregated like identification of female headed households, separate recording of number of days of employment generated for women, level of women involvement in watershed institutions, number of women disaggregated by social groupings benefited through different activities of the watershed program etc.

97. Though extending benefits for income generation to women members through SHGs is a tested significant step that has shown visible impacts; however, it also runs the risk of excluding those women who may not be members of such groups. In such a scenario, there is a need to expand SHG coverage base or other mechanism for involving such women members. The reasons and factors preventing other women to be a part of SHGs need to be assessed and suitable measures are to be undertaken for their inclusion.

98. Special attention is required especially for tribal and marginalized population and in Scheduled-V areas as they require more handholding support and awareness building to participate and take equitable benefit of the program. Convergence and coordination among tribal and other agencies at district and block level would need to be strengthened.

6.7 Social Conflict

99. **Core Principle -6: Program E&S systems avoid exacerbating social conflict, especially in fragile states, post-conflict areas, or areas subject to territorial disputes.**

100. Program area is likely to cover left wing extremism (LWE) affected areas. Program will be investing in some of the poorest and socioeconomically backward areas of the country, with higher vulnerability to climate change and food security issues. The overall environmental and social impact of the watershed Program is going to be positive in terms of improved crop productivity and rural livelihoods. Program is expected to increase people's participation, equitable and inclusive benefit sharing, gender equality and citizen's engagement in the watershed sector in the participant states. In addition, the program will also enhance local employment and livelihood opportunities for watershed populations including for marginal and small farmers as well as for wage laborers.

101. Program activities are unlikely to exacerbate the conflict in such areas. The watershed experience in Odisha and Andhra Pradesh suggests that there are no systemic features in the program that exacerbate social conflict. On the contrary, community participation in watershed planning, and investments in agriculture lands and local livelihoods stimulates the local ownership and demand for

such interventions in these resource poor areas. In many ways, watershed interventions coupled with livelihood investments integrate community priorities into development planning and reduce the alienation of local population in LWE areas.

6.8 Summary of Environmental and Social Systems and Capacity

6.8.1 Environment Systems and Capacity

102. While Karnataka has experience of watershed planning and implementing using comprehensive LRI based approaches under the KWDP-II (Sujala-III) project, it is new to Andhra Pradesh and Odisha, and they will need support during the transition phase to upscale their institutional and technical capacity for the same. Under the REWARD program, both states have identified technical and scientific partners to support them. In addition, Karnataka will act as Lighthouse state by sharing its knowledge and experience with Andhra Pradesh and Odisha and other states in collecting, processing and applying LRI based watershed planning and implementation. The LRI-DSS based system uses the land resource site-specific data (both physical and chemical properties) at the cadastral level along with hydrological data on permeability, infiltration rate, run-off, erosion, soil moisture, soil storage, ground water storage, recharge, etc. and the Hydrology partner to develop Models for estimating water fractions (ET, Soil Moisture, run-off, Groundwater) 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. In this process, while there is a system in place to protect environmentally sensitive areas which is already captured but accumulated under one layer, but it is not clearly visible and need to be clearly displayed on DPR outputs with database. The risk screening at present depends on knowledge the community and the field level functionary. In absence of systematic and informed approach of E&S risk screening and lack of inter-departmental co-ordination there are chances of extension of watershed interventions to forest areas or wetlands or common property resources like pastureland etc. The inter-departmental co-ordination especially with forest department and revenue department is a major gap in protection, conservation efforts including treatment of upper ridge areas the inter-departmental meetings among functionaries of forest department, revenue department, and wildlife department with the officials from Irrigation, Watershed, Agriculture and Horticulture Departments are missing in present system. In the implementation chain there is no articulation of individual or agency responsible for implementing and monitoring the E&S activities. Also, lack of skill among frontline functionaries to demystify core technical details is built in the LRI-DSS with environment and social aspects. The system of crop advisories, use of fertilizer, water use, etc. generated through DSS and communicated regularly need to be documented and used in monitoring of benefits. The hydrological data on ground water storage, silt movement, surface water flow is collected periodically in the model watersheds and benchmark sites for monitoring. The same database can be for measuring mid-term and end-term impacts and shall capture larger goals of protecting and conserving hydrologic services and/or managing negative downstream and groundwater impacts which otherwise remains unaddressed. Also, in LRI, the climate resilience is addressed with input of dynamic weather data of rainfall, relative humidity, temperature, etc. These datasets capture and address climate variations. Therefore, outputs so generated are accommodating climate issues and environmental sustainability effectively. Crop choices based on the prevailing weather conditions, soil quality and site data collected through LRI will ensure the success of farming and thereby enhance the resilience of the farmers in the watershed areas. Establishing a scientific assessment and evaluation system, including a system of valuation of ecosystem services 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 is possible with huge data sets generated under LRI based planning. An effective institutional mechanism will have to be developed for the same and to move towards capturing additional benefit on environmental sustainability. Learning from state implementation, DoLR also need to mainstream the same at national level.

6.8.2 Social Systems and Capacity

103. The existing legislative framework is adequate to ensure social sustainability and the interest of marginalized and vulnerable population including the SC and ST. Primarily it is the IWMP/WDC-PMKSY guideline and its further replacement with new generation Watershed Development Guideline provides the legal and regulatory framework to the program and is adequate and quite comprehensive. It has core principles related to ensuring equitable benefits, addressing gender issues, building accountability, being inclusive, and setting up effective monitoring and evaluation system. It clearly articulates the principles, processes, institutional responsibilities at different level of program implementation right from national, state, district, Block/ PIA, and village level for watershed planning and implementation. The process of watershed selection for treatment is based on regional assessment of the environment especially soil health and water availability in the rainfed area. Geographically these areas also house higher proportion of poor, and hence, addressing equity and inclusion is quite important and rightly being prioritized in the watershed guideline. The WDC-PMKSY guidelines promote detailed consultation with community groups including with SC, ST, and other marginalized groups on each land parcel to prepare the watershed plan. The process also includes using PRA tools and mapping such as participatory wellbeing ranking and social mapping to ensure inclusion of women, tribal, and other vulnerable groups. The watershed institutions also have participation from SC, ST, women, and other marginalized groups, though vary across states and some states like Andhra Pradesh have also developed guidance for the same. However, the DPR preparation using LRI based data has brought in more accurate and efficient watershed treatment activities for any land parcel using the computer-based decision support system (DSS) in a scientific manner which is currently being done using community consultative processes. And hence, it poses the risk of compromising the community consultative process and/or giving inadequate importance to it for preparation of the draft DPR/ watershed plan. While this requires to be addressed by the participating states at state level, recognizing this risk DoLR also needs to provide guidance on community consultation and community participation along with new national watershed development guideline.

104. While state like Andhra Pradesh has good mechanism of ensuring social accountability in watershed planning and implementation through social audit by the well-laid process by Society for Social Audits Accountability and Transparency (SSAAT), an autonomous body, is responsible for the conduct of social audits in the state, other states like Karnataka and Odisha does not have such elaborate process and lack in detailing. Also, promoting women SHGs is an important means to their participation, empowerment, and building stake in decision making. Though extending benefits for income generation to women members through SHGs is a tested significant step that has shown visible impacts; however, it also runs the risk of excluding those women who may not be members of such groups.

105. 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 involved and hence the risk relating to acquiring land and resettlement is minimal or non-existent. Also, as most of the watershed works involve the local community working on it or local labor employed, any large-scale labor influx is not anticipated. Though there is mandate of addressing marginalized groups including tribal population, the assessment suggests no special measures planned to focus on specific needs of tribal groups and which also lacked inter departmental coordination for any convergence with schemes focusing on tribal development. Even though equity and sustainability are considered as guiding principles of the program, operational or institutional mechanisms are not in place to ensure this. The states also show gaps in systematic E&S monitoring and reporting, including gender, inclusion and grievance redressal aspects, and lacks in collecting and reporting disaggregated data on gender and on specific community groups (such as ST and SC) to track benefits and impact on them.

106. Rural women play a central role in managing land, water, biomass, and agriculture, as well as addressing household requirements of food and income, and are consequently most affected by

climate-change and vulnerabilities associated with rainfed agriculture³². Successive guidelines³³ as well as Projects on watershed development have emphasized on women's representation in water institutions as well as their participation in watershed planning and management. However, the implementation experience and outcomes for gender equity have shown significant variations. This is due to multiple reasons, such as inadequate project focus on women's engagement, and their differential needs and priorities, social and cultural constraints that limit women's voice and agency, as well as longer term constraints such as women's ownership of land. Despite several success stories on women's engagement in watershed development, their overall participation in watershed development as leaders of watershed committees, as participants in watershed planning and as direct beneficiaries of watershed investments has been mixed and limited.

6.9 Key Environmental and Social Gaps

107. The key environmental and social gaps identified are (a) the LRI based watershed planning being top-down planning approach compared to currently 'bottoms up' approach, poses gaps in detailed process guideline in giving adequate priority to community participation and risk of compromising the community consultative process for preparation of the DPR/ watershed plan; (b) The current system lacks in doing systematic screening for environmental and social risks and issues including for any adverse effects on biodiversity and cultural resource; e.g. clear demarcation between revenue land and forest land do not exist on the ground and appears similar in rain fed areas. Thus there is chance of extension of agricultural activities to forest land with availability with water in proximity when adjacent watershed is treated with harvesting structures, (c) There is increased chance of interventions spreading into forest boundary and/or common property resources in absence of mechanism to check it; (d) Lack of inter-departmental co-ordination mechanism in dealing with forest, wetland and other environmentally sensitive areas as part of watershed plan; (e) Lack in addressing impact of existing structures on forests those located in adjacent watersheds or on upstream users and impact on downstream users; (f) Intensive agriculture with crop growing conditions, may lead to risks of overuse of chemical fertilizers, pesticides, etc., thus polluting groundwater and surface runoff ; (g) In absence of proper guidance, improper management of the civil activities may lead to worker safety issues albeit of low magnitude; (h) Convergence of different schemes targeting tribal and vulnerable groups remains a challenge; (i) Methods and parameters of M&E system is not spelt out properly for Environmental and social risks and impacts e.g. monitoring gender specific data as well as data on equitable benefit sharing to SC, ST, landless and other socially disadvantaged groups; and (j) Lack of systematic reporting and tracking of grievances received manually at different administrative level.

108. The persistent gender gaps pertain to: *first*, women's leadership in watershed development committees, water user groups and watershed development teams/associations³⁴; *second*, women's structured participation in watershed infrastructure planning, prioritization, implementation and operation and maintenance of watershed investments³⁵; *third*, absence of gender-disaggregated data in baseline surveys, detailed project reports (DPRs) and monitoring and reporting systems;³⁶ and *fourth*, targeting of women farmers, women agriculture workers and women-headed households as direct beneficiaries of watershed interventions. However, the Result Area-1(a) aims to address inclusion of women as leaders and decision-makers in watershed committees, watershed development teams and water-user groups/ associations, provide targeted training/capacity building approaches for women/women-led groups in WCs and GPs guidelines, and institute mechanism for structured consultations with women's groups as part of baseline survey and DPR preparation.

³² Gender Perspective in Water Management: The Involvement of Women in Participatory Water Institutions of Eastern India, Varsha Khandker; 2019

³³ Integrated Watershed Management Guidelines, 2011; GoI

³⁴ Women, Water and Leadership; Asian Development Bank (ADB) Briefs 2014

³⁵ Impact Study of Karnataka Watershed Development Project II (Sujala III), TERI; 2019.

³⁶ Implementation Completion and Results Report, World Bank, 2017.

6.10 Borrower's Experience in Managing E&S Risks

Both Government of India and all the three state governments have long association with World Bank over the last four decades have experience of implementing numerous projects and have had experience of managing E&S risks in compliance with projects. Government of Karnataka had experience with World Bank in implementing watershed development programs since 1984 with KWDP-I (2000-2009) and KWDP-II (2013-2019) in recent years. Government of Odisha is also presently involved in joint implementation of the World Bank supported Odisha Integrated Irrigation Project for Climate Resilient Agriculture project along with Department of Water Resources (DoWR), and Directorate of Fisheries and Animal Resources Development (DoFARD). Similarly, Government of Andhra Pradesh has had a long experience with World Bank projects in the past and includes the World Bank supported Andhra Pradesh Rural Water Supply and Sanitation Project for improving rural water supply and sanitation services through progressive decentralization, community participation, and enhanced accountability. Also, DoLR has had experience of implementing World Bank projects in past including the Neeranchal National Watershed Project.

6.11 Grievance Redress Mechanism (GRM)

109. REWARD participating states leverage existing country system to receive, resolve and manage grievances, mainly grievance redress portals, Chief Minister's (CMs) grievances cell and other state specific mechanisms. The current grievance redress mechanism in the participating states has multiple ways to register grievances and get redressal. This includes:

- Using Right to Information (RTI) Act to get information and resolution of grievances as mandated under the Act.
- Registering grievances online through Chief Minister's (CM's) grievance cell in all three participating states under the control of Department of Personnel Administration and Reforms (DP&AR) which are generally received and tracked through state online portals such as <http://www.espandana.karnataka.gov.in/cms/portal/login.jsf> in Karnataka, <https://www.spandana.ap.gov.in/> in Andhra Pradesh, and <https://cmgcodisha.gov.in/> in Odisha. On receipt of the grievances, initial screening is done at DP&PR and forwarded to the concerned department for resolution. The concerned departments make further investigations and address the grievances and report back to DP&PR where the grievances are monitored and tracked online.
- In addition to the online system, Karnataka and Odisha has a system of registering grievances at watershed level or cluster of village level or block/ district level or to SWD level manually. In Andhra Pradesh, following the *Spandana* program, weekly meetings are held to redress public grievances at State, District and Mandal levels.
- At the national level the Centralized Public Grievance Redress and Monitoring System (CPGRAMS) is an online web-enabled system (<https://pgportal.gov.in/>) in association with Directorate of Public Grievances (DPG) and Department of Administrative Reforms and Public Grievances (DARPG) to register and track grievance.

110. However, the key systems gap is lack of systematic reporting and tracking of grievances received at watershed level, at cluster level (e.g., at RSK in Karnataka), and at block/ Mandal and district level largely due to current systems being manual, there is no consolidation and tracking of grievances received and resolved in specified period at the SLNA level. And this needs to be strengthened in a manner that all grievances received are tracked properly for resolution. The REWARD program will support the strengthening of the GRM and its integration with M & E systems.

7 STAKEHOLDER CONSULTATIONS AND DISCLOSURE

111. The stakeholder consultations were undertaken with both primary and secondary in all three participating states. It included (a) Field visits to watersheds and consultations with primary stakeholders and watershed communities; (b) Face-to-face discussions with SLNAs/ SWDs, other line departments, and technical partners; (c) Written comments from SLNAs based on E&S checklist and virtual consultations with SWD officials; (d) Sharing of draft ESSA and feedback by SLNA/ SWDs; (e) Multistakeholder consultations primary and with secondary stakeholders.

112. **Field Visits:** Prior to COVID19 lockdowns, field visits were undertaken in Karnataka to watersheds in different agro-climatic zones in two districts. During the field visit, consultations and focus group discussions were held with key program stakeholders including with Watershed Committees/ Executive Committees, Panchayat Raj Institutions (PRIs), Women SHGs, community members - farmers and landless including SC, ST and women, Non-Governmental Organizations (NGOs), and discussions were also held with program implementation chain at PIA, district and state level. In addition to discussions, visits were also made to various watershed structures. Given the COVID19 situation with travel restrictions field visit could not be taken up in Andhra Pradesh and Odisha by the safeguard team and relied on field information shared by the technical team.



Discussion with community members at Nabhapur Village of Belanhadi GP in Gadag district



Discussion with women SHG members at Nabhapur Village of Belanhadi GP in Gadag district

113. **Face-to-face discussions:** Prior to COVID19 lockdowns, face-to-face discussions were held with SLNAs of all three participating states along with some of their technical partner agencies and other line departments including Agriculture Department, Horticulture Dept., Animal Husbandry Dept, Panchayati Raj and Rural Development Department etc. and NGOs.

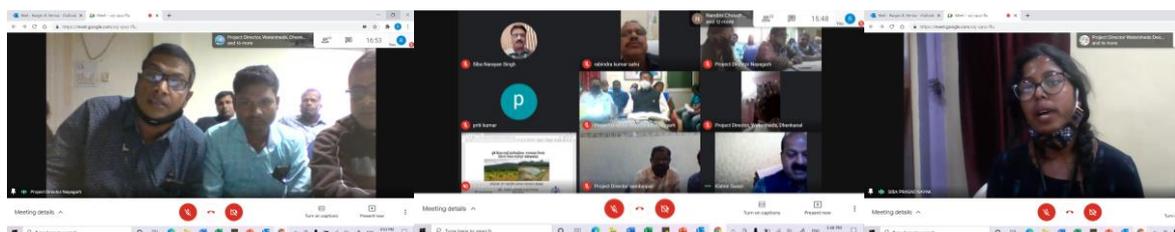
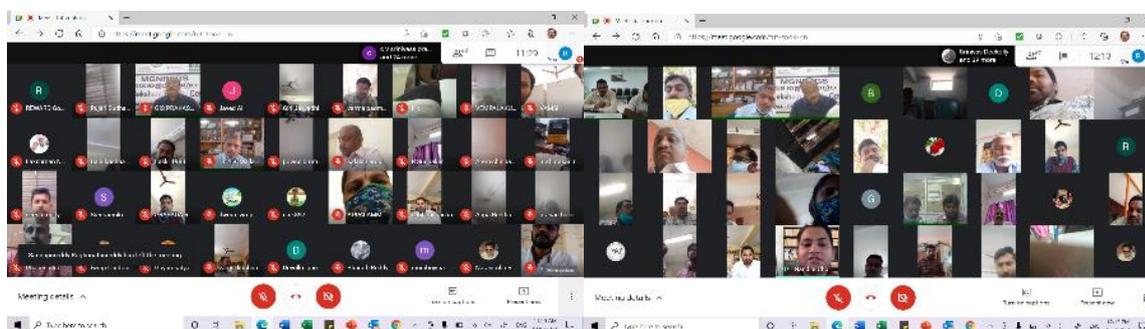
114. **Virtual consultations:** Virtual consultations were done in a systematic manner with SLNA/ SWD officials in all three participating states based on checklist developed and shared with them for their written response and using that as base for further consultations and discussions with the key officials. Virtual consultations were done multiple times with key officials in Andhra Pradesh, Karnataka, and Odisha and with DoLR officials to get clarity on system and processes being followed on ground.

115. **Sharing of draft ESSA and feedback by SLNA/ SWDs:** The draft ESSA report prepared based on desk review, field visits and consultations was also shared with SLNAs of all the participating states for their feedback and suggestions. Based on their feedback and suggestions the draft ESSA reports were revised.

116. **Multi-stakeholder Consultations:** The revised ESSA report was further presented to wide range of stakeholders for their comments and suggestion through multi-stakeholder consultation virtually organized with secondary stakeholders including district and block level officials of the SWDs and line departments, technical partners and civil society partners in August 2020. Further, a series of consultations held with primary stakeholders and their institutions from all REWARD

districts in all three states covering representatives from PIAs, Watershed Committees, SHG members and their federations, user groups and farmers, PRI members, and local NGOs in a virtual manner on in January/ February 2021 in all three participating states. The draft final ESSA was prepared after incorporating the feedback and suggestions from both the stakeholder workshops.

State	Multi-stakeholder consultation with Secondary Stakeholders	Multi-stakeholder consultation with Primary Stakeholders
Andhra Pradesh	August 14, 2020 with 30 participants	30th January 2021 with 79 participants from all REWARD districts
Karnataka	August 13, 2020 with 60 participants	4 th , 5 th , 8 th , and 9 th February 2021 covering primary stakeholders. In each of the consultations about 50-60 participants from 5-6 districts joined covering all 21 REWARD districts.
Odisha	August 12, 2020 with 50 participants	05 th February 2021 with around 63 participants from all REWARD districts





117. Multi-stakeholder Dissemination workshop: In addition to the above a final multi stakeholder dissemination workshop is planned during appraisal mission of the REWARD project.

118. Disclosure: The updated ESSA reports will be disclosed on websites of SLNAs/Departments in Andhra Pradesh, Karnataka and Odisha as well as DoLR and World Bank's external website by the completion of appraisal of the project. State ESSA Reports are presented as separate volumes. The links for accessing them is presented below as they are also disclosed by the respective SLNAs.

- Detailed ESSA Report for REWARD Program in Andhra Pradesh – available at <http://iwmp.ap.gov.in/WebReports/>
- Detailed ESSA Report for REWARD Program in Karnataka – available at <https://watershed.karnataka.gov.in/storage/pdf-files/REWARD-ESSA%20Report%20for%20Karnataka.pdf>
- Detailed ESSA Report for REWARD Program in Odisha – available at https://odishaagriclicense.nic.in/public/actsRules/ESSA_REWARD.pdf

8 DEPARTMENT OF LAND RESOURCES

8.1 Program Scope

119. The DoLR, within the Ministry of Rural Development (MoRD), is the national nodal agency for managing the government watershed program. DoLR's main role is to develop national programs and guidelines to implement them, raise and manage finances (central share), monitor implementation, and promote knowledge sharing. It acts as central nodal agency for the WDC-PMKY program. DoLR is supported by the National Rainfed Areas Authority (NRAA), an autonomous agency under the Ministry of Agriculture and Farmers Welfare (MoAFW). The NRAA's key support to DoLR is in developing/updating national watershed guidelines, strategic plans, technical manuals, and standards, monitoring program impacts, conducting special studies, etc. The REWARD Program aims to further strengthen DoLR's capacity through the establishment of a national Program Management Unit (PMU). Under REWARD, DoLR will be carrying out the following activities, with support of the NRAA:

1. Establish a PMU for REWARD program.
2. Mobilize financial resources for state Program implementation.
3. Establish a Secretary level, national steering committee to improve convergence between agriculture, watershed, ground water and other related departments.
4. Establish a national technical committee (headed by NRAA) to develop, test and standardize scientific protocols and Decision Support System (DSS) tools and strengthen the national digital library.
5. Support implementation of the Program in REWARD states through coordination with national technical agencies, guidance and monitoring.
6. Organize national/ international knowledge exchange events.
7. Develop/refine national guidelines for watershed development.
8. Distil lessons from REWARD and mainstream these in revised national guidelines.

8.2 Implementation Arrangements

120. To strengthen the national capacity at DoLR level, a National Program Management Unit (NPMU) has been set up and being staffed with about seven staffs and consultants including (i) National Additional Program Director; (ii) National Watersheds Management Expert; (iii) Hydrologist/ Water Resource Expert; (iv) Institution and Capacity Building Expert; (v) Monitoring and Evaluation Expert; (vi) Financial Management Expert; and (vii) Procurement Expert to support implementation of activities including coordination with states and key partners, and assist in day-to-day functioning of the department for effective implementation of REWARD program.

121. To ensure close coordination and synergy, under the umbrella of REWARD Program DoLR aims to set up three committees such as:

1. National Level Steering Committee (NLSC) under the chairmanship of Secretary – DoLR to review and guide the program integration and convergence with other line departments and related schemes such as Agriculture, Rural Development, Water Resources and Environment & Forest etc.; and
2. National Level Technical Committee (NLTC) headed by COO, NRAA for overall technical support and guidance to DoLR, technical institutions as well as to the REWARD states and help standardizing National watershed approaches/ protocols/ methodologies etc.

8.3 Environmental and Social Systems Assessment

122. In the participating states, the overall E&S impacts of the REWARD Program are likely to be positive, owing to benefits such as increased ground water level, improved soil condition and increase in crop productivity due to multi-cropping, increased rural incomes and reduced poverty. Strengthening state and national institutions to coordinate and provide appropriate policy and program guidance and learnings from best practices will have long-term positive impact. Most of the potential E&S effects of the Program are localized, reversible and predictable, and can be effectively mitigated and managed through strengthening of existing E&S systems of the implementing agencies at district/ state level.

123. The key social risk emerges from risk to community participation with potential change in watershed planning process being a 'top down' approach compared to the IWMP 'bottoms up' approach currently being followed. This poses the social risks and issues relate to weak community ownership and preparedness to participate in science-based watershed planning and DPR preparation, and inadequate inclusion of small and marginal farmers, women, and vulnerable population including tribal and landless. This may lead to their further marginalization and lack of access to program benefits. 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 including in low lying areas susceptible to inundation; risk of restricting surface flow at plot level thereby impacting water bodies in the downstream and overall hydrology. There are no specific measures instituted for management of E&S activities in the process of Program implementation. The planned convergence of other programs of partner departments of agriculture, horticulture, and forestry to conserve soil moisture will contribute to effectively managing all such environmental risks.

124. The REWARD program support to DoLR is mainly towards national capacity enhancement to support national program, promote learning from state level implementation. There are no direct Environment and Social Risks and Impacts arising out of DOLR interventions under REWARD.

125. Given their role in knowledge creation and capacity building, learning and sharing best practices, and setting up technical standards and methodologies for improved outcome, DOLR provides opportunities for promoting environmental and social sustainability not only in the REWARD states but also in other states that enhances project outcomes. DoLR is well positioned to provide overall leadership and guidance on addressing the key E and S gaps identified in the States, as well as issue guidance and advisory on standards, mechanisms and processes for integrating environmental and social sustainability measures in the new guidelines.

126. The WDC-PMKSY program guide clearly articulates the institutional responsibilities at different levels of program implementation right from national, state, district, Block/ PIA, GP, and village level. However, in the existing implementation chain articulation environmental and social responsibility is somewhat unclear and requires strengthening.

8.4 ESSA Recommendations

127. The key recommendations for DoLR are as below.

1. The NPMU being established should also include nodal officials/experts responsible for coordinating, guiding, supervising, implementation of key Environmental and Social actions.
2. To ensure environmental and social systems and processes are further strengthened, additional responsibilities on environmental and social management need to be allocated to nodal officials/experts in the National Program Management Unit (NPMU) to take forward the implementation of ESSA recommendation.

3. 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.).
4. The knowledge exchange events shall also include lessons and insights from implementation of environmental and social actions under the REWARD Implementation.
5. The national guideline mainstreaming the lessons learned from REWARD program shall also include guidance on implementing environment and social sustainability measures including:
 - i. Learning from eco-system services pilots through Centre of excellence.
 - ii. Development of protocols and guidelines for standardizing identification of benchmark sites and model watersheds which will facilitate capturing key E&S data and positive externalities in larger context.
 - iii. Guidance on Institutional arrangements and key implementation processes and procedures, E&S capacity enhancement across the implementation chain.
 - iv. Guidance for community participation and consultation (including field surveys, PRA exercises), building community ownership, and accountability mechanism (including community validation and endorsement etc.).
 - v. LRI atlas shall include information on land use and ownership to screen out forest, ecologically sensitive areas, and common property resources etc.
 - vi. Guidance for screening of potential environmental and social risks and preparation of mitigation measures.
 - vii. Capacity building on environmental and social risk management.

9 RECOMMENDATIONS AND ACTIONS

128. The assessment identifies the existing environmental and social systems and processes in place in the participating states and the gaps that are emerging to align with ESSA core principles. The recommendations and actions presented below are mainly to address these gaps and further strengthen the existing environmental and social systems. The key recommendations addressing the environmental and social systems gaps identified, as well as for enhancing environmental and social benefits for the respective SLNAs includes:

9.1 REWARD States

129. Excluded Activities. REWARD Program will not finance any activities that would cause high or substantial E&S risks and impacts including activities involving:

- any land acquisition, physical relocation and/or involuntary resettlement impacts.
- use of child or bonded or forced labor or labor involved in any hazardous activities.
- destruction of any physical and cultural resources.
- any work that would convert or encroach forest lands, notified wetlands or any eco-sensitive areas.
- any work that would bring large scale submergence beyond drainage line.
- any work that would convert common property resources including grazing lands.
- any work that would restrict ecological flow of the rivers and rivulets.
- use of toxic pesticides classified as ‘Class I’ (based on toxicity of the active ingredient) by the World Health Organization; and (i) use of or generation of hazardous material or chemicals beyond permissible levels specified in Schedule II of Hazardous Waste Handling and Management Rules, 2016.

130. Strengthening Staffing and institutional mechanism for E&S aspects with clear roles and responsibilities at different administrative levels. *(With finalization of program manual and within three months of the project effectiveness; SLNAs)*

131. Environment and Social Screening. Undertake Early screening of DPRs and FPO Business Plans for identification of potential environmental and social risks during DPR preparation including LRI and DSS platform to show land use and environmental areas; and guidance on preparation of environmental and social management plan (ESMP). Institutionalizing E&S risk screening and climate smart agro advisories will address the identified gaps related to extension of watershed interventions to forest, wetland and other environmentally sensitive areas; change in cropping pattern to more water intensive high value crops leading to excessive withdrawal of ground water, and increase use of fertilizer and pesticides; risk of increase in salinity & 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. *(With finalization of program manual and within three months of the project effectiveness; SLNAs)*

132. Process Guidelines. Each participating state will need to prepare a process guideline for institutionalizing consultations, participation and inclusion of Gram Sabha as well as women, tribal, and other marginalized groups (SCs, landless, migrant labor etc.) during DPR preparation, validation, The Process guidelines on community participation, social inclusion, building community ownership, and accountability mechanism will be in line with the new watershed development guideline for different phases of watershed planning and implementation. *(Within six months of the project effectiveness; SLNAs)*

133. E and S Operations Guidance. Preparation and adoption of E&S operations guidance note for watershed sub-projects and FPO business plans, including, a mechanism for institutionalizing DPR specific Environment and Social Management Plans (ESMPs). *(Within six months of the project effectiveness; SLNAs)*

134. Providing E&S Training and Capacity program for frontline program staff, PIAs, WDCs, FPOs, field NGOs and PRIs. *(Within one year of the project effectiveness for model watersheds and continue with refresher trainings; SLNAs)*

135. Inclusion of gender and socially disaggregated data in M&E system along with periodic monitoring and reporting on E&S parameters. *(With finalization of program manual and within six months of the project effectiveness; SLNAs)*

136. Capacity Building and Training. 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 watershed committees 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. In addition, the Program will design and implement ‘performance incentives/rewards’ to the WCs/GPs to enhance active engagement, local innovations and accountability. Specific Activities to include are:

1. Undertake Training and Capacity Interventions for watershed committees, PRIs, User Groups, FPOs and other community institutions on i) participating in watershed planning/DPR Preparation, inclusive watershed institutions, implementation and sustainability; ii) Gender, Inclusion, Benefit Sharing, Social Accountability, Grievance Management, Livelihood Support iii) Environment and Social Risk Screening and Management
2. Capacity building for 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.
3. capacity building related to dissemination of LRI cards will help improve decision making by farmers on appropriate crop selection and agriculture practices.

137. Crop Advisories. In the program design LRI-DSS supported advisories issued to farmers for crop selection including nutrition management, fertilizer use and water conservation efforts are well designed. Crop Advisories by the Government shall include the advisories on adverse impact of overuse of insecticides and chemical fertilizers as per the Pesticide & fertilizer management plan to be prepared by the Government. *(Within 12 months of the project effectiveness; SLNAs)*

138. Other envisaged issue of ignoring overall hydrology, which includes water resource budget, conservation, flow etc. in the macro watershed, change in ground water table, change in water quality, water intensive crop selection and increase in pesticide use can be addressed through macro-watershed level evaluation with the data captured in model watersheds and benchmark sites. These will be captured during mid-term and end-term evaluation.

139. Convergence with other departments. The planned convergence of other programs of the partner Departments of Agriculture, Horticulture, Forestry, and MNERGA to conserve soil moisture will contribute to effectively managing all such environmental issues identified in existing system. Support for converging with other government agencies on Forest Department, Tribal Development, Social Welfare, Rural Development and Panchayati Raj, and Forest. *(Strategy to be prepared within six months of the project effectiveness; SLNAs)*

140. Integrating Gender in Watershed Development. Including women in leadership positions in watershed committees and FPOs, as well as among direct participants and beneficiaries of livelihood interventions. *(Strategy for promoting women in the leadership position shall be prepared by the participating states within six months of the project effectiveness).* The REWARD program further plans to support the activities on women’s representation in decision-making roles and empowerment under the Result Area 1(a) and includes (i) systemic engagement of women as decision-makers in watershed committees, watershed development teams and water user groups and other common interest groups; (ii) integrating clearly defined roles for women in each of the four phases of watershed development; (iii) targeted leadership and technical training for women leaders on effective watershed management practices; (iv) structured consultations with women’s groups as part of the

baseline survey to be included in DPRs preparation/implementation and O&M phases; and (v) state-level MIS systems to adopt gender-disaggregated data collection in watershed planning.

141. Addressing macro and micro-level environmental issues such as overall hydrology which includes water budget, soil-moisture conservation, surface water and sediment flow, change in ground water table, change in soil and water quality parameters etc., in the model watersheds and benchmark sites. *(Strategy to be prepared within 12 months of the project effectiveness; SLNAs)*

142. Existing Grievance Redress Mechanisms (GRM) system to be further strengthened and streamlined for registering, screening, and redressing, monitoring, and reporting. *(Within six months of the project effectiveness; SLNAs)*

143. 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. *(Within six months of the project effectiveness; SLNAs)*

144. Adopting a system of valuation of ecosystem services like water budgeting and their contribution to watershed development scoping will be explored and also 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. *(Strategy to be prepared within 24 months of the project effectiveness; SLNAs)*

145. While some of the recommendation has been already mainstreamed, the remaining has been proposed to be addressed by including them in the program manual. The recommendations that are mainstreamed includes (a) Restricting adverse impact of overuse of insecticides and chemical fertilizers as per the pesticide & fertilizer management has been mainstreamed is part of the Result Areas and also mentioned in disbursement-linked indicator through state-specific innovative pilots (e.g., the behavior change pilot on fertilizer use); (b) 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; (c) 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; (d) 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. *(SLNAs)*

146. 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. *(SLNAs)*

9.2 Department of Land Resources (DoLR)

147. The REWARD program support to DoLR is mainly towards national capacity enhancement to support national program, promote learning from state level implementation. And hence, the assessment in the participating states also feeds into the recommendations for DoLR. The key recommendations for DoLR are as below.

1. The NPMU being established should also include nodal officials/experts responsible for coordinating, guiding, supervising, implementation of key Environmental and Social actions. *(Before project negotiation)*

2. 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.). *(Strategy to be prepared along with establishment of national digital library)*
3. The knowledge exchange events shall also include lessons and insights from implementation of environmental and social actions under the REWARD Implementation. *(Strategy to be prepared within 12 months of the project effectiveness)*
4. The national guideline mainstreaming the lessons learned from REWARD program shall also include guidance on implementing environment and social sustainability measures including:
 - i. Learning from eco-system services pilots through Centre of excellence.
 - ii. Development of protocols and guidelines for standardizing identification of benchmark sites and model watersheds which will facilitate capturing key E&S data and positive externalities in larger context.
 - iii. Guidance on Institutional arrangements and key implementation processes and procedures, E&S capacity enhancement across the implementation chain.
 - iv. Guidance for community participation and consultation (including field surveys, PRA exercises), building community ownership, and accountability mechanism (including community validation and endorsement etc.).
 - v. LRI atlas shall include information on land use and ownership to screen out forest, ecologically sensitive areas, and common property resources etc.
 - vi. Guidance for screening of potential environmental and social risks and preparation of mitigation measures.
 - vii. Capacity building on environmental and social risk management.

9.3 Input to Program Action Plan

148. While most of the recommendations for the participating states will be incorporated in the program operations manual and some are mainstreamed as part of result framework, a higher-level action is recommended as part of the program action plan (PAP). The details of which is as below.

Action description	Responsibility	Timing	Completion Measurement
1. Protocol/ Standard Operating Procedure (SOP) to be prepared and adopted by SWDs/ DoLR detailing out mechanism of community participation and building ownership of the watershed plan based on science-based data inputs.	SLNA/ SWD and DoLR	One-time activity (within six months of program effectiveness)	Process guideline prepared for participation/ community consultation covering women, tribal, and other marginalized groups during WS plan preparation and before Gram Sabha approval; and guidance/GO issued for adopting the same.
2. Adoption/ strengthening of capturing gender-disaggregated data for watershed planning and reporting towards enhancing women participation in local	SLNA/ SWD	One-time activity (within 24 months of program	Gender disaggregated data collection at watershed level, and state-level reporting on (a) representation

Action description	Responsibility	Timing	Completion Measurement
institutions.		effectiveness)	in WCs, (b) investments in common assets and (c) women-led WCs.
3. Strengthening Grievance Redress Mechanism (GRM) for registering, screening, redressing, and monitoring of grievances, and periodic reporting on the same.	SLNA/ SWD	One-time activity (within six months of program effectiveness)	Strengthened GRM system functional and periodic reports being generated.

149. Human Resource/ Staffing: At DoLR and at the SLNAs/ SWDs existing PMU experts will be designated and have the responsibility to oversee the implementation of E&S activities including the monitoring, and reporting. 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.

150. Implementation Support Plan: The Implementation Support Plan (ISP) outlines the approach that the World Bank will take to support DoLR, WDD (in Karnataka), PR&RD Department (in Andhra Pradesh), and DSC&WD (in Odisha) in the implementation of environmental and social recommendation and actions of the REWARD Program, including reviewing the implementation progress, providing technical support where needed and will be delivered through multiple channels: six-monthly implementation support missions; interim technical missions. The main thrust of the Bank's implementation support will be concentrated on the overall implementation quality of Environmental and social risk management for sustainable environmental and social outcomes of the project. The Bank will provide implementation support to the REWARD Program to remain in compliance with the agreed Environment and Social requirements as wells the PforR policy.
