

**ENVIRONMENTAL AND SOCIAL SYSTEMS
ASSESSMENT (ESSA)**

**FOR
KARNATAKA**

FOR THE

**India: Rejuvenating Watersheds for Agricultural
Resilience through Innovative Development (REWARD)
(P172187)**

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LIST OF ACRONYMS

AIBP	Accelerated Irrigation Benefit Programme
APD	Additional Project Director
CCF	Chief Conservator of Forest
CEO	Chief Executive Officer
DAC	Department of Agriculture and Cooperation, Govt of India
DANIDA	Danish International Development Agency
DAY-NRLM	Deendayal Antyodaya Yojana-National Rural Livelihoods Mission
DDP	Desert Development Program
DFID	Department for International Development
DLRC	District Level Review Committee
DoA	Department of Agriculture
DoAF	Department of Agriculture and Farmers Empowerment
DoLR	Department of Land Resource, Government of India
DSC&WD	Directorate of Soil Conservation and Watershed Development
DPAP	Drought Prone Areas Programme
DPR	Detailed Project Report
DSS	Decision Support System
DWDO	District Watershed Development Officer
DWDT	District Watershed Development Team
E&S	Environmental and Social
EC	Executive Committee
FPO	Farmers' Producer Organisation
GIS	Geographic Information System
GoI	Government of India
GoK	Government of Karnataka
GP	Gram Panchayat
GRM	Grievance Redressal Management
GSDP	Gross State Domestic product
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
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
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
RSK	Ryoatha Samparka Kendras (Farmer Contact Centres)
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
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 about 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. Both 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 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 center 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 Karnataka: The REWARD program in Karnataka will be implemented in twenty-one rainfed districts of Karnataka using WDC-PMKSY scheme with IBRD contribution to the tune of USD 60 million over the five-year period. Under Sujala-III project, it covered a total of 2534 micro-watersheds (MWS) covering 14.06 lakh ha, of which 89 MWS was taken up in saturation mode covering 46.7 thousand ha and created LRI data base for another 2445 MWS covering 13.6 lakh ha

across 11 districts of Karnataka viz. Bidar, Gulbarga, Yadgir, Koppal, Gadag, Davangere/ Bellary, Chamrajnagar, Bijapur, Chikkamangalur, Raichur and Tumkur. The REWARD program proposes to contribute to GoK in saturating the watershed development interventions in remaining MWSs in these 11 districts, and also creates Land Resource Inventory (LRI) data set for another 8-9 districts. It will also support value chain development towards livelihood development and building agriculture resilience through formation and strengthening of Farmer Producer Organizations (FPOs). The REWARD program plans to further strengthen WDD with policy and institutional capacity to enhance efficiency and effectiveness of the watershed program in Karnataka. In addition, under the REWARD program, Karnataka has also been identified to have an additional role as a 'lighthouse' state that will enable knowledge exchange and provide capacity building support to other states because of its experience in implementing science-based watershed planning and monitoring.

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 primary field visit to watersheds in two districts i.e. Gadag and Kolar districts situated in different agro-climatic zones, and 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. Preliminary discussions and interviews were conducted with relevant experts and officials from Department of Land Resources (DoLR) at Government of India (GoI), and State level nodal agency (SLNA)/ Watershed Development Department (WDD) in Karnataka, and other stakeholders across the implementation chain at district, taluka, and Gram panchayat (GP), including non-governmental organizations (NGOs) involved, and community members and their institutions at village level. In addition, two rounds of multi-stakeholder consultations were carried out in preparation of draft ESSA report. Findings of the assessment have 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/WDD in Karnataka.

Environmental and Social Summary

The state has a dynamic and erratic weather that changes from place to place within its territory. Due to its varying geographic and physiographic conditions, Karnataka experiences climatic variations that range from arid to semi-arid in the plateau region, sub-humid to humid tropical in the Western Ghats and humid tropical monsoon in the coastal plains. Karnataka has total geographical area of about 12.9 million ha. of which 5.2 million ha area is already treated and about 1.8 million ha is under treatment under various watershed programs. About 5.2 million ha (52.31 lakh ha) rainfed watersheds yet to be treated on watershed approach.

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

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 also environmental sustainability. Establish high-level coordinating bodies in the state government on the lines of Multi Stakeholder Platforms, supported by 2030 WRG, for convergence of watershed issues will benefit environment with convergence of state specific goal on forest cover, agriculture and horticulture development in terms of developing rainfed districts. The 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.

E&S Effects: 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 are highly amenable to risk mitigation measures.

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 pattern 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. 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. 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

Assessment of Environmental Systems: Karnataka has experience in implementing science-based LRI-DSS driven 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 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. Hydrological data on permeability, infiltration rate, run-off, erosion, soil moisture, soil storage, ground water storage, recharge, etc. on similar scale is used alongside land resources information and water budget calculation. In LRI-

DSS system, it is responsibility of Hydrology partner to develop Models for estimating water fractions (ET, Soil Moisture, run-off, Groundwater) leading to Water Balance. Presently water budget and hydrological outputs are calculated with mathematical models with limited ground measurements which are normalized according to soil management units. In this process though there is a system in place to protect environmentally sensitive areas by design, but it is not clearly visible. LRI-based DPR preparation shall clearly display all environmentally sensitive areas like forests, wildlife habitats, low lying areas, common property resources, etc with a database, which is already captured but accumulated under one layer, to mainstream E&S parameters in the program design itself. The risk screening at present depends on knowledge the community and the field level functionary. though implementation chain is well established but at present there is no articulation of individual or agency responsible for implementing the E&S activities and monitoring the same. Also, lack of skill in local level field staff to demystify core technical details in built in the LRI-DSS with environment and social aspects. The system is in crop advisories, use of fertiliser, water use, etc generated through DSS and communicated regularly that need to be documented and used in monitoring of benefits. The hydrology data input data in hydrological models used for DPR preparation and issuing advisories to farmers are used extensively at different phase of the program. Hydrological data on ground water storage, silt movement, surface water flow is 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 remains 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 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 process of watershed selection for treatment is based on regional assessment of the environment especially soil health and water availability in the rainfed area. Geographically these areas also house higher proportion of poor, and hence, addressing equity and inclusion is quite important and rightly being prioritized in the watershed guideline. The WDC-PMKSY/ 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. The watershed institutions also have participation from SC, ST, women, and other marginalized groups as per the guidance by the state. 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.

Key Environmental and Social Gaps identified: The key environmental and social gaps identified are (a) the LRI based watershed planning being top-down planning approach compared to currently ‘bottoms up’ approach, poses gaps in detailed process guideline in giving adequate priority to community participation and risk of compromising the community consultative process for preparation of the DPR/ watershed plan; (b) The current system lacks in doing systematic screening for environmental and social risks and issues including for any adverse effects on biodiversity and cultural resource; (c) There is increased chance of interventions spreading into forest boundary and/or common property resources in absence of mechanism to check it; (d) Lack of inter-departmental co-ordination mechanism in dealing with forest, wetland and other environmentally sensitive areas as part of watershed plan; (e) Lack in addressing trans-boundary impact of existing structures, forests, upstream users and impact on downstream users; (f) Intensive agriculture with crop growing conditions, may lead to risks of overuse of chemical fertilizers, pesticides, etc, thus polluting groundwater; (g) In absence of proper guidance,

improper management of the civil activities may lead to worker safety issues; (h) Convergence of different schemes targeting tribal and vulnerable groups remains a challenge; (i) Methods and parameters of M&E system is not spelt out properly for Environmental and social risks and impacts e.g. monitoring gender specific data as well as data on equitable benefit sharing to SC, ST, landless and other socially disadvantaged groups; and (j) Lack of systematic reporting and tracking of grievances received at RSK, ADA, and JDA level as the current systems being a manual system.

Stakeholder Consultations and Disclosure

Stakeholder consultations were undertaken with both with primary and secondary at all levels. During initial period before COVID19 related lockdown, primary field visit was made to watersheds in two districts i.e., Gadag and Kolar districts situated in different agro-climatic zones along with consultations with key stakeholders along the program implementation chain at PIA, district and state level. Draft ESSA report was also shared with WDD 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 13th August 2020 and with primary stakeholders including civil society partners in four rounds covering all 21 districts in 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/WDD's website in Karnataka 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. Details SOP/ guideline to be prepared and adopted by WDD based on learning from Sujala-III for community participation, building community ownership, and accountability mechanism in line with the new watershed development guideline. This should also 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. Field functionaries such as PIA members, Watershed Assistant/ Agriculture Assistant shall be trained 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 WDD 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. M&E system should have special focus on monitoring of Environmental and Social safeguards. 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. Further, to capture key environmental and hydrological parameters it is important to capture data from model micro-watersheds and benchmark sites and report representative databases throughout project cycle. The present good practice of identifying benchmark sites and standard practices of data collection as initiated in Karnataka, shall be further replicated.
 6. 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 that is to be prepared by the Government.
 7. Special Strategy to be prepared by WDD focusing specific needs of the women, ST, SC and other marginalized groups as part of the program operational manual.
 8. WDD to develop mechanism for effective coordination and convergence with other department such as Forest Department, Revenue Department, Tribal Welfare Department, Karnataka State Rural Livelihood Promotion Society etc. for convergence of different schemes for larger benefits through bringing synergy.
 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. This can be instituted through capable NGOs providing handholding support for longer duration compared to other areas.
 10. Enhancing women participation including in local institutions by promoting more women to take leadership role in watershed development and income generation activities including FPOs along with capacity development.
 11. Existing Grievance Redress Management (GRM) system to be further strengthened by either adding additional module to the farmer's help desk or extending the MIS system for registering, screening and redressing, monitoring grievances, and periodic reporting on the same.
 12. 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.
 13. Adopting a system of valuation of ecosystem services like water budgeting and their contribution to watershed development scoping will be explored and also landscape approach for integrating planned convergence of other programs (including with partner Departments of Agriculture, Horticulture, Forestry, and MGNERGA) to conserve soil moisture to improve outcomes on water yield, ground water and sediments in the long run for environmental sustainability.

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
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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/ WDD	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/ WDD	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 WDD 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

1. A World Bank ESSA Team for the proposed Rejuvenating Watersheds has prepared this Environmental and Social Systems Assessment (ESSA) for Agricultural Resilience through Innovative Development (REWARD) program in India. The participating states includes 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.

2. 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.

3. 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

- (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.

4. An additional purpose of this ESSA is to account for the decisions made 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, becoming legally binding agreements under the conditions of the new loan.

1.1.2 ESSA Methodology

5. The ESSA covered a comprehensive review of all relevant E&S plans/frameworks, implementation documents and other technical studies/reports related to the National as well as State-supported watershed programs, including the World Bank supported watershed projects in Karnataka. This was further complemented with consultations with WDD and partner agencies and primary data collection/assessment through field visits in two watersheds in two districts in different agro-climatic zones, consultations/ interviews/ discussions with key stakeholders to capture opinions, anecdotal evidence, functional knowledge, and concerns. It involved (a) 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 (b) interviews and consultations were conducted with relevant experts and officials from Department of Land Resources (DoLR) at Government of India (GoI), and State level nodal agency (SLNA)/ Watershed Development Department (WDD) and officials and stakeholders across the implementation chain at district, taluka, Gram panchayat (GP), and village level. It also involved face-to-face interactions with community groups including small and marginal farmers, women and women SHGs, landless households, user groups/ common interest groups, etc., and community institutions including Watershed Committees, PRIs, NGOs and government line departments and partner agencies.

6. Findings of the assessment have been used in the formulation of an overall Program Action Plan (PAP) with key measures to improve environmental and social management outcomes of the Program. The findings, conclusions, and opinions expressed in the ESSA document are those of the World Bank. Recommendations contained in the analysis have been discussed and agreed with SLNA in Karnataka.

7. The draft ESSA was shared with WDD for their comments and feedback and was further consulted with various stakeholders through multi-stakeholder consultation workshop. The ESSA was further updated based on feedback received from stakeholders. The updated ESSA will be made publicly available in accordance with the Bank's policy on Access to Information. The final ESSA will be disclosed prior to World Bank Board consideration of the Program.

1.2 Environment and Social Overview

1.2.1 Environment Overview

8. The REWARD programs propose to cover 11 rainfed districts of Karnataka namely Bidar, Gulbarga, Yadgir, Koppal, Gadag, Davangere/ Bellary, Chamrajnagar, Bijapur, Chikkamangalur, Raichur and Tumkur, and also create LRI data set for another 8-9 districts. This section covers an overall environmental overview of Karnataka including its rainfed areas.

Location & Physical Environment

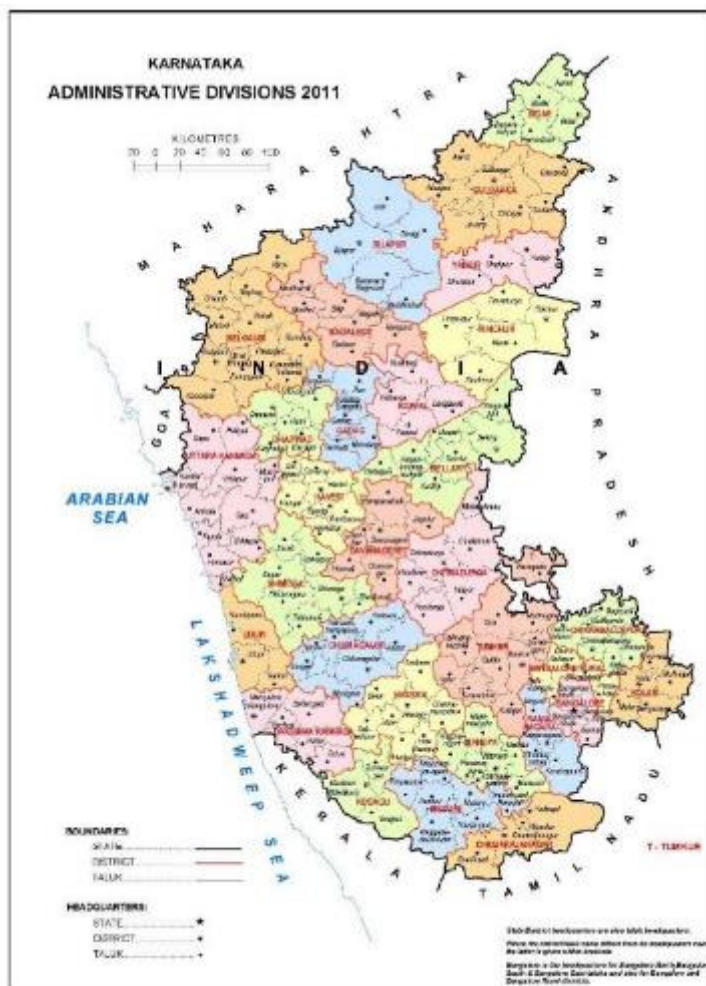
9. Karnataka is bounded by the Arabian Sea on the west, Goa on the northwest, Maharashtra on the north, Telangana on the northeast, Andhra Pradesh on the east, Tamil Nadu on the southeast and Kerala on the southwest. It has 30 districts spread over four physiographic regions, namely, Northern Karnataka Plateau, Central Karnataka Plateau, Southern Karnataka Plateau and Karnataka Coastal region. Karnataka has four physiographic regions namely, Northern Karnataka Plateau, Central Karnataka Plateau, Southern Karnataka Plateau and Karnataka Coastal region. The state has all types of variation in topography consisting of high mountains, plateaus, residual hills and coastal plains. It consists mainly of plateau, which has high elevation of 600 to 900 meters above mean sea level. The entire landscape is undulating, broken up by mountains and deep ravines.

Climate and Rainfall

10. Karnataka witnesses three types of climate – Coastal Karnataka, North Interior Karnataka and South Interior Karnataka. The state has a dynamic and erratic weather that changes from place to place within its territory. Due to its varying geographic and physiographic conditions, Karnataka experiences climatic variations that range from arid to semi-arid in the plateau region, sub-humid to humid tropical in the Western Ghats and humid tropical monsoon in the coastal plains. The average annual rainfall of the state is 1248mm. The occurrence and spatial distribution of rainfall is variable and not dependable. As much as 70 percent of the total geographical area of the state falls under arid climatic zone where the rainfall is scanty and the mean temperature high. In order to assess drought vulnerability at Taluk level in Karnataka, a climate-soil based (CSI) index has been developed. It shows that about 40% of the Taluks are highly to very highly vulnerable to droughts, while 34% of the Taluks are moderately vulnerable and 26% of the Taluks are slightly vulnerable in the state.

Soil & Crop

11. Six major soil types are found in Karnataka in addition to 75 associations of sub-groups. The major soil types include red soils covering 37.2% of the total geographical area followed by black cotton soil with 27.77%. Other major types are alluvial soils (15.74%) followed by lateritic soil (11.6



%). In Karnataka around 19.52% of soils are found to be acidic, and 11.21% of soils are alkaline in nature. Around 41.17%, 26.31% and 28.45% soils are found to be deficient in N, P and S respectively. Whereas only 7.96% of soils are deficient in potassium. Zinc is found to be deficient in around 52.24% of soils whereas Iron and Boron are found to be deficient in 24.76% and 35.3% of soils respectively.

12. Climate Crop cover-based index (CCI): The crop vigour and extent of crop cover in an area is directly related to the weather parameters and their variability. To measure this relationship the Normalized Difference Vegetation index (NDVI) during the crop season was estimated from 2000-2015 through remote sensing. The lower values in Malnad region and Coastal region taluks indicate low vulnerability and higher values in South Interior Karnataka & North Interior Karnataka taluks indicate high vulnerability.

Water Availability and Status

13. It has been found that groundwater has been over-exploited in the state and due to such over exploitation, dug wells have dried, shallow bore wells have failed, yield in deep bore wells has declined and area irrigated by ground water extraction structures has decreased. Fluctuation of ground water 0.03 to 29.3 mbgl in Bangalore Urban, 0.07 – 21.23 mbgl in Belgaum, 1.43- 25.71 mbgl in Gadag, 0.89- 16.30 mbgl in Haveri and 0.70-19.21 mbgl in Kolar shows heavy water drawl leading to depletion of groundwater resources.

14. Ground Water Quality: The pH levels of the State show wide variations from 6.8 to 10.3. In the State, 88.1% of the samples collected were found well within the permissible limit for drinking water standard. 17 districts showed pH levels of above 8.5 rendering them unsuitable for drinking. Conductivity (EC) shows wide variations 43–11380 $\mu\text{S}/\text{cm}$ at 25° C. The EC values of coastal districts such as Dakshina Kannada, Uttara Kannada and Udupi were generally below 750 $\mu\text{S}/\text{cm}$ at 25°C. In general, 90% of the samples in the State were in the 'desirable limits for drinking while about 5% of the samples were more than the 'permissible limit' which is not suitable for drinking. Chloride followed a similar trend as that of EC and the values were in the range of 7 to 2659 mg/l, the highest value in Mallanagekamhalli and Haveri district, which shows a value of 2659 mg/l. In Karnataka, 98% samples are within 'permissible' limits for drinking and about 2 % samples are unsuitable for drinking purpose. Fluoride (F⁻) occurrence in ground water in the State exhibited wide variations from 0.002 mg/l to 9.6mg/l. F- concentration in Bandri, Bellary district is the highest value of 9.6 mg/l. It has been found that in Bagalkot, Bijapur, Bellary, Bangalore (Urban, Rural) Raichur, Koppala, Gadag, Yadgiri, Chitradurga, Chickballapur, C.R.Nagar, Davanagere, Gulbarga, Haveri, Kolar, Mandya and Tumkur districts fluoride concentration was beyond 1.5 mg/l rendering them unsuitable for drinking.

Flora & Fauna

15. Karnataka exhibit 4758 species from 1408 genera and 178 families and accounts for about 27 per cent of the country's floral diversity. The districts along the Western Ghats are florally rich. The dry tracts harbor unique elements of the flora. Dry zone districts, rain shadow districts (Annual average rainfall in these forests is less than 800 mm) of the state have low rocky hills supporting xerophytic scrub forests. These are scattered between vast stretches of agricultural land and occupy about 7,655 km² of dry uplands. These forests have abundance of Acacia species such as A. catechu (katha), A. nilotica (karijali), A. chundra (kempujali), A. leucophloea (bilijali), A. latronum (hottejali), etc. Other species like Albizzia amara (chujjulu/tugli), A. lebbek (bage), A. odoratissima (goddahunse/bilwara), Santalum album (shrigandha), Hardwickia binata (kamara).

1.2.2 Social Overview

Demography

16. Karnataka is the sixth largest state in India with 191.8 thousand sq.km of area and ranks ninth in terms of population with 61.13 million in 2011¹, and the population density of the state is 319 per

¹ Census 2011

sq.km. compared to the national average of 382 persons per sq.km., and the sex ratio in Karnataka is 973 females to 1000 males compared to national average of 940 females per 1000 males. The literacy rate of the state is 75.4% with male literacy being 82.5% and female literacy being 68.1% that are marginally higher than the national average.

17. Kannada is the native language of the state spoken by about 65% of its population and is the official language of the state. Tulu, Kodava, Konkani and Havyaka Kannada are other minor native languages of the state. Urdu is spoken widely among Muslim population. Less widely spoken languages include Beary bashe and certain dialects such as Sankethi².

18. About 61.3% of the population lives in rural Karnataka with agriculture being the main occupation. About 65% of the total geographical area of the state is utilized for agriculture.

19. Scheduled castes (SC) account for 17.1% of the population with Kolar, Gulbarga and Chamrajnagar districts having more than 25% of population as SC population, whereas Dakshin Kannada, Dharwad, Udupi and Uttara Kannada districts have less than 10% of SC population. Scheduled Tribe (ST) account for 6.95% of total population in Karnataka (9.15% in rural Karnataka and 3.47% in urban areas) with highest of 19% in Raichur district and lowest of 1.2% in Madya district. Ten districts - Bellary, Bidar, Chamrajnagar, Chikballapura, Chitradurga, Davangere, Kodagu, Koppal, Mysore, Raichur and Yadgir have more than 10% of their population as tribal population. Major tribes of Karnataka include Bedar, Toda, Hakkipikki, Jenu Kuruba, Kadu Kuruba, Kattunayakan, Konda Kapus and Sholagas.

Occupational Pattern

20. Worker population accounts for 49.4% of the population in rural Karnataka of which about 81.4% are main workers and 18.6% are marginal workers. Among the main workers in rural Karnataka, 34.3% are cultivators, 36.4% are agricultural laborers, and 2.8% are engaged in household industry while the remaining 26.5% are other workers.

21. According to 2010-11 Agriculture Census³, 7.83million farm holdings are operating 12.16 million hectares of agriculture land. Small and marginal holdings account for 76.44% of total holdings and operate only 40.05% of the total operated area, while semi-medium, medium and large holdings account for 23.57% of the total holdings and their operational land holding is 59.95% out of the total operational area. The 11.7% of SC farmers operate only 8.8% of land with average holding size being 1.18 Ha, while 6% of ST farmers operate 5.8% of agricultural land with average holding of 1.49 Ha.

Table (1): Agricultural Land Holding Pattern in Karnataka			
Size Class Holdings/ Farmers	Holdings (%)	Area (%)	Average Holding size (Ha)
Marginal (below 1 Ha)	49.1%	15.2%	0.48
Small (1 to 2 Ha)	27.3%	24.8%	1.41
Semi-medium (2 to 4 Ha)	16.2%	27.9%	2.68
Medium (4 to 10 Ha)	6.5%	23.9%	5.69
Large (10 Ha and above)	0.9%	8.2%	14.71
Scheduled Caste Land Holding	11.7%	8.8%	1.18
Scheduled Tribe Land Holding	6.0%	5.8%	1.49
Source: Agriculture Statistics Karnataka. Available at http://raitamitra.kar.nic.in/KAN/Document/agriprop.pdf			

Watershed Program in Karnataka

22. Karnataka has been a forerunner in the context of watershed management and has taken a number of initiatives including the implementation of number of externally aided projects from DFID, DANIDA, SDC and the World Bank- supported KWDP I and KWDP II. It was amongst the first states

² State of Environment, Karnataka, 2015

³ Agriculture Profile of Karnataka, available at <http://raitamitra.kar.nic.in/KAN/Document/agriprop.pdf>

to constitute a separate Watershed Development Department in 2000. The allocation by the state government of INR 100 crore from the state budget towards watershed works based on land resource inventory (LRI) in 100 extreme drought prone taluks indicates its appreciation of the benefits of LRI-based watershed planning for farmers in rainfed areas. In addition, the state has taken up the *Jalamrutha* Program in convergence with MGNREGA funds where planning and implementation of works is done on a watershed basis.

23. World Bank supported Karnataka Watershed Development Project -1 (KWDP-1) (2002 – 2009), popularly known as Sujala-1 was implemented in six districts and were acknowledged as success story where high level of community participation, utilizing technology inputs such as remote sensing, GIS etc., and improved decision making system with involvement of the existing institutions were integrated and harmonized for watershed development helped in increased cropping intensity from 129 to 144% and increased crop yield by 24% and shift from agriculture to agro-horticulture/ agro- forestry by 22%. With success of KWDP-1, KWDP-II (known locally as Sujala-III) was implemented with World Bank support in another 11 districts of Karnataka from 2013 – 2019 with more science and technology-based inputs in watershed development and crop production for increasing and sustaining farmers' income.

24. Karnataka State has about 5.2 million ha (52.31 lakh ha) rainfed watersheds still to be scientifically treated on watershed approach. The Sujala-III project has created improved infrastructure, skilled manpower and knowledge. The Watershed Development Department (WDD), Government of Karnataka (GoK) plans to further scale up the Sujala-III interventions in the State, and also disseminate the scientific information and its methodology to other states in the proposed multi-state watershed project.

2 PROGRAM DESCRIPTION

2.1 Program Context

25. Rainfed agriculture represents a major share of the country's agricultural sector and is facing significant challenges. Of the 127 agro-climatic zones in India, 73 are rainfed, with 13 states accounting for about three-quarters of the total rainfed area. A total of 66 Districts of the country's poorest 100 districts are in rainfed areas. Generally, these rainfed areas receive less than 750 mm of rainfall annually and have less than 30 percent of cropland under irrigation (from both surface and ground water). Rainfed agriculture accounts for more than half of the net sown area in the country, mostly in arid and semi-arid areas, and supports an estimated 480 million people. Rainfed areas are home to 86 percent of the country's poor, produce 40 percent of the food grains, support two-thirds of the livestock population, and are thus critical to poverty alleviation and food security in the country. Dry, rainfed regions are susceptible to drought and soil degradation that reduces fertility and increases downstream sedimentation.

26. 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.

27. 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 areas⁴.

28. 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 agencies⁶, are responsible for delivering national watershed programs, including

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.

watershed planning, resource mobilization, monitoring, capacity building, and coordination through their district and block level structures. To facilitate meaningful engagement of the community in planning, implementation, and monitoring of watershed development, community level institutions and local government bodies are supported. These include Watershed Development Committees (WDCs), farmer or water user groups, Self-Help Groups (SHGs), and the Gram Panchayats (GPs).

29. 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 level⁷. 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

30. 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.

31. The Program is planned to be implemented in selected states of India. The initial selection of the state of Karnataka was based on their willingness to implement a science-based watershed program and their track-record in implementing WDC-PMKSY. The state of 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.

2.2.1 Program Development Objective

32. 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.

⁷The 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.

- d. Increase in climate-adjusted soil moisture in targeted watershed areas; and
- e. Direct Program beneficiaries (number, disaggregated by gender and social group).

33. 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.

34. 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 GPs⁸ 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.

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.

- d. Establish a national center of excellence on watershed management: Karnataka has rich expertise in implementation of science-based watershed management including the application of LRI, hydrogeology, DSS to planning; and the use of remote sensing and Geographic Information Systems (GIS) for planning and monitoring. It will be supported under the REWARD Program to become the 'lighthouse' state for science-based watershed management. India will benefit from the creation of a specialized institution that focuses on dissemination of knowledge from Karnataka to all states, and whose existence outlasts the REWARD Program. Towards this, the REWARD Program will incentivize the: (i) establishment of a national center of excellence on watershed management in Karnataka, drawing on the expertise and experience of key technical partners involved in KWDP-II; (ii) development of the curriculum framework, teaching-learning modules and materials (such as training manuals, learner resources) on science based watershed management; (iii) roll out of trainings for national and state functionaries of participating states as well as other states; (iv) action research studies and demonstration pilots on thematic areas relevant to science-based watershed management (such as soil carbon, monitoring of ground and surface water resources); and (v) development and management of a knowledge portal on science-based watershed management.
- e. Incentivize the development and dissemination of supportive policies at the national and state levels. At the national level, the Program will generate data and lessons learned to support the development of new technical standards and operational protocols for science-based watershed development. These standards will be developed by the DoLR, based on implementation experience in the participating states, and will be disseminated to other states. At the state level, the Program will support the development of a strong O&M policy, and the piloting of science-based fertilizer demand and supply policies.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.

35. **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

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.

between SWDs and scientific and technical institutions through formal arrangements such as contracts and memoranda of understanding (MoUs) in key areas;¹² (ii) development of LRI¹³ and hydrology¹⁴ 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 (DPRs¹⁵) 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.

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.

- c. Farmers empowered with science-based and just-in-time agro-advisories. A key element of building climate resilience in rainfed areas is empowering farmers with timely information on land resources, soil status, weather events, etc., along with recommendations on relevant crop selection and management practices (such as fertilizer selection and scheduling, irrigation management). The REWARD Program emphasizes the role of agro-advisories in supporting climate change adaptation through the adoption of LRI and weather-based agro-advisories disseminated among farmers through information and *communication technologies* (ICT) channels and the agriculture extension system. The Program will support multiple extension channels including trainings, exposure visits, field demonstrations, mobile solutions (interactive voice response (IVR), short messaging services (SMS), mobile apps), in partnership with agriculture extension institutions such as the district level Agriculture Technology and Management Agencies (ATMAs) and *Krishi Vigyan Kendras* (KVKs), block level *Rythu Sampark Kendras* in Karnataka, 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.
36. 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

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.

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

2.3 Geographic Scope of the Program

37. Under Sujala-III, the project has covered a total of 2534 micro-watersheds (MWS) covering 14.06 lakh ha, of which 89 MWS was taken up in saturation mode covering 46.7 thousand ha and created LRI data base for another 2445 MWS covering 13.6 lakh ha across 11 districts of Karnataka viz. Bidar, Gulbarga, Yadgir, Koppal, Gadag, Davangere/ Bellary, Chamrajnagar, Bijapur, Chikkamangalur, Raichur and Tumkur. The REWARD program proposes to contribute to GoK in saturating the watershed development interventions in remaining MWSs in these 11 districts, and also creates LRI data set for another 8-9 districts. In addition, the REWARD program plans to further strengthen WDD with policy and institutional capacity to enhance efficiency and effectiveness of the watershed program in Karnataka.

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

38. 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.

39. 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	5 million ha to be treated during	Not applicable	0.8 million ha

	WDC-PMKSY program	REWARD Program	
	Nation-wide program	National level	State level
hectares)	2021-2026		
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	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Development of supportive policy on technical standards at national level• A national center of excellence on watershed management	<ul style="list-style-type: none">• 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

40. The REWARD program in Karnataka will be implemented in twenty-one rainfed districts of Karnataka using WDC-PMKSY scheme with IBRD contribution to the tune of USD 60 million over the five-year period. Under Sujala-III project, it covered a total of 2534 micro-watersheds (MWS) covering 14.06 lakh ha, of which 89 MWS was taken up in saturation mode covering 46.7 thousand ha and created LRI data base for another 2445 MWS covering 13.6 lakh ha across 11 districts of Karnataka viz. Bidar, Gulbarga, Yadgir, Koppal, Gadag, Davangere/ Bellary, Chamrajnagar, Bijapur, Chikkamangalur, Raichur and Tumkur. The REWARD program proposes to contribute to GoK in saturating the watershed development interventions in remaining MWSs in these 11 districts, and also creates LRI data set for another 8-9 districts. In addition, the REWARD program plans to further strengthen WDD with policy and institutional capacity to enhance efficiency and effectiveness of the watershed program in Karnataka. In addition, the REWARD program plans to further strengthen WDD with policy and institutional capacity to enhance efficiency and effectiveness of the watershed program in Karnataka.

2.5 Key Program Implementing Agencies

41. 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. The SLNA of Government of Karnataka is the Watershed Development Department (WDD) and is embedded within the state Ministry of Agriculture, Government of Karnataka (GoK). WDD 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.

42. 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.

2.5.1 Institutional Arrangement in Karnataka

43. **Implementing Agency:** In Karnataka, the Watershed Development Department (WDD) 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. At the district level, Watershed Cell cum Data Centre (WCDC) is responsible for overseeing the implementation in the district. The Project Implementation Agency (PIA) located either at the block level or sub-block level carries out the actual planning and implementation. A PIA can either be a government unit or an NGO, with adequate expertise and capacity. The village level institutions involved in watershed development planning, implementation, monitoring and post-project sustainability include the Watershed Development Committee, User Groups, Self Help Groups and the Gram Panchayat. In addition, WDD will be partnering with Department of Agriculture (GoK), Department of Horticulture (GoK), Department of Animal Husbandry (GoK), and Department of Rural Development and panchayati Raj (GoK).

44. **Field Partner Agency:** An NGO will be appointed for each of the districts to support the capacity of the User Groups/Watershed committees. The participatory planning process is outsourced to NGOs at the sub-watershed level, who will be assigned with the responsibility of awareness creation, social mobilization and group formation at GP level as well as community training in various aspects of watershed, livelihoods and the like. The NGO partner will help constitute the watershed executive committee at GP level and will assist the WDTs in participatory planning process at micro-watershed level.

45. **Technical Partner Agency:** Under Sujala-III project, the state has developed partnership with 14 academic and research institutions to provide technical support and to develop and implement the Land Resources Inventory (LRI) based watershed planning and management. In similar lines, the technical agencies proposed to be partnered with under the REWARD program includes: (1) National Bureau of Soil Survey & Land Use Planning (ICAR-NBSS&LUP), Regional Centre, Bengaluru; (2) University of Agricultural Sciences-Bengaluru, Dharwad & Raichur; (3) University of Agriculture and Horticulture Sciences, Shivamoga; (4) University of Horticultural Sciences, Bagalkote; (5) Karnataka state Remote Sensing Application Centre (KSRSAC), Bengaluru; (6) Karnataka state Natural Disaster Monitoring Centre (KSNDMC), Bengaluru; (7) Indian Institute of Science (Dept. of Civil Engineering), Bengaluru; (8) Central Ground Water Board, Bengaluru; and (10) Minor irrigation and Ground water Department, Govt. of Karnataka.

2.6 Borrower's previous experience in Watershed Management

46. The Government of Karnataka has had a long experience with watershed development interventions through a wide range of agencies, policies and programs. Over the past four decades, GoK has wide experience of implementing watershed program with various bilateral and multilateral support. The landmark Kabbalanala Project of 1983 (assisted by the World Bank) gave a big push to watershed development in Karnataka. Acknowledging the importance of watershed development approach, the Government of Karnataka, in 1984, established Dry Land Development Boards that covered 19 districts under their purview.

47. Watershed development in the State reached a major milestone with the establishment of a dedicated Watershed Development Department in 2000. All the watershed schemes and projects under State sector, Central sector, externally aided projects as well as district sector programs come under the purview of the Watershed Development Department. Through these watershed projects, the GoK has worked with a wide range of partners; they include: Ministries of Agriculture and Rural Development (GoI) and externally aided projects supported by agencies such as the World Bank and Department for International Development (DFID). The Sujala Watershed Development Project (Sujala I) over 2000-2009 implemented in six districts, followed by the Karnataka Watershed

Development Project II (Sujala III) successfully implemented over 2013-2019 with World Bank support in another 11 districts of Karnataka. This clearly shows GoK's and WDD's prior experience in implementing Bank projects and with Bank safeguard policies.

3 PROGRAM ENVIRONMENTAL AND SOCIAL EFFECTS

3.1.1 Environmental Effects

48. The overall environmental 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.

49. REWARD design incorporates several international and national good practices: REWARD design, goals and activities meet several benchmarks for a good watershed program that were identified in a review of a portfolio of World Bank supported national and international watershed projects²¹. This approach builds on the experience gained in KWDP-II (Sujala-III), a World Bank supported watershed project in Karnataka (2013-2019) helped user communities manage their ground water sources. Both projects worked at multi-district scales and were thus large-scale proof of concept.

50. In LRI, climate resilience is addressed with the input of dynamic weather data of rainfall, relative humidity, temperature, etc. These data sets capture and address climate change issues at large and environmental sustainability in particular. Therefore, outputs so generated accommodate climate issues and thus environmental sustainability effectively. 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.

51. Current scale of planning IWMP 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 Gujarat²² 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. Enable Karnataka Watershed Development Department, their experienced scientific and technical network of top caliber scientific partners, and other institutions as needed to help new project states and DoLR prepare and implement the project and establish and train their own partners.

52. LRI-DSS takes into account detailed, site-specific data at the cadastral level on land resources (both physical and chemical properties) that is collected as part of the activities under REWARD. Hydrological data on permeability, infiltration rate, run-off, erosion, soil moisture, soil storage, ground water storage, recharge, etc. on similar scale is used alongside land resources information to calculate the water budget. In LRI-DSS system, it is the responsibility of the Hydrology partner to develop/identify model for estimating water fractions (ET, Soil Moisture, Run Off, Groundwater) leading to Water Balance. Presently the water budget and hydrological outputs are calculated using mathematical models with limited ground measurements, normalized according to soil management units. As these are model-based measurements, under Sujala III, they are calculated using or modifying the existing models, algorithms and expert systems depending on selected criterions. These models or outputs are subsequently validated with actual data collected from the field stations established in model micro watersheds and benchmark sites. These data layers can also help to capture (a) silt/sediment in micro watershed and (b) environmental flows downstream.

53. Water balancing or water budgeting in a watershed or in micro-watershed is another important aspect on managing upstream and downstream correlation and evidence-based watershed planning for environmental sustainability and must be suitably monitored.

54. This same database can be effectively used during mid and end-term monitoring evaluations to achieve large scale goals of protecting and conserving hydrologic services and/or managing negative downstream and groundwater impact which otherwise remains unaddressed.

²¹ Watershed Management Portfolio Review FY1990–FY2015

²² Catchment Assessment and Planning for Summary report June 2015 Water shed Management

55. Strengthen capacities of project authorities and functionaries, and both private and public specialized institutions to implement more science-based watershed projects. It will be beneficial for overall hydrological services and also environmental sustainability. Establish high-level coordinating bodies in the state government on the lines of Multi Stakeholder Platforms, supported by 2030 WRG, for convergence of watershed issues will benefit environment with convergence of state specific goal on forest cover, agriculture and horticulture development in terms of developing rainfed districts.

56. The environmental quality will be improved through transfer of knowledge and experiences across Indian states and globally through national and international workshops and conferences, and international and national study tours/exposure visits. A primary focal area would be on South-South Knowledge Sharing with Africa and South America.

3.1.2 Social Effects

57. 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.

58. The government program in Karnataka is taking forward the experience from recently concluded World Bank supported Sujala-III program and its key elements such as LRI based planning to other state funded watershed program as well. Adopting the science-based watershed development as in case of Sujala-III in Karnataka showcased good result on enhancing soil and moisture conservation compared to conventional program, and in turn leading to income generation and building climate resilience to reduce vulnerability of rainfed farmers. This is evident from the fact that under Sujala-III increased crop yield was observed in 75% of the sites with yield increase of 15-17% as compared to conventional practice²³.

59. Accelerated growth in rainfed agriculture is also crucial from the point of inclusiveness of the large majority, mostly poor, who still depend on it for their livelihood. It is one of the key strategies to enhance growth with equity in rainfed areas. The impact study of Sujala-III by TERI (2019) suggests of the 359 SHGs studied, 28% members were SC and ST and 22% were Landless women and indicates program being inclusive and influencing livelihood of marginalized and asset less population in positive manner.

60. Watershed development approach has emerged as an important strategy for an integrated development of dryland areas in Karnataka. 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. 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. This may lead to their further marginalization and lack of access to program benefits.

Type of Activity	Potential Social Benefits	Potential Adverse Impact
Policy, Institutions and Capacity Building	<ul style="list-style-type: none"> 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, 	<ul style="list-style-type: none"> While there is no adverse impact of the activities planned towards capacity building of institutions, the lack of it will certainly pose adverse impact. Also, if there is any lack of transparency and/or inequitable distribution of benefits, then that will also have adverse

²³ TERI Impact Study of Sujala-III, 2019

Type of Activity	Potential Social Benefits	Potential Adverse Impact
	<p>equitable sharing of benefits, increased transparency leading to enhanced incomes.</p> <ul style="list-style-type: none"> The development of state-level data bases, portals and digital libraries is expected to benefit in program convergence, improved farm-level decisions, and enable user access through web/mobile interfaces, and all these is expected to enhance farmer's income using sustainable methods and sustainable use of resources. 	<p>impacts on the target community.</p> <ul style="list-style-type: none"> 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.
<p>Infrastructure and Works</p> <p>- In select watersheds in rainfed agricultural areas</p>	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> There is no adverse impact as the site-specific planning based on scientific data reduces unnecessary structures and hence reduce wastage of resources and submergence of areas by the watershed structures.
<p>Services</p>	<ul style="list-style-type: none"> 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, post-harvest management, infrastructure development, and 	<ul style="list-style-type: none"> 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. Farmers need to be mobilized for group action, into Common Interest Groups (CIG), and be provided a platform to interface

Type of Activity	Potential Social Benefits	Potential Adverse Impact
	<p>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.</p> <ul style="list-style-type: none"> • The livelihood and income generation activities through microenterprise is expected help improve the income of women SHG members. Further convergence with NRLM/ SRLM and access to credits will help in sustainable livelihoods and income generation for women. 	<p>with the external agencies. Participation of small and marginal farmers and especially the poor and vulnerable sections will make the process more inclusive.</p> <ul style="list-style-type: none"> • 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

61. 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.

62. 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.

63. 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

64. **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

4.1 Legal, Regulatory and Institutional

65. 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.

66. 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.

67. 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.

68. With regard to environment, the following relevant legal and regulatory frameworks were assessed: (i) Environment (Protection) Act of 1986 and associated Rules, Forest (Conservation) Act No. 69 of 1980 and amended in 1988, (ii) The Wildlife (Protection) Act 1972, Amendment 1991 (iii) Air (Prevention and Control of Pollution) Act 1981 and associated Rules, (iv) Water (Prevention and Control of Pollution) Act 1974 and associated Rules, (v) Noise Pollution (Regulation and Control) Rules 2000, (vi) Biological Diversity Act 2002 Biological Diversity Rules 2004, (vii) Solid Waste Management Rules, 2016, (viii) Bio-medical Waste Management Rules, 2016, (ix) Other Waste Management Rules; (x) The Ancient Monuments, Archaeological sites and Remains Act, 1958, (xi) National Green Tribunal (NGT) Orders.

69. 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

70. The implementing agency of the proposed REWARD program in Karnataka is the WDD and headed by a full time Commissioner. At the state level, WDD is the primary responsible agency for the day-to-day implementations of the entire watershed program in Karnataka including the proposed the REWARD program. WDD is adequately housed with 7 Joint Project Directors with each handling a specific sectoral area. The Commissioner WDD is further assisted by Chief Conservator of Forest

(CCF) and Director WDD. At district level, the Agriculture department units implement the watershed programs. The block level office acts as the Project Implementation Agency (PIA). 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 and requires strengthening.

71. Even though equity and sustainability are considered as guiding principles of the program, there are hardly any operational or institutional mechanisms being put in place to ensure this. Implementation of Sujala-III in Karnataka suggests even though the implementation was done in saturation mode (i.e. saturating the program interventions in every land parcel of the watershed), there are farmers whose lands were not treated. This could be due to various reasons including farmer not been explained the program properly and hence do not want to participate or have very small land parcel etc. Also, there is no system of systematic screening of E&S risks.

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

72. In Karnataka innovation brought in for more science-based watershed planning using LRI, modifications were made to prepare the DRP based on LRI data and then to be revalidated with community and passed by Gram Sabha following common guideline 2011 as recommended by the WDC-PMKSY. LRI-DSS based DPR preparation integrates large numbers of data on land use, landform, terrain characteristics, infiltration, erosion, etc. to identify the most suitable technical alternative for all watershed interventions. Under Sujala III, LRI data sets were addressing the Environmental risk partially by eliminating forests or low lying or common property resources by taking it under a broad layer of non-arable land. However, no interventions were proposed on those areas. While finalizing of DPR at WDC and GP level these areas were screened out through community consultation. The current system by default has some E&S Assessment and management systems but not by design. Present LRI systems assess data at soil management unit basis and normalize it for micro-watersheds based on geology, terrain and soil quality primarily.

73. The interventions and change are expected to be observed primarily in micro-watersheds which tend to go upto soil management units. The WDC-PMKSY program guide clearly articulates the institutional responsibilities at different levels of program implementation right from national, state, district, Block/ PIA, GP and village level. However, in the existing implementation chain, only one E&S officer has been deputed at the state level, there is need to strengthen institutional mechanisms for this with clear responsibilities at different levels. KWDP-II had deputed an official from Agriculture dept for large part of the project period with additional responsibilities to oversee E&S implementation.

74. Also, in LRI, the climate resilience is addressed with input of dynamic weather data of rainfall, relative humidity, temperature, etc. These datasets capture and address climate variations. Therefore, outputs so generated are accommodating climate issues and thus environmental sustainability effectively. Crop choices based on the prevailing weather conditions, soil quality and site data collected through LRI will ensure the success of farming and thereby enhance the resilience of the farmers in the watershed areas.

75. There is evidence of awareness trainings on IPM, propagation of organic farming, multi-layer farming, water conservation techniques, discouraging water intensive crop being regularly done by WDD and Agriculture and Horticulture Department through LRI-DSS based agro-advisory systems. At the same time these are more mechanical and not demystified to user groups, thus creating a gap in understanding and documentation. This need to be brought in with clear articulation to avoid risk of

ground water and surface water getting polluted by overuse of pesticide or by chemical fertilizer. Similarly, over irrigation need to be discouraged which may cause salinity and sodicity in of the soil.

76. Cumulative impacts on environmental perspective can be captured through increase in downstream flow, decrease in silt movement, increase in ground water storage, increase soil moisture and NDVI value, etc. interventions planned from LRI at micro-watershed level can be captured in midterm and end term of the projects when data will be available from model micro-watersheds and benchmark sites. These data have potential to evaluate larger impacts on watershed level or upto sub-basin level on all important hydrological and environmental parameters.

Key Gaps Identified and Areas of Improvement

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

78. The DPR preparation for watershed development using LRI data has brought a more accurate and scientific basis for planning watershed treatment activities for any land parcel in a reduced time. Major gaps identified are:

- a. Lack of informed decision making in LRI approach while addressing E&S parameters. E&S risk screening were done by default not by design and lacked clarity. LRI based DPR can also display environmental sensitive layers such as Forest land, Area impacted with salinity ($E_{ce} = >4.0$) or sodicity ($ESP = >25$), Waterlogged areas, Physical and cultural resources like monuments, temples, religious or socially sacred areas as LRI outputs maps. These layers are already available as excel data in the LRI database.
- b. In absence of systematic and informed approach of E&S risk screening and management there are associated risks such extension of watershed interventions to forest areas or wetlands or common property resources like pastureland etc.
- c. Inter-departmental co-ordination especially with forest department and revenue department is a major gap in protection, conservation efforts including treatment of upper ridge areas, and this could lead to risks of negative impact on forest, wetland and other environmentally sensitive areas.
- d. There is no process is instituted to monitor or document advisories issued for crop selection and nutrient management which is key on addressing over exploitation of groundwater.
- e. At present there is no system to capture cumulative E&S impacts. M&E process for mid-term and end term evaluation for E&S parameters including baseline database creation at DPR stage was also absent.

79. The LRI based DPR preparation has made the planning top-down, which is very different than the WDC-PMKSY/ IWMP guideline of being very participatory and bottoms up planning. With the merit of improved science-based approach in planning for watershed, it is important to address the community participation and acceptance of the same. The assessment suggests that though it was intended it could not be instituted adequately in KWDP-II (Sujala-III) for reasons being (1) paucity of

time for detailed consultative process, (2) capacity of Watershed assistant and/ or Agriculture assistant to undertake the process of social mobilization and consultations, (3) limited or no supportive role of NGOs at field level to provide handholding support, and (4) quality of partnered NGOs selected at the field level being poor given the process of selection using lowest bid value instead of quality and cost based system.

80. In the existing watershed program implementation chain, there is no articulation of individual or agency responsible for implementing the E&S activities and monitoring the same. In addition, field functionaries such as Watershed assistant/ Agriculture assistant shall be trained in undertaking activities of building up scientific understanding of LRI, DSS 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.

81. Visit to field sites under Sujala-III watershed in Gadag district of Karnataka suggests many of the field bunds, farm pond bunds were cleared up even though the farmer received a good result from them last year. This raises concern on complete understanding of farmer on need for those structures and why they should retain it and maintain it. Field officials felt that more consultations required with farmers during the DPR preparation, which was not the case during Sujala-III. And as a contrast, physical structures seen in Kolar district in Karnataka are mostly intact and maintained for the last few years, which was largely under IWMP. This is also because the key difference in the type of NGO support provided during the planning stage.

82. With LRI based watershed plan preparation, there is need for (a) preparing protocol/ SOP with detailed process of consultation to be prepared and incorporated in the operational manual for watershed planning and implementation; (b) building the capacities of frontline workers such as Watershed Assistant, Agriculture Assistant and NGOs/Agencies associated on improved mechanism and also on the process of social mobilization and ecological conservation and environmental safeguard issues; (c) need for preparation of E&S Manual and template development for E&S risk assessment and management; (d) adequate human resources placed for the E&S activities across the implementation chain specially at the state level and at the PIA.

Recommendations

83. Protocol/ SoP to be prepared and adopted by the state for how science-based input such as using LRI data for DPR preparation is translated for building scientific understanding and community ownership of the process. This should also 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.

84. E&S Screening to be conducted using screening checklist as per Annex-9 by WDC and GP during DPR preparation and shall form as part of the DPR.

85. To address the inter-departmental co-ordination especially with forest department and revenue department is a major gap in protection, conservation efforts including treatment of upper ridge areas, it is suggested that an inter-departmental committee shall be constituted at PIA level including representative 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.

86. To capture key environmental and hydrological parameters it is important to standardize model micro-watersheds and benchmark sites and report representative databases throughout project cycle. The present good practice of identifying benchmark sites and standard practices of data collection as initiated in Karnataka, should be further replicated. Then the need of capturing important sustainability parameters of hydrological services without any compromise can be a reality. Therefore, documentation and dissemination of good practices need to be mainstreamed in the watershed management practices. For addressing this at baseline condition E&S database (Annex 8)

can be captured in the DPR and M&E parameters can be instituted for mid-term and end-term evaluation.

87. The detailed Planning element wise assessment for Core Principle 1 is given in Annex- 4A.

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.

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88. The land Resource Inventory (LRI) is effectively used in Karnataka and will be upscaled in Orissa under the project to demonstrate science-based planning of watersheds. The upfront environmental screening will be key elements in the watershed projects, which can be effectively captured using the LRI tools. Exploring LRI further, suggests the larger part of such indicators related to screening such as forests, land use, waterlogged areas etc. are being captured and thus mainstream environment in one sense and can be improvised.

89. There is LRI system which is capturing the data on forest, wetland and other sensitive areas but as it is clubbed under once category therefore systematic screening is not taking place and posing E&S risks though those are identifiable and reversible in nature. Therefore, interventions to be taken up under the project would not convert or degrade natural habitats. Presently these areas are getting avoided by virtue of public consultation at WDC and GP levels while finalizing DPR but not by design. 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. Detail analysis is given in Annex 4B for Core Principle 2.

90. 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 natural, physical and cultural resources such as reserved and protected forests, wildlife protection areas, revenue forests, 'sacred groves' etc.

Key Gaps Identified and Areas of Improvement

91. 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 for systematic screening of E&S risks. Also, lack of skill in local level field staff to demystify core technical details in built in the LRI-DSS with environment and social aspects.

92. However, on ground because most of these landforms like forests appears barren and alike as its adjacent agriculture land, there are chances that the interventions may extend to these areas without clear visual display of the database in the DPR. Designated wetlands are also not added in the LRI-DSS data set. This can also be risk on changing the use of wetland for treatment purposes.

Recommendations

93. Upfront environmental and social screening is required for protecting environmentally sensitive areas and natural and cultural heritage in micro watersheds. This will eliminate chance of extending project interventions to such sensitive areas. Displaying of map and data on environmentally sensitive areas on LRI-DSS based outputs will be very useful for screening and to be enclosed in the DPR. This will also be used for ruling out any high-risk activity in the project. The screening can be duly applied using following layers captured through LRI data outputs while DPR preparing.

- (b) LRI system currently can display following layers with excel databases as LRI outputs for DPR preparation, which are already captured in the LRI database:

1. Forest land,
 2. Area impacted with salinity (Ece = >4.0) or sodicity (ESP = >25),
 3. Waterlogged areas,
 4. Steeply sloping lands
 5. Physical and cultural resources like monuments, temples, religious or socially sacred areas
- (c) Another layer which is currently not being captured through LRI is of designated wetlands and requires to be captured. The environmental screening can be made tool based and self-sufficient using LRI tool if the additional layers can be included. This could be done through state data on GIS (if available) or using the services of State remote sensing agency.

94. 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 to be used during the project.

Identification and screening of natural habitat and physical and cultural resources are mostly covered under LRI based DSS system and may need to be re-verified with screening tool, but there is need of integration and use of data layers of forests and other natural habitat during community consultation and on ground execution. There is need of preparation of E&S screening checklist at Annex-9 and also documentation and training on ecological sensitive areas, natural habitat and archeological areas to each and every level of implementation agency.

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

95. Regulation) Act, 1986, amended in 2016 ("CLPR Act")²⁴ 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.

96. Most of the watershed works involve local community working on it or local labor employed, and any large-scale labor influx is not anticipated. No large-scale construction contracts or construction sites and camps are expected under the watershed program. While the watershed program in line with national legislations prohibits child labor, there is need to build awareness among the community to ensure adherence.

97. While there is existing legislative framework in India applicable to all state, census 2011 found about 61.7%²⁵ of children in the age group of 5-14 years employed in agriculture in rural areas²⁶. A large number of them working in land owned by their parents or other family members.

98. A detailed analysis on Core Principle 3 is given in Annex 4C wherein it is stated that there is need to educate farmers on the rights of children and issues and provisions related to child labor as per the Child Labor (Prohibition and Regulation) Act, 1986, amended in 2016 (CLPR Act). The field monitoring formats should capture the child labor issue and training to be provided to Watershed Assistant/ Agriculture Assistant on capturing the same.

²⁴<https://labour.gov.in/childlabour/child-labour-acts-and-rules>

²⁵<https://www.livemint.com/politics/news/where-is-child-labour-most-common-in-india-1549906952167.html>

²⁶<https://pib.gov.in/PressReleasePage.aspx?PRID=1539009>

Key Gaps Identified and Areas of Improvement

99. 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.

100. There is also existing inbuilt system of Pest Management and Advisories on regulated use of chemical fertilizer and no use of hazardous material but those need to be brought under E&S Management Framework.

Recommendations

101. With intensive agriculture due to improved crop growing conditions and increased availability of water, it may lead to risks of overuse of chemical fertilizers, pesticides, etc, thus leading to groundwater and soil contamination. And hence, control should be exercised over cultivation of crops with intensive use of insecticides and chemical fertilizers. Awareness for use of manures and organic pesticides to be encouraged and made part of stakeholder training.

102. Suggested measures to protect public and worker safety against the potential risks associated with construction of watershed intervention structures are given in Annex 10. Also, 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, fertilizer use, nutrient management should be made part of E&S manual.

103. 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.

104. 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 Karnataka 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.

105. However, there is possibility of small, localized submergence of private land if the design of watershed structures is not properly taking note of it. Hence, the E&S screening to be instituted to screen out any such eventualities. Detailed planning element wise analysis is given in the table of Annex 4D on 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

106. The process of watershed selection for treatment is based on regional assessment of the environment especially soil health and water availability in the rainfed area. Geographically these

areas also house higher proportion of poor. Hence, addressing equity and inclusion is quite important. Though the WDC-PMKSY/ IWMP guideline acknowledge this and provide 9% allocation for livelihood activities for asset less people, and another 10% for production system and micro enterprise. However, it requires better institutional mechanism to support the process of inclusion in a meaningful manner to reduce poverty.

107. 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 including participatory wellbeing ranking is followed during DPR preparation stage to ensure inclusion of women, tribal, and other vulnerable groups. Further modification with LRI based DPR preparation also requires consultation with each farmer for their land parcel, and finally the DPR is discussed and passed by Gram Sabha.

108. In the present system, watershed committees have membership from SC and ST community (where exists) and women representation. Also, the WDS-PMKSY guideline had laid more emphasis on equity and women participation. Under WDS-PMKSY, the DPR preparation and consultation is also informed by participation SC, ST and women. 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. However, the program lacks in monitoring the information on of benefits shared socially disadvantaged groups including SC, ST and women.

109. 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.

110. The program is encouraged to ensure that the interest, perceptions and priorities of women, SCs, STs 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.

Key Gaps Identified and Areas of Improvement

111. 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. Also, there has been issues related to convergence of different schemes targeting tribal and vulnerable groups and need addressing.

112. The Current process of WSD-PMKSY of 'bottom's up' planning is now changed to '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.

113. Program monitoring requires strengthening to capture monitoring gender specific data as well as data on equitable benefit sharing to SC, ST, landless and other socially disadvantaged groups.

Recommendations

114. Special attention to be given to tribal and backward 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. NGOs contracted in these areas should have scope for providing little more in building overall capacity of the community for taking benefits of the

program in efficient and effective manner. These areas may require some repeated awareness building exercises and training for enhancing overall capacity of the community.

115. For equitable benefit sharing and ensuring inclusion of SC and ST, special institutional mechanism and efforts are required to be put in place such as providing handholding support for longer duration compared to other areas. And proper coordination mechanism to be setup for convergence of different schemes for larger benefits through bringing synergy.

116. 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.

117. The Core Principle 5 that discuss and analyze on Rights and interest of indigenous people is detailed out in Annex 4E.

4.3.6 Core Principle-6: Social Conflict

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

118. There is no social conflict affected areas or presence of left-wing extremist (LWE) areas in the state. And in any case the program intervention does not exacerbate any social conflicts as it is working towards soil and water conservation leading to enhanced productivity of crops and improving the livelihood and income of the population living in rainfed areas. Also, exclusion of any groups in terms of caste, religion, and/ or geography by the program activities is not expected.

4.4 Institutional capacity for E&S management

119. The current institutional capacity requires strengthening under the proposed REWARD project. The WDD has deputed an official for E&S safeguard at the state level. However, there is no mechanism at the district and PIA level to ensure implementation of E&S safeguard activities and its compliance. For this, 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.

4.5 Borrower's experience in managing E&S risks

120. Government of Karnataka has a long experience with World Bank in implementing watershed development programs since 1984 with KWDP-I (2000-2009) and KWDP-II (2013-2019) in recent years. Apart from watershed programs GoK have implemented numerous projects over the last four decades and have had experience of managing E&S risks in compliance with projects. This clearly shows GoK's and WDD's prior experience in implementing Bank projects and with Bank safeguard policies.

4.6 The Grievance Redress Mechanism

121. 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.
- Registering grievances online to Chief Minister's (CM's) grievances cell <http://www.espandana.karnataka.gov.in/cms/portal/login.jsf> . This cell is under the control of Department of Personnel Administration and Reforms (DP&AR) or *Jana Spandana* as locally known. On receipt of the grievances, initial screening is done at DP&PR and forwarded to the concerned department for resolution. The concerned departments make further investigations and address the grievances and report back to DP&PR where the grievances are monitored and tracked online. In case of watershed related grievances, the grievance received at state

level is sent to the concerned district Joint Director of Administration (JDA) offices at the district level to get it investigated. The action taken is centrally monitored at the state level. At the department level there is vigilance cell of Agriculture Department working directly under the Secretary, Department of Agriculture (GoK). Wherein grievances are received and addressed by team of officers of the Agriculture Department.

- At the taluka level the Assistant Director of Agriculture (ADA) is entrusted to receive and address the grievances. Any farmer can also register grievances with ADA office at Taluka level and at the JDA office at district level.
- Farmers can also register grievances at the *Raitha Samparka Kendra* (RSK) situated at the Hobli (cluster of adjoining villages) level. A grievance register (*Spandana Vahi*) is maintained at RSK to record the grievances/ requirement of farmers. Most of such grievances are addressed on the spot by the Agriculture Officer (AO) in-charge who is heads the RSK. If it could not be resolved by AO, the grievance to forwarded to ADA for resolution.

122. However, the key systems gap is lack of systematic reporting and tracking of grievances received at RSK, ADA, and JDA level largely due to current systems being manual, there is no consolidation and tracking of grievances received and resolved in specified period at the SLNA level. And this needs to be strengthen in a manner that all grievances received are tracked properly for resolution.

4.7 List of Excluded Activities

123. 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-5A.

5.2 Field Visits and Consultations

124. Field visits were undertaken to Sujala-III Watershed in Gadag district of Northern dry zone of Karnataka and IWMP Watershed in Kolar districts of Eastern dry zone of Karnataka. Visits were made to Nabhapur Village (Sujala-III), Belanhadi GP in Gadag; and Kurdumali and neighboring villages (IWMP-Batch IV), Mulbagal Taluk of Kolar district. The two areas visited represent different agro-climatic zones, have different land use and soil types and are inhabited by different community groups. In Watersheds, consultations were held with Watershed Committees/ Executive Committees, PRIs, Women SHGs, community members - farmers and landless including SC, ST and women. Discussions were also held with Watershed Assistants and Agriculture Assistants. In addition to discussions, various watershed structures were also visited.

125. Discussions were also held with PIA staffs, NGO, and district level staffs in each district. In addition to field visits, discussion was also held at the State level with WDD, Agriculture Department, Horticulture Dept., Animal Husbandry Dept, NGOs, and some of the technical partners. The key issues noted from these discussions are presented in the Annex-2.



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



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



Discussion with EC members and SHG members at Kurdumali village of Kollar district



Discussion at state level with officials from WDD, Agri. Dept, Horticulture Dept, Animal Husbandry Dept., and members of other technical partner agencies.

5.3 Disclosure

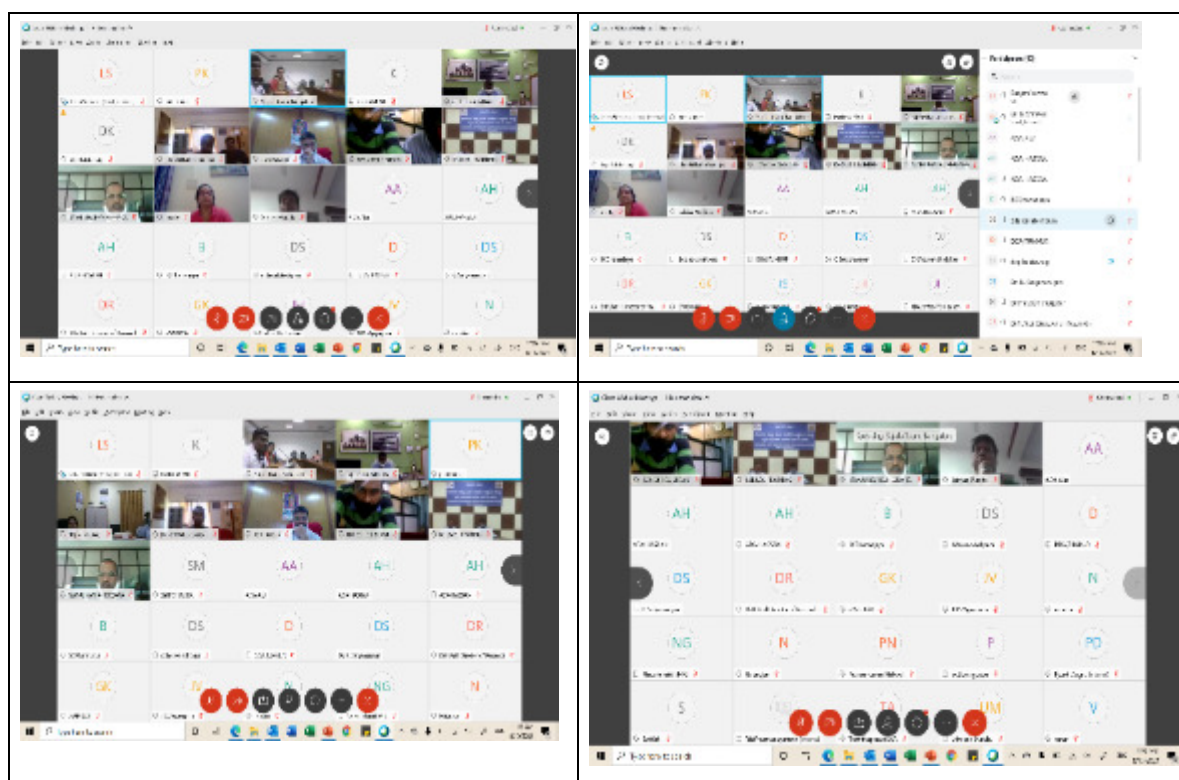
126. This draft ESSA will be disclosed in country at the SLNA/WDD's website in Karnataka and on the World Bank's external website, prior to completion of appraisal of the program, to serve as the basis for receipt of feedback and suggestions. A multi-stakeholder workshop involving WDD officials, partner agencies, NGOs, and district and taluka level watershed program officials was conducted on 13th August 2020 in a virtual manner using World Bank's guidance on Public Consultations and Stakeholder Engagement in constraint situation and in and in February 2021 with primary stakeholders in face-to-face manner. The ESSA report is further revised based on feedback and suggestions received during the consultation workshop. 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 Multi-stakeholder Consultation on August 13, 2020

127. A multi-stakeholder workshop in Karnataka was conducted on August 13, 2020. Around 60 participants deliberated and discussed over ESSA analysis and outcome. Among the participants officials from notable partner agencies like ICAR-NBSSLUP, DSS-Dhadwad, UAHS-Shivamogga, KSNDMC, Bangalore, Groundwater Directorate and other agencies along with SLNA – WDD, Karnataka engaged in detailed discussion. NGO representatives like Foundation for Ecological Security (FES), Chintamani, Chikkaballapur district, notable professors and also agriculture officers of various Districts of Karnataka attended the online multi-stakeholder workshop. The list of participants is enclosed in Annex – 5(c).

128. Stakeholders agreed with most of the ESSA findings and recommendations including the negative list and up-front E&S screening. Officials of WDD shown keen interest on inbuilt the mechanism of documenting crop and pesticide advisories and also mid-term and end-term impact evaluation. 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 Multi-stakeholder Consultation in February 2020

129. A second multi-stakeholder workshop in Karnataka was conducted in February 2021 in four rounds on 4th, 5th, 8th and 9th February 2021 largely coving primary stakeholders from all 21 districts proposed under the REWARD program at the DATC Mysuru and DATC Vijayapura. In each round participant different districts were called at DATC and consultation was done on face to face following social distancing and other guidance as per COVID19 protocols. In each of the consultations about 50-60 primary stakeholder participants from 5-6 districts joined including representatives from Watershed institutions such as Watershed Association (WA) members, Executive Committee (EC) members, Watershed Committee (WC) members, SHG members, FPO members, user groups and farmers, PRI members, local NGOs, SC and ST farmer, and landless labourer. In the four rounds a total of about 219 participants joined. The list of participants and the detail minutes in enclosed in Annex – 5(D).

130. Key feedback and suggestions from the primary stakeholder consultations includes (a) Identification and implementation of entry point activities (EPA), which has larger impact on community; (b) Use of PRA as an effective tool for community participation and shall be continued; (c) identifying progressive farmer, SHG member, PRI member etc will help in building champions on ground; (d) building awareness about Gram Sabha and conducting Gram Sabha in an effective manner will not only enhance participation but also help resolve many issues on ground; (e) Formation of asset management committee at village level in post project phase and assigning asset responsibilities to user groups along with departmental oversight will useful from sustainability perspective; (f) capacity of local NGOs and CBOs need to be enhanced to support in an effective manner; (g) organising exposure visit to model watersheds and motivating progressive farmers to adopt improved practices will be useful; (h) Inclusion of minimum 25% Farm Women in all User groups or FIG should be compulsory, also encouraging women in FPO Governing body and FIGs will help in gender inclusion; (i) Preparing viable and profitable IGA action plan along with capacity building, Bank linkage and market linkages and continuous follow up is important; (j) Awareness creation in tribal community through community meeting and trainings, and encouraging traditional practices and activities without hindering their culture and emotions will support tribal community in better way; (k) Restricting over exploitation of ground water by limiting depth of borewell(l) GRM can be improved by (i) installing Complaints Box at Gram panchayat and Village level; (ii) ensuring timebound redressal; (iii) nominating a Nodal Officers or Special Officer or Committee for addressing grievances at GP level; (iv) Conducting regular Grama sabha and assigning responsibilities to EC to address grievances; and (m) there should be provision to discuss M & E observations in Gramashabha and EC meetings, ensuring regular compliance.





6 RECOMMENDATIONS AND ACTIONS

6.1 Summary of identified gaps and recommendations

131. This section summarizes the measures that have been recommended based on gap/risks identified in the previous sections. The recommendations will address the important gaps identified in the project systems and core principles as well as any capacity building needs. During the preparation and appraisal process for the PforR, the actions recommended below will be clarified through consultations with program counterparts and specific agreements will be made to address recommendations by including them in the Program Action Plan (PAP).

132. Designed process of 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 pattern to more water intensive high value crops leading to excessive withdrawal of ground water, and increase use of fertilizer and pesticides; risk of increase in salinity & sodicity due to excessive irrigation in some areas; risk of restricting surface flow at plot level thereby impacting water bodies in the downstream and overall hydrology. 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.

133. 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.

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. The summary of recommendations for SLNA is presented below.

1. Details SOP/ guideline to be prepared and adopted by WDD based on learning from Sujala-III for community participation, building community ownership, and accountability mechanism in line with the new watershed development guideline. This should also 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. Field functionaries such as PIA members, Watershed Assistant/ Agriculture Assistant shall be trained 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 WDD 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:
 - vi. Forest land,
 - vii. Area impacted with salinity (Ece = >4.0) or sodicity (ESP = >25),
 - viii. Waterlogged areas,
 - ix. Steeply sloping lands
 - x. 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. M&E system should have special focus on monitoring of Environmental and Social safeguards. 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. Further, to capture key environmental and hydrological parameters it is important to capture data from model micro-watersheds and benchmark sites and report representative databases throughout project cycle. The present good practice of identifying benchmark sites and standard practices of data collection as initiated in Karnataka, shall be further replicated.
6. 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 that is to be prepared by the Government.
7. Special Strategy to be prepared by WDD focusing specific needs of the women, ST, SC and other marginalized groups as part of the program operational manual.
8. WDD to develop mechanism for effective coordination and convergence with other department such as Forest Department, Revenue Department, Tribal Welfare Department, Karnataka State Rural Livelihood Promotion Society etc. for convergence of different schemes for larger benefits through bringing synergy.
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. This can be instituted through capable NGOs providing handholding support for longer duration compared to other areas.
10. Enhancing women participation including in local institutions by promoting more women to take leadership role in watershed development and income generation activities including FPOs along with capacity development.
11. Existing Grievance Redress Management (GRM) system to be further strengthened by either adding additional module to the farmer's help desk or extending the MIS system for registering, screening and redressing, monitoring grievances, and periodic reporting on the same.

12. 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.
13. Adopting a system of valuation of ecosystem services like water budgeting and their contribution to watershed development scoping will be explored and also landscape approach for integrating planned convergence of other programs (including with partner Departments of Agriculture, Horticulture, Forestry, and MGNERGA) to conserve soil moisture to improve outcomes on water yield, ground water and sediments in the long run for environmental sustainability.

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). The E&S section of the Program Manual to further detail out the plans for addressing the above recommendations along with timeline.

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 WDD detailing out mechanism of community participation and building ownership of the watershed plan based on science-based data inputs.	SLNA/ WDD	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/ WDD	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 Support Plan

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

6.2.2 Implementation and Reporting Arrangements

136. 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.

6.2.3 Proposed Staffing

137. At the SLNAs/ WDD, experts from the PMU 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.

6.2.4 Training and Capacity Building

138. 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.

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

Institution Level	Proposed Staffing
	safeguard activities and assisting PIA in implementation of the same.

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

139. 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 WDD in organizing stakeholder workshops and Training project staff, project partners, NGOs and other project States on LRI including the E&S aspects of LRI
UAS B, UAS D, UAS R, UHS B and UAHS Shimoga	Provide training to district, PIA level project officials and FNGOs on E&S safeguard management (as per E&S manual)
Field NGOs (FNGO)	<ul style="list-style-type: none"> 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

140. 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
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	Any new species of trees,	Bio-diversity Survey	PIA/ District team

Key Areas of impact	Monitoring Indicator	Periodicity	Responsibility
there should be positive impact on bio-diversity. New species of trees, shrubs, medicinal plants, birds, animals may add to existing baseline.	shrubs, medicinal plants, birds, animals in the vicinity	Annual	
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
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	Annual	PIA/ District team/ SLNA/ DoLR

Key Areas of impact	Monitoring Indicator	Periodicity	Responsibility
	3. Grievances pending and escalated to next level for resolution		

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

141. An inter-departmental Committee is suggested at PIA level that will address upfront E&S risk screening (Annex 10) 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-9 and Annex-10 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:

- Watershed Development Department
- 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 Sujala-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 I
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. Economic Survey of Karnataka 2018-19
14. State of Environment, Karnataka, 2015
15. Agriculture Statistics Karnataka. Available at <http://raitamitra.kar.nic.in/KAN/Document/agriprop.pdf>
16. Impact Evaluation Study, TERI 2019
17. Sujala-III: Post Saturation Impact Evaluation Study, 2019
18. Lobo, Crispino. An Institutional Study on Watershed Services: Improving Operational Effectiveness and Impacts of the Integrated Watershed Development Program (IWMP), 2012
19. Detailed Project Report for Dindur Subwatershed of Gadag Taluka in Gadag District, 2017. Under Sujala-III
20. Prioritization of Rainfed Areas in India. NRAA, 2012
21. Rainfed Ecosystem in India – A Perspective. WASSAN, 2017

ANNEX-2: LIST OF INDIVIDUAL AND ORGANIZATION MET

S.NO.	NAME (Sri/Smt./Dr.)	DESIGNATION
State Level		
1.	Prabhash Chandra Ray IFS	Commissioner, WDD
2.	A. Padmaya Naik	Director, WDD
3.	Prakash Kumar	DOC & IGA Specialist
4.	Sudhindra Kumar S.N.	SADH, DATC
5.	Sandeep C. Hebick	M&D Consultant, Sujala-III
6.	G.G. Kadalade	Assoc. Professor UAS, GKVK, Vellore
7.	A.Satish	Professor UAS, GKVK
8.	Sudha G.	KAVAFSU Bangalore
9.	R. Prakash	Consultant
10.	Venkatesh	Director Horticulture
11.	Smt. Ranjana B.K.	Dy. Director Horticulture (Planning & Project Coordinator)
12.	K. Satyanarayan	Nodal Officer Sujala-III, KVA, USU
13.	Rajendra Hegde	ICAR NVSSKNUP
14.	Rashmi Alias	WDD, DDA (Head.cell)
15.	Suma MR	JDA Soil Conservation
16.	Dr. Rajendra Hedge	PSLHRC, ICAR- NBSSLURC,
17.	Mahantesh Hanji	SADH, WDD
18.	Umber Farid	SAOH, WDD
19.	Lalitha Reddy, S	JDA (Agronomy)
20.	Praveen G.S.	GIS Expert
21.	Vasu D.G.	Concoltech Ltd.
22.	G.G. Kadalade	Assoc. Professor UAS, GKVK, Vellore
23.	A. Satish	Professor UAS, GKVK
24.	Dr. Mohit Gupta	Project Manager
25.	Raghuram Garga	IT consultant, WDD
26.	R. Senthil Kumar	System Administrator, Censys Tech Ltd.
District and Taluka Level – Gadag		
1.	Rudreshappa T. S.	Joint Director Agriculture, Gadag

S.NO.	NAME (Sri/Smt./Dr.)	DESIGNATION
2.	Veeresh Hungund	Deputy Director Agriculture, Gadag
3.	Mallayya C.K.	Assistant Director Agriculture, Gadag
4.	Demonagoda Patil	ADM Agro-Industry
5.	Ramesh	Joint Director Horticulture
6.	Narayan Bandi	Soil Science Sr. Scientist, KVK
7.	Watershed Assistant	Nabhapur Village (Sujala-III), Belanhadi GP in Gadag
8.	Members of Watershed Committee/ Executive Committee and PRI members	Nabhapur Village (Sujala-III), Belanhadi GP
9.	Community members including marginal groups and landless	Nabhapur Village (Sujala-III), Belanhadi GP
10.	SHG members	Nabhapur Village (Sujala-III), Belanhadi GP
District and Taluka Level – Kolar		
1.	Dr. K Naeem	Deputy Director Agriculture, Kolar
2.	G. R. Bhavya Rani	Deputy Director Agriculture, Muibaiu
3.	Amarnarayana Reddy	Assistant Director Agriculture, Mulbagal
4.	Dr. Shivakumar H.K	Assistant Director Agriculture, Kolar
5.	Promod Kumar	Technical Officer, Kolar
6.	Lokaraj	Assistant Agriculture Officer, Mulbagal
7.	Agriculture assistant	Kurdumali and neighbouring villages (IWMP-Batch IV), Mulbagal Taluka
8.	Members of Watershed Committee/ Executive Committee and PRI members	Kurdumali villages (IWMP-Batch IV), Mulbagal Taluka
9.	Community members including marginal groups and landless	Kurdumali villages (IWMP-Batch IV), Mulbagal Taluka
10.	SHG members	Kurdumali villages (IWMP-Batch IV), Mulbagal Taluka

ANNEX-3: APPLICABLE LEGAL AND REGULATORY FRAMEWORK

1. 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

2. **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.

3. **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.

4. 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.

5. 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.

6. 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, rain water 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.

7. 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

8. **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.

9. **MGNREGA:** Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) initiated by the MoRD²⁷. 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 allowed²⁸ 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 Karnataka has been using the convergence with MGNREGS to undertake watershed development activities.

10. **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 Karnataka.

11. **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 WDD/ DoA in proportion to the tribal population living in the state.

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

Table (A3.1): 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	Relevant to the overall Program

²⁷ Although EAS and MGNREGA are employment-oriented programs, priority has been given to rejuvenation of natural resources, including water and soil conservation.

²⁸ <https://nrega.nic.in/netnrega/writereaddata/Convergence/HP/circulars/cir310.pdf>

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
		the weaker sections of the people, particularly of the Scheduled Castes and the Scheduled 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	Not applicable as no land acquisition or resettlement is anticipated.

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
		improvement in their post-acquisition social and economic status.	
6	The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013	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 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.	Relevant and applicable to all formal institutions including WDD
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	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 in 1988	<ul style="list-style-type: none"> 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.

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
10	Forest (Conservation) Act No. 69 of 1980 and amended in 1988	<ul style="list-style-type: none"> • 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. • Proposals for diversion of forest land for construction of dwelling houses are not to be entertained 	<ul style="list-style-type: none"> • 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 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	<ul style="list-style-type: none"> • Relevant to employment generation in forest lands. Controlled felling and transportation of trees
12	Joint Forest Management, 1993	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Relevant to Forestry, Intervention in common resource property and Horticulture • Pastureland development Guideline on the sharing mechanism
13	The Wildlife (Protection) Act 1972, Amendment 1991	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 300m from the 'protected property' are designated as 'Protected	Deals with Cultural safeguards

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
		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'	
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	<ul style="list-style-type: none"> • Relevant to Forestry, Horticulture, Livestock, Silviculture, Soil conservation and Agriculture. • Provides Ecological integration. • Increased ecological symbiosis (e.g. Pollination) increases production
17	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 <p>The Program will have to ensure that its institutional development and resilient investments are in line with the requirements, if any, under these Rules.</p>
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.	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • The Program will have to ensure that its institutional development and information disclosure are in line with the requirements, if any, under

Sl. No.	Applicable Act/ Regulation/ Policy	Objective and Provisions	Relevance to the Program and key Findings
		aims to assess the potential effects of these products on the health of people and the environment.	these Rules.
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.	<ul style="list-style-type: none"> • 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-4(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 (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	<ul style="list-style-type: none"> • Planning and implementation of the entire watershed program in Karnataka follow the common guideline 2011 as recommended by the WDC-PMKSY. However, with innovation brought in for more science-based watershed planning using LRI, modifications were made to prepare the DRP based on LRI data and then to be revalidated with community and passed by Gram Sabha. • 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 policies and legislation covers all aspects on program implementation, it requires enabling institutional and 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Adequately covered but knowledge on major central and state Government Act related with the project may additionally benefit the projects. • Such applicable acts are: -The Environment (Protection) Act No.29 of 1986; Water and Air (Prevention and Control of Pollution) Act, 1974 & 1981 (Central Act 6 of 1974) as amended in 1988; Forest (Conservation) Act No. 69 of 1980 and amended in 1988; National Forest Policy, 1988; Joint Forest Management, 1993; The Wildlife (Protection) Act 1972, Amendment 1991; EIA Notification of MoEF&CC 2006; The Ancient Monuments, Archaeological sites and Remains Act, 1958; Biological Diversity Act 2002 Biological Diversity Rules 2004; State/Union Territory Minor Forest Product (Ownership of Forest Dependent Community) Act, 2005; The Scheduled Tribes and other; Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; Karnataka State Agricultural Policy – 1995; Karnataka Tree Preservation Act, 1976; Karnataka Biological Diversity Rules, 2005

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		technical capacity for compliance.		
2	Recognized elements of good practices in E&S assessment and management	<ul style="list-style-type: none"> The current system by default has some E&S Assessment and management systems but not by design. There are some evidence of awareness trainings on IPM, propagation of organic farming, multi-layer farming, water conservation techniques, discouraging water intensive crop being regularly done by WDD and Agriculture and Horticulture Department through LRI-DSS based agro-advisory systems. At the same time these are more mechanical and not demystified to user groups, thus creating a gap in understanding and documentation. 	<ul style="list-style-type: none"> In absence of systematic and informed approach of E&S risk screening and management there are associated risks such as extension of watershed interventions to forest areas or wetlands or common property resources like pastureland. It could also impact water budget as with water availability there could be chance of selection of high value, water intensive crop. Chance of increase in use of chemical fertiliser and pesticide along with high value crop selection can also lead to pollution of common resources like ground water and surface water. In current program there are hardly systems of documentation of good practices to learn and disseminate specially on NPM/IPM, fertiliser and crop advisories. Wherever there are few efforts noted, they are bit ad-hoc and require a more systematic approach. At present data-based output of effectiveness of the program could not be spelt out in absence of effective M&E parameters being captured at baseline and in mid-term or end term. Though discussion revealed that water availability has increased, soil erosion has reduced, and there are new flora or fauna observed, these need to be captured in baseline as well as mid-term and end 	<ul style="list-style-type: none"> Upfront E&S risk screening to be adopted in LRI system with clear display of layers and database on forest, wetland, common property resources, etc. Same need to be verified by PIA while finalising DPR with the WDCs and GPs. In DPR with risk screening (Annex 3) format there should also be E&S baseline format which would enable informed decision on E&S parameters. E&S Operational Manual for watershed program with training module should be prepared. E&S indicator-based template will be developed which will assist in documentation of data and progress. Documentation and learning of good practices and using them for capacity building requires strengthening. Documentation of all training and capacity building activities need to be done systematically. Documentation of success stories on all environmentally beneficial activities on NPM/IPM, crop selection advisories, reduction in use of pesticide, fertiliser, etc need to be done along with evidence. M&E parameters on E&S aspects need to be inbuilt in the program for mid-term and end-term review. Mid-term review shall be

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
			term reviews and properly documented with evidence.	effectively used for course correction process, if required.
3	Key E&S risks that requires screening and management of risk	<ul style="list-style-type: none"> The LRI system is capturing the data on forest, wetland and other sensitive areas but as it is clubbed under one category therefore systematic screening is not taking place and posing E&S risks. However, the risks are identifiable and reversible in nature. 	<ul style="list-style-type: none"> The clubbing of data and without initial screening at DPR level may lead interventions spreading into extension of watershed interventions to forest, wetland and other environmental sensitive areas is worth mentioning. Other risk which can be envisaged are ignoring 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, water intensive crop selection and increase in pesticide use. Adversely affect some of the physical and cultural resources such as forests, sacred groves and other such sites and structures. Conflict among the users over common resources and encroaching degraded forest land may lead to issues in future. Inter-departmental co-ordination specially with forest departments and revenue departments were major gap in protection, conservation efforts including treatment of upper ridge areas. 	<ul style="list-style-type: none"> These risks can be designed to be mitigated under REWARD programme by LRI-DSS based DPR preparation process which should screen out such eventualities by ensuring no adverse impact to any sensitive areas and common resource areas by displaying layers and information on DPR maps. Capacity Building of implementation agencies, functionaries and WDCs to inculcate processes of demystifying science, technological advancements and explaining farmers about negative impact of encroachment may be done at DPR stage and also during execution. An inter-departmental committee shall be constituted at PIA level including representative from forest department, revenue department, wildlife department in addition to officials from irrigation, watershed, agriculture and horticulture departments for resolving conflict among users. This committee would manage overall environmental risks treating and responsible for conserving the natural habitats, forests, common properties for its own assigned environmental functions and protecting them from any negative impact.
4	Strategic, technical	<ul style="list-style-type: none"> Already well addressed in LRI-DSS 	<ul style="list-style-type: none"> No major gap whereas consultation 	<ul style="list-style-type: none"> A process guideline prepared for community

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
	and site alternatives	based DPR preparation wherein large number of data on land use, land form, terrain characteristics, infiltration, erosion, etc has been integrated to identify most suitable technical alternative for all watershed interventions, that further get validated and finalised by WDCs and User Groups through stakeholder consultation.	process can be more structured.	consultation during watershed plan preparation and before approving and/or passing it in Gram Sabha for further considerations; and necessary guidance/ GO issued for adopting the same.
5	Assessment of potential cumulative, and trans-boundary impacts	<ul style="list-style-type: none"> • Present LRI systems assess data at soil management unit basis and normalise it for micro-watersheds based of geology, terrain and soil quality primarily. The interventions and change is expected to observe primarily in micro-watersheds which tend to go upto soil management units. • Cumulative impacts on environmental perspective can be captured through increase in downstream flow, decrease in silt movement, increase in ground water storage, increase soil moisture and NDVI value, etc. interventions planned from LRI at micro-watershed level can be captured in midterm and end term of the projects when data will be available from model micro-watersheds and benchmark sites. These data have potential to evaluate larger impact on watershed level or upto sub-basin level 	<ul style="list-style-type: none"> • Change in crop selection (introduction of high value cash crops) leading to change in cropping pattern due to increased availability of water may lead to eventual over drawl of ground water. Increased use of water may reduce ground water level in shallow water table. • There is risk of decrease in downstream surface water flow if water is stored in upper ridges. • Agriculture run-off with chemical fertilizer, pesticide & insecticide may pollute surface water as well as groundwater quality • The income generation and micro-enterprise activities intend to improve the livelihood of women and landless households and intends to benefit the marginalised and contribute in reduction of poverty. 	<ul style="list-style-type: none"> • System should be in place to address macro and micro-level environmental issues such as overall hydrology which includes water resource budget, conservation, flow rate etc. in the macro watershed, change in ground water table, change in water quality, water intensive crop selection and increase in pesticide use. • However, these risks were designed to be mitigated under REWARD programme by LRI-DSS supported advisories issued to farmers for crop selection including nutrition management, fertiliser use and water conservation efforts. • 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 Gujarat²⁹ suggests that a hydrological assessment at the catchment

²⁹Catchment Assessment and Planning for Summary report June 2015 Water shed Management.

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		<p>on all important hydrological and environmental parameters.</p> <ul style="list-style-type: none"> Watershed interventions have definite contribution towards reduction in poverty and reduced forced migration. However, no systematic assessment has been done to identify indicators to quantify the magnitude of the reduction. 	<ul style="list-style-type: none"> At present there is no system to capture cumulative E&S impacts. 	<p>level should precede micro or sub watershed level planning to ensure that externalities are properly acknowledged and addressed.</p> <ul style="list-style-type: none"> Operational manual to be prepared along with key indicator-based template for documentation and addressing key E&S issues with formats for E&S monitoring and mid term and end term evaluations.
6	Environmental or Social impacts mitigation measures	<ul style="list-style-type: none"> Under Sujala III, LRI data sets were addressing the Environmental risk partially by eliminating forests or low lying or common property resources by taking it under broad layer of non-arable land. However, no interventions were proposed on those areas. Further while finalising of DPR at WDC and GP level these areas were screened out through community consultation. 	<ul style="list-style-type: none"> The system lacks in doing systematic screening for E&S risks and issues including for any adverse effects on biodiversity and cultural resource. At present there is no system to address environmental and social impact and mitigation plans that exists at implementation agency. Implementation agency have no dedicated personnel at any level to address E&S risk and management. Therefore, on ground, there are risks of interventions spreading out to environmental sensitive areas. 	<ul style="list-style-type: none"> Upfront Environmental Screening to be added in LRI system. LRI based DPR should display following environmental sensitive layers of Forest land, Area impacted with salinity (Ece = >4.0) or sodicity (ESP = >25), Waterlogged areas, Physical and cultural resources like monuments, temples, religious or socially sacred areas as LRI outputs maps. These layers are already available with excel databases in the LRI database. A separate layer on District wise Designated Wetlands can be added to LRI data set to address risk on interventions to include wetland in the project. Screening Checklist for community consultation by WDC and GP to be added in DPR as part of DPR finalisation so that all other issues on contamination, pesticide use, etc area addressed.
7	Institutional responsibilities and resources to support implementation	<ul style="list-style-type: none"> The WDC-PMKSY program guide clearly articulate the institutional responsibilities at different level of program implementation right from 	<ul style="list-style-type: none"> The current institutional mechanism lacks in E&S screening, implementing and monitoring of E&S effects arising out of program activities. 	<ul style="list-style-type: none"> Clear articulation for managing and monitoring E&S activities at State, District, PIA and village/watershed level to be there with placement of HR for the same. Technical

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		<p>national, state, district, Block/ PIA, GP and village level.</p> <ul style="list-style-type: none"> • However, in the existing implementation chain, only one E&S officer has been deputed at the state level, there is needed to strengthen institutional mechanism for this with clear responsibilities at different levels. • KWDP-II had deputed an official from Agriculture dept for large part of the project period with additional responsibilities to oversee E&S implementation. 	<ul style="list-style-type: none"> • There is no articulation of individual or agency responsible for implementing the E&S activities and monitoring the same. 	<p>functionary at PIA level who can demystify science and address E&S indicators during planning and execution would be critical for addressing safeguard issues.</p> <ul style="list-style-type: none"> • There is need to either 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 who have personnel with adequate knowledge on science behind LRI-DSS. • DPR preparation through participatory approach, community training, activity supervision-monitoring and review, build indigenous technical knowledge, post project operation and maintenance of project assets.
8	Responsiveness, inclusion and accountability through stakeholder consultation and dissemination	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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
9	Responsive GRM	<ul style="list-style-type: none"> • The current grievance redress 	<ul style="list-style-type: none"> • It requires the beneficiaries to travel to 	<ul style="list-style-type: none"> • WDD (GoK) is setting up Help Desk for

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		mechanism is based on RTI Act, CM's grievance cell and <i>Spandana Vahi</i> (feedback/ complaint register) at RSK and at Taluka and district level.	RSK and other places at Taluka/ District level to register any complaint. Also, one has to be literate to write down the complaint.	farmers advisory. An additional module on GRM could easily be added and will help in easy recording, monitoring and tracking the redressal.

ANNEX-4(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 natural, physical and cultural resources such as reserved and protected forests, wild life protection areas, revenue forests, 'sacred groves' etc.	<ul style="list-style-type: none"> The current institutional mechanism lacks in E&S screening, implementing and monitoring of E&S effects arising out of program activities. There is risk of disturbing the reserved and protected forests, wildlife protection areas, revenue forests, 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 	<ul style="list-style-type: none"> 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. Upfront Environmental Screening to be added in LRI system. LRI based DPR should display following environmental sensitive layers of Forest land, Area impacted with salinity (Ece = >4.0) or sodicity (ESP = >25), Waterlogged areas, Physical and cultural resources like monuments, temples, religious or socially sacred areas as LRI outputs maps. These layers are already available with excel databases in the LRI database. A separate layer on District wise Designated Wetlands can be added to LRI data set to address risk on interventions to include wetland in the project. 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	There is LRI system which is capturing the data on forest, wetland and other sensitive areas	<ul style="list-style-type: none"> There is gap of systematically identifying and screening of areas needs conservation, maintenance and rehabilitation of natural 	<ul style="list-style-type: none"> Early screening of potential E&S risks and issues needs to be instituted in the process of DPR preparation.

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
	habitats; avoid the significant conversion or degradation of critical natural habitats and if avoiding the significant conversion of natural habitats is not technically feasible, includes measures to mitigate or offset impact or programme activities	but as it is clubbed under once category therefore systematic screening is not taking place and posing E&S risks though those are identifiable and reversible in nature. Therefore, interventions to be taken up under the project would not convert or degrade natural habitats.	<p>habitats. 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.</p> <ul style="list-style-type: none"> Inter-departmental co-ordination especially with forest departments and revenue departments were major gap in protection and conservation of natural habitats. 	<ul style="list-style-type: none"> Cadastral-based data integration on natural resources in LRI based DSS will minimize risk of the interventions spreading into forest boundaries and common property resources. An inter-departmental committee may be suggested at PIA level including representative from forest department, revenue department, wildlife department in addition to officials from irrigation, watershed, agriculture and horticulture departments for making the program more effective and reduce any risk that may pose on natural and cultural habitats. The Committee would be responsible to observe that no natural or cultural habitats are affected by the planned interventions done for watershed development.
3	Physical cultural property and as warranted, provides adequate measures to avoid, minimize, or mitigate such effects.	<p>Presently these areas are getting avoided by virtue of public consultation at WDC and GP levels while finalising DPR but not by design.</p> <p>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</p>	<ul style="list-style-type: none"> There is system risk on avoiding Physical cultural property in absence of designed measure at planning stage to mitigate impact. Inter-departmental co-ordination is missing at implementation level which is important to bridge. 	<ul style="list-style-type: none"> Early screening of potential E&S risks and issues needs to be instituted in the process of the DPR preparation. 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. Inter-Departmental committee would be

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		natural values will not impact in the watershed area.		<p>effective intervention at the DPR stage who would minimise any negative impact on physical & cultural properties.</p> <ul style="list-style-type: none"> • 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-4(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	<ul style="list-style-type: none"> The Child Labour (Prohibition and Regulation) Act, 1986, amended in 2016 ("CLPR Act")³⁰ 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%³¹ of children in the age group of 5-14 years employed in agriculture in rural areas³². A large number of them working in land owned by their parents or other family members. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> Though there is system of advisories that is been issued to farmers on pest management but there is no system to check imbalanced use of chemical fertilizers that might result in soil 	<ul style="list-style-type: none"> Intensive agriculture with crop growing conditions, may lead to risks of overuse of chemical fertilizers, pesticides, etc, thus polluting groundwater and 	<ul style="list-style-type: none"> Advisories that are part of DSS system need to be demystified and documented and Control should be exercised towards overuse of insecticides and chemical fertilizers with formal pesticide

³⁰<https://labour.gov.in/childlabour/child-labour-acts-and-rules>

³¹<https://www.livemint.com/politics/news/where-is-child-labour-most-common-in-india-1549906952167.html>

³²<https://pib.gov.in/PressReleasePage.aspx?PRID=1539009>

Sl. No	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		degradation. Similarly, indiscriminate use of chemical pesticides builds up resistance among insect pests and 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.	downstream surface water bodies.	&fertilizer management plan. <ul style="list-style-type: none"> The awareness trainings on IPM, propagation of organic farming, multilayer farming, water conservation techniques, discouraging water intensive crop are regularly done by WDD and Agriculture and Horticulture Department.
3	Production, management, storage, transportation and disposal of hazardous materials	<ul style="list-style-type: none"> No system existed to identity and address this issue except for verbal commitment that in such scale of operation no hazardous material are either generated or used. 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. 	<ul style="list-style-type: none"> There is a system gap to report at State or PIU level and follow-up issues on Production, management, storage, transportation and disposal of hazardous materials. 	<ul style="list-style-type: none"> As REWARD being moderate risk category therefore it is recommended not to take up any activity that produces, storage, of involve in transportation and disposal of hazardous materials.
4	Safety for labors and public at construction sites	<ul style="list-style-type: none"> The Environment (Protection) Act No.29 of 1986, the central government is empowered to take measures necessary for protection of public health and 	<ul style="list-style-type: none"> During the planning and construction phase there will be activities related to trenching, civil construction, storage of raw and waste materials. Improper 	There is a need to devise mitigation measures which will minimize risks such as: <ul style="list-style-type: none"> Proper refilling of trenches and sampling sites with soil

Sl. No	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		welfare. <ul style="list-style-type: none"> All legal enactments related to protection of labors and labor welfare 	management of the above activities may lead to safety and health risks among the public and labors.	<ul style="list-style-type: none"> Covering of storage areas with tarpaulin Proper barriers and signage in excavated areas to prevent public from accessing the areas

ANNEX-4(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	<ul style="list-style-type: none"> Though not required for watershed program. However, the current system for any land acquisition follow the 'Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARA) Act, 2013' and further amendments in 2015', which 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. 	<ul style="list-style-type: none"> The analysis of other watershed projects in India and in Karnataka 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. 	<ul style="list-style-type: none"> 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-4(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 SC and ST population	<ul style="list-style-type: none"> The WDC-PMKSY guidelines does promote very detailed consultation process with community groups in order to prepare the watershed plan. For inclusion of vulnerable families in the developmental programs and to bring them to the mainstream, Government of Karnataka has enacted “Scheduled Caste and Tribal sub plan” Act 2013. As per the act, every department is mandated to spend the amount allotted under SCP, TSP to only to those vulnerable target beneficiaries. In general watershed activities are focused for land holding farmers. However, in order to address the equity, gender aspects and social inclusion with respect to landless families, special focus is provided to bring them under the umbrella of Self Help Group, nurture them with various training programs including the skill development training and the SHGs are supported with a financial assistance of Rs.25,000 as revolving fund grant to initiate 	<ul style="list-style-type: none"> The WDC-PMKSY guideline provides a detailed consultation process during initial phase when the DPR is being prepared. In Karnataka, with further changes in the operational guideline for KWDP-II to incorporate LRI based DPR preparation, there has been some deviation seen in the field with compromising the participatory processes. The watershed assistant/ agriculture assistant has limited capacity for social mobilization. This has impacted the community in general with some opting out of the program including some of the SC and ST framers who largely belong to small and marginal category. The current measures using SCP and TSP as per the Scheduled Caste and Tribal sub plan” Act 2013, though useful to some extent but it is too broad brushed and there is no specific measures seems to have been used in the past to address the specific needs of the SC and ST population in the watershed planning and implementation. 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, 	<ul style="list-style-type: none"> There is a need to converge with the Department of Tribal Affairs and design Tribal Development Plan in consultation with them. Also, at the watershed level, forest-based livelihood activities need to be included in the DPR wherever applicable, to propose and channelize appropriate funds for promoting and undertaking these activities.

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
		income generation activities and improve their livelihoods.	there is risk of exclusion and/ or benefit sharing being not equitable to SC and ST population.	
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.	<ul style="list-style-type: none"> 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. Even though majority of land holding is in the name of head of the family i.e. mostly male, there is attempt to provide equal opportunities to both men and women in the watershed programs in Karnataka in all the stages of implementation. Women focussed Self Help Groups (SHGs) are formed, nurtured and promoted for 	<ul style="list-style-type: none"> 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-lending 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. 	<ul style="list-style-type: none"> 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
		<p>inclusion of women in the watershed programs. Due share SHG members is provided in the Executive committee of watershed by including 4-6 women members from the SHGs and ensuring at-least 50% women representation in the Executive Committee (EC). Wherever, women headed Grama Panchayats are there as per the Karnataka reservation policy, in those gram panchayat ECs are also headed by women as GP president by default becomes the president of EC.</p> <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> There is a need to expand SHG coverage base with women who are otherwise left out of it especially from marginalized community. 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

Sl. No.	Planning Elements	Management System	Capacity, Risks and Gaps	Recommendations to align with Core Principle
			<p>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.</p> <ul style="list-style-type: none"> • One of the observations made during site visits to watersheds that majority of women in SHGs are over 40 years of age. This is largely because that is the age when they are relatively free from household chorus and can give more time to SHG/ community works. However, this also guides the reduced ability to learn and do newer things that requires higher risk-taking ability. It was felt that younger women between the age group of 20-35 are less risk averse and may have agility to learn and engage in newer activities such as marketing their produce through e-commerce platforms etc.. 	<p>inclusion.</p> <ul style="list-style-type: none"> • Gender disaggregated data to be collected as part of baseline to measure impacts and benefits on women. • Younger women (between the age group of 20-35) may need to be encouraged to join SHGs/ FIGs.

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

Category	Stakeholder groups
Primary Stakeholders	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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): STAKEHOLDER CONSULTATION

S. No.	Consultations Undertaken		Key Points
1	SLNA	<ul style="list-style-type: none"> Prabhash Chandra Ray, IFS, Project Director, Sujala-III Commissioner, WDD A. Padmaya Naik, Executive Director, Sujala-III, Director, WDD Prakash Kumar, DOC & IGA Specialist Smt. Ranjana B.K., Dy. Director Horticulture (Planning & Project Coordinator) Rashmi Alias, WDD, DDA (Head. cell) Lalitha Reddy, Joint Director Agriculture Dr. K. Satyanarayan, Nodal Officer Sujala-III, KVA, USU 	<ul style="list-style-type: none"> It is conveyed that LRI data-based Decision Support System has been worked out to address issues on soil moisture conservation and increase in water availability for longer period in the rainfed drought prone areas. It is aimed at 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' adaptation to climate change; and improving rural livelihoods. Therefore, program by design is taking care of E&S need. WDD tried to address execution of suggested Environmental Safeguards with existing Scientist at PMC i.e. at State Level. At State Level also, functionaries need staff support since they are already having huge pressure for their existing work. On above of it, at District, Taluka and Panchayat levels, there is a severe staff constraint. Suggested framework for implementation of Environmental Safeguards has not been followed due to issues of manpower availability and gaps within the existing institutional mechanism. It was suggested and accepted that an agency or NGO capable of implementing Environmental Safeguards and with their exposure on environmental/science, will be put into place at PIA level that would monitor that the environmental screening is done properly at planning stage and Environmental Data Sheets are there in all DPRs. The same agency/NGO would submit Detailed Appraisal Sheet to identify the environmental impacts and assist in designing mitigation measures. Under LRI, nearly 700 professionals with qualifications in agriculture/ computer application were trained, out of which 300 are highly skilled. These 300 already trained professionals can be utilized as LRI Extension Officers and can work exclusively for soil and water conservation. It is been discussed that exclusive MNE indicators need to be worked out for watershed program to monitor process and outcome with and without controls. At present there is no mechanism available for

S. No.	Consultations Undertaken		Key Points
			social audit as well.
2	Technical Partners	<ul style="list-style-type: none"> • Dr. Rajendra Hegde, ICAR, NBSSL, UP • Sudhindra Kumar S.N., SADH, DATC • Sandeep C. Hebick, M&D Consultant, Sujala-III • G.G. Kadalade, Assoc. Professor UAS, GKVK, Vellore • A.Satish, Professor UAS, GKVK • Dr. Sudha G., KAVAFSU, Bangalore • R. Prakash, Consultant 	<ul style="list-style-type: none"> • Detailed water budgeting has been worked out to keep the ecological flow required for the downstream users. • All existing structures and planned structures are geo-tagged and planned in such a manner that even upper ridge farmer get equitable benefits. • The LRI based decision-making system has been changed to thumb rule based data analysis to real time data of rainfall and run-off analysis. • There has been advisory issued and awareness training imparted to discourage farmers to grow water intensive crops like rice, banana, arecanut, etc. • With LRI based decision-making system, even elite farmers cannot negotiate for higher bunds, since watershed/agriculture assistant have clear scientific justification for particular height determination. By plantation of fodder trees on bunds, along with bund stabilization along farm ponds can create value for farmers having cattle and also reduce soil erosion. Karnataka has successfully demonstrated fodder silos and fodder slips, enriched fodder silage making and are now distributing fodder mini-kits to farmers. • LRI data and card has enabled the State to distribute input based on soil health and it has been reported there is reduction of 10% in fertilizer use while 8% increase in production.
3	PIA - GADAG	<ul style="list-style-type: none"> • Rudreshappa T. S., Joint Director Agriculture, Gadag • Veeresh Hungund, Deputy Director Agriculture, Gadag • Mallayya C.K., Assistant Director Agriculture, Gadag • Demonagoda Patil, ADM Agro-Industry • Ramesh, Assistant Director Horticulture • Narayan Bandi, Soil Science Sr. Scientist, KVK 	<ul style="list-style-type: none"> • One of the major issues faced by WDD are of availability of manpower for particularly watershed and soil conservation activities. Presently Agriculture Assistants or Watershed Assistants who are already overloaded with work related to micro-irrigations, seeds, crop demonstration etc. are responsible for water and soil conservation work. There is requirement of identifying, deploying and training of manpower who can work independently on water and soil conservation work. • There is no control on ground water extraction. On one side, watershed activities recharge ground water and on the other, extraction is very high. • In Gadag, while farmers have seen the availability of soil moisture and taken benefit
	PIA - KOLUR	<ul style="list-style-type: none"> • Dr. K Nayeem, Deputy Director Agriculture, Kolar • G. R. Bhavya Rani, Deputy 	

S. No.	Consultations Undertaken	Key Points
	<p>Director Agriculture, Muibaiu</p> <ul style="list-style-type: none"> • Amarnarayana Reddy, Assistant Director Agriculture, Mulbagal • Dr. Shivakumar H.K, Joint Director Agriculture, Kolar • Promod Kumar, Technical Officer, Kolar • Lokaraj, Assistant Agriculture Officer, Mulbagal 	<p>using second crop, still some farmers demolish the bunds to cultivate additional land without realising that damaged caused by them will adversely affect them.</p> <ul style="list-style-type: none"> • Paucity of time and absence of clarity lead to compromise the community consultation on draft DPR prepared using LRI • While farmers demand more check-dams, whether it is required or not, or whether the drainage line can support this - the intention behind this is to get water for irrigation • There is need for NGOs to support longer term than just during planning for better mobilization and support to marginalized community. • Though there have been attempts to follow wealth ranking system, there is no specific measures or support system for SC and ST community. Sometimes, that poses limitation as some of the community members take longer time to follow what is told to them • Therefore, PIU at Taluka level will be strengthened and their capacities will be enhanced to train Executive Committees at Village/Panchayat levels and report the same to District and State Level. • It was observed during field visit that there is increased chance of the interventions spreading into forest boundary and common property resources. Therefore, it would be suggested if layers on such land ownership and uses can be made visible in LRI/DSS platform, then such risk can be easily mitigated and informed decision can be taken regarding intervention areas. • NGOs were involved in IWMP and Sujala I but its involvement were almost negligible for this project except for facilitating manpower support, which too is limited to the salaries only. • There is gap in information on monitoring and reporting for surface water quality parameters particularly addressing the irrigation water quality. There are issues of heavy metal pollution in baby corn in Ramnagar District where industrial wastewater is been used for agriculture. For reporting status or any change in surface water quality, a framework needs to be worked out. • Change in ground water quality may also be critical and it may be suggested to report

S. No.	Consultations Undertaken		Key Points
			faecal coliform, residual pesticide, heavy metals in third party audit by external agency or any suitable protocol may be developed. There are areas, which could be prone to fluoride, iron, arsenic or any other heavy metal pollution.
4	WC/IC and SHG in Gadag	<ul style="list-style-type: none"> • Consultation done with around 50 villagers/beneficiaries and women representation was more than 50%. The group consisted of: <ul style="list-style-type: none"> ○ 5-6 representatives of WC/IC ○ Main Functionaries of 6 SHGs ○ Opinion leaders and elected representative among farmers groups ○ Landless Families 	<ul style="list-style-type: none"> • They welcomed the proposed watershed treatment activities • Water table has improved, leading to bore wells having availability of water • Earlier use to take only one crop, now they are able to take second crop as well leading to increased income from cropping • Increased vegetation and fodder – now they are able to support more animals • Implementation of watershed treatment activities; expect that watershed development activities would make agriculture more reliable by increasing water availability
5	WC/IC and SHG in Kolar	<ul style="list-style-type: none"> • Consultation done with 20-25 villagers/beneficiaries and women representation was more than 30%. The group consist of: <ul style="list-style-type: none"> ○ Around 10 representatives of WC/IC were present ○ Main Functionaries of 3 SHGs were there ○ Opinion leaders and elected representative among farmers groups were there ○ Landless families were there in the group 	<ul style="list-style-type: none"> • Wage employment through watershed treatment activities • LRI card and crop advisory have helped diversify crops for better yield in sustained manner • More physical structure such as check-dams will be useful • Training given but no revolving fund were given and hence can't start any micro-enterprise • Linkages with NRLM and Mudra yojna have yielded in getting more funds and wider training • Skill training given on tailoring • Traditional crafts are not promoted with training and market linkages • Increased availability of labour demand for cultivation, given water availability for second crop • Wage employment through watershed treatment activities • Alternate income source to be identified
6	NGO, FPO and KVK/RSK at Gadag	Consultation and visits were done in KVK/SRK at Gadag and discussed with their functionaries. Also, consultation was done with representative of FPO.	<ul style="list-style-type: none"> • Like to be involved in the project, playing facilitative roles in areas such as social mobilization, capacity building, institution-building such as constitution of Watershed Committees and post-project handholding, and income generation and federations.

S. No.	Consultations Undertaken	Key Points
		<ul style="list-style-type: none"> • Expect an independent role in discharging their responsibilities in project implementation/facilitation. • Staff strength should be increased to effectively implement the project. It is currently stretching to its limit. Any additional area beyond what is being committed will require additional field staffs. • Strengthening capacity building of field staffs will help improve efficient program implementation

ANNEX-5(C): LIST OF PARTICIPANTS – ESSA STAKEHOLDERCONSULTATION

(WebEx online meeting) on ESSA Conducted on 13th August, 2020

Sl. No.	Name (Mr./Mrs./Dr.)	Designation	Institution	Contact No. & e-mail ID
1	K. R. Gurumurthy	Joint Director of Horticulture	WDD	8277934109
2	Shobha H.B	Joint Director of Agriculture (Soil Conservation)	WDD	8277934097
3	Umber Farid	Joint Director of Agriculture (IGA)	WDD	8277930318
4	M. R. Suma	Joint Director of Agriculture (Agronomy)	WDD	8277934173
5	Geetha Halli	Deputy Director of Agriculture, Sujala	WDD	8277930267
6	Thimmaya A.G.	Deputy Director of Agriculture (Watershed Cell)	WDD	8277934166
7	Devaki N.k.	Chief Accounts Officer	WDD	9632491234
8	K. Ramakrishnaiah	Deputy Director (Planning)	WDD	8277934174
9	Nagaraja H.M	Deputy Director I/c Geologist Office of the Director	Groundwater Directorate	
10	M. Sekhar Muddu	Professor	IISC-Bangalore	9845096259
11	Rajendra Hegde	RC, Principal Scientist & Head	ICAR-NBSSLUP	9448738297
12	P.L. Patil	Director of Research & Nodal Officer, Sujala-III,	UAS-Dharwad	9448861025
13	U. Sathish Kumar	Professor, Dept. of Agril. Engineering,	UAS-Raichur	9448973765
14	K.T. Gurumurthy	Professor, Dept. of Soil Science & Agril. Chemistry,	UAHS-Shivamogga	9449452607
15	C.N. Prabhu	Senior Scientific Officer,	KSNDMC Bangalore	8762171751
16	Satyanarayana	Professor	KVAFSU	
17	Pramod Babu	Technical Officer I/c	Kolar	8277932055
18	K.H. Ravi	Joint Director of Agriculture	JDA Office Hassan	8277931700
19	T.S. Rudreshappa	Joint Director of Agriculture	Gadag	8277931400
20	Puttanna	Assistant Director of Agriculture	ADA Office Koppal	
21	H.S. Sateeshkumar	DTC	JDA Office Koppal	
22	Veeresh Hunagund	Deputy Director of Agriculture	Gadag	8277931401
23	A.S. Kokila	Deputy Director of Agriculture	DDA-1	8277931701

			Hassan Taluk	
24	Sushma K.C.	Deputy Director of Agriculture	DDA-2 Sakleshpura Taluk Hassan District	8277931702
25	R. Smita	Deputy Director of Agriculture-1,	Dharwad	
26	H. Huliraj	Deputy Director of Agriculture-1	Chitradurga	8277930950
27	Parmesh	Assistant Director of Agriculture	Belur Taluk Hassan District	8277931736
28	Ajaykumar R.	Assistant Director of Agriculture	Hassan Taluk Hassan District	8277931753
29	Ashok M.	Assistant Director of Agriculture	Arsikere Taluk Hassan District	8277931724
30	Rashmi	Assistant Director of Agriculture	Channarayapatna Taluk Hassan District	8277931709
31	Sapna K.H.	Assistant Director of Agriculture	Holenarsipura Taluk Hassan District	8277931720
32	Janardhan M.S.	Assistant Director of Agriculture	Sakleshpura Taluk Hassan District	8277931770
33	Thimmanagowda Siddappa Patil	Assistant Director of Agriculture	Alur Taluk Hassan District	8277931705
34	K H Ramesh kumar	Assistant Director of Agriculture	Arkalgudu Taluk Hassan District	8277931712
35	Mallayya Koravanavar	Assistant Director of Agriculture	Gadag	8277931407
36	Savitha B N	Agriculture Officer / Technical Officer	Hassan JDA Office	8277931756
37	Shivakumar Kashappanavar	Agriculture Officer DDA Office	Gadag	8277931408
38	Devappa G.K.	Technical Officer	Chikkaballapur	8277930812
39	Malati R	Agriculture Officer, DDA-1 Office	Dharwad	
40	Jayashree Y	Agriculture Officer, DDA-2 Office	Hubli	
41	Chandrakumar N.	Technical Officer , DDA-1 Office,	Chitradurga	8277931027
42	Girish Reddy M.C.	Technical Officer , JDA Office,	Chitradurga	8277930964

ANNEX-5(D): LIST OF PARTICIPANTS AND KEY SUGGESTIONS

Stakeholders Consultative Workshop on Environmental and Social Systems

Assessment (ESSA) under REWARD Program at DATC Mysuru

Summary of Participants Details

Sl No.	District	Category of participants											
		G.P Member	E.C Member	U.G Member	F.P.O Member	N.G.O Reps	S.H.G Member	W.A	S.C Farmer	S.T. Farmer	Agri Labour	others	Total
1	Shivamogga	1	2	1	1	-	1	1	1	1	1	-	10
2	Kolar	1	1	1	1	1	1	1	1	1	1	-	10
3	Tumakuru	1	1	1	1	1	1	1	1	1	1	-	10
4	Chamarajanagar	-	1	2	1	1	1	1	1	1	-	-	9
5	Chikkahallapur	1	1	1	1	1	2	1	1	1	1	-	11
Batch-I Total		4	6	6	5	4	6	5	5	5	4	-	50
1	Bellary	2	-	1	1	1	-	2	1	1	-	1	10
2	Chitradurga	2	1	1	1	1	1	1	1	1	-	2	12
3	Chikkamagaluru	-	-	5	-	1	-	1	1	1	1	1	11
4	Hassan	3	1	1	2	1	1	1	1	1	1	2	15
5	Davanagere	1	1	1	1	2	1	1	1	1	1	-	11
Batch-II Total		8	3	9	5	6	3	6	5	5	3	6	59
Grand Total		12	09	15	10	10	9	11	10	10	7	6	109

Stakeholders Consultative Workshop on Environmental and Social Systems

Assessment (ESSA) under REWARD Program at DATC Vijayapur

Summary of Participants Details

Sl No.	District	Category of participants											
		G.P Member	E.C Member	U.G Member	F.P.O Member	N.G.O Reps	S.H.G Member	W.A	S.C Farmer	S.T. Farmer	Agri Labour	others	Total
1	Raichur	1	1	1	1	1	1	1	1	1	1	-	10
2	Koppal	1	1	1	1	1	1	1	1	1	1	-	10
3	Gadag	1	1	1	1	1	1	1	1	1	1	-	10
4	Kalahuragi	1	1	1	1	1	1	1	1	1	1	-	10
5	Yadagiri	1	1	1	1	1	1	1	1	1	1	-	10
Batch-I Total		5	5	5	5	5	5	5	5	5	5	-	50
1	Dharwad	1	1	1	1	1	1	1	1	1	1	-	10
2	Bidar	1	1	1	1	1	1	1	1	1	1	-	10
3	Haveri	1	1	1	1	1	1	1	1	1	1	-	10
4	Vijayapur	1	1	1	1	1	1	1	1	1	1	-	10
5	Belagum	1	1	1	1	1	1	1	1	1	1	-	10
6	Bagsalkot	1	1	1	1	1	1	1	1	1	1	-	10
Batch-II Total		6	6	6	6	6	6	6	6	6	6	-	60
Grand Total		11	11	11	11	11	11	11	11	11	11	-	110

CONSOLIDATED PARTICIPANTS FEEDBACK
of Two day Stakeholders Workshop on ESSA under REWARD Project
Date: 04 & 05 February 2021

Place: District Agriculture Training Centre, Naganahalli, Mysuru

Sl No	Questions for Feedback, Suggestions and Concerns	Stakeholders feedback
1	Community Participation in planning, Construction	<ol style="list-style-type: none"> 1. Identification and implementation of EPA, which has larger impact on community. 2. Use of PRA as an effective tool while Planning. 3. Ensure participation from all Communities. 4. Awareness through Gramasabha, Wardwsabha, Steet plays, Video Shows on evening time. 5. Giving importance to SHG members, Progressive farmers and Gram Panchayath members, giving them the leadership. 6. Conduct Gramsabha very effectively with meaningful agenda by ensuring people participation.
2	Community participation in operation and maintenance	<ol style="list-style-type: none"> 1. Need to strengthen Capacity Building of CBO's. 2. Formation of asset management committee at Village level during Post Project Phase 3. Assets responsibilities to be assigned to local Users groups during Post Project Phase. 4. During Post Project Phase- Taking decision in WMC, but Maintenance and operations of structures should be through department instead of GP. 5. Farmers share should also be collected from User group and kept as maintenance fund (For Community assets) 6. Instituting user agreement ensures proper asset usage. 7. Watershed management committee has to take decision regarding management.
3	Strengthening capacity of Watershed committees User Group, Common Interest Group.	<ol style="list-style-type: none"> 1. Ensuring Quality training with effective visual aids is essential (at Village Level). 2. Organising Exposure visit to the Model Watershed Areas/ Plots will help to motivate the community. 3. Motivating and Developing selected local progressive farmers to adopt model Watershed approach with IFS and organic farming practices. 4. Motivation and compulsory inclusion of marginal farmers.

		5. Conduct effective training on IFS and Organic Farming in Local progressive farmer fields.
4	Including women in watershed institutions, Planning and construction and maintenance	<ol style="list-style-type: none"> 1. Encouraging women in FPO Governing body and FIGs and developing model FPO. 2. IGA activities should be implemented effectively. 3. Other activities like organising women Health Camps, Use of Smokeless Chula, female education support, facilitating higher education for girl child will encourage more women participation. 4. Meticulous planning and implementation of IGA follow up support, Bank Linkage and Market linkage has to be provided. 5. Inclusion of minimum 25% Farm Women in all User groups or FIG should be compulsory.
5	Livelihood Support to Poor, Landless and Marginal Farmers	<ol style="list-style-type: none"> 1. Proper planning for utilisation of fallow lands by landless farmers with norms thereby improving the environment. 2. More emphasis has to be given for traditional income generating activities and creating local market linkage. 3. Preparing viable and Profitable IGA action plan Capacity Building, Bank linkage, Market linkage and Continuous follow up is very important. 4. Encouraging marginal Farmers to adopt Integrated farming system.
6	Special Considerations in Tribal Schedule V Areas: Inclusion of Tribal Communities In Project Interventions,	<ol style="list-style-type: none"> 1. Awareness creation in tribal community through community meeting and trainings. 2. Encouraging traditional practices and activities without hindering their culture and emotions. 3. Training on Bee-keeping Marketing linkages and follow-up. 4. Encouraging Planting of local tree Species like Bamboo, which can yield raw materials for Tribal.
7	Any concern regarding Grievance Management System?	<ol style="list-style-type: none"> 1. Installing Complaints Box at Gram panchayat and Village level. 2. Ensuring Solutions for the complaints within 15 days. 3. Nominating a Nodal Officers or Special Officer or Committee formation for addressing grievances. 4. Conducting regular Grama sabha and assigning responsibilities to EC to address grievances. 5. Developing a transparent and addressable module with time limits to address grievances.
8	Does the ESSA reflects the	1. Formation of Village level Sub-committees to discuss,

	current system and ground realities?	<p>Plan and supervise implementation of Watershed activities while conserving environment and social safe guards.</p> <p>2. It is very effective system.</p>
9	Are there any other Environmental and Social Risks and gaps that is missing in the assessment?	<p>1. Monitoring and Evaluation through expert team at field level is essential at least three times in a year. (Planning, Implementation and Post Implementation)</p> <p>2. Provision to discuss M & E observations in Gramashabha and EC meetings, ensuring regular compliance.</p>
10	Any Suggestion on making the recommendations more sharper and easy to implement?	<p>1. Use of Satellite based digital technology using Mobile Apps for preparing action plan, works monitoring and transparency.</p> <p>2. Data collection, consolidation of Base line survey data through Mobile Apps.</p> <p>3. Ensuring release of funds in time as watershed works should be taken up in lean season.</p> <p>4. Implementation of watershed programme as per PERT chart.</p> <p>5. A separate implementing Officer (AAO) should be notified for implementing watershed works at each project.</p> <p>6. Making use of already collected data for REWARD Project</p> <p>7. Ground truthing of LRI based action plan and social confirmation through PRA.</p>
11	Any suggestions for better implementation of environmental and Social safeguard Activities?	<p>1. Creation of Expert teams, regular meeting and advisory support can be given.</p> <p>2. Adoption of roof water harvesting and ground water recharge activities are very important.</p> <p>3. Promotion of micro irrigation and micro nutrients in project area is most important.</p> <p>4. Restricting over exploitation of ground water by limiting depth of borewell</p> <p>5. Importance should be given for Animal Husbandry.</p> <p>6. As Agriculture and Watershed Department has been merged, Watershed programmes are not being implemented in time, so separate Officer at RSK level has to be appointed for the implementation.</p> <p>7. Even after implementation also, It needs Regular follow up.</p>

CONSOLIDATED PARTICIPANTS FEEDBACK
of Two day Stakeholders Workshop on ESSA under REWARD Project

Date: 08 & 09 February 2021

Place: District Agriculture Training Centre, Vijayapur

S.No	Questions	Stakeholders Feedback
1	Community Participation in Planning, Construction	While planning all categories of farmers (i.e SC, ST, SF, MF etc) and all aged farmers have to participate, then it will reach the objectives of the project.
2	Community Participation in Operation & Maintenance	All community farmers must be involved in community participation to run the project successful and longer period.
3	Strengthening Capacity of Watershed Committees, User Groups, Common Interest Groups.	To conduct more number of trainings to all groups, field visits, agri educational tours and exposure visits to farmer interest groups (FIG), UG's, NGO's, SHG's and already successfully running project areas and even after the completion of project, hand over the project area to concern groups.
4	Including Women in Watershed Institutions, Planning and Construction & Maintenance.	Women participation is important in the project because woman is know for commitment to the work and dedication compare to men and also increase the financial position of women in the society and also make the woman independency.
5	Livelihood Support to Poor, Landless and Marginal Farmers.	It is important to involve poor, landless and Small farmer, Medium farmer to increase their financial position and it also avoid migration of farmers and also include agriculture allied activities like poultry, fisheries, dairy farming etc with the help of Government schemes like Narega
6	Special Considerations in Tribal Schedule V Areas: Inclusion on Tribal Communities in Project Interventions.	Inclusion of Tribal farmers in this project will enhance financial position of ST farmers, ultimately they will come to the main stream of society.
7	Any concern regarding Grievance Management System?	It is necessary to open separate help desk at district level and make janaspandana programme more effective.
8	Does the ESSA reflects the current System and ground realities?	Give the more importance to conserve the forest, Horticultural trees etc and implement the legal policies like putting the fine for deforestation activities.
9	Are there other Environmental & Social Risks & gaps that is missing in the assessment?	Give the more importance for forestation with the help of concerned SHG, UG & NGO's.
10	Any suggestion on making the recommendations more sharper & easy to implement?	Use of social media's like Radio, TV, News paper and as per the action plan. The work has to complete and grants must be released in time will help easy for implementation of scheme with the co-ordination of all agricultural and allied departments and adaption of season wise cropping pattern.
11	Any suggestions for better implementations of Environmental & Social Safeguarded Activities?	Detailed information of the schemes advantage and disadvantage s must be known by all stake holders and cost benefit ratio (CBR) of the scheme must be known by the beneficiaries and also give the more importance for soil and water conservation activities like check dam, Nala bund, contour bund, farm ponds etc.

ANNEX-6: DESCRIPTION OF E&S MANAGEMENT SYSTEM

13. 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
		(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

Sl. No	Result Area	Key Focus Areas	Key Risk and gaps	Potential Measures to align with ESSA Core Principles
		(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: Science-based 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
		(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

Sl. No	Result Area	Key Focus Areas	Key Risk and gaps	Potential Measures to align with ESSA Core Principles
		(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-7: TYPICAL SIZE AND COST OF PHYSICAL STRUCTURES UNDER WATERSHED PROGRAM

Table: 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/ Nala Bund	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			
Gokatte (water body for cattle)	Mostly on Government / Panchayat Land/ CPRs	Construction/ Rejuvenating existing Gokattes	Average unit cost ranging between 3 - 4 lakh
Soil conservation			
Contour trench cum bunds	Mostly on Private land	5m length, 1.0 m width, height 0.45 to 0.6m and berm 0.6m for pit to pit and bund	Average unit cost - 0.18 to 0.24 lakh /Ha
Contour bunds, Graded bunds	Mostly on Private Land	On Contour lines	
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 10x10x3Dmtrs/ 12LX 12W X 3D mtrs. to 21LX 21WX 3D mtrs.	Per unit cost ranging between – 0.5 - 2 lakh
Recharge pits/ mini percolation tanks,	Mostly on Private Land; also on Govt land	Very small size usually 2m x 1m-1.5m x 1m / 10-15 m length	Per unit cost ranging between – 0.3 / 2.5 lakh
Shallow wells, Open well Recharge, Bore well recharge	Mostly on Private Land		

ANNEX-8: 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 notified Eco Sensitive Zone in the			

Sl.No.	Criteria / Information to Check for	Details	Category/Type	Issues or Management Measure in brief
	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 medicinal 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			
2.6.4	If draining line treatment is done details need to be added about HFL vis a vis bund height and how			

Sl.No.	Criteria / Information to Check for	Details	Category/Type	Issues or Management Measure in brief
	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-9: 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 (Amendment and Validation) Act,			High	If yes, any interventions should be avoided ³³ .

³³ 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 metres construction. 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		
	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.
9	Does the intervention work involve requirement of additional land for upgradation/ expansion through transfer from another government department for lands such as			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		
	pasture/grazing land, natural habitats or other common use land?				
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-10: 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
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	<p>indigenous varieties.</p> <p>2. Debris management to be done so that it is not left in the agriculture field and thereby impact soil quality.</p> <p>3. No child labour or forced labour to be involved.</p>
Farm pond	Size of the farm pond-maintained varies from 10x10x3Dmtrs/ 12LX 12W X 3D mtrs. to 21LX 21WX 3D mtrs.	<p>1. Fencing of farm ponds especially those closer to habitations to avoid any accidental fall and personal injury to humans including children and animals.</p> <p>2. Upper ridges need to be treated with grasses and plantation to restrict silt movements.</p>
Recharge pits/ mini percolation tanks,	Very small size usually 2m x 1m-1.5m x1m / 10-15 m length	<p>1. All such structures need to be fenced and adequately closed to avoid accidents to children, animals and address risk to safety concerns.</p> <p>2. Signage with local language to be displayed which would make the local community aware of its location.</p>
Shallow wells, Open well Recharge, Bore well recharge		