ENVIRONMENTAL AND SOCIAL SYSTEMS ASSESSMENT (ESSA)

FOR

ODISHA

FOR THE

India: Rejuvenating Watersheds for Agricultural Resilience through Innovative Development (REWARD)

(P172187)

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TABLE OF CONTENTS

LIST OF ACRONYMS

AIBP	Accelerated Irrigation Benefit Programme
APD	Additional Project Director
CCF	Chief Conservator of Forest
CEO	Chief Executive Officer
CFR	Community Forest Rights
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 & 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
DWDO	District Watershed Development Officer
DWDT	District Watershed Development Team
E&S	Environmental and Social
EC	Executive Committee
FPO	Farmers' Producer Organization
CGWB	Central Ground Water Board
GIS	Geographic Information System
GoI	Government of India
GoK	Government of Karnataka
GoO	Government of Odisha
GP	Gram Panchayat
GRM	Grievance Redressal Management
GSDP	Gross State Domestic product
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
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
MoRD	Ministry of Rural Development
NBSS & LUP	National Bureau of Soil Survey and Land Use Planning
NGO	Non-Government Organization
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 programme through Public Private Partnership
PVTG	Particularly Vulnerable Tribal Group
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
ST	Scheduled Tribe
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
ZP	Zilla Parishad

EXECUTIVE SUMMARY

The REWARD Program

The REWARD program plans to support the WDC-PMKSY scheme with the Department of Land Resources (DoLR) within the Ministry of Rural development (MoRD) at the centre and three states over a period of five years. The DoLR is the national focal point and implementing agency for the WDC-PMKSY scheme and will have key activities supported by the proposed REWARD Program. Two states, i.e., Karnataka and Odisha have agreed to participate based on their willingness to implement a more science-based watershed program, readiness to adopt results-based financing, and their positive track-record in implementing the current WDC-PMKSY. 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 at a fairly large scale through the recently concluded Bank supported KWDP II project (also referred to as Sujala III). The Program will also support selected investments at the national level focused on strengthening capacities and systems in the DoLR.

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).

The Program focuses on two key result areas which have been agreed with the Government and through which the Bank's support is likely to make a significant impact. These result areas are inter-linked and mutually reinforcing. The result areas are:

Result Area 1: Strengthened Institutions and Supportive Policy for Watershed Development

Result Area 2: Science-based Watershed Development and Enhanced Livelihoods

The Results Area-1 focuses on strengthening the institutional capacity and policy environment for science-based, participatory watershed development in the participating states. The key results under this Results Area includes (a) Strengthening community institutions and local government bodies engaged in watershed management; (b) Activities enhancing women's representation in decision-making roles and empowerment; (c) Enhancing institutional capacity for watershed management; (d) Establishing a national centre of excellence on watershed management; (e) Incentivizing the development and dissemination of supportive policies on watershed development; and (f) Strengthening monitoring and evaluation systems at national and state levels.

The Result Area-2 focuses on Science-based watershed development and enhanced livelihoods. The 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 key sub-result areas under this includes (a) Science-based watershed development plans being developed and implemented; (b) Incentivizing implementation of participatory, inclusive and science-based watershed development in selected model watersheds; (c) Empowering farmers with science-based and just-in-time agro-advisories; and (d) Incentivizing value-chain interventions and provides livelihood support for the poorest households and women towards livelihood enhancement and COVID-19 recovery.

REWARD Program in 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 49 million over the five-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.

The Environmental and Social Systems Assessment

The World Bank policy and directive on PforR financing requires an environmental and social system assessment (ESSA) of operations financed under the PforR instrument. Accordingly, an ESSA of operations to be financed under the Program was carried out to assess the adequacy of environmental and social systems at the state level in context of the Program boundary. The broad scope of the ESSA is to assess the extent to which the Program systems promote environmental and social sustainability; avoid, minimize, or mitigate adverse impacts on natural habitats and physical cultural resources; protect public and worker safety; manage land acquisition; consider issues related to indigenous peoples and vulnerable groups; and avoid social conflict. Further, it identified required actions for enhancing/strengthening the Program systems and mitigating potential environmental and social risks. The specific objectives of the ESSA included the following: (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 system performance with respect to the core principles of the PforR instrument and identify gaps, if any; and (e) describe actions to be taken to fill the gaps that will be used as inputs to the PAP.

ESSA Methodology: The ESSA primarily relied on desk review of existing information and data sources, complemented by assessment through consultations, interviews and discussions with key stakeholders. The desk review included a comprehensive review of government policies, legal frameworks, Program documents, national guidelines for IWMP and PMKSY and other assessments of India's environmental and social management systems. Given the COVID19 situation and travel restrictions and advisories on social distancing etc., primary field assessment could not be undertaken in conventional manner and followed World Bank guidance for 'Public Consultations and Stakeholder Engagement in constraint situation'. This included consultations with Department of Land Resources (DoLR) at Government of India (GoI), and State level nodal agency (SLNA)/ Directorate of Soil Conservation and Watershed Development (DSC&WD) in Odisha, and other stakeholders including Agriculture Department, Horticulture Dept., and some of the technical partners across the implementation chain. Consultation with secondary stakeholders was done in a virtual manner and based on checklist developed and shared with DSC&WD for their written response and using that as base for further consultation/ discussion with them. In addition, two rounds of multi-stakeholder consultations were carried out in preparation of draft ESSA report including with primary stakeholders. Findings of the assessment have also been used in the formulation of the Program Action Plan (PAP) along with key measures to improve environmental and social management outcomes of the Program and have been discussed and agreed with SLNA/DSC&WD in Odisha.

Environmental and Social Summary

Odisha topography consists of fertile coastal plains to the east bounded by Bay of Bengal. Mountainous highlands and plateau regions occupy the centre 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.

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 labourers. 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.

Expected Environment and Social Effects

Potential Benefits: The overall environmental and social impact of the watershed Program is likely to be positive, owing to benefits such as increased ground water level, improved soil moisture and increase in green coverage, crop productivity due to multi-cropping and increase in rural incomes subsequently reducing poverty. Strengthen capacities of project authorities and functionaries, and both public and private specialized institutions to implement more science-based watershed projects will be beneficial for overall hydrological services and environmental sustainability. This will improve the quality of surface water as well as ground water and have a significant positive effect on aquatic biodiversity and alter the diversity index of floral and faunal characteristic feature. The key social benefit of the program includes (1) Employment creation for both marginal and small farmers as well as for wage laborers, (2) Increased availability of drinking water, (3) Improvements in household incomes and general economic development, (4) Improvement in the levels of knowledge about water conservation and agriculture.

Potential Environmental and Social Risks: Potential environment risks arise from the extension of watershed interventions to forest, wetland and other environmentally sensitive areas without initial screening at DPR level. With increased water availability there is risk of change in cropping patter to more water intensive high value crops which may lead to excessive withdrawal of ground water. With excessive irrigation there could be risk of increase in salinity & sodicity. Along with more water intensive crops, there is risk to increase use of fertilizer and pesticides which eventually could pollute ground water and downstream surface water bodies. Also, there is risk of restricting surface flow at plot level thereby impacting water bodies in the downstream and overall hydrology. Potential social risk emerges from the change in planning process of 'bottoms up' to 'top down' approach using LRI data, and hence there is risk to lack of participation by small and marginal farmers, women, and vulnerable population including tribal and landless. With change in process of planning to 'top down' approach, there is risk to inadequate planning for landless and marginals. This may lead to their further marginalization and lack of access to program benefits. The REWARD Program's overall environmental and social risk rating is 'Moderate', given that most of the Environmental and Social Effects of the program are small scale, localized, reversible and predictable, and can be effectively mitigated and managed through the strengthening of the existing environmental and social management systems of the implementing agencies.

Environment and Social Systems Assessment : The present practice followed in Odisha as per the Common Guidelines for Watershed Development Projects encourages a multi-tier ridge to valley sequenced approach and provides for funding works (in addition to convergence with Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Afforestation Schemes, etc.) which have

implications for the lower reaches of watershed in terms of runoff/water yield, soil erosion & sedimentation, fodder, etc. Irrespective of the type of forests, the land forming integral part of the selected watershed project area having agriculture/ wasteland and forest land use, the fringe-forest areas and the degraded areas is part of the holistic watershed treatment plan. REWARD will introduce scientific approaches and new ways of LRI-DSS based working into the watershed development sector in Odisha. The LRI-DSS based system takes into account detailed, site-specific data at the cadastral level on land resources (both physical and chemical properties), which will be collected as a part of activities under REWARD. There is a gap related to the understanding, dissemination and application of LRI data for science-based watershed planning because of lack of experience. Therefore, scientific agencies with experience in LRI need to train the functionaries demystifying science and in built E&S aspects. The risk screening at present depends on knowledge of the community and the field level functionary. Present implementation chain is well established but at present there is no articulation of individuals or agencies responsible for implementing the E&S activities and monitoring the same. Hydrological data on ground water storage, silt movement, surface water flow will be collected periodically in the model watersheds and benchmark sites. This same database can be effectively used during mid-term and end-term monitoring and evaluations to capture larger scale goals of protecting and conserving hydrologic services and/or managing negative downstream and groundwater impacts which otherwise remain unaddressed. If micro-watershed programs are to effectively contribute toward achieving higher-level objectives at the watershed, sub-basin and/or basin-levels, effective institutional mechanisms will have to be developed for this purpose as well as to measure and monitor outcomes and impacts. Thus, it will add value to the project through an additional benefit by capturing environmental sustainability scientifically through LRI.

Assessment of Social Systems: The existing legislative framework is adequate to ensure social sustainability and the interest of marginalized and vulnerable population including the SC and ST. However, the IWMP guideline and its further replacement with new generation Watershed Development Guideline 2020 provides the legal and regulatory framework to the program and is adequate and quite comprehensive. It clearly articulates the principles, processes, institutional responsibilities at different level of program implementation right from national, state, district, Block/ PIA, GP and village level for watershed planning and implementation. The WDC-PMKSY/ IWMP guidelines promotes a detailed consultation process with community groups and farmers on each land parcel in order to prepare the watershed plan and included consultation with SC, ST and other marginalized groups. Also, a detail consultative process using PRA methods has been instituted including participatory wellbeing ranking is followed during DPR preparation stage to ensure inclusion of women, tribal, and other vulnerable groups. One of the guiding principles of the WDC-PMKSY program is to build equity and promote gender sensitivity. The watershed institutions also have participation from SC, ST, women, and other marginalized groups as per the guidance by the state. The Tribes Advisory Council has been constituted in Odisha which advises Government in matters related to tribal development and welfare. The tribal families living outside the geographical area of Intensive Tribal Development Agency (ITDA), Micro Project, MADA and Cluster are covered under the Dispersed Tribal Development Program (DTDP). The civil works involved in the construction of watershed structures are small in nature such as check dams, anicuts, tanks, ponds, and trenches, and the impacts of these civil works are localized and reversible without much effort. About 15 out of the 30 districts in Odisha including some of the project districts have been identified as Left-wing extremism (LWE) areas. Government of Odisha also undertakes various development projects, including livelihood programs and irrigation facilities, besides critical road networks to regain lost ground and trust by integrating community concerns into the development plans. The activities under the program does not exacerbate any social conflicts and in-fact aligned with the government approach of community empowerment and regaining trust.

Key Environmental and Social Gaps identified: The key environmental and social gaps identified are (a) LRI based watershed planning and implementation being new to Odisha, hence require building institutional capacity for the same; (b) 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; (c) 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; (d) There is increased chance of interventions spreading into forest boundary and/or common property resources in absence of mechanism to check it; (e) Lack of inter-departmental co-ordination mechanism in dealing with forest, wetland and other environmentally sensitive areas as part of watershed plan; (f) Lack in addressing trans-boundary impact of existing structures, forests, upstream users and impact on downstream users; (g) Intensive agriculture with crop growing conditions, may lead to risks of overuse of chemical fertilizers, pesticides, etc, thus polluting groundwater; (h) In absence of proper guidance, improper management of the civil activities may lead to worker safety issues; (i) Convergence of different schemes targeting tribal and vulnerable groups remains a challenge; and (j) 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.

Stakeholder Consultations and Disclosure

Stakeholder consultations were undertaken with both with primary and secondary at all levels. Given the COVID19 situation and travel restrictions and advisories on social distancing etc., primary field assessment could not be undertaken in conventional manner and followed World Bank guidance for 'Public Consultations and Stakeholder Engagement in constraint situation'. This included consultations with Directorate of Soil Conservation and Watershed Development (DSC&WD) in Odisha, and other stakeholders including Agriculture Department, Horticulture Dept., and some of the technical partners across the implementation chain. Consultation with secondary stakeholders was done in a virtual manner and based on checklist developed and shared with DSC&WD for their written response and using that as base for further consultation/ discussion with them. In addition, two rounds of multi-stakeholder consultations were carried out in preparation of draft ESSA report including with primary stakeholders. Draft ESSA report was also shared with DSC&WD for their feedback and suggestions. 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 NGOs on 12th August 2020 and with primary stakeholders including civil society partners in four rounds covering REWARD districts on 05th February 2021. The draft final ESSA report was prepared after incorporating comments and suggestions received from these multi-stakeholder consultation workshops.

Disclosure: The updated draft ESSA will be disclosed in country at the SLNA/DCS&WD's website in Odisha and on the World Bank's external website, prior to appraisal of the project, to serve as the basis for discussion and receipt of feedback and comments. The final ESSA will be disclosed prior to World Bank Board consideration of the Program.

Recommendations and Actions

The key recommendations addressing the environmental and social systems gaps identified, as well as for enhancing environmental and social benefits includes:

1. With transition to science-based approach to watershed planning, SOP/ guideline to be prepared and adopted for community participation, social inclusion, building community ownership, and accountability mechanism in line with the WDC-PMKSY new watershed development guideline for different phases of watershed planning and implementation. This should include a detailed process guideline for undertaking the consultations with community during DPR preparation and before approving and/or passing the DPR in Gram Sabha for further considerations.
2. All functionaries at every levels of DSC&WD including field functionaries such as PIA members, Watershed Assistant/ Agriculture Assistant shall be trained of in demystifying science-based

planning approach to farmers and undertaking environmental and social risk management activities and social mobilization and consultation with farmers and community groups. The process of social mobilization and field level consultations shall be supported by local NGOs not only during preparation but for a longer-term during implementation.

3. Early screening of potential environmental and social risks and issues using screening checklist as per Annex-9 by WDC and GP during DPR preparation and shall form as part of the DPR. WDC and GP members to be trained by DSC&WD on conducting screening.
4. Land use and ownership should be made visible in LRI/ DSS platform to avoid any issue. Also, displaying the environmentally sensitive areas on LRI map and data. This will help in protecting environmentally sensitive areas and natural and cultural heritage in micro watersheds and eliminate chance of extending project interventions to such sensitive areas. The environmental screening can also be duly applied using following layers captured through LRI data outputs during DPR preparation.
    a. LRI system currently can display following layers with excel databases as part of LRI outputs for DPR preparation, which are already captured in the LRI database and includes:
        i. Forest land,
        ii. Area impacted with salinity (Ece = >4.0) or sodicity (ESP = >25),
        iii. Waterlogged areas,
        iv. Steeply sloping lands
        v. Physical and cultural resources like monuments, temples, religious or socially sacred areas
    b. Another layer which is currently not being captured through LRI is of designated wetlands and requires to be captured.
6. Inclusion of gender and socially disaggregated data in M&E system along with periodic monitoring and reporting on E&S parameters. This should include capturing gender-disaggregated data for watershed planning, including women in leadership positions in watershed committees and FPOs, as well as among direct participants and beneficiaries of livelihood interventions, and reporting towards enhancing women participation in local institutions.
7. 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).
8. Strengthening institutional mechanism for E&S aspects with clear roles and responsibilities at state, district, block and PIA level. This will include co-designating officials involved in watershed program with environmental and social safeguard responsibilities along with providing E&S training to them e.g., Assistant Director (NRM) and Assistant Director (Livelihood) at the district level can be co-designated for district level E&S responsibilities.
9. DAFE to develop mechanism for effective coordination and convergence with other department including Forest Department, ST &SC Development, Minority, and Backward Class Welfare Department, and Rural Development and Panchayati Raj Department especially in Scheduled-V areas.
10. Extended handholding support to be provided focusing more on building overall capacity of the tribal and vulnerable groups including women for taking equitable benefits of the program.
11. 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.
12. 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.

13. DAFE will further assess the existing Grievance Redress Management (GRM) system and based on requirements, will further strengthened it potentially by adding additional module to the farmer's help desk for registering, screening and redressing and monitoring grievances.
14. 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.

While most of the recommendations will be incorporated in the program operations manual, a higher-level action is recommended as part of the program action plan (PAP).

Input to Program Action Plan: While most of the recommendations will be incorporated in the program operations manual, a higher-level action is recommended as part of the program action plan (PAP) as detailed out below. In addition, the E&S section of the Program Manual to further detail out the plans for addressing the above recommendations along with timeline.

Action description	Responsibility	Timing	Completion Measurement
1. Protocol/ Standard Operating Procedure (SOP) to be prepared and adopted by WDD detailing out mechanism of community participation and building ownership of the watershed plan based on science-based data inputs.	SLNA/ PR&RD Department	One time activity (within twelve 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 institutions.	SLNA/ WDD	One time activity (within 24 months of program effectiveness)	Gender disaggregated data collection at watershed level, and state-level reporting on (a) representation 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/ PR&RD Department	One time activity (within twelve months of program effectiveness)	Strengthened GRM system functional and periodic reports being generated.

Mainstreaming of E&S Recommendations: Most of the E&S recommendation will be part of State Specific Program Manual and some would be mainstreamed and are incorporated in Result Areas, PDO indicators and DLRs.

Implementation Support Plan

The Implementation Support Plan (ISP) outlines the approach that the World Bank will take to support DSC&WD 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.

1 ENVIRONMENT AND SOCIAL OVERVIEW

1.1 The Environmental and Social Systems Assessment (ESSA)

1.1.1 ESSA: Purpose and Objectives

This Environmental and Social Systems Assessment (ESSA) has been prepared by a World Bank ESSA Team for the proposed Rejuvenating Watersheds for Agricultural Resilience through Innovative Development (REWARD) program in India with two participating states, i.e., Karnataka and Odisha, and will be supported by the World Bank's Program for Results (PforR) financing instrument. In accordance with the requirements of the World Bank Policy Program-for-Results (PforR) Financing Policy, PforRs rely on country-level systems for the management of environmental and social effects. The PforR Policy requires that the Bank conduct a comprehensive ESSA to assess the degree to which the relevant PforR Program's systems promote environmental and social sustainability. Additionally, the ESSA is in place to ensure that effective measures are in place to identify, avoid, minimize, or mitigate adverse environmental, health, safety, and social impacts. Through the ESSA process, the Bank ESSA Team develops recommendations to enhance environmental and social management within the Program, which are both included in the overall management action plan.

1. The main purposes of this ESSA is to: (i) identify the Program's environmental, health, safety, and social effects; (ii) assess the legal and policy framework for environmental and social management, including a review of relevant legislation, rules, procedures, and institutional responsibilities that are being used by the Program; (iii) assess the implementing institutional capacity and performance to date, to manage potential adverse environmental and social issues; and (iv) recommend specific actions to address gaps in the Program's environmental and social management system, including with regard to the policy and legal framework and implementation capacity.

2. This ESSA assesses or considers the extent to which the Program's environmental and social management systems are adequate for and consistent with six core environmental and social principles (hereafter, Core Principles), as may be applicable or relevant under PforR circumstances. The Core Principles are listed below and further defined through corresponding Key Planning Elements that are included under each Core Principle in Section **Error! Reference source not found.**.

(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***: 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. An additional purpose of this ESSA is to inform decision making by the relevant authorities in the borrower country and to aid the Bank's internal review and decision process associated with the proposed Rejuvenating Watersheds for Agricultural Resilience through Innovative Development (REWARD) program. The findings, conclusions and opinions expressed in this document are those of the World Bank and the recommended actions that flow from this analysis will be discussed and agreed with counterparts in DoLR (GoI) and the borrowing states and will become legally binding agreements under the conditions of the new loan.

1.1.2 ESSA Methodology

4. The current ESSA report is based on desk review of existing information and data sources. Given the COVID19 situation, primary field assessment and consultations is yet to be conducted to supplement the assessment to captures opinions, anecdotal evidence, functional knowledge, and concerns of various stakeholders. Based on ground level situation of COVID19 in near future, the field visit, and stakeholder consultations will be undertaken to further improve upon the current draft. The desk review included a comprehensive review of government policies, legal frameworks, Program documents, national guidelines for IWMP and PMKSY and other assessments of India's environmental and social management systems.

5. Given the COVID19 situation and travel restrictions and advisories on social distancing etc., primary field assessment could not be undertaken in conventional manner and followed World Bank guidance for 'Public Consultations and Stakeholder Engagement in constraint situation'. This included consultations with Department of Land Resources (DoLR) at Government of India (GoI), and State level nodal agency (SLNA)/ Directorate of Soil Conservation and Watershed Development (DSC&WD) in Odisha, and other stakeholders including Agriculture Department, Horticulture Dept., and some of the technical partners across the implementation chain. Consultation with secondary stakeholders was done in a virtual manner and based on checklist developed and shared with DSC&WD for their written response and using that as base for further consultation/ discussion with them.

6. In addition, two rounds of multi-stakeholder consultations were carried out in preparation of draft ESSA report including with primary stakeholders. Findings of the assessment have also been used in the formulation of the Program Action Plan (PAP) along with key measures to improve environmental and social management outcomes of the Program and have been discussed and agreed with SLNA/DSC&WD in Odisha.

1.2 Environment and Social Overview

1.2.1 Environment Overview

1.2.1.1 Administrative

7. Odisha extends over an area of 155,707 sqkm and is split into 30 districts. Mayurbhanj is the largest district while Jagatsinghpur is the smallest. The state is further divided into 314 revenue blocks. The largest district has the highest number of blocks with 26 blocks, while Deogarh and Boudh district have lowest with three blocks.

1.2.1.2 Agro-climatic zones

8. The state has also been divided into ten agro-climatic zones under National Agricultural Research Project (NARP), ICAR. The zones comprise of two plateau zones, two coastal zones, three Ghat zones and three Table Land zones. Generally, each NARP zone covers 2 to 4 districts and is spread over an area of 40,000 to 50,000sq.km. Agro-climatic zones assist in finding out land suitability, potential production and environmental impact.

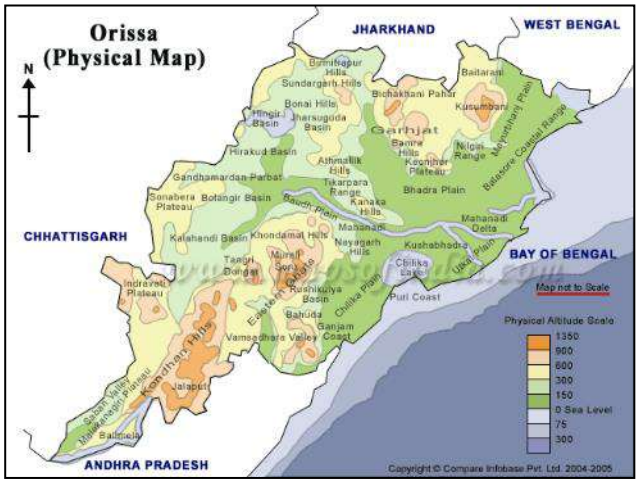
1.2.1.3 Climatology

9. Orissa enjoys a typical tropical climate, mainly because of its proximity to the sea. Here, summers are very hot and monsoons very wet. Orissa 3experiences three main seasons, namely summer, winter and monsoons.

10. The state gets maximum rainfall, nearly 80% of the annual, from the South- west (SW) monsoon during June to September (IMD, 2000). The long-term average rainfall of Orissa (1901-1996) is 1422 mm with standard deviation (SD) of 204.1 mm and coefficient of variation (CV) of 14.3%.

11. December and January are the coldest months, while May is the hottest month. The mean monthly maximum temperature (1901-1996) of May is 37.10C with standard deviation of 3.64 and coefficient of variation of 9.94%. The mean monthly temperature of December is 13.8°C with SD of 4.6 and CV 33.3%. Among the districts, the annual mean maximum temperature varies from 28.1 to 34.9°C and the mean minimum temperature varies from 16.7 to 23.2°C.

12. Mean relative humidity (RH) is maximum (84%) during July to August, while it is minimum during April to May (63%). The annual evaporation rate in the state is 1598 mm. It is the highest during May (241 mm) and the lowest during December (87 mm). The mean annual wind speed in the state is 7.6 km per hour. The average sunshine per day is 7.3 hour. It is minimum of 3.5 hour per day in July and August. From October sunshine duration increases and reaches 9.4 hour per day during February to March.



1.2.1.4 Physiography

13. Odisha can be broadly divided into five major physiographic regions. They are the coastal plains of the east, the central plateaus, the central mountainous and highlands region, the western rolling uplands and the main flood plains. It is a coastal state and has a coastline 450km long. The western and northern portions of the state are part of the Chota Nagpur plateau. The coasts consist of fertile alluvial plains and the valleys of major rivers such as Mahanadi, Brahmani and Baitarani, which drains to the Bay of Bengal.

1.2.1.5 Geology

14. The geology of Odisha is complex and varied. The state is home to some of the oldest rock formations on the planet. The second oldest rocks, 4.2 billion years old, were found in Champua, Kendujhar. Odisha is part of two cratonic blocks called North Orissa Craton (NOC) and the West Orissa Craton (WOC). There is a third block called the Eastern Ghats Granulite Belt (EGB). It was considered a 'mobile belt' during the middle Proterozoic Era. These formations are separated from each other by deep-seated regional fault boundaries. The fault boundaries are called as the north Orissa boundary fault (NOBF) (running along Mahanadi Valley this is also called the 'Mahanadi Rift') and the west Odisha boundary fault (WOBF).

1.2.1.6 Soil

15. Odisha's soil has lost its productive potential, over the years, due to imbalanced fertilizer use, over-exploitation from mining and poor replenishment of nutrients. Texture-wise, 54.8 per cent soils in the state are loamy, 43.3 per cent clayey and 0.3 per cent sandy. Twenty per cent soils have high water holding capacity, 46.2 per cent medium and 32.4 percent low.

16. About 60% soil in the state has medium status OC and 40% low. Soils in the state are generally low in total N. The P status ranges from low (27 %) to medium (73 %). The K status ranges from

medium (86 %) to high (7 %). The deficiencies of S, B and Zn have a mean value of 28%, 44% and 19% respectively. Sporadic deficiency of Fe and Mn occurs in intensively cultivated areas.

17. A few problem soils in Odisha are as follows:

- Acid soils - Nutritionally acid soils are deficient in N, P, Ca, Mg, S, B, Zn, Mo and Si. Biologically acid soils are inactive,
- Saline soils – decline in productivity ranging from 10 – 50%,
- Water logged soils – water logging due to poor drainage systems is a major problem in the state,
- Spoil soils – a large number of mining operations in Odisha are open cast; mine spoils from the mining sites are dumped degrading the soil and adjoining areas,
- Shifting sand dunes – infertile soil which shifts due to the prevalence of strong coastal winds,
- Strip lands – land along public roads, railways, canal areas are not cultivated and remain fallow; they account for 1.15 lakh ha in the state.

1.2.1.7 Ground Water Condition

18. In general, the state recorded water level in 2-10mbgl range in all the districts during April, 2016. Some wells in the hilly areas recorded water level in the range of 10-20mbgl. During August, 2016, water level was found in the range of 0-2mbgl in coastal stretch and in parts of the hilly terrain, whereas 2-5 mbgl in the coastal and hard rock terrain. During November, 2016, the water level was found to be same as August, 2016.During January, 2017, water level was in the range of 2-5mbgl in the coastal stretch / parts of hilly terrain, whereas 0-2m in coastal and command areas.

19. During April 2016, the water level (meter below ground level) in the state varies from minimum of 0.2 mbgl in Bargarh district to a maximum of 18.8 mbgl in Angul district and water levels mostly range from 2 to 10 mbgl. Some wells in the hilly districts recorded water level in 10-20 m range. During August 2016, the depth to water level ranges from 0.05 to 11.4 mbgl and in majority (53%) of National Hydrograph Stations wells level was in the range of 0-2 m below ground level and 38.4% of wells in 2-5 m below ground level. In general, as it should be, a rise in water level is observed throughout the state during January 2017 with respect to April 2016 and majority of wells recorded 0-4 m rise because of recharge of aquifer due to monsoon rainfall.

20. Network of National Hydrograph Stations (CGWB) monitored in the REWAD districts in 2016-17 is indicated below.

Table (1): Network of Hydrograph Stations in the REWTAD Districts

Sl No	Districts	April, 2016	Aug, 2016	Nov, 2016	Jan, 2017
1	Sambalpur	87	87	87	90
2	Dhenkanal	46	46	46	46
3	Nayagarh	55	55	55	55
4	Deogarh	12	12	12	12
5	Koraput	64	64	64	64
6	Nowarangpur	27	27	27	27
7	Sundargarh	99	99	99	99

1.2.1.8 Ground Water Quality

21. The shallow aquifers of inland zone of the state are mostly fresh and dominated by Ca-Mg-HCO_3 and mixed types of water. In the coastal plain where most of the wells are located in alluvium, the water is relatively saline. The shallow aquifers of the coastal plain are of Na-HCO_3 type with some isolated patches of NaCl and Ca-Mg-HCO_3 types, which may be due to Base Exchange process and also due to the vicinity of the sea. These aquifers, at places, are of high Electrical Conductivity and high

Chloride, Nitrate, and Fluoride content. In the coastal districts the Electrical Conductivity concentration ranges from 43 to 4240 µ S/cm[1].

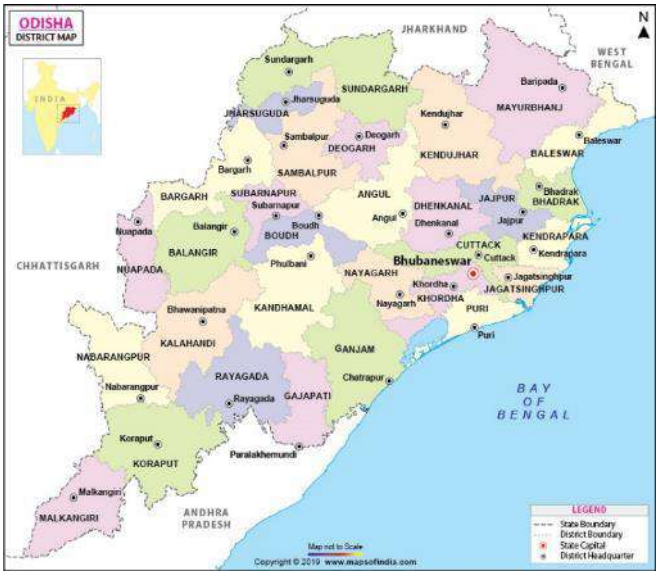
1.2.1.9 Forest and Flora

22. Odisha has a recorded forest area of about 37.34% of the total geographical area. Based on the relief, rainfall and vegetation types, the forests of Odisha are mainly divided into following four categories: a) Northern Tropical Semi-evergreen Forests - The important tree species are: Arjun, Mango, Mankar Kendu, Champak, Rai, Manda and Nageswar; b) Tropical Moist Deciduous Forests or the Monsoon Forests - The top canopy is formed by Sal and its allies Asan, Piasal, Kurum, Kangra and Dhawra and Daba bamboo; c) Tropical Dry Deciduous Forests - Teak and Salia bamboo predominate in these forests; d) Tidal Mangrove Forests- The characteristic tree species are Karika (*Bruquiera* sp), Sundari (*Heritiera* sp), Bani (*Avicennia* sp), Rai (*Rhizophora* sp), Guan (*Exocaria* sp), etc. As Hental (*Phoenix paludosa*) grows here abundantly in clusters, the mangrove forests are locally called 'Hental van' or Hental forests.

1.2.2 Social Overview

23. Odisha is the eighth largest state in India with 155.7 thousand sq.km of area and ranks eleventh in terms of population with 41.97 million in 2011[2]. Odisha has a stretch of coast line of about 480 kms on the Bay of Bengal, and has been divided into five major morphological regions i.e the Odisha Coastal Plain in the east, the Middle Mountainous and Highlands Region, the Central plateaus, the Western rolling uplands and the major flood plains.

24. The population density of the state is 269 per sq.km. compared to national average of 382 persons per sq.km., and the sex ratio in Odisha is 979 females to 1000 males compared to national average of 940 females per 1000 males. The literacy rate of the state is 72.9%, with male literacy being 81.6% and female literacy being 64% which are very similar to the national average.



25. About 83.3% of the population live in rural Odisha with agriculture being the main occupation. Workers population account for 43.2% of the population in rural Odisha of which about 57.1% are main workers and 42.9% are marginal workers. Among the main workers in rural Odisha, 26.7% are cultivators, 43.8% are agricultural laborers, 4.4% are engaged in household industry while remaining 25.1% are other workers.

26. The per capita availability of cultivated land was 0.39 hectares in 1950-51, which has declined to 0.12 hectares in 2015-16. During 2010-11 there were 46.67 lakh operational holdings in the State out of which marginal and small account for 91.86%,medium 8.04% and large, less than 1%.The average size of holding is 1.04 ha during 2010-11. The average size of holding in marginal, small, semi-medium, medium and large categories in 2010-11 was 0.57ha, 1.63 ha, 2.95 ha, 5.99 ha and 23.72 ha respectively. The total No. of SC & ST holdings were 7.02 lakh and 14.26 lakh respectively. The average area of holdings operated by SC & ST during 2010-11 were 0.81 ha and 1.13 ha respectively. In the present agricultural scenario, the marginal farmers, constituting more than 50 % of the farmers, either own or rent a piece of land for cultivation.

1Ground Water Year Book 2016-201, Odisha
[2] Census 2011

Table (2): Agricultural Land Holding Pattern in Odisha

Size Class Holdings/ Farmers	Holdings (%)	Area (%)	Average Holding size (Ha)
Marginal (below 1 Ha)	72.17%	39.61%	0.57
Small (1 to 2 Ha)	19.68%	30.87%	1.63
Semi-medium (2 to 4 Ha)	6.67%	18.94%	2.95
Medium (4 to 10 Ha)	1.36%	7.86%	5.99
Large (10 Ha and above)	0.12%	2.72%	23.72
Source: Status of Agriculture in Odisha 2015			

27. Scheduled castes (SC) account for 17.1% of the population and Scheduled Tribe account for 22.8% of the total population. Odisha has the third largest concentration of tribal population in the country. The state comprises 9.66% of the total tribal population of the country and has one of the most diverse tribal populations in India, with 62 tribes, including 13 Particularly Vulnerable Tribal Groups (PVTGs), residing in the State. The tribes are mostly inhabited in the hilly regions of the state. Eight districts of the state are having more than 50% tribal population and six districts are having tribal population within 25% to 50%. 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 13tribal Districts. The districts of Gajapati, Kandhamal, Keonjhar, Koraput, Malkangiri, Mayurbhanj, Nabarangpur, Rayagada and Sundergarh have more than 40% tribal population[3].

28. All the scheduled blocks come under Tribal Sub-Plan (TSP) area. Apart from TSP area, the state is having 47 blocks under MADA and 12 blocks identified as clusters, and 17 Micro Projects which are mostly looking for the development of PVTGs.

Table (3): Spread of Scheduled Tribes in Odisha

Sl. No.	Particulars	Numbers
1	Districts	13
2	Block	119
3	Villages with 100 % tribal	3839
4	ITDA	22
5	MADA Blocks	47
6	Cluster Blocks	12
7	Micro Projects (for PVTG Development)	17
Source: Tribal Development Department, Govt of Odisha		

29. While Odiya is the native language of the state spoken by more than 82.7% of its population and is the official language of the state. Linguistically defined, a number of independent tribal languages are spoken within the boundaries of modern Odisha. There are four written tribal languages found in modern Odisha. These are Santhali, Saura, Kui and Ho. The districts in which the major 8 tribal languages are mostly spoken are:

Table (4): Tribal Languages Spoken in Districts of Odisha

Language	Tribal Districts	Language	Tribal Districts
Santali	Mayurbhanj	Kuvi	Rayagada
Sadri	Sundargarh, Jharsuguda	Koya	Malkangiri
Munda	Mayurbhanj, Keonjhar, Sundargarh	Saora	Ganjam, Gajapati
Kui	Kandhamal, Kalahandi	Desia	Koraput, Nawarangpur, Malkangiri

[3] Odisha Profile 2018, Department of Economic and Statistics, Govt. of Odisha

2 PROGRAM DESCRIPTION

2.1 Strategic and Institutional Context

30. Rainfed agriculture represents a major share of the agricultural sector and is facing significant challenges. Of the 127 agro-climatic zones in India, 73 are rainfed, with 13 states accounting for about three-quarters of the total rainfed area. Generally, these rainfed areas receive less than 750 mm of rainfall annually and have less than 30 percent of cropland under irrigation (from both surface and ground water). From the total area under agricultural in India (141 million hectares), approximately 55 percent of the gross cropped area is under rainfed cultivation, mostly in arid and semi-arid areas.

31. Integrated watershed management provides a constructive framework to deal with the challenges facing rainfed farmers by addressing issues relating to land and water resources in an integrated manner. It offers a significant improvement in sustained water resource development through recharging local aquifers and improving downstream water flows; increasing more effective water demand practices; decreasing soil erosion and loss of fertility; increasing agricultural productivity and income; helping farmers adapt to climate change; and improving rural livelihoods. Watershed development is also seen as a key measure by the Government to achieve SDG 15.3.

32. 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 Odisha (supported by Department for 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 areas[4].

33. 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)[5], housed in various agencies[6], 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

[4] 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.

[5] also referred to as State Watershed Departments (SWDs) in this document.

[6] 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.

government bodies are supported. These include Watershed Development Committees (WDCs), farmer or water user groups, Self-Help Groups (SHGs), and the Gram Panchayats (GPs).

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 level[7]. 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.

2.2 Bank Financed PforR Program Scope and Boundaries

34. The REWARD PforR (Program for Results) will support the next phase of the WDC-PMKSY program. The proposed USD 115 million allocation to the REWARD PforR will be a sub-set of the new WDC-PMKSY program at both the national level and in the two project states. Through the 2020-21 fiscal year in the current WDC-PMKSY and the follow-on program, the DoLR plans to undertake watershed management on 4.95 million ha during 2021-2026. The USD 1.14 billion allocation represents only DoLR's share. The cost-sharing with states is expected to continue at 60:40, inferring that the total cost of the new program will be USD 1.9 billion. While the WDC-PMKSY program is implemented across all states (except for the Union Territory of Goa), the REWARD Program will be initially supporting the watershed program in two selected states – Karnataka and Odisha, as well as at the national level over a five-year period. At the national level, the REWARD Program scope covers management, monitoring, communication and knowledge sharing functions of the DoLR. At the state level, the REWARD Program will be contiguous in scope to the WDC-PMKSY, and support implementation of key science-based activities and demonstration sites, and in so doing, aim to influence the broader WDC-PMKSY in these two states.

35. The Program is planned to be implemented in selected states of India including Odisha based on them meeting specific qualifying and readiness criteria including their willingness to implement a science-based watershed program. The state of Karnataka has 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 at a fairly large scale through the recently concluded Bank supported KWDP II project (also referred to as Sujala III). The Program will also support selected investments at the national level focused on strengthening capacities and systems in the DoLR.

2.3 Program Development Objective

36. 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).

[7] 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.

37. 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.

38. 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 GPs[8] 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 for WCs and GPs for effective planning, implementation and sustainable watershed management;[9] 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.[10]

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

[8] 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.

[9] 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.

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

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 becomes 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.[11]

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.

39. **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

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

memoranda of understanding (MoUs) in key areas;[12] (ii) development of LRI[13] and hydrology[14] 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 (DPRs[15]) for selected model watersheds based on scientific information and community participation.[16] Activities (i) through (iv) will be implemented across about 1.7 million ha, while activity (v) will target around 200,000 ha, across both the states.

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,[17] engineering works;[18] agriculture, horticulture and forestry interventions;[19] 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

[12] 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.

[13] 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.

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

[15] 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.

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

[17] 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.

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

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

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, and GP level Farmer Counseling Centers in Odisha 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 use of energy efficient equipment and renewable energy in agri-processing, climate risk resilient infrastructure development).

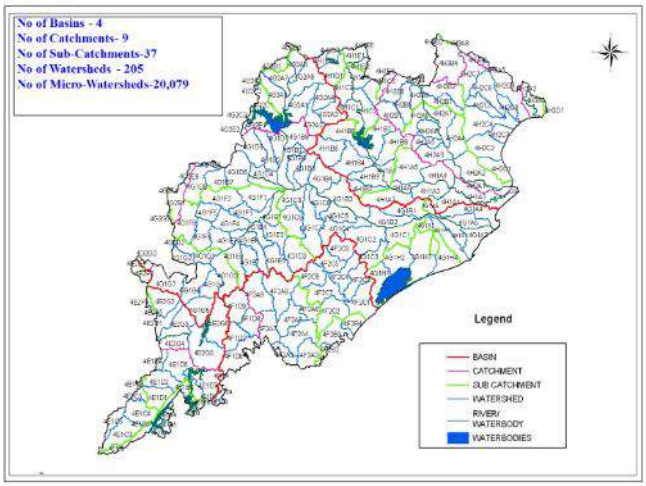
a. Watershed development has been focused largely on improving the quality of land resources through water and soil conservation measures – with the main livelihood impact being improvement to farm owner land and water retention assets such as bunding, farm ponds. The benefits to the poor and land-less 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;[20] (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.

40. 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. In particular, it will have positive impacts on women, small and marginal farmers, and

[20] 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.

agricultural laborers. The efforts to ensure social inclusion in watershed planning and management will enhance the benefits that accrue to the most vulnerable.

2.4 Geographic Scope of the Program



41. 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.

42. While the state level capacity building activities will benefit the whole state, the REWARD program 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.

2.5 Government Program and Bank Financed Program (P Vs p)

43. The WDC-PMKY is a key source of funds for watershed management in the country**.** The DoLR provides national guidelines and funds to states through national watershed schemes for execution at the sub-project level. DoLR aims to bring at least one-third of untreated land under watershed development. The current WDC-PMKSY national watershed scheme is ending in March 2021, and a new follow-on program with a planned outlay of USD 4.6 billion is awaiting Cabinet approval. Through the 2020-21 fiscal year in the current WDC-PMKSY and the new follow-on program, DoLR plans to undertake watershed management on 20-25 million ha. The USD 4.6 billion allocation represents only DoLR's share. The cost-sharing with states is expected to continue at 60:40, inferring that the total cost of the new program will be in the order of USD 7.7 billion.

44. The REWARD program will support the next phase of the WDC-PMKSY program. The WDC-PMKSY program is implemented across all states (except for the state of Goa) and has an allocation of USD 1.14 billion from the central government. The REWARD Program is a sub-set of the new WDC-PMKSY program with activities at the central level and in a number of participating states over a five-year period. The proposed International Bank for Reconstruction and Development (IBRD) financing of the REWARD Program is USD 115 million including USD 109 million to be allocated across both the 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. At the state level, the REWARD Program will support implementation of key evidence-based watershed activities and value addition initiatives, and in so doing, aim to influence the WDC-PMKSY in these two states. The scope of the program is presented in Table (5) below.

Table (5): 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 and Odisha,
Area (in hectares)	5 million ha to be treated during 2021-2026	Not applicable	0.8 million ha
Financing	USD 1.8 billion (central share of USD 1.08 billion, state share of USD 0.72 billion)	USD 17.4 million (of which IBRD provided USD 6.0 million)	Karnataka: USD 234.4 million (of which IBRD provided USD 60 million) Odisha: USD 159.2 million (of which IBRD provided USD 49 million)
Duration	2021-22 to 2025-26		
Activities	• Institutional arrangements at national, state, district, watershed sub-project (community) levels • 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	• Development of supportive policy on technical standards at national level • A national center of excellence on watershed management	• Strengthening community institutions in watershed management • 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

2.6 Key Program Implementing Agencies

45. The Department of Land Resources (DoLR) at the national level and the State Watershed Department (SWD) at the state level, which have been implementing watershed programs since 1980s. In Odisha, the Directorate of Soil Conservation and Watershed Development (DSC&WD) also known as State Level Nodal Agency (SLNA) housed within the state's Agriculture Ministry, is responsible for overall program development, budget allocations, technical sanctions, support to districts in implementation, and monitoring. A State Level Sanctioning Committee (SLSC), headed by the Chief Secretary, has the authority to sanction watershed projects keeping in view synergy with other elements of PMKSY and long terms strategies recommended in the District Irrigation Plans.

46. The institutional framework for implementing the Program is defined by the national IWMP guidelines (2011) that are to be replaced by the Guidelines for New Generation Watershed Development Projects (2021) once these are finalized and approved. The prescribed guidelines are followed by most states in spirit, while the actual institutional arrangements differ from state to state, defined by local needs and historic evolution of its institutions.

2.6.1 Implementation Arrangement in Odisha

Implementing Agency: In Odisha, the Directorate of Soil Conservation & Watershed Development (DSC&WD) i.e., the designated State Level Nodal Agency (SLNA), housed within the Agriculture & Farmers' Welfare Department, is the key state level organization. The DSC & WD is responsible for overall program development, budget allocations, technical sanctions, and support to districts in implementation and coordination with other departments, agencies, and GOI. The Director heads the DSC&WD and reports to Secretary, Department of Agriculture & Farmers Empowerment, Senior technical officers drawn from areas related to agriculture, horticulture, Agricultural Engineering etc support the Director. A State Level Sanctioning Committee (SLSC), headed by the Chief Secretary, has the authority to sanction watershed projects keeping in view synergy with other elements of PMKSY and long terms strategies recommended in the District Irrigation Plans. Directorate of Soil Conservation & Watershed Development (DSC&WD) will be the implementing agency of the REWARD Program, with responsibility to prepare the annual work plan and carrying out Program activities. DSC & WD is well embedded within the Department of Agriculture & Farmers' Empowerment (DoA&FE) at the state and district levels. The watershed trainings will be conducted by experienced local NGOs.

47. **Technical Partner Agency**: Similar to Karnataka, it is expected that in order to develop each land parcel wise LRI data set and other technical advisories, partnership will be developed with various Agricultural and allied universities and other research institutions including National Bureau of Soil Survey & Land Use Planning (ICAR-NBSS&LUP).

District and Block Levels: At the district level, Project Director, Watershed cum Deputy Director, Soil Conservation is supported by a team of 3 Assistant Project Directors responsible for NRM, livelihood and finance issues. The Assistant Project Directors (Livelihood) of the REWARD operational districts will function as the designated official for environment and social safeguards in their respective districts. At the district level, a District Office[21] (also called as Watershed Cell cum Data Centre (WCDC) is responsible for overseeing the implementation in the district. The district office is headed by a Joint Director - Agriculture (or an officer of that rank) and supported by a multi-disciplinary technical team (about 10 people). A district level watershed committee, headed by the District Collector/ CEO, approves the DPRs and monitors progress. The district office is responsible for technical guidance to PIAs, review and approval of DPRs and annual action plans, organizing necessary capacity building and fund management.

48. The actual planning, DPR preparation and implementation is carried out by the Project Implementation Agency (PIA) located either at the block level or sub-block level, based on the program guidelines. A PIA is a government unit under the administrative control of DSC &WD, with adequate expertise and capacity to implement watershed projects under IWMP / PMKSY-WDC. The PIA is set up for a project period (5-7 years) and gets dismantled after handing over the completed project to GPs/WCs and is a 'temporary arrangement'. The PIAs are headed by an Assistant Soil Conservation Officers/ Assistant Agriculture Engineers of DSC&WD and supported by a dedicated Watershed Management Team (WMT) hired on a contract basis for the project period. Each WMT is a 4-member team broadly with knowledge and experience of agriculture, NRM, livelihood and social mobilization/ institution building. The social mobilization/ institution team members of the WDT will be the designated officials for environment and social safeguards in their respective watershed clusters.

49. ***GP Level***: At GP level, the Watershed Committee (WC) is responsible for implementing the Micro-Watershed project with the technical support of the Watershed Management Team (WMT). In Odisha, the members of the community who are directly or indirectly dependent upon the watershed

[21]District offices and PIAs in Orissa are dedicated for watershed works

are organized into a Watershed Association (WA), which is registered as a society under the Registration of Societies Act 1860. The WA constitutes the Watershed Committee (WC) comprising of at least 10 members with adequate representation from SHGs and User Groups, SC/ST community, women and landless persons in the watershed area. Once the watershed works are completed, the same is handed over to the WC in Odisha along with the Watershed Development Fund[22], to be used for O&M.

50. **Field Partner Agency**: NGOs are involved as Implementing Agencies, and for awareness creation/capacity building of primary stakeholders. However, a SOP may be developed with specific roles and responsibilities to bring in qualitative improvements in the participatory planning process.

2.7 Borrower's previous experience in Watershed Program

51. The Government of Odisha has had a long experience with World Bank projects over the past two decades apart from being part of multi-state and national programs for long time. Over the past two decades, GoO has wide experience of implementing watershed program with various bilateral and multilateral support. The prominent one being the Western Orissa Rural Livelihoods Project (WORLP) during 2001-2011 assisted by DFID gave a big push to watershed development with focus on enhancing rural livelihood in Odisha. The Department of Agriculture and Farmers Empowerment (DAFE) 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), GoO. This suggests the GoO's experience in implementing Bank projects and with Bank safeguard policies.

52. Most of the watershed investment in Odisha states has been donor funded in the beginning and through centrally funded program later on. Among the donor funded watershed projects in Odisha were the World Bank assisted IWDP in Kandhmal (Khajuripada) and Ganjam (Bhanjanagar), DANIDA assisted Comprehensive Watershed development project in Koraput (1993-2003), DFID assisted Western Odisha Rural Livelihoods Project (WORLP) (2001-2011), and FAO-GEF assisted Green Agriculture Project in Mayurbhanj district. The major donor funded watershed program in Odisha has been the WORLP in four Western Odisha districts of Bolangir, Nuapada, Kalahandi and Bargarh. And, subsequently the IWMP program which started in 2009-10 in Odisha with central assistance has been under implementation.

[22] For all assets built within an individual's property (farm bunds, farm tanks etc), the owner has to pay a community contribution of about 10%. This is 5% for individual beneficiaries from SC/ST. This contribution is deposited into a separate bank account and is handed to the GP/ Watershed committee, once the project is complete.

3 PROGRAM ENVIRONMENTAL AND SOCIAL EFFECTS

3.1.1 Environmental Effects

53. The overall environmental and social impact of the watershed Program is likely to be positive, owing to benefits such as increased ground water level, improved soil moisture and increase in green coverage, crop productivity due to multi-cropping and increase in rural incomes subsequently reducing poverty. Strengthen capacities of project authorities and functionaries, and both public and private specialized institutions to implement more science-based watershed projects will be beneficial for overall hydrological services and also environmental sustainability.

54. Studies of the watershed programs under IWMP in Odisha have found that there have been substantial beneficial impacts on land development, soil and water conservation. District wise achievements with respect to land quality improvement have shown overall improvement of 51% in the cultivated land area. Although the moisture improvement has shown in almost all projects, it has wide spatial as well as inter and intra-seasonal variations in its intensity. There has been improvement in the cropping pattern and productivity with introduction of multiple crop varieties and crop yield has been increased. This is due to enhancement in moisture content of the soil, water availability and soil quality. These positive impacts have been achieved with activities such as bunding, farm pond creation and in-stream water retention through check dams. It is found that land treatment under watershed development programs has halted land degradation to some extent. Treated areas have experienced deceleration in land degradation earlier caused by gully erosion and soil erosion due to heavy rains. Some of these lands have in fact improved in quality and have now become suitable for agriculture purposes.

55. DoA&FE (GoO) responds to pollution related hazards by making an assessment of damage and crop loss and advice on specific soil amendments in the affected areas. Installing centralized purification systems, effluent treatment plants, water distribution networks and laying of piped water supply system are some of the high priority activities under Odisha Disaster Management Fund (ODMF) rules, 2015, which responds well to pollution of surface and ground water resources.

56. The project will strengthen the science based watershed management in the watershed development component by introducing innovations in the planning process through: (a) characterization of natural resources at cadastral level for estimation of resource potential and conservation; (b) understanding hydrological dynamics vis-a-vis hydrogeology and climatic variability and develop tools to measure them; (c) Development and maintenance of a digital library for integrated landscape approach for WSM planning (soil and water conservation works, land resource inventory, hydrology, land-use and land cover, soils, cadastral base, etc.), watershed management portal for the decision support system; (d) enable and strengthen the local watershed institutions in a participatory bottom up approach for sustaining development and incorporate the same into the watershed planning and implementation to address the needs of rain-fed farmers for sustainable natural resource management for ensuring economic development of the local people.

57. Support for improved program integration in rain-fed areas through local capacity building for integrated WSM and Integrated sub-watershed assessment and planning, linked to regional plans including land resources, hydrogeology, groundwater mapping, climate change, development constraints and potentials, etc. Participatory micro watershed master planning will be conducted through support program integration and convergence (including integrated land-use, soil and water conservation, water management, soil suitability for agricultural production – cropping systems, livestock, horticulture, etc. – rainfed farming systems, etc.) Training programs will be undertaken for impact assessment studies to quantify economic gains to the beneficiaries, which can be attributed to project investments for the project accessing and intensive monitoring and documentation at local level. Development of guidelines for integrated planning and resource deployment by state line departments, adoption of O&M policy guidelines will support for policy making of rainfed areas and watersheds.

58. Effective watershed management performed by greater integration of programs related to rain-fed agriculture and local environmental condition, innovative and science-based approaches by strengthened institutions. With activities like bunding, farm pond creation and in-stream water retention

through check dams there is increase in soil-moisture and decrease in soil erosion. The area of land use and land cover changes at watershed level, like cropland, agro horticulture, agro forestry. The water bodies/ reservoirs and tanks and farm ponds are able to retain water for a longer period. There is considerable reduction in the fallow land, scrub land, degraded land and waste land, which indicate that such area has been brought under productive use. In the project area, under Sujala III there is increase in the cropping pattern using multiple crop varieties and crop yield has been increased for green gram, groundnut, maize, ragi and red-gram. Establishment of the digital library and portal with Land Resources Inventory (LRI) data, Hydrology data and Decision Support Systems (DSS) will improve of weather-based agro-advisories for farmers in local level, which will change the cropping pattern in sustainable way. Science-based approaches watershed management will effectively improve the storage of groundwater and change the water table in water shade areas.

59. The Program includes several elements of Climate Smart Agriculture including: soil management (soil moisture management, erosion control, integrated soil fertility management, etc.); water management (ridge area treatment, drainage line treatment, rain water harvesting, efficient irrigation, etc.) provision of weather-based and LRI-based agro-advisories to farmers; appropriate crop selection (including horticulture and agro-forestry); and, value-chain interventions that can reduce post-harvest losses and enhance incomes through better access to markets.

60. Vulnerability of crops to chemical poisoning (ash pond leakage / industrial waste poisoning) is restricted to industrial areas of the state, where crop loss and degradation of land has been reported. The risk analysis matrix is indicated to be 'LOW' in the state due to chemical poisoning. DoA&FE (GoO) responds to chemical poisoning related hazards by making an assessment of damage and crop loss and advice on specific mitigation measures in the affected areas.

3.1.2 Social Effects

61. People living in watershed areas draw their livelihoods from natural resources either directly and/or indirectly, including farm-based incomes. Any improvement in land and water resources impacts positively to their livelihood and food security. Enhanced capacity of DoLR and participating states will help achieve their goals and in turn improve livelihoods of people living in the target areas.

62. The key social benefit of the program includes (1) Employment creation for both marginal and small farmers as well as for wage laborers, (2) Increased availability of drinking water, (3) Improvements in household incomes and general economic development, (4) Improvement in the levels of knowledge about water conservation and agriculture.

63. Experience from WORLP suggests that, most of the watersheds show improved water availability, crop diversity and agricultural production leading to increased income and food availability. By involving communities, water and land resources were managed better than by local government on its own. Grants and loans built micro-enterprises for women and men that have resulted in higher incomes.

64. As regards to the watershed management, the beneficiary communities are diverse in many ways - social (Scheduled Caste, others), economic (landless, small, marginal), ethnic (Scheduled Tribes, others), occupation (fishers, crop producers), water usage (domestic, aquaculture and irrigation purposes), and proximity to the head works (head, middle and tail ends). This diversity renders community mobilization for collective action and linkage to support institutions, a daunting task. However, (i) participation; (ii) inclusion and equity; and (iii) decentralization are the key principles which underpin watershed project implementation. Watershed Associations constitute a Watershed Committee (WC), which comprises of at least 10 members with adequate representation from Self-help Groups and User groups, SC / ST community women and landless persons. The WC is responsible to implement the watershed program in consultation with the PIA and ensures that the project benefits the resource poor tribal community in terms of proving irrigation, improving farming practices, linking their produce with the market, promotion production of value-added products and improving their skill / knowledge base.

65. Watershed development approach has emerged as an important strategy for an integrated development of rainfed areas across different states in India. Apart from a range of positive outcomes, the implementation of watershed development programs over the years has thrown up both challenges that need to be addressed and the potential that need to be exploited.

Type of Activity	Potential Social Benefits	Potential Adverse Impact
Policy, Institutions and Capacity Building	• Policy guidance and frontline institutions and staffs' capacity will help in watershed planning being more inclusive, grounded to local reality and equitable sharing of benefits. • Strengthening institutions and its capacity is expected to benefit in increased participation of people, equitable sharing of benefits, increased transparency leading to enhanced incomes. • Development of Land Resource Inventory to inform watershed planning has emcee potential in increasing farm income with more accurate for each land parcel wise scientific planning.	• While there is no adverse impact of the activities planned towards capacity building of institutions, the lack of it will certainly pose adverse impact with lack of transparency and inequitable distribution of benefits among others. • Strengthening institutions and policy guidance to address concerns of marginalized population including SC and ST community is expected to help mitigate the political risk and potential elite capture of the proposed activities. • With potential change in change in planning process of 'bottoms up' to 'top down' approach using LRI data, and hence there is risk to lack of participation mainly from small and marginal farmers, women and other disadvantaged groups including SC, ST and landless.
Infrastructure and Works **- Demonstration Watersheds in Rainfed Agricultural Areas**	• The integrated watershed plans and implementation using science-based data and tools is expected to yield better crop returns and hence farmer's income. • While the construction of watershed infrastructure will help initially in wage earnings for the local wage labors mainly the landless households and marginal farmers, in the medium term it will help with improved water availability in the wells, better economic return from farm with especially able to take the second crop, and hence it will in turn reduce distress migration.	• The site-specific planning based on scientific data reduces unnecessary physical structures and hence reduce wastage of resources. On the contrary, lack of scientific planning may lead to wastage of resources and may lead to unnecessary submergence of areas.
Services	66. The multi-sectoral approach with agriculture, horticulture, animal husbandry, and other such participating departments is in effect will benefit farmers in crop diversification, appropriate use of input based on scientific information, value chain development including through value chain interventions focusing on production enhancement,	• Choices of crop not suitable to specific soil and water characteristics of particular land parcel may lead to adverse impact in the long run. The scientific advisory and other knowledge sharing with farmers mitigate the risk and the adverse impacts associated.

Type of Activity	Potential Social Benefits	Potential Adverse Impact
	post-harvest management, infrastructure development, and forward and backward linkages of producers to markets will lead to better income of farmers. This will include establishment and/or strengthening of Farmer Producer Collectives (FPCs) in select watershed clusters, including FPCs led by women and providing working capital support to women groups for the same. • The livelihood and income generation activities through microenterprise is expected help improve the income of women SHG members.	• Farmers need to be mobilized for group action, into Common Interest Groups (CIG), and be provided a platform to interface with the external agencies. Participation of small and marginal farmers and poor and vulnerable sections will make the process more inclusive. • The lack of coordination between departments/ agencies and lack of convergence with other government schemes may leave the impacts muted and hence requires efforts towards this for a positive outcome.

3.2 Indirect and Cumulative Impact

67. 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.

68. The watershed development activities generate significant positive externalities which have a bearing on all expected environmental outputs, achieved especially on conserving hydrological services like enhancing soil moisture, ground water storage, maintaining ecological/downstream flow, controlling silt movement, protecting intervention structures for designed life, etc. It has been revealed that watershed development activities generate significant positive impacts in the environment and the treatment activities help in conservation and enhancement of water resources. It is reported that water level in the wells increases leading to expansion in irrigated area in the watershed and 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. Also due to change in cropping pattern, development of water bodies, increase in water availability and varied biodiversity, the faunal population of the area increases.

69. 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. This includes livelihood activities though pisciculture in farm ponds/ tanks, reduction in energy consumption to draw water from wells due to increased water level in wells, better availability of drinking water, and in some areas and settlements which are still left out from piped water connection it reduces drudgery of women who may have to otherwise walk long way to fetch drinking water.

3.3 Overall E&S Risks and Impacts

70. **The E&S risks are assessed to be 'Moderate'** as the 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 highly amenable to risk mitigation measures.

The watershed development activities have significant positive impacts, which has 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. The science-based planning approaches to be adopted by the REWARD program 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. However, on the social side, the transition to a science-based approach may weaken the systems and mechanisms of community participation including risk of excluding SC and ST communities, landless and wage dependent households, and women from program planning processes, inclusive benefit sharing, and grievance redress. 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.

4 ASSESSMENT OF ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM, CAPACITY AND PERFORMANCE

4.1 Legal, Regulatory and Institutional

72. India has an adequate legal framework for environmental and social systems and backed by a set of comprehensive laws, regulations, technical guidelines and standards, which apply nationwide. Over the last four decades, the watershed program has gradually evolved into a comprehensive system with WDC-PMKSY guideline that is generally consistent with the PforR. With the innovation brought in for science-based watershed planning, NRAA is in the process of helping DoLR prepare new watershed guideline incorporating the same.

73. While the legislative and regulatory provisions are adequate, the WDC-PMKSY program guide 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 the process to be adopted for watershed planning and implementation, some risk emerges from its weak compliances, as it requires enabling institutional and technical capacity for compliance. 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.

74. 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 I972, 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.

75. Also, the existing legislative framework is adequate to ensure social sustainability and the interest of marginalized and vulnerable population including the SC and ST population, but require strengthening institutional capacity to comply. It ensures the following: (a) protection of the interest of SC and ST population, (b) 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. The provisions of the existing social legal and regulatory framework are adequate but require enabling institutional and technical capacity for compliance.

76. The core guiding principle of the WDC-PMKSY program includes (1) Inclusion and equity by attempting to ensure more equitable benefit to most marginalized sections of the communities including Scheduled Tribes, the Scheduled Castes, landless, women, small and marginal farmers living in the watershed villages, (2) Addressing gender issues by ensuring inclusion in accessing opportunities and resources, (3) Building accountability by ensuring transparency at all levels and ensuring Gram Sabha's participation in planning and management along with mechanism of social audits, (4) Involvement of NGOs and/or facilitating agencies for social mobilization, build capacities of community, CBOs, SHGs and Gram Panchayats and to help support the process of planning and implementation, and (5) setting up effective monitoring and evaluation mechanism of the program interventions.

4.2 Institutional Organization for Program Implementation

77. In Odisha, the Directorate of Soil Conservation and Watershed Development (DSC&WD) is the designated State Level Nodal Agency (SLNA) housed under the Department of Agriculture and Farmers Empowerment (DAFE) will be the main implementing agency of the REWARD Program in Odisha. At the District level, the District Watershed Development Committee (DWSC) is headed by a

Project Director (PD) and further supported by four Assistant Project Directors (APDs) with specific responsibilities of Land and Water, Livelihood, Finance and M&E. The PIA is at the block level and is supported by four-member watershed development team (WDT) and three-member livelihood support team (LST). And at the GP level, the Watershed Committee (WC) implements the program at micro-watershed level.

4.3 Environmental and Social management system assessment

4.3.1 Core Principle-1: Program E&S Management System

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

System and Capacity Assessment

78. India has an adequate legal framework for environmental and social systems and backed by a set of comprehensive laws, regulations, technical guidelines and standards, which apply nationwide. Over the last four decades, the watershed program has gradually evolved into a comprehensive system with WDC-PMKSY guideline that is generally consistent with the PforR.

79. In addition, the legislative and regulatory provisions under various acts such as RTI Act 2005; Minimum Wages Act 1948 (with amendments); Child Labour (prohibition and regulation) Act 1986, 2015; LARR, 2013 with further amendments; and provision under the constitution and Fifth schedule areas are applicable as the case maybe and provide for larger umbrella of guidance and framework.

80. The WDC-PMKSY program guide 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, some risk emerges from its weak compliances as it requires enabling institutional and technical capacity for compliance.

81. The implementation chain ensures no activities are undertaken in areas having sensitive natural habitats, wetlands and ecological sensitive areas or in case submergences occurs beyond drainage line. Activities / treatments which involve encroachment of forestland require permission of the Forest & Environment Department under existing provisions. Provision for approval and sanction of community forest rights (CFR) and individual forest rights (IFR) under the FRA support watershed treatments in forestlands. E&S screening are done by implementation chain and without any formal systems or procedure.

82. The process of selection of watershed for treatment is based on regional assessment of environment especially soil health and water availability in the rain fed area to enhance productivity of the crops. Baseline is created to assess and inform the changes due to intervention.

83. The important cumulative impacts of watershed development are reduction in poverty and reduced forced migration and overall benefits of improved hydrological cycle including water-budget. However, no systematic assessment has been done to quantify the magnitude of the reduction.

84. Detailed Planning element wise assessment for Core Principle 1 is given in Annex- 3A.

Key Gaps Identified and Areas of Improvement

85. The current process of watershed plan preparation following IWMP 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 manner which is currently being done under WDS-PMKSY 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.

86. In the existing implementation chain, there is no articulation of individual or agency responsible for implementing the E&S activities and monitoring the same. Also, there is no system of systematic screening of E&S risks. Also, inadequacy in training systems such as fewer expert trainers, mismatching training requirements and material and lack of orientation on safeguard policies.

87. With improved water availability there will be risk of intensive agriculture with high crop growing conditions, may lead to risks of overdraft of ground water and overuse of chemical fertilizers, pesticides, etc., thus impacting hydrological cycle. Overdraft and water intensive high value crops both can cause over-irrigation thus leading to salinity and sodicity. Odisha is the only participating state that is already facing issue with salinity, sodicity and water logging issues and DSC&WD recognizes the issue and taking up measures those need to be mainstreamed while addressing E&S aspects for REWARD.

88. There is risk of skipping the process of community participation completely as the objective of the initial participation and consultation process as in case of IWMP/ WDC-PMKSY is to reach to watershed plan/DPR, and which in case of LRI based process the watershed plan/ DPR draft is prepared using computer based digital support system.

89. The program does not take into account trans-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 also reduction in the effectiveness of the program. At present WC and community are responsible to protect such resource areas without any framework and Watershed Assistant is believed to be taking care of in co-ordination with other line Departments. However, the program has a mechanism to ascertain the conditions of the upper ridges during treatment. At present there is also issue in co-ordination among Departments in absence for clear guidelines. Also, the program does not provide adequate opportunity to engage stakeholders on induced, cumulative, and trans-boundary impacts.

Recommendations

90. There is need for detailing out E&S aspects of implementation in the program manual including template development for E&S risk assessment and management.

91. Protocol/ SOP to be prepared and adopted by the participating state for how science-based input (such as LRI data) for DPR preparation is translated for the community. A detailed process guideline for undertaking the consultations with community during DPR preparation and before approving and/or passing the DPR in Gram Sabha for further considerations. Also, field functionaries at the micro-watershed level along with watershed committee shall be trained in undertaking activities in scientific manner with understanding of LRI/DSS; social mobilization and consultation with farmers and community groups during DPR preparation and implementation involving local NGOs.

92. Screening to be conducted using E&S screening checklist with draft DPR activities to rule out any adverse environmental and social risks. The field level staff of the implementing department including in PIA along with and village level functionaries such as Watershed assistant and/or agriculture assistant, Watershed Committees, and NGOs shall be trained by PIU E&S officer in conducting the screening in the field and in LRI-DSS driven process.

93. It is suggested that an inter-departmental committee shall be constituted at PIA level including representatives from forest department, revenue department, and wildlife department in addition to officials from Irrigation, Watershed, Agriculture and Horticulture Departments as members for resolving conflict among users. This committee should be responsible for environmental risk mitigation at DPR stage and treating and conserving the natural habitats, forests, common properties and protecting them from any negative impact. This can also help in managing salinity and sodicity issues.

94. 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 to address any risk towards groundwater and downstream surface water pollution.

95. 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.

96. 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.

4.3.2 Core Principle-2: Natural Habitat and Physical and Cultural Resources

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. Program activities that involve the significant conversion or degradation of critical natural habitats or critical physical cultural heritage are not eligible for PforR financing.

System and Capacity Assessment

97. Issues of encroaching forest land or notified wetland or natural habitat are addressed in the present watershed works are:

- 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.
- 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.
- In cases, if encroachment is observed and the encroached land is proposed for development, the project does not take up any such activity in the encroached land that is expected to upset the livelihood of the family depending upon that patch of land.

98. Detail analysis is given in Annex 3B for Core Principle 2.

Key Gaps Identified and Areas of Improvement

99. With departure from detailed consultative processes being used for bottoms up planning to LRI based top-down planning with inadequate participation and consultation on the draft plan, there is no mechanism to screen out physical cultural resources such as ‘sacred groves’ etc.

100. The REWARD program does not take into account trans-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 also reduction in the effectiveness of the program.

Recommendations

101. There is need of preparation of E&S screening checklist and also documentation and training on ecological sensitive areas, natural habitat and archeological areas to each and every level of implementation agency. The screening checklist to include micro-level issues including focus on physical and cultural resources and potential impacts on them. DPR preparation process should also screen out ensuring no adverse impact to any physical resources or stakeholders.

102. Upon implementation of LRI based DPR screening can be duly applied using following layers captured through LRI data outputs while planning and preparing DPR. Displaying of map and data on

environmentally sensitive areas on LRI-DSS based outputs will be key on upfront screening and needs to be prepared and enclosed in the DPR.

(a). LRI system currently can display following layers with excel databases as LRI outputs for DPR preparation, which are already captured in the LRI database on Forest land, Area impacted with salinity, sodicity, water logging Physical and cultural resources like monuments, temples, religious or socially sacred areas.

(b) Another layer, which needs to be captured, is of designated wetlands. The whole upfront environmental screening aspect can be made tool based and self-sufficient using LRI tool if this layer can also be included. The possibility is either through state data on GIS, if available, or this aspect can be added in remote sensing agency's terms of reference.

(c) During consultation, which will take place at WDC/GP level for DPR finalization, data on Ground/ Surface water contamination can be captured at micro-watershed level. The same data can also be obtained from Benchmark sites and model Micro-watersheds used during the project.

4.3.3 Core Principle-3: Public and Workers Safety

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 Assessment

103. Most of the watershed works involve local community working on it or local labor employed, any large-scale labor influx is not anticipated. Also, large-scale construction contracts or construction sites and camps are not expected under the watershed program.

104. The forced labor participation is not anticipated in the program, however, there is a possibility of finding child labor working in their family farm plots for watershed works as part of labor contribution by the family. This is largely due to socio-economic problems such as poverty, economic backwardness, illiteracy etc. While there are adequate policy and legislation on child labor and forced labor in the country, there is need to educate farmers on the rights of children and issues and provisions related to child labor as per CLPR Act 2016. Also, field monitoring formats being used by watershed assistant/ agriculture assistant should capture the child labor aspect. Further training to be provided to watershed assistant/ agriculture assistant on capturing the same. Detail analysis is given in Annex 4C for Core Principle 3.

Key Gaps Identified and Areas of Improvement

105. The construction of watershed structures does require proper management of construction activities, given it poses risks to people and animals falling in these trenches and other structures if not properly managed and/or aware of it. And hence, there is need to devise mechanism to minimize risks and requires awareness creation among local community on this.

106. Intensive agriculture due to improved crop growing conditions, may lead to risks of overuse of chemical fertilizers, pesticides, etc, thus leading to groundwater and soil contamination.

107. Though child labor is not anticipated in the program, which is in line with national legislations that prohibits child labor. However, there is need to build awareness among the community to ensure adherence.

Recommendations

108. The specific mitigation measures related to community health and safety especially for i) fencing of water impounding structures and other construction areas, especially those closer to habitations ii) general work site related hazards on dust, sound and debris; iii) water quality and availability, disease prevention and communicable diseases iv) integrating and documenting IPM including advisories on crop selection, fertiliser use, nutrient management should be made part of E&S manual. Also, awareness for use of manures and organic pesticides to be encouraged and made part of stakeholder training.

109. There is need to educate farmers on the rights of children and issues and provisions related to child labor as per CLPR Act 2016.

4.3.4 Core Principle -4: Land Acquisition and Resettlement

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.

110. The Program does not intend to do any land acquisition or resettlement. Hence, this principle is not applicable. The analysis of other watershed projects in India and in Odisha suggests that in watershed projects there is no land acquisition involved and hence the risk relating to acquiring land and resettlement is minimal or non-existent. The civil works proposed are going to be small in nature such as check dams, anicuts, tanks, ponds, and trenches. The impacts of these civil works are localized and reversible without much effort. The project will not finance any land acquisition or support activities that require doing so. The E&S screening to be instituted to screen out any such eventualities. Detail analysis is given in Annex 3D for Core Principle 4.

4.3.5 Core Principle- 5: Rights and Interests of Indigenous People

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 Scheduled Tribe people (Indigenous Peoples) and scheduled caste people, and to the needs or concerns of vulnerable groups.

System and Capacity Assessment

111. In the present system, watershed committees are encouraged to ensure that the interest, perceptions and priorities of women, dalits, tribals and landless population are adequately addressed in the DPR. To ensure inclusive development and screening of the vulnerable groups, a participatory wellbeing ranking is followed during DPR preparation stage. However, the review of earlier program suggests no special measures have been planned to focus on specific needs of tribal groups, and other vulnerable population including scheduled caste population. For equitable benefit sharing and ensuring inclusion of SC and ST, special institutional mechanism and efforts are required to be put in place specially to provide handholding support for longer duration compared to other areas. A detail analysis is given in Annex 3E for Core Principle 5.

112. In Odisha, at the state level, tribal development is administered by The ST & SC Development, Minorities and Backward Class Welfare Department of GoO, supported by different other state level institutions/ organizations and have their own programs to promote livelihood, art and culture and other tribal welfare schemes. The Tribes Advisory Council has been constituted which advises Government in matters related to tribal development and welfare. The tribal families living outside the geographical area of Intensive Tribal Development Agency (ITDA), Micro Project, MADA and Cluster are covered under the Dispersed Tribal Development Program (DTDP). The project districts also spread over the ITDA areas and potentially includes ITDA areas in Sambalpur (Kuchinda), Koraput (Jeypore & Koraput), Deogarh (Tikibani), Nowarangpur and Sundargarh (Panposh) districts.

113. Convergence of different schemes targeting tribal communities is endeavored to improve beneficiary coverage, bridge the gap and drive the project towards achieving a higher order outcome, bringing all such departments to a common platform remains a challenge.

114. 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. SHGs are undertaking credit and thrift activities, and inter-loaning and have also availed of revolving fund benefits. 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. In such a scenario, there is a need to expand SHG coverage base. 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.

115. The proposed program plans to further support farmers and especially women among them with 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. However, the current monitoring system requires strengthening to capture monitoring gender specific data as well as data on equitable benefit sharing.

Key Gaps Identified and Areas of Improvement

116. The Current process of WSD-PMKSY of 'bottom's up' planning is now under REWARD is going to be more of 'top-down' planning using LRI data and DSS model. Review of Sujala-III suggested that though a balance between scientific knowledge for planning and consultation with farmers and marginalized groups were intended, it could not be institutionalized properly. And hence, there is need for development of SOP/ detailed guideline to community participation and consultation process using scientific data for watershed planning.

117. A lack of gender-disaggregated data also makes it ineffective to measure impacts and benefits for women, and plan for the subsequent years. 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.

Recommendations

118. Special attention to be given to tribal and Scheduled V areas with their local needs during DPR preparation and implementation. SC and ST community and marginalized groups does require little more handholding support and awareness building. For equitable benefit sharing and ensuring inclusion of SC and ST, special institutional mechanism and efforts are required to be put in place especially in Scheduled-V areas and other tribal backward areas such as providing handholding support for longer duration compared to other areas. Also, proper coordination mechanism to be setup for convergence of different schemes for larger benefits through bringing synergy especially with Department of Tribal Affairs and ITDAs and design Tribal Development Plan in consultation with them at the watershed level.

The program monitoring should capture the information of benefits shared with socially disadvantaged groups including SC, ST, women and landless. Also, gender disaggregated data will make tracking the gendered aspects of the program including women in leadership positions in watershed committees and FPOs, as well as among direct participants and beneficiaries of livelihood interventions.

4.3.6 Core Principle- 6: Social Conflict

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

120. It is important to note that the program interventions do not exacerbate any social conflicts as it is trying to improve upon soil and water conservation leading to enhanced productivity of crops and poverty reduction.

121. About 15 out of the 30 districts including Koraput, Deogarh, Nayagarh, Sambalpur, Nowarangpur and Sundargarh districts have been identified as Left-wing extremism (LWE) areas in Odisha. With experience of last 2-3 years, Government of Odisha has proposed to remove 5 districts (including Deogarh, Nayagarh and Sambalpur) from the LWE list. The state Government undertakes various development projects, including livelihood programs and irrigation facilities, besides critical road networks to regain lost ground and legitimacy in these areas and further endeavors to integrate community concerns into the development plan, thereby reducing the psychological and political alienation of the local population in the troubled territories, especially in south-western parts of the state. Approval and sanction of community forest rights (CFR) and individual forest rights (IFR) under the FRA are taken up in the mission mode in this respect. Prompt sanction of titles under the FRA is seen as a confidence building measure.

122. Though some of the districts proposed under the REWARD program may fall as part of the LWE areas, the activities under the program does not exacerbate any social conflicts and in-fact aligned with the government approach of community empowerment and regaining trust.

4.4 Institutional capacity for E&S management

123. The current institutional capacity requires strengthening under the proposed REWARD project. There is no placement of any official for E&S safeguard management at the state level or below. While it is proposed that SWD will have separate E&S designated person and at the district level, the Assistant Project Directors (Livelihood) of the REWARD operational districts will function as the designated official for environment and social safeguards in their respective districts, they require capacity enhancement to oversee the E&S implementation.

4.5 Borrower's experience in managing E&S risks

124. The Government of Odisha has had a long experience with World Bank projects over the past two decades. The Department of Agriculture and Farmers Empowerment (DAFE) 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), GoO. While there is some experience of E&S management by the department, this requires strengthening and close monitoring.

4.6 The Grievance Redress Mechanism

125. The current grievance redress mechanism in Karnataka 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.
- Communities and individuals who believe that they are adversely affected by a watershed project take support of existing project-level grievance redress mechanisms. They submit complaints to the President of the Watershed Association, who ensures that the WC promptly reviews complaints in order to address project-related concerns. In case of the non-compliance of the complains at WA level, they submit their complaints to the Project Implementing Agency at cluster level, the Project Director, Watersheds at district level or the Director, Soil Conservation & Watershed Development at state level. Besides,

grievance petitions are also received online through **e-Abhijog portal** (Odisha State Grievance Redressal Portal). It facilitates online availability of the grievance redressal mechanism to citizens thereby providing the facility to lodge their grievances at any time.

126. Existing Grievance Redress Management (GRM) system to be further strengthened and streamlined for registering, screening and redressing, monitoring and reporting.

4.7 List of Excluded Activities

127. Based on assessment of systems and capacities and aligning with national and state regulation as well as World Bank's ESSA core principles, all activities causing high or substantial E&S risks and impacts are excluded from the REWARD program, and includes:

1. Any activities that would impact any physical cultural resources like religious structures, etc.
2. Any work that would covert or encroach forest land, notified wetland or any eco-sensitive area
3. Any work that would bring large scale submergence beyond drainage line
4. Any work that would convert common property resources including grazing land
5. Any work that would restrict minimum ecological flow of the rivers and rivulets
6. Any land acquisition and/or involuntary resettlement
7. Use of child labor
8. Any activity that would use most toxic pesticides classified as 'Class I' (based on toxicity of the active ingredient) by the World Health Organization; and
9. Any work that would use or generate hazardous material or chemicals beyond permissible levels specified in Schedule II of Hazardous Waste Handling and Management Rules, 2016

5 CONSULTATION AND DISCLOSURE

5.1 Key Stakeholders

In this project stakeholder consultations were undertaken with primary, secondary and tertiary stakeholders. The primary stakeholders include Farmers, Women SHGs, Gram Sabha members etc. The detailed list of key stakeholders is given in Annex-5(A).

5.2 Consultations

Given the COVID19 situation with travel restrictions and advisories on social distancing etc, the field visits and consultation could not be undertaken in conventional manner and followed World Bank guidance for 'Public Consultations and Stakeholder Engagement in constraint situation'. While the primary consultation was relied on earlier field visits of the task team members to select watersheds in two districts, consultation with secondary stakeholders was done in a virtual manner on 12th August 2020 and based on checklist developed and shared with client for their written response and using that as base for further consultation/ discussion with them. During the primary consultation, discussions were also held with PIA staffs, and district level staffs in each district along with village level institutions and community groups. Discussion was also held at the State level with Directorate of Soil Conservation and Watershed Development (DSC&WD), Agriculture Department, Horticulture Dept., and some of the technical partners. In addition, another stakeholder consultation was carried out primarily with primary stakeholders and their institutions 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 05th February 2021.

5.3 Disclosure

128. This draft ESSA will be disclosed in-country at the SLNA/ Department's website in Odisha and on the World Bank's external website, prior to formal appraisal of the relevant PforR, to serve as the basis for discussion and receipt of formal comments. Multi-stakeholder workshop on this ESSA and have taken place on 12th August 2020 with secondary stakeholders and partner agencies and on 5th February 2021 with primary stakeholders using World Bank's guidance on Public Consultations and Stakeholder Engagement in constraint situation. The ESSA has been further revised based on feedback and suggestions received during the consultation workshop. Other consultation workshop by SLNA is suggested wherein larger participation is expected. The final ESSA will be disclosed in-country at the client's website, and on the World Bank's external website.

5.4 Summary of Multi-stakeholder consultation workshop

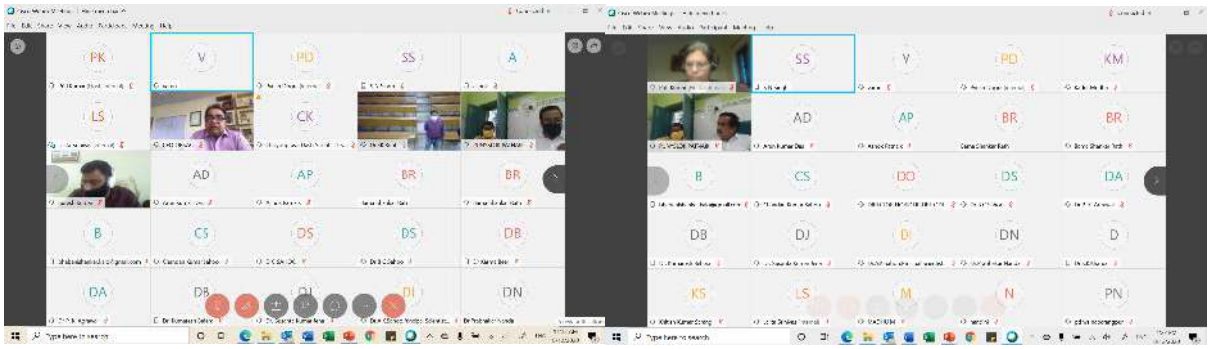
A. Summary of Stakeholder Consultation on August 12, 2020

129. A multi-stakeholder workshop is planned in each of the participating states and for Odisha it was conducted on August 12, 2020. Around 50 participants deliberated and discussed over ESSA analysis and outcome. Among the participants' officials from notable partner agencies like ICAR-NBSS&LUP, Kolkata, OUAT, Bhubaneswar, ORSAC, Bhubaneswar, CSWCRTI, Koraput, Director, Horticulture, Director, Agriculture & Food Production and District level Functionaries of DSC&WD and representative of NGO were present. The list of main participants in enclosed in Annex – 5(B).

130. Stakeholders agreed with most of the ESSA findings and recommendations including the negative list and up-front E&S screening. NGO representative suggested that due to rainfall pattern of Odisha low lying areas need to be taken care, which is already part of negative list. Another suggestion was to take care of salinity and water logging issue due to over exploitation of ground water by farmer for agriculture. NGO stakeholder also requested to add architectural heritage sites under Negative list.

131. In the consultation Officials of DSC&WD informed stakeholders that Odisha is already having a good crop advisory and epest surveillance platform. The system has added about 9 lakh farmers through WhatsApp. REWARD may customize information to mini advisories appropriate to

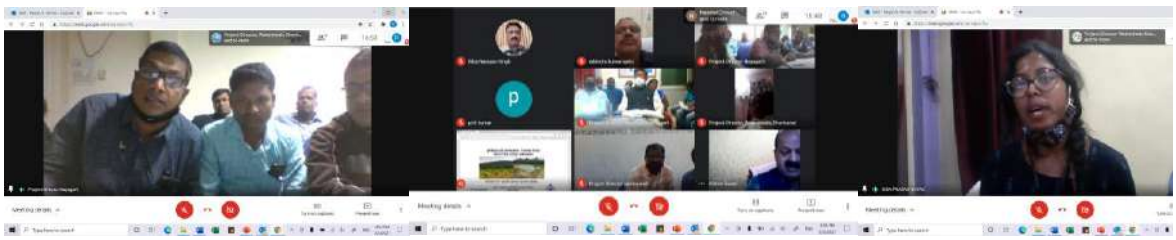
implementing districts. They also agreed that there is need of strengthening inter-departmental co-ordination to address treatment of upper ridge areas and other program convergence issues.



B. Summary of Stakeholder Consultation on February 05, 2021

132. A multi-stakeholder workshop is planned primarily with primary stakeholders from all the REWARD districts of Odisha including representatives from PIAs, Watershed Committees, SHG members and their federations, user groups and farmers, PRI members, and local NGOs in a virtual manner on 05th February 2021. Around 63 participants deliberated and discussed over ESSA analysis and outcome. The list of main participants in enclosed in Annex – 5(B).

133. Key feedback and suggestions from the primary stakeholder consultations includes (a) present system of providing Rs 25,000 per SHG under the livelihood component of PMKSY-WDC is not adequate and to be enhanced/ revisited under REWARD; (b) there is need for entrepreneurship and activity specific training to women SHG members; (c) support required for post-harvest processing and market; (d) greater involving of PRI members required for effective coordination and convergence; (e) involving forest department officials in DPR preparation process will be useful for building upstream and downstream linkages in watershed boundary bordering with forest; (f) special plans for migration prone villages and households; and (g) support value addition of agricultural produce and infrastructure such as cold storage etc.



6 RECOMMENDATIONS AND ACTIONS

6.1 Summary of identified gaps and activities

134. Strengthening watershed committees, PRIs and other community institutions and building their capacities 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. Key environmental and social risks are related to weak capacity for screening, planning and monitoring and will be addressed through relevant capacity building measures. 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. Also, capacity building related to dissemination of LRI cards will help improve decision-making by farmers on appropriate crop selection and agriculture practices. The Program will undertake appropriate trainings and capacity building measures on participatory watershed planning and implementation, adoption of gender and socially inclusive processes, governance and functioning of the 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.

135. Systematic upfront 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 patter 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 and water logging in some areas; risk of restricting surface flow at plot level thereby impacting water bodies in the downstream and overall hydrology. 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. 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.

136. 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.

137. The key recommendations for SLNA in addressing the environmental and social systems gaps identified, as well as for enhancing environmental and social benefits includes:

1. With transition to science-based approach to watershed planning, SOP/ guideline to be prepared and adopted for community participation, social inclusion, building community ownership, and accountability mechanism in line with the WDC-PMKSY new watershed development guideline for different phases of watershed planning and implementation. This should include a detailed process guideline for undertaking the consultations with community during DPR preparation and before approving and/or passing the DPR in Gram Sabha for further considerations.
2. All functionaries at every level of DSC&WD including field functionaries such as PIA members, Watershed functionaries including Community linked workers (CLWs) shall be trained of in demystifying science-based planning approach to farmers and undertaking environmental and social risk management activities and social mobilization and consultation with farmers and community groups. The process of social mobilization and field level consultations shall be supported by local NGOs not only during preparation but for a longer-term during implementation.

3. Early screening of potential environmental and social risks and issues using screening checklist as per Annex-8 by WDC and GP during DPR preparation and shall form as part of the DPR. WDC and GP members to be trained by DSC&WD on conducting screening.

4. Land use and ownership should be made visible in LRI/ DSS platform to avoid any issue. Also, displaying the environmentally sensitive areas on LRI map and data. This will help in protecting environmentally sensitive areas and natural and cultural heritage in micro watersheds and eliminate chance of extending project interventions to such sensitive areas. The environmental screening can also be duly applied using following layers captured through LRI data outputs during DPR preparation.

    a. LRI system currently can display following layers with excel databases as part of LRI outputs for DPR preparation, which are already captured in the LRI database and includes:

        i. Forest land,
        ii. Area impacted with salinity (Ece = >4.0) or sodicity (ESP = >25),
        iii. Waterlogged areas,
        iv. Steeply sloping lands
        v. Physical and cultural resources like monuments, temples, religious or socially sacred areas

    b. Another layer which is currently not being captured through LRI is of designated wetlands and requires to be captured.

5. Inclusion of gender and socially disaggregated data in M&E system along with periodic monitoring and reporting on E&S parameters. This should include capturing gender-disaggregated data for watershed planning, including women in leadership positions in watershed committees and FPOs, as well as among direct participants and beneficiaries of livelihood interventions, and reporting towards enhancing women participation in local institutions.

6. 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).

7. Strengthening institutional mechanism for E&S aspects with clear roles and responsibilities at state, district, block and PIA level. This will include co-designating officials involved in watershed program with environmental and social safeguard responsibilities along with providing E&S training to them e.g., Assistant Director (NRM) and Assistant Director (Livelihood) at the district level can be co-designated for district level E&S responsibilities.

8. DAFE to develop mechanism for effective coordination and convergence with other department including Forest Department, ST &SC Development, Minority, and Backward Class Welfare Department, and Rural Development and Panchayati Raj Department especially in Scheduled-V areas.

9. Extended handholding support to be provided focusing more on building overall capacity of the tribal and vulnerable groups including women for taking equitable benefits of the program.

10. 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.

11. 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.

12. DAFE will further assess the existing Grievance Redress Management (GRM) system and based on requirements, will further strengthened it potentially by adding additional module to

the farmer's help desk for registering, screening and redressing and monitoring grievances.

13. 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.

Input to Program Action Plan: While most of the recommendations will be incorporated in the program operations manual, a higher-level action is recommended as part of the program action plan (PAP) as detailed out below.

Action description	Responsibility	Timing	Completion Measurement
1. Protocol/ Standard Operating Procedure (SOP) to be prepared and adopted by SLNA detailing out mechanism of community participation and building ownership of the watershed plan based on science-based data inputs.	SLNA/ DSC&WD	One time activity (within twelve 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 institutions.	SLNA/ DSC&WD	One time activity (within 24 months of program effectiveness)	Gender disaggregated data collection at watershed level, and state-level reporting on (a) representation 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/ DAFE/ DSC&WD	One time activity (within twelve months of program effectiveness)	Strengthened GRM system functional and periodic reports being generated.

6.2 Inputs to the Program Implementation Support

6.2.1 Implementation and Reporting Arrangements

138. While the program institutional setup is adequate, there is no articulation of individual or agency responsible for implementing the E&S activities at State, District and PIA level to do systematic screening of E&S risks, monitoring of E&S risks and activities, and hence requires strengthening. Even though equity and sustainability are considered as guiding principles of the program, there are hardly any operational or institutional mechanisms that are put in place to ensure this.

6.2.2 Proposed Staffing

139. 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 identified and trained for providing implementation support, monitoring and reporting of implementation of E&S activities in the participating states.

Institution Level	Proposed Staffing
SLNA	Both a Social Development specialist and an Environmental specialist are designated as part of the PMU at the SLNA level to oversee the implementation of E&S activities including the monitoring and reporting aspect of it during the project time period.
District Levels	Agriculture/ Watershed Officer at the district office will be designated and be made responsible overseeing the implementation of Environmental safeguard activities; while the official dealing with Social Mobilization/ Capacity Building shall be made responsible for overseeing the implementation of Social Safeguard activities in the district including monitoring and reporting aspects.
PIA Levels	At the PIA level the Technical Officer/ consultant who can demystify the science-based planning should be made in-charge of implementing and reporting the Environmental safeguard activities; and another officer/ consultant with expertise of community mobilization shall be made in-charge of implementing social safeguard aspects including periodic reporting.
Village/Watershed Level	At the watershed level the Watershed Assistant/ Agriculture Assistant, and the Field level NGO worker(s) to be trained to undertake the implementation of environmental and social safeguard activities and assisting PIA in implementation of the same.

6.2.3 Training and Capacity Building

140. For harnessing potential benefits and addressing the E&S risk by all the implementing partners, awareness creation and capacity building would be necessary. Centre of Excellence as planned under REWARD may take up the capacity building activities. It can be also addressed in detailed E&S training manual to impart training by specialist institutions, consultants, etc. to project stakeholders on environmental and social safeguards. The project will provide additional support to bolster the existing capacities of these institutions to deliver trainings on environmental and social safeguards, participatory approaches and inclusion.

Training Aspects	Intended Audience	Trainers & Training partnerships
☐ LRI based Planning – demystifying science ☐ E&S Benefits ☐ E&S Screening ☐ E&S Risk ☐ M&E Indicators & Reporting for E&S	☐ Key officials of the project including implementing agencies – SLNA, District Level and PIU ☐ NGOs and members of community institutions	The Key Technical Resource Agencies/Partners as discussed in previous section would provide Master Trainers.

141. Under the REWARD program for E&S training at different level and the key agencies involved for training and the training responsibility will be as below.

Agency	Key training responsibility
NBSS&LUP	Co-ordinate with DSC&WD in organizing stakeholder workshops and Training project staff, project partners, NGOs and other project States on LRI including the E&S aspects of LRI
Technical Partners and Universities	Provide training to district, PIA level project officials and FNGOs on E&S safeguard management (as per E&S manual)
Field NGOs (FNGO)	• To create effective awareness and sensitization on E&S aspects of the programs at the village level including role of various watershed institutions at the village level and PRIs on E&S safeguards. • Mobilizing community and conduct Participatory rural appraisal exercises • Help support PIA in implementation of E&S activities at the watershed/ village level

6.3 E&S indicators and Reporting

142. LRI-DSS offers huge opportunity in the project to achieve larger 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 document change in critical hydrological and environmental parameters to generate realistic representative data. LRI system a few model MWS sites would be selected for hydrological investigation (including setting up instruments, collecting data, validating models, etc.) such that they represent the whole set. This same database can be effectively used during mid-term and end-term monitoring and evaluations to capture larger scale goals of protecting and conserving hydrologic services and/or managing negative downstream and groundwater impacts which otherwise remains unaddressed. Thus, it will add value to project through an additional benefit by capturing environmental sustainability scientifically through LRI. Key indicators for mid-term and end term evaluation is given which may be evaluated and re-worked during implementation phase. Similarly, the PRA based identification and quantification of watershed population in terms of different socio-economic and wealth ranking categories and skill sets will work as baseline for future assessments and impacts.

Key Areas of impact	Monitoring Indicator	Periodicity	Responsibility
Environmental Safeguard			
E&S Screening and management	1. DPRs with completed screening and ESMP 2. MWS with Satisfactory implementation of ESMP	Annual	PIA/ District team
Groundwater table is expected to rise with watershed activity.	Change in depth of water table during pre-monsoon and post-monsoon	Half Yearly (Month of May and Month of October)	PIA/ District team

Key Areas of impact	Monitoring Indicator	Periodicity	Responsibility
With improvement of soil moisture the downstream discharge i.e. flow in surface water bodies is expected to increase	Increase in flow in nearest stream/river/ Nala	Half Yearly (Month of May and Month of October)	PIA/ District team
With watershed conservation efforts duration or months of water availability in the ponds/lakes/reservoirs should increase	Duration of water available on nearest ponds/lakes/ reservoirs	Half Yearly (Month of May and Month of October)	PIA/ District team
With treatment there should be increase in vegetation cover.	NDVI Analysis	Annual	PIA/ District team (be taken from LRI Data either from State or from Technical Partner)
With bunding, trenching and other watershed treatments erosion is supposedly to be reduced	Silt Monitoring in nearest silt monitoring station	Annual after monsoon	PIA/ District team (To be taken from LRI Data either from State or from Technical Partner)
There might be risk of increase in salinity with over irrigation of land or over withdrawal of groundwater	Ground water quality analysis with special reference to sodium, potassium, cation-exchange capacity	Annual	PIA/ District team
Due to land treatment there will be improvement on the organic content of soil	Soil Analysis with special reference to organic content, organic carbon, NPK content.	Annual	PIA/ District team
There would risk of downstream surface water and ground water pollution due to overuse of pesticide and fertilizer with high value crop selection with increase in water availability	Ground water quality analysis with special reference to sodium, potassium, cation-exchange capacity, PAH, PCB	Annual	PIA/ District team
With availability of water there should be positive impact on bio-diversity.	Any new species of trees, shrubs, medicinal	Bio-diversity Survey Annual	PIA/ District team

Key Areas of impact	Monitoring Indicator	Periodicity	Responsibility
New species of trees, shrubs, medicinal plants, birds, animals may add to existing baseline.	plants, birds, animals in the vicinity		
There could be risk that intervention gets into nearest forest or common property areas.	If people have moved into nearest forest/ common property area or they have started cultivating near s near to/ inside forest land	Annual	PIA/ District team
Social Safeguard			
Community Participation and Empowerment	1. DPRs/ Watershed plans following community participation and conducted PRA exercises. 2. DPRs/Watershed Plans with community endorsement of DPRs	Annual	PIA/ District team
There is expected increase in income from farm and non-farm activities adding to overall socio-economic and wealth status	Change in household income	Mid-term/ End-term	SLNA through independent survey
Increased involvement of women, landless and other marginalized groups - during watershed plan preparation	No. of women, landless, marginal farmers, SC, ST population participated in (a) PRA exercise; (b) DPR consultation process	During the DPR preparation phase - Annual	PIA/ District team
Increased involvement of women, landless and other marginalized groups - during implementation	No. of women, landless, marginal farmers, SC, ST population participating in (a) Watershed Committee (b) Other watershed institutions – SHGs, CIGs, FPOs etc. (c) Benefited through income generation activities (d) Received credits/ linked for credits with other agencies/ schemes for entrepreneurial activities	Annual	PIA/ District team

Key Areas of impact	Monitoring Indicator	Periodicity	Responsibility
Women participation and women in leadership role	1. In Watershed Committee 2. In Gram Panchayat 3. In FPO/Cs 4. In leadership role of WC, GP, FPO/Cs	Annual Mid-term/ End-term	PIA/ District team SLNA through independent survey
Grievances Resolved	1. Grievances received 2. Grievances resolved 3. Grievances pending and escalated to next level for resolution	Annual	PIA/ District team/ SLNA/ DoLR

6.4 Inter-Departmental Committee to address E&S Risks and Mitigation

143. An inter-departmental Committee is suggested at PIA level that will address upfront E&S risk screening and also responsible for capturing E&S baselines. The committee would be responsible to supervise aspects on LRI-DSS based E&S screening are captured properly and it is reflected in the DPR databases validating ground scenario as given in Annex-8 and Annex-9 as well as M&E indicators as given in Section 6.4. The committee should have representative of members from following Department and responsible for forwarding DPR after validating E&S Screening, E&S risk management addressing negative list and M&E indicators:

- SLNA
- Department of Forest
- Revenue Department
- Directorate of Agriculture
- Directorate of Horticulture
- Directorate of Animal Husbandry & Veterinary Services
- Directorate of Fisheries
- Department of Environment (State Pollution Control Board)
- Directorate of Soil Conservation
- SC & ST Development Department
- Women & Child Development Department

ANNEXURES

ANNEX-1: LIST OF DOCUMENTS REVIEWED

1. IWMP Guideline 2008 and 2011
2. Implementation Manual for Suajla-III Project, 2017. Watershed Development Department, Government of Karnataka.
3. Karnataka Watershed Development Project-II: Environmental Management Framework – Final Report – December 2011
4. Social Assessment Report - Karnataka Watershed Development Project-II (Sujala-III), 2011
5. Supplementary Social Assessment Horticulture Components Karnataka Watershed Development Project-II (Sujala-III)
6. Neeranchal: Strategic Environment and Social Assessment –Phase 1
7. Environment and Social Assessment Including Monitoring Plan for HP Mid-Himalayan Watershed Development Project 2012
8. Guidelines for Evaluation of Preparatory Phase of IWMP Projects
9. Organizational Structure Involving Community for Effective Watershed Development 2011
10. Watershed Development in India - An Approach Evolving through Experience, World Bank, 2014
11. Benchmarking of Watershed Management Outcomes - Operational Guidelines, 2015, Department of Land Resources, Ministry of Rural development, Government of India.
12. Census of India, 2011
13. Lobo, Crispino. An Institutional Study on Watershed Services: Improving Operational Effectiveness and Impacts of the Integrated Watershed Development Program (IWMP), 2012
14. Prioritization of Rainfed Areas in India. NRAA, 2012
15. Rainfed Ecosystem in India – A Perspective. WASSAN, 2017
16. Odisha Gazette Notification dated August 17, 2012 on Creation/ Setting up Project Directors in Watershed Offices in 26 Districts
17. Status of Agriculture in Odisha 2014-15
18. Odisha Profile 2018. Directorate of Economics and Statistics, Govt of Odisha

ANNEX-2: APPLICABLE LEGAL AND REGULATORY FRAMEWORK

144. The Government of India and the state government have enacted a range of laws, regulations, and procedures relevant to managing the environmental and social effects of the proposed Program. The following criteria were used to select the relevant legislation that best describes the country's system for managing the Program's effects:

i. environmental and social policies,

ii. environmental and social protection laws, and

iii. laws, regulations, or guidelines in the relevant sectors and subsectors that provide relevant rules or norms for environmental and social management.

Relevant National and State Programs

145. **PMKSY**: The *Pradhan Mantri Krishi Sinchayee Yojana* (PMKSY) has been formulated with the vision of extending the coverage of irrigation '*Har Khet ko pani*' (*water to every farm*)and improving water use efficiency 'More crop per drop' in a focused manner with end to end solution on source creation, distribution, management, field application and extension activities. Watershed Development Component of PMKSY (erstwhile IWMP), PMKSY has been formulated amalgamating ongoing schemes viz. Accelerated Irrigation Benefit Programme (AIBP) of the Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD&GR), Integrated Watershed Management Programme (IWMP) of Department of Land Resources (DoLR) and the On Farm Water Management (OFWM) of Department of Agriculture and Cooperation (DAC).The Integrated Watershed Management program was subsumed into the current PMKSY on 26 October 2015. The core implementation activities of IWMP were unchanged and were as per the Common Guidelines 2008 (Revised 2011) of IWMP. Convergence with other Central and State Government schemes, remains the top of the agenda for the program towards optimal and judicious utilization of financial resources.

146. **IWMP**: The Integrated Watershed Management Programme (IWMP) one of the Flagship program of Government of India is under implementation by the Department of Land Resources since 2009-10 after integrating three area development program namely (a) Desert Development Programme (DDP), (b) Drought Prone Areas Programme (DPAP) and (c) Integrated Wastelands Development Programme (IWDP), for development of rainfed/ degraded land in the country.

147. The Desert Development Program (DDP) focused on reforestation to arrest the growth of hot and cold deserts while the Drought Prone Areas Program (DPAP) concentrated on non-arable lands and drainage lines for in-situ soil and moisture conservation, agro-forestry, pasture development, horticulture and alternative land uses. The IWDP, on the other hand, made silvipasture, soil and moisture conservation on wastelands the predominant activity. The NWDPRA was implemented with a major thrust on arable land treatment, non-arable land treatment, drainage line treatment and livestock development. Based on the implementation experience of the above listed watershed projects, the Government of India realized the imperative of bringing about uniformity and harmonization in the implementation of various watershed development projects and which lead IWMP with common guidelines in 2008.

148. The main aims of IWMP are harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water; prevention of soil run-off; rain water harvesting and recharging of the ground water table; increasing the productivity of crops; introduction of multi-cropping and diverse agro-based activities; promoting sustainable livelihoods and increasing the household incomes.

149. The project duration of IWMP project varies from 4-7 years. The major activities taken up under IWMP inter-alia include ridge area treatment, drainage line treatment, soil and moisture conservation, rainwater harvesting, nursery raising, afforestation, horticulture, pasture development, livelihoods for asset less persons. The benefits that are expected to accrue under the IWMP include increase in availability of surface water & groundwater, changes in cropping pattern from one to two crops annually, increase in fodder availability and increase in milk yield, increase in agriculture productivity and increase in employment opportunities and household income.

150. IWMP is more diverse and socially inclusive compared to earlier watershed guidelines. It also focuses on:

a) Securing rural livelihood of small and marginal farmers and the landless in terms of food security and income.

b) Reducing distress migration from watersheds

c) Social audits are built in the process of IWMP implementation

d) Gram sabha's participation planning and management

e) No. of CBOs/ SHGs/ Micro-enterprise formed and linked to market

f) Productivity enhancement and livelihoods were given priority along with conservation measures

151. **The Guiding Principles** as mentioned in the IWMP Common Guideline 2011 is as below:

a. **Equity and Gender sensitivity**: Watershed Development Projects should be considered as levers of inclusiveness. Project Implementing Agencies (PIAs) must facilitate the equity processes such as a) enhanced livelihood opportunities for the poor through investment in their assets and improvements in productivity and income, b) improving access of the poor, especially women to the benefits, c) enhancing role of women in decision making processes and their representation in the institutional arrangements and d) ensuring access to usufruct rights from the common property resources for the resource poor.

b. **Decentralization**: Project management would improve with decentralization, delegation and professionalism. Establishing suitable institutional arrangements within the overall framework of the Panchayati Raj Institutions (PRIs), and the operational flexibility in norms to suit varying local conditions will enhance decentralization. Empowered committees with delegation to rationalize the policies, continuity in administrative support and timely release of funds are the other instruments for effective decentralization.

c. **Facilitating Agencies**: Social mobilization, community organization, building capacities of communities in planning and implementation, ensuring equity arrangements, etc. need intensive facilitation. Competent organizations including voluntary organizations with professional teams having necessary skills and expertise would be selected through a rigorous process and may be provided financial support to perform the above specific functions.

d. **Centrality of Community Participation**: Involvement of primary stakeholders is at the centre of planning, budgeting, implementation, and management of watershed projects. Community organizations may be closely associated with and accountable to Gram Sabhas in project activities.

e. **Capacity Building and Technology Inputs**: Considerable stress would be given on capacity building as a crucial component for achieving the desired results. This would be a continuous process enabling functionaries to enhance their knowledge and skills and develop the correct orientation and perspectives thereby becoming more effective in performing their roles and responsibilities. With current trends and advances in information technology and remote sensing, it is possible to acquire detailed information about the various field level characteristics of any area or region. Thus, the endeavor would be to build in strong technology inputs into the new vision of watershed programs.

f. **Monitoring, Evaluation and Learning**: A participatory, outcome and impact-oriented and user-focused monitoring, evaluation and learning system would be put in place to obtain feedback and undertake improvements in planning, project design and implementation.

g. **Organizational Restructuring**: Establishing appropriate technical and professional support structures at national, state, district and project levels and developing effective functional partnerships among project authorities, implementing agencies and support organizations would play a vital role.

152. **MGNREGA**: Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) initiated by the MoRD[23]. The MGNREGA aims to provide a strong social safety net for the vulnerable groups by providing a fall-back employment source, when other employment alternatives are scarce or inadequate Through the process of providing employment on works that address causes of chronic poverty such as drought, deforestation and soil erosion, the Act seeks to strengthen the natural resource base of rural livelihoods and create durable assets in rural areas. It aims at empowering the rural poor through the processes of a rights-based law and fostering conditions for inclusive growth.

Watershed development works mainly the NRM works predominantly the water and soil conservation, afforestation and land development works are allowed[24] to be taken up in convergence with MGNREGS and government orders and guidelines have been issued by the Ministry of Rural Development (MoRD) with this effect. States including Odisha has been using the convergence with MGNREGS to undertake watershed development activities.

153. **Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM)**: The DAY-NRLM is a centrally sponsored program that aims at eliminating rural poverty through promotion of multiple livelihoods for each rural poor household. The DAY-NRLM seeks to reach out to all rural poor households and impact their livelihoods significantly by 2024–25. This is sought to be achieved through universal social mobilization, inter alia, organizing one woman member from each rural poor household into Self Help Groups (SHGs), their training and capacity building, facilitating their micro-livelihoods plans, and enabling them to implement their livelihoods plans through accessing financial resources from their own institutions and banks. The mission aims at creating efficient and effective institutional platform for the rural poor, enabling them to increase household income through sustainable livelihood enhancement and improved access to financial services. NRLM is complementing rural poor groups with knowledge, information, skills, tools, finances and collectivization. As NRLM expands to watershed areas, convergence is sought to build linkages for women SHGs already created under the watershed program towards skill development initiatives of NRLM and enhancing further income generation and livelihood activities. Both MoRD and DoLR have issued guidelines with this effect and are being followed in various states including Odisha.

154. **Panchayats (Extension to the Scheduled Areas) Act, 1996**:

To mainstream the tribal issues in the development process, without disturbing or destroying their cultural identity and socio- economic milieu, the Parliament extended the provisions of 73rd Amendment Act to the Scheduled Areas by passing Provisions of Panchayats (Extension to the Scheduled Areas) Act, 1996. The Panchayat (Extension to the Scheduled Areas) Act, 1996, commonly known as PESA, legally recognizes Scheduled Tribe's own systems of self-governance. The Gram Sabha of the village becomes the focal institution, endowed with significant powers. Under section 4(d) of PESA: "every Gram Sabha shall be competent to safeguard and preserve the traditions and customs of the people, their cultural identity, community resources and the customary mode of dispute resolution." PESA legally recognizes the right of tribal communities to govern themselves through their own systems of self-government and also acknowledges their traditional rights over natural resources. The salient feature of the Panchayats (Extension to the Scheduled Areas) Act includes the following:

1. Legislation on Panchayats shall be in conformity with the customary law, social and religious practices and traditional management practices of community resources;
2. Habitation or a group of habitations or a hamlet or a group of hamlets comprising a community and managing its affairs in accordance with traditions and customs; and shall have a separate Gram Sabha.
3. Every Gram Sabha to safeguard and preserve the traditions and customs of people, their cultural identity, community resources and the customary mode of dispute resolution.

[23] Although EAS and MGNREGA are employment-oriented programs, priority has been given to rejuvenation of natural resources, including water and soil conservation.

[24] https://nrega.nic.in/netnrega/writereaddata/Convergence/HP/circulars/cir310.pdf

4. The Gram Sabhas have roles and responsibilities in approving all development works in the village, identify beneficiaries, issue certificates of utilization of funds; powers to control institutions and functionaries in all social sectors and local plans.
5. Gram Sabhas or Panchayats at appropriate level shall also have powers to manage minor water bodies; power of mandatory consultation in matters of land acquisition; resettlement and rehabilitation and prospecting licenses/mining leases for minor minerals; power to prevent alienation of land and restore alienated land; regulate and restrict sale/consumption of liquor; manage village markets, control money lending to STs; and ownership of minor forest produce.
6. The provisions of Panchayats with certain modification and exceptions have been extended to the Schedule V areas.

In line with the PESA Act, the Government of Odisha has formulated rules for the Panchayats (Extension to Scheduled Areas) Act, 1996.

155. **Odisha Pani Panchayat Act**: High dependency on agriculture in the state demands efficient and equitable supply and distribution of water and its optimal utilization. It is also required that scientific and systematic development and maintenance of irrigation infrastructure by which water will be made available to the farmers. It is realized that decentralized system of operation and management of irrigation structures and water distribution networks will yield better result where farmers will participate and take up the ownership of irrigation systems at their field level. Participatory Irrigation Management (PIM) was conceived as the vehicle to improve water distribution mechanism and attending water use efficiency along with maintenance of the structures. It was planned to promote farmers organizations, in shape of Pani Panchayat, who will take up required responsibility for water distribution, management and maintenance of the irrigation structures. In this context, the Orissa Pani Panchayat Act, 2002, was enacted to ensure participation of the farmers' / water users in the management of irrigation systems and for matters connected therewith or incidental thereto (The Orissa Gazette, No.1053, 8 July, Cuttack: 2002). The object of the PP is "to promote and secure distribution of water among its users, adequate maintenance of the irrigation system, efficient and economical utilization of water to optimize agricultural production, to protect the environment, and to ensure ecological balance by involving the farmers, inculcating a sense of ownership of the irrigation system in accordance with the water budget and the operational plan".

156. **Tribal sub plan (TSP) and Scheduled Caste sub plan (SCSP)**: The strategy of Tribal Sub Plan (TSP) has been in force since 1974, to ensure adequate flow of plan resources for the development of Scheduled Tribes in proportion to their population. The strategy of Scheduled Castes Sub Plan (SCSP) (earlier known as the Special Component Plan for Scheduled Castes) has been in force since 1979-80, to ensure a proportionate flow of plan resources for the development of Scheduled Castes. TSP funds are earmarked by the state through their annual budget under each of the department's budget including the budget of DSC&WD/ DoA in proportion to the tribal population living in the state.

157. A brief summary of environmental and social laws, regulations and policies that are relevant to the proposed Program is mentioned in table below.

Table (A2.1): Relevant Environmental and Social Laws, Regulations and Policies

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
1	The Constitution of India (especially, Articles 15,16 and 46)	The Indian Constitution (Article 15) prohibits any discrimination based on religion, race, caste, sex, and place of birth. Article 16 refers to the equality of opportunity in matters of public employment. Article 46 directs the state to promote with special care the educational and economic interests of the weaker sections of the people, particularly of the Scheduled Castes and the Scheduled	Relevant to the overall Program

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
		Tribes and also directs the state to protect them from social injustice and all forms of exploitation.	
2	Right to Information Act, 2005	Provides a practical regime of right to information for citizens to secure access to information under the control of Public Authorities. The act sets out (a) obligations of public authorities with respect to provision of information; (b) requires designating of a Public Information Officer; (c) process for any citizen to obtain information/disposal of request, etc.; and (d) provides for institutions such as Central Information Commission/State Information Commission	Relevant as all documents pertaining to the Program requires be disclosed to public.
3	Minimum wages Act, 1948	This act ensures minimum wages that must be paid to skilled and unskilled labors. The employer shall pay to every employee engaged in scheduled employment under him, wages at the rate not less than the minimum wages fixed by such notification for that class of employee without any deductions except authorized.	Applicable to the overall Program
4	Child labour (prohibition and regulation) Act 1986; 2015	This act prohibits the engagement of children below 14 and 15 years in certain types of occupations and regulates the condition of work of children in other occupations. No child shall be employed or permitted to work in any of the occupations set forth in Part A of the schedule, processes set forth in Part B of the schedule which includes building and construction industry.	Applicable to hiring contract labour for construction activities
5	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	Aims to ensure, a humane, participative, informed and transparent process for land acquisition with least disturbance to the owners of the land and other affected families and provide just and fair compensation to the affected families whose land has been acquired or proposed to be acquired or those that are affected by such acquisition and make adequate provisions for their rehabilitation and resettlement and for ensuring that the cumulative outcome of compulsory acquisition should be that affected persons become partners in development leading to an improvement in their post-acquisition social and economic status.	Not applicable as no land acquisition or resettlement is anticipated.
6	The Sexual Harassment of Women at Workplace	An act that aims at providing a sense of security at the workplace that improves women's participation in work and results in their economic empowerment. It	Relevant and applicable to all formal institutions including WDD

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
	(Prevention, Prohibition and Redressal) Act, 2013	requires an employer to set up an "Internal Complaints Committee" (ICC) and the Government to set up a 'Local Complaints Committee' (LCC) at the district level to investigate complaints regarding sexual harassment at workplace and for inquiring into the complaint in a time bound manner. The ICC need to set up by ever organization and its branches with more than 10 employees.	
7	Fifth Scheduled Areas as in the Constitution of India	In the Scheduled Areas, involvement of tribal councils and communities, incorporating their views and culture specific needs will enhance their participation in the Program. Under the provisions of Fifth Scheduled Areas, the State should set up a Tribes Advisory Council (TAC) to advise the State Government on matters of welfare and development of the Scheduled Tribes in the State.	Applicable as AP has Schedule V areas.
8	The Environment (Protection) Act No.29 of 1986	• Under this Act, the central government is empowered to take measures necessary to protect and improve the quality of the environment by setting standards for emissions and discharges; regulating the location of industries; management of hazardous wastes, and protection of public health and welfare. • This encompasses all legislations providing for the protection of environment in the country. It includes the power to direct the closure, prohibition or regulation of any industry, operation or process by the government	• Relevant to Water conservation, Agriculture, Forestry, Pasture lands, Horticulture, etc. activities • Preservation of air and water quality. • Control of pesticides &insecticide runoff. Control dust pollution due to quarrying, which might harm the vegetation.
9	Water and Air (Prevention and Control of Pollution) Act, 1974 & 1981 (Central Act 6 of 1974) as amended in1988	• This Act prohibits the discharge of pollutants into water bodies beyond a given standard and lays down penalties for noncompliance. • Water act includes the maintenance or restoring the wholesomeness of the water. Air act restricts the operation of any industrial plant in an air pollution control area without a valid consent	Not relevant to project activities.
10	Forest (Conservation) Act No. 69 of 1980 and amended in 1988	• This Act restricts the powers of the state in respect of de-reservation of forests and use of forestland for non-forest purposes. • All diversions of forestlands to any non-forest purpose, even if the area is privately owned, require approval of the central government. • Leases of forest land to any organization or individual require approval of the central government.	• Relevant to Forestry and Agriculture components. • Conservation of indigenous biomass. • Retar evapotranspiration, generates organic manure, increased soil flora & fauna. Permission is to be obtained from the Forest Department

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
		Proposals for diversion of forest land for construction of dwelling houses are not to be entertained	when forestland is required for the project activities.
11	National Forest Policy, 1988	Protect and enhance the yields of non-timber forest products in order to generate employment and income for forest and village communities	• Relevant to employment generation in forest lands. Controlled felling and transportation of trees
12	Joint Forest Management, 1993	• Induces people participation in forest management sharing mechanism to distribute the benefits of interventions carried out on common resources property, government lands, wastelands, etc. Benefits are categorized into two – ecological benefits and economic benefits	• Relevant to Forestry, Intervention in common resource property and Horticulture • Pastureland development Guideline on the sharing mechanism
13	The Wildlife (Protection) Act I972, Amendment 1991	• This Act provides for protection to listed species of Flora and Fauna in the declared network of ecologically important protected areas such as wildlife sanctuaries and national parks. The wildlife protection act has allowed the government to establish a number of national Parks and Sanctuaries, over the past 25 years, to protect and conserve the flora and fauna of the state	• Relevant to Forestry. • Preservation of biodiversity. Ecologically sensitive areas, wildlife sanctuaries and national parks should be avoided while selecting sites for project components. If this is not possible, permission should be obtained from the Forest Department and appropriate safeguards must be adopted.
14	EIA Notification of MoEF 2006	All projects listed under Schedule-I of the Notification require environmental clearance from the MoEF. Water supply and sanitation projects, however, are not covered in the Schedule. The list of project categories under Schedule I of the Environmental Impact assessment Notification is available on the MoEF Website.	This project does not require EIA. However, the EMF is designed to ensure that environmental safety measures are integrated into the project
15	The Ancient Monuments, Archaeological sites and Remains Act, 1958	The Ancient Monuments and Archaeological sites should be protected from any developmental activity. The area within the radial of 100 m and 300mfrom the 'protected property' are designated as 'Protected area' and 'controlled area' respectively. No development activity (including building, mining, excavating, blasting etc.,) is permitted in the 'protected area' and developmental activities likely to damage the protected property are not permitted in the 'controlled area' without prior permission of the Archaeological Survey of India'	Deals with Cultural safeguards

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
16	Biological Diversity Act 2002 Biological Diversity Rules 2004	The Biological Diversity Act, which came into force in February 2003, aims to promote conservation, sustainable use and equitable sharing of benefits of India's biodiversity resources. It provides for establishment of a National Biodiversity Authority at national level, State Biodiversity Boards at state level and Biodiversity Management Committees at the level of Panchayats and Municipalities	• Relevant to Forestry, Horticulture, Livestock, Silviculture, Soil conservation and Agriculture. • Provides Ecological integration. • Increased ecological symbiosis (e.g. Pollination) increases production
17	• Wetland (Conservation and Management) Rules 2010	These ensure better conservation and management and to prevent degradation of existing wetlands in India. Under these Rules, States have to declare wetlands for protection, identify those that are to be notified, develop plans including list of permissible activities, develop an integrated master plan and ensure that these are adhered to	• Relevant to conservation and not using protected wetlands for watershed intervention. • Provides Ecological integration. • Helps in benefits of overall recharge in ground water and aquatic and avi-fauna The Program will have to ensure that its institutional development and resilient investments are in line with the requirements, if any, under these Rules.
18	Various Waste Management Rules 2016: There are four Waste Management Rules that are pertinent: (i) Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016; (ii) Construction and Demolition Waste Management Rules 2016, (iii) Solid Waste Management Rules 2016 and (iv) Plastic Waste Management Rules 2016.	• There are guidelines for generation, storage, transport and disposal of C&D waste, hazardous waste, plastic waste and municipal solid waste. For all civil works related to the WRM resilient investments, the contractor will have to obtain authorizations for all the different types of wastes as required, and will dispose scrap / waste only to authorized agencies.	• The Program will have to ensure that its institutional development and resilient investments are in line with the requirements, if any, under these Rules.
19	The Pesticide Management Bill, 2020	The bill proposes to promote the production and distribution of safe and effective pesticides and to reduce crop losses due to the use of spurious and substandard products. The bill also aims to assess the potential effects of these products on the health of people and the environment.	• The Program will have to ensure that its institutional development and information disclosure are in line with the requirements, if any, under these Rules.

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
20	The Insecticides Act, 1968 and Insecticides Rules, 1971	This is to regulate the import, registration process, manufacture, sale, transport, distribution and use of insecticides (pesticides) with a view to prevent risk to human beings or animals and for all connected matters, throughout India.	• The Program will have to ensure that its institutional development and information disclosure are in line with the requirements, if any, under these Rules.

ANNEX-3(A): CORE PRINCIPLE #1: PROGRAM E&S MANAGEMENT SYSTEMS

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
Core Principle #1: Program E&S management systems are designed to 1.(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				
1.	Adequate legal and regulatory framework	• Planning and implementation of the entire watershed program in Odisha follow the common guideline 2011 as recommended by the WDC-PMKSY i.e. involvement of primary stakeholders is at the centre 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. • MGNREGS is also used to work on watershed development but remain 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 Labour (prohibition and regulation) Act 1986, 2015; LARR, 2013 with further amendments; and provision under the constitution and Fifth schedule areas are applicable as the case maybe and provide for larger umbrella of guidance and framework.	• While the legislative and regulatory provisions are adequate, also the watershed guidelines spell out clear roles and responsibility, and the process to be adopted for watershed planning and implementation, some risk emerges from its weak compliance as it requires enabling institutional and technical capacity for compliance. • There is risk of skipping the process of community participation completely as the objective of the initial participation and consultation process as in case of IWMP/ WDC-PMKSY is to reach to watershed plan/DPR, and which in case of LRI based process the watershed plan/ DPR draft is prepared using computer based digital support system.	• Protocol/ SOP to be prepared and adopted by the state for how science-based input (such as LRI data) for DPR preparation is translated for the community and the detailed process guideline for undertaking the consultations with community during DPR preparation and before approving and/or passing the DPR in Gram Sabha for further considerations. • Build the capacities of frontline workers and NGOs/Agencies associated on improved mechanism and also on the process of social mobilization and ecological conservation and environmental safeguard issues. •
2	Key E&S risks that requires screening and management of risk	• There is no system of screening of E&S risks given the size of physical structures are quite small in size.	• This may lead to adversely affecting some of the physical and cultural resources such as sacred groves and other such sites and structures.	• E&S screening to be instituted based on screening format (see Annex-VIII) during watershed plan/ DPR preparation.

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
3	Strategic, technical and site alternatives	• 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; • Activities / treatments which involve encroachment of forest land require 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. • No activities are undertaken in areas having sensitive natural habitats, wetlands and ecological sensitive areas. • Areas where submergence may occur is not considered.	• The planning process should include analysis of alternative designs and sites, or consideration of "no option". • Assessment procedures and mitigation measures have been put into place through the EMF so that any likely negative impacts on the natural environment are minimized.	• Any physical displacement, program interventions in sensitive natural habitats, wetlands and ecological sensitive areas, and areas where submergence may occur will not be taken up under the project and will be part of excluded activities under the project. • The schemes to be taken up under the project would not convert or degrade natural habitats. • Marginal groups should be given awareness training on illegal conversion of forest land to agriculture land. • Though project is not financing procurement of any pesticides but supports environmentally sound pest management, including integrated pest management, but does not prohibit the use of highly hazardous pesticides.
4	Assessment of potential cumulative, and trans-boundary impacts	• The process of selection of watershed for treatment is based on regional assessment of environment especially soil health and water availability in the rainfed area to enhance productivity of the crops. Baseline is created to assess and inform the changes due to intervention. • One of the important cumulative impacts of watershed development is reduction in poverty and reduced forced migration. However, no systematic assessment has been done to quantify the magnitude of the reduction.	• Agriculture run-off with chemical fertilizer, pesticide & insecticide may pollute surface water as well as groundwater quality • Increased use of water may reduce ground water level in shallow water table • Change in cropping pattern (introduction of cash crops) due to increased availability of water may lead to eventual over drawl. • There is risk of decrease in downstream surface water flow if water is stored in upper ridges.	• Regular monitoring of environment parameters in project areas. Parameters will be ground water level and quality, soil testing to ascertain there is no erosion. • Current scale of planning is usually at the micro (500 Ha) or the sub watershed (5000 Ha) scale but does not take into account impact of existing structures upstream and impact on downstream users. A World Bank study carried out in Gujarat[25] suggests that a hydrological assessment at the catchment level should precede micro or sub watershed level planning to ensure that externalities are properly acknowledged and addressed.

[25]Catchment Assessment and Planning for Summary report June 2015 Watershed Management

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
				• Evaluate how effectively IWMP works have been carried out in forestlands, especially where ridges are under forest cover
5	Institutional responsibilities and resources to support implementation	• The WDC-PMKSY program guide clearly articulate the institutional responsibilities at different level of program implementation right from national, state, district, Block/ PIA, GP and village level. • However, in the existing implementation chain, there is no articulation of individual or agency responsible for implementing the E&S activities and monitoring the same.	• The current institutional mechanism lacks in E&S screening, implementing and monitoring of E&S effects arising out of program activities.	• The state proposes to ensure E&S officer at the state level and well as designate an official at district level for the proposed project. • However, there is need to train frontline workers in environmental issues so that they can monitor E&S impact or appoint third party Agency/NGOs for monitoring and addressing E&S concerns. • DPR preparation through participatory approach, community training, activity supervision-monitoring and review, build indigenous technical knowledge, post project operation and maintenance of project assets.
7	Responsiveness, inclusion and accountability through stakeholder consultation and dissemination	• The current watershed program aims not only to improve the soil and water conservation but also improve the livelihood and income of farmers as well as skill-based opportunities and income generating activities for women and landless.	• The guideline provides for about 10% of funds for livelihood improvement of landless and vulnerable. Program also attempts to link women SHGs to SRLM. However, there is no systematic assessment of its impact on women and landless has been assessed. • The WDC-PMKSY guideline does provide for building of accountability of local institutions involved with a detailed process of consultation with community and other stakeholders. This requires strengthening for the new LRI based watershed planning and implementation.	• A detailed participatory mechanism to build accountability among local institutions and state level institutions including those responsible for DPR preparation requires strengthening. • Impact assessment study of watershed activities including focus on landless and vulnerable needs to be conducted and the findings to be used for filling gaps in future program activities. • A comprehensive Stakeholders Engagement Plan has to be evolved and implemented

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
8	Responsive GRM	• The current grievance redress mechanism is based on RTI Act, CM's grievance cell, Odisha State Grievance Redressal Portal: e-Abhijog portal (https://cmgcodisha.gov.in/).	• It requires the beneficiaries to travel to other places at Taluka/ District level to register any complaint. Also, one has to be literate to write down the complaint.	• DSC&WD need to address proper mechanism for GRM and strengthen the complaint registering and resolving mechanism.

ANNEX-3(B): CORE PRINCIPLE #2: NATURAL HABITAT AND PHYSICAL AND CULTURAL RESOURCES

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
1	Identification and screening of potentially important biodiversity and cultural resource areas	With departure from detailed consultative processes being used for bottoms up planning to LRI based top down planning with inadequate participation and consultation on the draft plan, there is no mechanism to screen out physical cultural resources such as 'sacred groves' etc.	• There is risk of disturbing the sacred groves unknowingly may be possible as the DPR preparation is more of computer-based algorithms to plan for each plot and prepare DPR • The vegetative cover for enhanced NRM and ecosystem services on the lines of watershed interventions that result in losses of biodiversity and forest areas • Introduction of exotic/ alien species of grasses and fodder crops to meet the demand of fodder that dominate the local species. • Change in diversity of flora and fauna • Increased risk of forest fire, habitat and grazing resources loss • Change in cropping pattern can impact the natural habitat especially of avi-fauna	• Screening to be instituted along with community consulting to rule out any adverse impact. At the screening stage only there is need of identifying structures of cultural and religious importance. • Support establishing village level Biodiversity Management Committees and preparation of Biodiversity Registers (under National Biodiversity Act) that not only documents traditional knowledge, but also provide NRM solutions
2	The conservation, maintenance and rehabilitation of natural habitats; avoid the significant conversion or degradation of critical natural habitats and if	The schemes to be taken up under the project would not convert or degrade natural habitats. However, assessment procedures and mitigation measures have been put into place through the EMF so that any likely	• Many natural habitats, including forestland, non-forestland with tree cover, pastures/meadows, common property resource etc. May be involved and therefore, these areas do not undergo any degradation and people dependent on these common property resources continue to enjoy the access and rights they currently are entitled	• Natural habitats, including forestland, non-forestland will be maintained according to National Environment Policy 2006; National Water Resources Policy 2002 and National Biodiversity Strategy and Action Plan (NBSAP)

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
	avoiding the significant conversion of natural habitats is not technically feasible, includes measures to mitigate or offset impact or programme activities	negative impacts on the natural environment are minimized.		• Activities under IWMP focusing on increasing area under vegetation and grasses through afforestation, increase in availability of green and dry fodder both in quality and quantity, increase in availability of crop stalks as dry fodder and habitat improvement through soil and moisture conservation works.
3	Physical cultural property and as warranted, provides adequate measures to avoid, minimize, or mitigate such effects.	Purpose is to assist in the preservation of cultural property, such as sites having archaeological, paleontological, historical, religious and unique cultural values. Generally, seeks to assist in their preservation and avoid their elimination. Discourages financing of projects that will damage cultural property.	• Based on the perception of the community, physical verification and related consultation, it can be inferred that as such there are no such cultural properties like sites having archaeological (prehistoric), paleontological, historical, religious and unique natural values will not impact in the watershed area. Overall, cultural aspects can be classified into community-oriented, caste oriented and individual oriented. No specific risks to any of the above cultural aspects were observed at present or as potential due to IWMP activity.	• At the screening stage only there is need of identifying cultural properties like sites having archaeological (prehistoric), paleontological, historical, religious and unique natural values along with ecological sensitive areas, natural habitats, migratory routes and cultural property so that proper impact mitigation is devised before project initiation. • Afforestation should be done in the government, village common /private land, forest land and waste lands depending on local vegetation, terrain, soil type, land tenure and local requirements. This will reduce risk of soil erosion.

ANNEX-3(C): CORE PRINCIPLE #3: PUBLIC AND WORKERS SAFETY

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
1	Adequate measures for child and forced labour	• The Child Labour (Prohibition and Regulation) Act, 1986, amended in 2016 ("CLPR Act")[26] prohibits employment of a Child below the age of 14 in any employment and also prohibits the employment of adolescents in the age group of 14 to 18 years in hazardous occupations and processes. • The Article 23 of The Constitution of India, Prohibition is imposed on the practice of Traffic in Human Being and of Forced Labor. It also provides that contravention of said prohibition is an offense under law. • While there is existing legislative framework in India applicable to all state, census 2011 found about 61.7%[27] of children in the age group of 5-14 years employed in agriculture in rural areas[28]. A large number of them working in land owned by their parents or other family members.	• While the forced labour participation is not anticipated in the program, there is a possibility of finding child labour working in their own family farm plots for watershed works as part of labour contribution by the family. This is largely due to socio-economic problems such as poverty, economic backwardness, illiteracy etc.	• There is need to educate farmers on the rights of children and issues and provisions related to child labor as per CLPR Act 2016. Also, field monitoring formats being used by Watershed Assistant/ Agriculture Assistant should capture the child labor issue. Further training to be provided to Watershed Assistant/ Agriculture Assistant on capturing the same.
2	Promotion to integrated pest management (IMP)	• Imbalanced use of chemical fertilizers has resulted in soil degradation. Similarly, indiscriminate use of chemical pesticides builds up resistance among insect pests and	• Non-availability of the required inputs and services at local level was one of the major factors for poor adoption of these technologies and this could put other agricultural interventions at risk.	• The awareness trainings on IPM, propagation of organic farming, multilayer farming, water conservation techniques, discouraging water intensive

[26] https://labour.gov.in/childlabour/child-labour-acts-and-rules
[27] https://www.livemint.com/politics/news/where-is-child-labour-most-common-in-india-1549906952167.html
[28] https://pib.gov.in/PressReleasePage.aspx?PRID=1539009

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		diseases. The technologies like, IPM, water management, are being disseminated by the extension agencies like state agricultural department and state agricultural universities to avoid further problems of crop production.	• Lack of knowledge regarding bio-pesticides and bio-fertilizers is another concern.	crop are regularly done by DSC&WD and Agriculture and Horticulture Department.
3	Production, management, storage, transportation and disposal of hazardous materials	• The Environment (Protection) Act No.29 of 1986, the central government is empowered to take measures necessary to protect and improve the quality of the environment by setting standards for emissions and discharges; regulating the location of industries; management of hazardous wastes, and protection of public health and welfare. • This encompasses all legislations providing for the protection of environment in the country. • It includes the power to direct the closure, prohibition or regulation of any industry, operation or process by the government	• There should be official reports to the national level and follow-up enquiries in the event of fires, spills, poisonings, and other hazardous events. • The awareness trainings on IPM, propagation of organic farming, multilayer farming, water conservation techniques, discouraging water intensive crop need to be done.	There is very little risk associated with hazardous material in construction and operation phase. For agriculture related activity: • Pesticides should be transported in well-sealed and labelled containers, boxes or bags. • Preservation of air and water quality • Control of pesticides & insecticide runoff • Control dust pollution due to quarrying, which might harm the vegetation
4	Safety for labors and public at construction sites	• The Environment (Protection) Act No.29 of 1986, the central government is empowered to take measures necessary for protection of public health and welfare. • All legal enactments related to protection of labors and labor welfare	During the planning and construction phase there will be activities related to trenching, civil construction, storage of raw and waste materials. Improper management of the above activities may lead to safety and health risks among the public and labors.	There is a need to devise mitigation measures which will minimize risks such as: • Proper refilling of trenches and sampling sites with soil • Covering of storage areas with tarpaulin • Proper barriers and signage in excavated areas to prevent public from accessing the areas

ANNEX-3(D): CORE PRINCIPLE #4: LAND ACQUISITION AND RESETTLEMENT

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
1	Avoid and minimize land acquisition and involuntary resettlement and related adverse impacts	• The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARA) Act, 2013 and further amendments in 2015 provides for a detailed process for any land acquisition, compensation, and dealing with involuntary resettlements and is in line with World Bank principles. • There is a clear formal mechanism detailed out under the RFCTLARA Act on processes to be followed including process o consultations and taking consent.	• The analysis of other watershed projects in India and in Odisha suggests that in watershed projects there is no land acquisition involved and hence the risk relating to acquiring land and resettlement is minimal or non-existent. The civil works proposed are going to be small in nature such as check dams, anicuts, tanks, ponds, and trenches. • The Program does not intend to do any land acquisition or resettlement. While acquisition of private lands and physical and economic displacement is not anticipated in the project, the watershed investments and civil works will involve small parcels of common, government and individually donated/ leased lands. • Also, given the physical size of the watershed structures being very small, and among them relatively bigger ones are planned on Panchayat land or government land, no land acquisition and involuntary resettlement is anticipated, and hence, no risk related to this under the program.	• Not applicable. • The project will not finance any land acquisition or support activities that require doing so and if physical works would be required, that would be only on Government land and no private land would be acquired.

ANNEX-3(E): CORE PRINCIPLE #5: RIGHTS AND INTERESTS OF INDIGENOUS PEOPLE

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
1	Mechanism for meaningful consultation with local communities especially with Tribal population	• The WDC-PMKSY guidelines do promote very detailed consultation process with community groups in order to prepare the watershed plan. • In the present system, watershed committees are encouraged to ensure that the interest, perceptions and priorities of women, dalits, tribals and landless population are adequately addressed in the DPR. To ensure inclusive development and screening of the vulnerable groups, a participatory wellbeing ranking is followed during DPR preparation stage. • At the state level, tribal development is administered by The ST & SC Development, Minorities and Backward Class Welfare Department of GoO, supported by different other state level institutions / organizations. The Tribes Advisory Council has been constituted which advises Government in matters related to tribal development and welfare. The tribal families living outside the geographical area of Intensive Tribal Development Agency (ITDA), Micro Project, MADA and Cluster are covered under the	• Convergence of different schemes targeting tribal communities is endeavoured to improve beneficiary coverage, bridge the gap and drive the project towards achieving a higher order outcome, bringing all such departments to a common platform remains a challenge. Also, there is limited consultation on needs of the tribal community on this. • Review of earlier program suggests no special measures have been planned to focus on specific needs of tribal groups, and other vulnerable groups including scheduled caste population, and hence, there is risk of exclusion and/ or benefit sharing being not equitable to SC and ST population.	• While it is proposed that the existing system shall continue, there is need to provide additional attention to specific needs of the tribal groups, and other vulnerable population including scheduled caste population. • There is a need to converge with the Department of Tribal Affairs and ITDAs and design Tribal Development Plan in consultation with them at the watershed level. Also, at the watershed level, forest-based livelihood activities need to be included in the DPR wherever applicable, so as to propose and channelize appropriate funds for promoting and undertaking these activities. • Special attention to be given to tribal areas especially the Scheduled V areas with their local needs during watershed plan preparation and implementation. These community groups require little more handholding support and awareness building. NGOs contracted in these areas should focus more on building overall capacity of the community for taking benefits of the program in efficient and effective manner.

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		Dispersed Tribal Development Program (DTDP). • The WDC-PMKSY guideline provides a detailed consultation process during initial phase when the DPR is being prepared. • The project districts also spread over the ITDA areas and potentially include ITDA areas in Sambalpur (Kuchinda), Koraput (Jeypore & Koraput), Deogarh (Tikibani), Nowarangpur and Sundargarh (Panposh) districts. •		
2	Does program discriminate among poor, disabled, women and children, elderly, ethnic minorities. And what special measures taken to ensure equitable access to program benefits.	• One of the guiding principles of the WDC-PMKSY program is to build equity and promote gender sensitivity. It suggests that PIA, must facilitate the equity processes such as (a) enhanced livelihood opportunities for the poor through investment in their assets and improvements in productivity and income, (b) improving access of the poor, especially women to the benefits, (c) enhancing role of women in decision making processes and their representation in the institutional arrangements, and (d) ensuring access to usufruct rights from the common property resources for the resource poor.	• The program capitalizes on the existing base of women SHGs that were established under SRLM and other programs including watershed program. SHGs are undertaking credit and thrift activities, and inter-loaning and have also availed of revolving fund benefits. Promoting women SHGs is an important means to their participation, empowerment, and building stake in decision making. • The SHGs are promoted for credit and thrift activities and are also linked with NRLM for skill building and micro-enterprise activities.	• The program monitoring should capture the information of benefits shared with women and children, elderly, disabled, poor and vulnerable, and ethnic minorities.

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		• The WDC-PMKSY guidelines provide budgetary allocation of 9% funds to livelihood activities for asset less (mainly landless) persons, and another 10% of the watershed funds for production system and microenterprises of which a portion is utilized by women SHGs in the watershed area.		
3	Gender concerns	• One of the guiding principles of the WDC-PMKSY program is to build equity and promote gender sensitivity in the program through promoting women SHGs in the project area for income generation activities.	• Other than involving women in the program institutions to meet the necessary reservation quota, there is no focused approach towards addressing gender concern or mainstreaming gender activities.	• Gender sensitization of the project staffs • Enhancing role of women in decision-making processes and their representation in the institutional arrangements especially in the Watershed Committee and their capacity building. • Promoting women enterprises through creating enabling environment for enterprise development including linking them to value chain development

ANNEX-4: DESCRIPTION OF E&S MANAGEMENT SYSTEM AND CAPACITY ASSESSMENT

158. This section provides the analysis of applicable E&S systems and risks for the proposed REWARD program based on secondary review, discussion with the state and field visit along with various consultations with stakeholders.

Table : E&S Risks and Gaps of the proposed program

Sl. No	Result Area	Key Focus Areas	Key Risk and gaps	Potential Measures to align with ESSA Core Principles
1	**Result Area 1**: Strengthened Institutions and Supportive Policy for Watershed Development	**(i)** Enhancing capacity for watershed management including developing JR policy, recruitment, training and capacity building	Various studies and reviews of WDC-PMKSY program have identified need for adequate skilled human resources at different level to support efficient implementation of watershed program. In absence of adequate number of skilled human resources, some of the intervention area suffer and become more mechanical in implementation. Lack of adequate institutional support for equity, inclusion and stakeholder consultations are some of the example of this.	The proposed activity is well aligned with ESSA core principles to build institutional capacities at all level and it may also add value to ensuring support towards equity and inclusion under the program implement.
		(ii) Leveraging agriculture extension systems including using science-based data and decision support systems (DSS) can enhance the quality of agriculture extension by increasing the precision of advisories	No specific risk associated. In fact, this will benefit in positive manner.	Aligned with ESSA core principle #1, #2, and #3
		(iii) Enhancing systems and capacity of community institutions and local government bodies for watershed management including capacity of watershed committees and GPs for increased participation and O&M	No specific risk associated. In fact, this will benefit in positive manner.	Aligned with all ESSA core principle

Sl. No	Result Area	Key Focus Areas	Key Risk and gaps	Potential Measures to align with ESSA Core Principles
		(iv) Center of Excellence on science-based watershed management	This will benefit from the creation of a specialized institution that focuses on dissemination of knowledge from Karnataka to all states.	Aligned with core principle #1
		(v) Strengthening monitoring and evaluation systems	No specific risk associated. In fact, this will benefit in positive manner.	Aligned with core principle #1
		(vi) Operational guidelines on science-based planning of watersheds	It should not compromise the community participation for ownership of the planning process and the DPR.	Mechanism of meaningful community consultation on draft DPR prepared using science-based data needs to be detailed out along with adequate institutional support to ensure community ownership of the process and the DPR.
		(vii) Creation of a Multi Stakeholder Platform (MSP) for policy advocacy for management of rainfed areas and watersheds	No specific risk associated. In fact, this will benefit in positive manner.	Aligned with core principle #1, and #3
2	**Result Area 2**: Scientific Watershed Development and Enhanced Livelihoods	**(i)** Development and dissemination of scientific information for watershed planning	No specific risk associated. However, this can also incorporate land parcel-wise information on physical and cultural resources, so that it can easily be screened out while preparation of DPR.	Screening mechanism for ensuring no adverse impact on physical and cultural resources to be setup and in compliance with ESSA core principle #2.
		(ii) Adoption of appropriate O&M policy for monitoring and supporting the sustainability of watersheds	This will help in sustaining the watershed structures for longer term benefit.	Aligned with core principle #1

Sl. No	Result Area	Key Focus Areas	Key Risk and gaps	Potential Measures to align with ESSA Core Principles
		(iii) Planning and implementation of watershed development interventions in select sub-watersheds in a saturation mode	No specific risk associated. In fact, this will benefit in positive manner by demonstrating watershed development using science-based data and planning.	The proposed activity is well aligned with ESSA core principles in demonstrating watershed planning and implementation in a scientific manner.
		(iv) Provision of weather-based agro-advisories for farmers	No specific risk associated.	Aligned with core principle #3
		(v) Implementation of value-chain development interventions for longer term COVID-19 recovery	Inclusion of women, SC, ST and other marginalized population to be ensured for leading to positive impact on them.	Aligned with core principle #1
		(vi) Livelihood protection and enhancement support for poor and land-less households for medium term COVID-19 recovery	Overall, it will have positive impact on poor and landless household living in watershed.	Aligned with core principle #1 and #5

ANNEX-5(A): CATEGORY WISE LIST OF STAKEHOLDERS

Category	Stakeholder groups
Primary Stakeholders	• Farmers: large, medium, small, marginal • Cattle grazers and livestock owners • Asset less/ land less population • Women and women SHGs • Farmer's interest groups (FIGs) • SC and ST community residing in the project area • Traditional/ customary Tribal institutions (if any) • Panchayati Raj institutions and their members • Gram Sabha members • Joint Forest Management Committee • Other user groups such as local dairy cooperatives etc • Frontline workers of Agriculture, Horticulture and Animal husbandry, and Forest departments • NGOs and NGO workers
Secondary Stakeholders	• Taluk level officials of Agriculture, Horticulture and Animal husbandry, and Forest departments • PIA members • District level officials of Agriculture, Horticulture and Animal husbandry, and Forest departments • Officials of other Line Departments/Agencies • NGOs
Tertiary Stakeholders	• SLNA • Watershed Development Department • Directorate of Agriculture • Directorate of Horticulture • Directorate of Soil Conservation • SC & ST Development Department • Directorate of Animal Husbandry & Veterinary Services • Directorate of Fisheries • Revenue Department • Women & Child Development Department • Department of Forest • Technical Partners and Support Agencies

ANNEX-5(B): LIST OF PARTICIPANTS – ESSA STAKEHOLDER CONSULTATION

A. List of Participants in ESSA Stakeholder consultation on 12th August 2020

Sl No	Agency/ Organisation	Name / Designation	Contact Detais
1	ICAR-NBSS&LUP, Kolkata	Dr A K Sahu, Principal Scientist	head.nbsscal@gmail.com
2	OUAT, Bhubaneswar	Dr P K Agarwal, Vice Chancellor & Team	vc@ouat.nic.in
3	ORSAC, Bhubaneswar	Mr P K Mallick, Chief Executive Officer & Team	orsac.od@nic.in
4	ICAR-IIWM	Dr Pravakar Nanda, Principal Scientist & Team	director.iiwm@icar.gov.in
5	CSWCRTI, Koraput	Dr M Madhu, Head & Team	madhupmd@gmail.com
6	Director, Agril & Food Production	Representative	diragri.or@nic.in
7	Director, Horticulture	Rohit Kumar Lenka, Director & Team	supportdho.od@nic.in
8	CITRAN	Dr Ashok Singha, CEO	ctran@ctranconsulting.com
9	DSC &WD	H K Panda, Director	iwmporissa@gmail.com
10	DSC &WD	S K Khatua, Joint Director	drskkhatua@gmail.com
11	DSC &WD	B B Panda, Deputy Director	Brajapanda1964@gmail.com
12	DSC &WD	Niranjan Sahu	owdmniranjan@gmail.com
13	DSC &WD	S K Bohidar	Sanjeebbohidar68@gmail.com
14	DSC &WD	S N Singh	sns1966@gmail.com
15	DSC &WD	S N Swain	Sachi.swain@yahoo.com
16	DSC &WD	J R Samantray	sjatiraj@gmail.com
17	DSC &WD	Chandan Kumar Sahu PD, Watershed, Nayagarh	pdws.nayagarh@gmail.com
18	DSC &WD	Punyasloka Patnaik PD, Watershed, Sambalpur	pdws.sambalpur@gmail.com
19	DSC &WD	Suvendu Kumar Das PD, Watershed, Mayurbhanj	pdws.mayurbhanj@gmail.com
20	DSC &WD	Arun Kumar Das PD, Watershed, Keonjhar	pdws.keonjhar@gmail.com
21	DSC &WD	Sudhakar Satapathy PD, Watershed, Deogarh	pdws.deogarh@gmail.com
22	DSC &WD	Bhabani Shankar Kalo, PD, Watershed, Koraput	pdws.koraput@gmail.com
23	DSC &WD	Sailendra Kumar Nayak PD, Waterrshed, Kandhamal	pdws.kandhamal@gmail.com

Sl No	Agency/ Organisation	Name / Designation	Contact Detais
24	DSC &WD	P. K. Nayak, PD, Watershed, Nowarangpur	pdws.nowrangpur@gmail.com
25	DSC &WD	P.K.Padhiari PD, Watershed, Dhenkanal	pdws.dhenkanal@gmail.com
26	DSC &WD	Pitabas Sahu PD, Watershed, Sundargarh	pdws.sundargarh@gmail.com
27	DSC &WD	Dr Kumaresh Behra	
28	DSC &WD	Bama Sankar Rath	
29	DSC &WD	P K Tripathy	
30	DSC &WD	Dr B C Sahoo	
31	DSC &WD	Hemanta Kumar Jena	
32	DSC &WD	Ch. Jyotiprava Dash	
33	DSC &WD	D C Sahoo	
34	DSC &WD	Sampad Swarup Sahu	
35	DSC &WD	Khitis Kumar Sarangi	
36	DSC &WD	Dr Kumaresh Behera	
37	DSC &WD	Jyoti Dash	
38	DSC &WD	Sarbani Das	
39	DSC &WD	Bidhos Pal	
40	DSC &WD	Debraj Singh	

B. List of Participants in ESSA Stakeholder consultation on 5th February 2021

Sl. No	**Name**	**District**	**Name of CBO / Institution**	**Designation**
1	Rajani Kisan	Sambalpur	Tikilipada G.P	Sarpanch
2	Gajamati Kisan	Sambalpur	Ramadevi SHG	Secretary
3	Karunakar Naik	Sambalpur	Kukurburanalla-VIII MWS	President
4	Kishor Naik	Sambalpur	Kukurburanalla-II MWS	President
5	Chandra Kisan	Sambalpur	Kukurburanalla-II MWS	Secretary
6	Lingaraj Pradhan	Sambalpur	Kesapali MWS	Secretary
7	Ramesh Biswal	Sambalpur	Kesapali MWS	President
8	Chitaranjan Badhai	Sambalpur	Kuturanalla MWS	Secretary
9	Sanjib Ku Singh	Nayagarh	WCDC	CBT Member
10	Yudhistira Sahoo	Nayagarh	Panchasikha WC	Secretary
11	Pradipta Ku Sethy	Nayagarh	Maa Kajalai WC	Secretary

Sl. No	Name	District	Name of CBO / Institution	Designation
12	Kanaka Dei	Nayagarh	Maa Mangala SHG	Member
13	Prabhati Das	Nayagarh	Brahmani Devi SHG	Member
14	Susanta Ku Swain	Nayagarh	Godijharanala WC	Secretary
15	Chinmaya Ku Sahoo	Nayagarh	Maa Sulia Devi WC	Secretary
16	Gopabandhu Sahoo	Nayagarh	Nila Kantheswar Dev WC	Secretary
17	Brajabandhu Das	Nayagarh	User Group	Progressive Farmer
18	Dillip Ku Nanda	Nayagarh	Sahaya NGO	Secretary
19	Pratima Mishra	Nayagarh	Sakuntala SHG	Secretary
20	Lokanath Sahoo	Nayagarh	Panchayati Raj Institution	Zilla Parisad Member
21	Dhaniram Mandi	Koraput	Dabuguda WC	Secretary
22	Jaya Nayak	Koraput	Petaladi WC	Secretary
23	Dhania Harijan	Koraput	Mankadabeda WC	Secretary
24	Nira Khara	Koraput	Mannisinguda WC	Secretary
25	Dayanidhi Badanayak	Koraput	Kenduguda WC	Secretary
26	Ramakantra Patra	Koraput	Ramgiri WC	Secretary
27	Siba Pattnaik	Koraput	Ramgiri WC	Community Link Worker
28	Rashmita Behura	Koraput	Pradan NGO	Executive
29	Srikanta Patnia	Koraput	Pitei WC	Secretary
30	Bimala Patnia	Koraput	Pitei WC	SHG member
31	Balaram Khara	Koraput	Chandalmundar WC	Secretary
32	Bhagaban Sukia	Koraput	Kalchur User Group	Member
33	Narendra Gouda	Koraput	Nuagaon WC	Secretary
34	Biswanath Amantya	Koraput	Birahandi WC	Secretary
35	Ballava Nayak	Koraput	Panchayati Raj Institution	Zilla Parisad memebr
36	Duryodhan Kandhpan	Koraput	Panchayati Raj Institution	Nayab Sarapanch
37	Anuman Balabanta Ray	Dhenkanal	WCDC	CBT Member
38	Premanada Khuntia	Dhenkanal	User Group	Progressive Farmer
39	Sudhakar Sahu	Dhenkanal	User Group	Progressive Farmer
40	Satyakhuma Khuntia	Dhenkanal	Maa Kalia SHG	Secretary
41	Sumitra sahu	Dhenkanal	Panchayati Raj Institution	Ward Member, Hindol
42	Sushanta Kumar Sahu	Dhenkanal	Panchayati Raj Institution	Sarapanch, Kankadahad
43	Chandamani Pradhan	Dhenkanal	User Group	Progressive Farmer

Sl. No	Name	District	Name of CBO / Institution	Designation
44	Dusmanta Kumar Singh	Dhenkanal	User Group	Progressive Farmer
45	Mandakini Singh	Dhenkanal	Maa Subhashree SHG	Secretary
46	Jhilli Singh	Dhenkanal	Maa Subhashree SHG	Member
47	Sudhakar Satapathy	Deogarh	PD-WS	PDWS, Deogarh
48	Ajit Kumar Bhoi	Deogarh	Panchayati Raj Institution	Sarpanch
49	Ranjan Kumar Nayak	Deogarh	NGO	NGO member
50	Haladhar Behera	Deogarh	User Group	Farmer
51	Sarita Behera	Deogarh	SHG	SHG member
52	Gouranga Kisan	Deogarh	User Group	Farmer
53	Dillip Kumar Pradhan	Deogarh	User Group	Farmer
54	Indira Nayak	Deogarh	SHG	SHG member
55	Khirod Nayak	Deogarh	User Group	Farmer
56	Sudhir Kumar Jena	Deogarh	User Group	Farmer
57	Nimchand Murmu	Deogarh	NABARD	NABARD Programme organiser
58	Narayan Bagh	Deogarh	WCDC	Watershed Secretary
59	Laxman Pradhan	Deogarh	User Group	Farmer
60	Santosh Kumar Sahu	Deogarh	Panchayati Raj Institution	Ex. Member of ZP, Deogarh
61	Gomati Sahu	Deogarh	SHG	SHG member
62	Basudev Pradhan	Deogarh	User Group	Farmer
63	Kabita Sahu	Deogarh	Panchayati Raj Institution	Ward member (PR member)

ANNEX-6: TYPICAL SIZE AND COST OF PHYSICAL STRUCTURES UNDER WATERSHED PROGRAM

Table (6.1): Range of Physical Structures Planned and Implemented for Soil and Water Conservation

Type of Structure	Type of Land	Broad Magnitude in Size	Cost Range (in INR)
Drainage line treatment			
Check dam	Mostly on Government / Panchayat Land/ CPRs	Usually less than 2 ft to 3 ft high	Per unit cost ranging between – 3 - 5 lakh
Boulder Checks or RFC	Mostly on Government / Panchayat Land/ CPRs	Along the nala/ drain based on requirement – usually small and linear structure	Average unit cost – 0.18 to 0.48 lakh/no.
Nala Bank stabilization			
Nala bunds			
Ponds- water body for cattle	Mostly on Government / Panchayat Land/ CPRs	Rejuvenating existing ponds	Average unit cost ranging between 3 - 4 lakh
Tanks/ Village ponds	Mostly on Government / Panchayat Land/ CPRs	Rejuvenating existing	
Soil conservation			
Contour trench cum bunds	Mostly on Private land	5m length, 1.5m width, height 0.45 to 0.6m and berm 1m for pit to pit and bund	Average unit cost - 0.18 to 0.24 lakh /Ha
Contour bunds, Graded bunds	Mostly on Private Land	1.29 Sqm Cross Sectional Area	
Contour trenches	Mostly on Private Land	0.27 Sqm Cross Sectional Area	
Farm pond	Mostly on Private Land	Size of the farm pond-maintained varies from 12LX 12W X 3D mtrs. to 21LX 21WX 3D mtrs.	Per unit cost ranging between – 0.5 - 2 lakh
Recharge pits and mini percolation tanks,	Mostly on Private Land	Very small size usually 2m x 1m-1.5m x1m	Per unit cost ranging between – 0.3 – 2.5 lakh
Shallow wells, Open well Recharge, Bore well recharge	Mostly on Private Land		

ANNEX-7: FORMAT FOR COLLECTING ENVIRONMENTAL BASELINE DATA

1. General Information				
Sl. No.	**Criteria / Information to Check for**			**Details**
1.1	**Date of Site Visit**		:	
1.2	**Site information**	**Village**	:	
		Micro Watershed	:	
		Watershed	:	
		Gram Panchayat	:	
		Taluk	:	
		District	:	
1.3	**Name of site visit person**		:	
1.4	**Name and designation of information provider**		:	
1.5	**Visiting in presence of (Full name &Designation)**		:	
1.6	**Type of utilization (mention agriculture/wasteland/fallow)**		:	
1.8	**Land pattern of the area (Plain / Valley / Hilly / Plateau etc)**		:	
1.9	**Land Ownership**		:	
1.10	**Land pattern/type and utilization to adjacent upper ridge area**			

Sl.No.	**Criteria / Information to Check for**	**Details**	**Category/Type**	**Issues or Management Measure in brief**
2. Resource				
2.1 Forest Land				
2.1.1	Nearest forest area (Reserve forests, Protected forest or Revenue Forest)			
2.1.2	Distance from project Watershed			
2.1.3	Is the Project located in ecologically sensitive zones? Mention distance of nearest ecologically sensitive area with details			
2.1.4	Is there any Wildlife sanctuary, Bio- reserve, National Park or			

Sl.No.	Criteria / Information to Check for	Details	Category/Type	Issues or Management Measure in brief
	notified Eco Sensitive Zone in the area of influence?			
2.1.4	Important/ Sensitive animal (fauna)			
2.1.5	Important/Sensitive plant (flora)			
2.1.6	Current use of forest for any livelihood activity			
2.2	**Grazing Land**			
2.2.1	Area (indicate any encroached area separately)			
2.2.2	Fallow Land			
2.2.3	Pasture Land			
2.2.4	Culturable Waste Land			
2.2.5	Season of green fodder scarcity			
2.2.6	Season of green and dry fodder scarcity			
2.2.6	Major animals grazed in land			
2.2.7	Nearest grazing area from the watershed (km)			
2.2 Biodiversity				
2.3.1	Major type of animals in area			
2.3.2	Major type of plants in area			
2.3.3	Is there any migratory birds?			
2.3.4	Season of the migratory birds found			
2.3.5	Primary habitat of migratory birds			
2.3.6	Important/Sensitive animal (fauna) in locality			
2.3.7	Important/Sensitive plant (flora) locality			
2.3.8	Any meditational plants found in area			
2.3.9	Is there any diseases found in domestic animals			
2.3.10	Is there available any veterinary doctor/hospital?			
2.3 Agriculture Need to check if ground data is align to LRI and DSS data, if not then have to mention it clearly in Remark column				

Sl.No.	Criteria / Information to Check for	Details	Category/Type	Issues or Management Measure in brief
2.4.1	Cropping pattern (mono-cropping/ mixed cropping/crop rotation)			
2.4.2	Main crops grown (Rabi, Kharif, and horticultural crops)			
2.4.3	Details on soil cards			
2.4.4	Pesticides/ fertilizer usage			
2.4.5	Source of irrigation			
2.4.6	Frequency of irrigation in different seasons			
2.4.7	Extent of irrigation (% of sown area which is irrigated)			
2.4.8	Methods of ploughing			
2.4 Soil quality				
2.5.1	Any Soil Quality issue including salinity range of soil			
2.5.2	Major animals found in soil (invertebrates)			
2.5.3	Any heavy metal or pesticide reported in soil.			
2.5 Ground Water				
2.6.1	Nearest tube wells with no and distance			
2.6.2	Total number of dried-up tube wells			
2.6.3	Depth of Ground water of active and in use tube-well (indicate feet or meters)			
2.6.4	Mention Ground water quality issue (like salinity, nitrate, Fluoride, Heavy metals etc.,)			
2.6 Surface Water				
2.6.1	Nearest of ponds – if not within the water shed then mention distance			
2.6.2	Details of Wetland with its location with its watershed number			
2.6.3	Details of any canals, streams with location in respect to watershed			

Sl.No.	Criteria / Information to Check for	Details	Category/Type	Issues or Management Measure in brief
2.6.4	If draining line treatment is done details need to be added about HFL vis a vis bund height and how inundation of agriculture field is been avoided			
2.6.5	Mention any surface water quality issue (pH, Biological Oxygen Demand, Chemical Oxygen Demand, Dissolved Oxygen, Heavy metals, pesticide, coliform etc.)			
2.6.6	Period of water availability in ponds			
2.6.7	Distance of Major river from the watershed			
2.7 Common Property Resources				
2.7.1	Is there any common property resource area located within the watershed			

ANNEX-8: SCREENING FORMAT FOR POTENTIAL ENVIRONMENTAL AND SOCIAL ISSUES

The Screening checklist is applicable to any intervention on watershed treatment. This form is to be used by PIA/District Team to rule out any adverse environment and social impacts due to program intervention under the guidance of the Project Management Unit (PMU) to screen for the potential environmental and social risks and impacts of a proposed subproject.

Site information	**Village**	:	
	Micro Watershed	:	
	Watershed	:	
	Gram Panchayat	:	
	Taluk	:	
	District	:	

Sl. No.	Key Question	Answer		Risk Category	Due diligence/ Actions
		Yes	No		
1	Is there any risk/impact/ disturbance to forests and/or protected areas because of watershed intervention activities? [Ref: Forest Conservation Act 1980 Forest (Conservation) Amendment Rules, 2016 Indian Forest Act 1927 The Karnataka Preservation of Trees Act 1976 The Karnataka Preservation of Trees Rules, 1977]			High	If yes, the intervention activities to be modified to avoid the risk? If not possible, such interventions should be avoided.
2	Is there any risk/impact/ disturbance to designated wetland because of watershed intervention activities? [Ref: Wetlands (Conservation and Management) Rules, 2017 Environment (Protection) Act, 1986]			High	If yes, the intervention activities to be modified to avoid the risk? If not possible, such interventions should be avoided.
3	Is the intervention work to be taken up 100 meters from any cultural, historic, religious site/buildings recognized/ designated by ASI? [Ref: Ancient Monuments and Archaeological Sites and Remains			High	If yes, any interventions should be avoided[29].

[29]Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010 there is ban on construction within 100 metres of a centrally protected monument and regulated construction within 100-200 metresconstruction. Any construction activity within 100-200 meters of the monument requires ASI permission.

Sl. No.	Key Question	Answer		Risk Category	Due diligence/ Actions
		Yes	No		
	(Amendment and Validation) Act, 2010]				
4	Is the intervention work to be taken up between 100 - 200 meters from any cultural, historic, religious site/buildings recognized/ designated by ASI? [Ref: Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010]			Substantial	If yes, due permission to be taken from ASI for any construction. Where there is no impact, chance finds procedures would be applicable and ASI norms would need to be followed.
5	Will planned physical infrastructure affect any natural, physical and cultural resources e.g. any cultural, religious sites including reserved and protected forests, wild life protection areas, revenue forests, groves etc.? [Ref: Forest Conservation Act 1980 Forest (Conservation) Amendment Rules, 2016 Indian Forest Act 1927 The Place of Worship (Special Provisions) Act, 1991]			Substantial	If yes, the intervention activities to be modified to avoid any risk? If not possible, such interventions should be avoided.
6	Does the intervention work involve requirement of additional land for upgradation/ expansion and/ or new construction through land acquisition or direct purchase and/or restrictions on land use? [Ref: The Right to Fair Compensation & Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013 and further Amendments]			High	If yes. It is not supported by the project and to be avoided. Alternate options to be explored.
7	Does the intervention work involve requirement of additional land for upgradation/ expansion through transfer from another government department like forest or even revenue forest?			High	If yes. It is not supported by the project and to be avoided. Alternate location to be identified.
8	Is there any chance of flooding of land beyond drainage line due to construction of check dams/ weirs?			High	If yes. It is not supported by the project. Alternate options to be explored.

Sl. No.	Key Question	Answer		Risk Category	Due diligence/ Actions
		Yes	No		
9	Does the intervention work involve requirement of additional land for upgradation/ expansion through transfer from another government department for lands such as pasture/grazing land, natural habitats or other common use land?			High	If yes. It is not supported by the project. Alternate options to be explored.
10	Will any intervention work have chances of increase in salinity by inundating low lying areas?			High	If yes, alternate option need to be explored.
11	Will any intervention work use or generate any hazardous chemicals or waste beyond permissible levels specified in Schedule II of Hazardous Waste Handling and Management Rules, 2016?			High	If yes. It is not supported by the project. Its fall in excluded activity list
12	Any activity that would use most toxic pesticides classified as 'Class I' (based on acute toxicity of the active ingredient) by the World Health Organisation			High	If yes. It is not supported by the project. Its fall in excluded activity list
13	Does the project activities as per DPR involve recruitment and use of contract workers for watershed activities?			Moderate	If yes, follow the provisions of Contract Labour Act to be followed.
14	Is the submergence affecting private lands?			Substantial	If yes. It is not supported by the project. Alternate location or design specifications to be changed. If not possible, such interventions should be avoided.

In-charge of PIA
Name……
Designation: ……
Phone No. ……
Signature ……..
Date: ……

ANNEX-9: MEASURES TO ADDRESS PUBLIC AND WORKER SAFETY AGAINST THE POTENTIAL RISKS ASSOCIATED

Type of Structure	Broad Magnitude in Size	Managing Public and Worker Safety
Drainage line treatment		
Check dam/ Nala Bund	Usually less than 2 ft to 3 ft high	1. Fencing of water impounding structures and other construction areas, especially those closer to habitations to avoid any accidental fall and personal injury to humans including children while trespassing or working. 2. All construction material to be transported in covered trucks and water sprinkling to be done to avoid dust to be air-borne during handling. 3. No child labour or forced labour to be involved. 4. No hazardous chemicals or pesticide will be used 5. Risks, if any from stagnant water and associated vector borne diseases need to be mitigated. 6. No construction to be taken up in forests or any other natural habitats including wildlife protection areas, common property resources or cultural heritage sites or socially significant areas. 7. For controlling silts banks need to be covered with grasses, shrubs and suitable plants of indigenous varieties. 8. Debris management to be done so that it is not left in the agriculture field and thereby impact soil quality.
Boulder Checks or RFC	Along the nala/ drain based on requirement – usually small and linear structure	
Nala Bank stabilization		
Gokatte (water body for cattle)	Construction/ Rejuvenating existing Gokattes	
Soil conservation		
Contour trench cum bunds	5m length, 1.0 m width, height 0.45 to 0.6m and berm 0.6m for pit to pit and bund	1. For protecting the structures and sustaining the structures for designed life trenches and bunds need to be covered with grasses, shrubs and suitable plants of indigenous varieties.
Contour bunds, Graded bunds	On Contour lines	

Type of Structure	Broad Magnitude in Size	Managing Public and Worker Safety
Contour trenches	0.27 Sqm Cross Sectional Area	2. Debris management to be done so that it is not left in the agriculture field and thereby impact soil quality. 3. No child labour or forced labour to be involved.
Farm pond	Size of the farm pond-maintained varies from 10x10x3Dmtrs/ 12LX 12W X 3D mtrs. to 21LX 21WX 3D mtrs.	1. Fencing of farm ponds especially those closer to habitations to avoid any accidental fall and personal injury to humans including children and animals. 2. Upper ridges need to be treated with grasses and plantation to restrict silt movements.
Recharge pits/ mini percolation tanks, Shallow wells, Open well Recharge, Bore well recharge	Very small size usually 2m x 1m-1.5m x1m / 10-15 m length	1. All such structures need to be fenced and adequately closed to avoid accidents to children, animals and address risk to safety concerns. 2. Signage with local language to be displayed which would make the local community aware of its location.