

DOLR

Strategic Environment and Social Assessment – Phase 1

Neeranchal

Thematic Area: Potential Impacts and Mitigation Measures

**SESA Team
12/10/2013**

DRAFT 6

Table of Contents

Abbreviations	i
Executive Summary	iii
1. Strategic Environment and Social Assessment (SESA).....	1
1.1 Neeranchal and the purpose of the SESA	1
1.2 Background of the Integrated Watershed Management Programme	2
1.3 Implementation Mechanism of the IWMP	3
1.4 Impact of investments made in IWMP	4
1.5 Scope and allocation of primary investments under IWMP	5
1.6 Key challenges in environmental and social sustainability of these investments	6
1.7 Opportunities in environmental and social sustainability of these investments	12
1.8 Compliance of the current IWMP interventions in sample States with overall IWMP guideline (policy level)	13
1.9 The SESA Report and its Methodology	14
1.10 Selection of States and Districts.....	15
1.11 Outline of sections covered in SESA	15
2. Environmental and Social Issues and Risks	17
2.1 Introduction	17
2.2 Environmental Issues and Risks	18
2.3 Social Issues and Risks.....	25
2.3.1 Social Diversity of Watersheds	25
2.3.2 Stakeholder/ Beneficiary Influence	27
2.3.3 Expectations of the Stakeholders/Beneficiaries	28
2.3.4 Issues of Significance/ Risks and Perceived Impact on Stakeholders/Beneficiaries.....	29
2.4.1 Capacity Building at the Watershed level:	36
2.4.2 Capacity Building at the PIA level:.....	37
2.4.3 Capacity Building at the District level:.....	37
2.4.4 Capacity Building at the State level:.....	37
2.4.5 Capacity Building at the National level:	37
2.5.1 Shortfalls / gaps, and needs / requirements (Central, state, district and local issues)	39
3. Environment and Social Management Framework.....	41
3.1 World Bank Safeguards Policies triggered and applicable GOI policies	41

3.2 Screening and Categorization of Sub-Project activities	44
3.3 Potential Impacts and their Mitigation	45
3.4 Safeguards Implementation Arrangements.....	56
3.5 Pest Management Plan (PMP) and Integrated Pest Management (IPM) Strategy.....	57
3.6 Indigenous People Development Framework and Plan.....	59
3.7 Capacity Building Strategy at the State/District/Watershed level.....	66
3.8 Safeguards Monitoring Plan.....	69
4. Recommendations	72
4.1 Recommendations Environment:	72
4.2 Recommendations- Social.....	73
Annexes.....	78
Annexure I: Stakeholder / beneficiary identification, mapping and roles- Current Status.....	79
Annexure II: Environment and Social Management Plan	92
Annexure III: Current IWMP Institutional Arrangements.....	99
Annexure IV: Integrated Pest Management Strategy	102
Components of IPM	102
Annexure V : List of banned Pesticides, Pesticides Refused Registration in India and WHO Class 1A and B and Class II.....	105
Annexure VII: Team Members and SESA Terms of Reference	112

Abbreviations

AC	Administration Cost
APD	Additional Project Director
APDAI	AP Drought Adaptive Initiatives
C	Consolidation
CB	Capacity Building
CB &T	Capacity Building and Training
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIG	Common Interest Group
C/LA	Community / Livelihood Activist
CLRC	Cluster Livelihood Resource Centre
CLW	Community Link Workers
CPR	Common Property Resource
CRP	Community Resource Person
DA	Dearness Allowance
DoRD	Department of Rural Development
DoLR	Department of Land Resources
DLRC	District Livelihood Resource Centre
DPAP	Drought Prone Area Programme
DPR	Detailed Project Report
DRDA	District Rural Development Agency
DWMA	District Watershed Management Agency
EAS	Employment Assurance Scheme
EFMS	Electronic Fund Management System
EPA	Entry Point Activity
EVA	Evaluation
FGD	Focus Group Discussion
FTO	Funds Transferring Order
GIS	Geographical Information System
GoI	Government of India
HLP	Household Livelihood Action Plan
I&CB	Institutional and Capacity Building
IGA	Income Generation Activities
IT	Information Technology
IWMP	Integrated Watershed Management Programme
LIV	Livelihoods
LST	Livelihoods Support Team
MC	Management Consultant
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MIS	Management Information System
MON	Monitoring
MPDO	Mandal Parishad Development Officer
MPRs	Monthly Progress Reports
MWS	Micro Watershed
NGO	Non-Government Organisation
NRM	Natural Resource Management
NTFP	Non Timber Forest Produce

PD	Project Director
PIA	Project Implementation Agency
PoP	Poorest of the Poor
PRIs	Panchayati Raj Institutions
PS&ME	Production System and Micro Enterprise
PSI	Productivity System Intensification
PTG	Primitive Tribal Group
SERP	Society for Elimination of Rural Poverty
SESA	Strategic Environment and Social Assessment
SHG	Self Help Group
SLNA	State Level Nodal Agency
SSAAT	Social Audit, Accountability and Transparency
TA	Travel Allowance
ToT	Training of Trainers
UG	User Group
VO	Village Organization
VSS	Vana Samrakshana Samithi
WA	Watershed Association
WBR	Well Being Ranking
WC	Watershed Committee
WCC	Watershed Computer Centre
WCDC	Watershed Cell cum Data Center
WDF	Watershed Development Fund
WDT	Watershed Development Team
WF	Work Force
WPP	Watershed Point Person
WRP	Watershed Resource Person
WUA	Watershed User Association
ZP	Zila Parishad

1. The Department of Land Resources, Government of India in collaboration with World Bank has undertaken a 'National Watershed Development Project' called *Neeranchal*, which proposes to positively influence the Integrated Watershed Management Programme (IWMP) with technical and financial support. The *Neeranchal* supported States include rain fed states of Maharashtra, Madhya Pradesh, Andhra Pradesh, Chhattisgarh, Gujarat, Odisha, Jharkhand and Rajasthan.
2. The complementarity between IWMP and Neeranchal is that while IWMP aims at restoring ecological balance by harnessing, conserving and developing degraded natural resources such as soil and vegetative cover and water, Neeranchal aims at providing such technical and financial support so as to ensure "Increased incomes through enhanced agricultural production and improved sustainability of natural resources through better watershed management among the people living in selected micro-watersheds in eight States, by adding value to IWMP programs through institutional reform, capacity building, the development and application of best practices, and convergence with other Government project."
3. People living in watershed areas draw their livelihoods from natural resources either directly and/or indirectly, including farm based incomes. This necessitates identification of critical issues around their livelihoods and environmental and social context to ensure that neither people nor their environment is impacted negatively with the proposed activities of the project and that any potential adverse impacts are duly safeguarded.
4. As part of preparatory activities of *Neeranchal* and to identify and mitigate such issues, safeguards requirements are in place for which an impact-centered Strategic Environment and Social Assessment (SESA) Part I was undertaken. It focuses on the current affairs of IWMP, impacts of ongoing and planned investments, institutional capacities and challenges as well as environmental and social risks, project specific monitoring measures and recommendations for a way forward. The findings are based on an analysis of watersheds in four districts spread across four states¹. Since a detailed policy level review has not been undertaken in SESA Phase I, it will be undertaken under SESA Phase II, which would be a policy centric SESA.
5. The methodology for conducting the SESA phase 1 included stakeholder consultations, situation analysis, risk analysis, secondary review of literature and data available at the national, state, district, block/project, watershed and community levels. Field visits were undertaken to each of the selected districts/states. Stakeholder mapping and consultations at the watershed level was undertaken with farmers (marginal/small/medium/large), Women, landless or asset less, Agriculture labourers or daily wage workers, Livestock keepers, people practicing other traditional occupations such as pottery, weaving, leaf plate making (non-farm), Indigenous People, Villagers, SHGs, User Groups and the Watershed Development Committee and representatives of implementing agencies.
6. Some of the key challenges and opportunities identified in SESA phase 1 vis-à-vis IWMP includes:

Key Environmental Issues/Risks/Challenges:

- Shortages in surface and ground water in rain fed areas and the absence of appropriate measures (scientific) to address the issues of water-induced soil erosion.

¹ Odisha (Kandhmal), Andhra Pradesh (Mehboobnagar), Maharashtra (Ahmednagar), Madhya Pradesh (Dewas)

- Loss of top soil, soil nutrients and soil moisture due to inadequate soil erosion control measures in some watersheds.
- Increasing trend in fallow lands and wastelands, mono cropping , lack of crop rotation, loweing crop yields, poor coverage of fodder crops, and inadequate horticulture uptake.
- Inadequate development of afforestation and social forestry measures in the watersheds (regardless of the state). Potential convergence opportunities for undertaking afforestation and re-vegetation not fully utilized. The risks of introduction of exotic and invasive species remain.
- Indiscriminate use of pesticides (including banned pesticides) and the risk of water pollution are real. Coupled with imbalanced and overuse of fertilizer dosage and other agrochemicals (insecticides) are causing soil degradation. Integrated Pest Management (IPM) approaches are available but not yet integrated fully in the cropping cycle. Non availability of alternatives (bio-pesticides and bio-fertilizers) at the local level is a concern.
- The increasing menace of aquatic weeds covering natural water bodies and water courses is becoming a management issue and impacting the local ecology. Also, many local varieties and landraces are in danger of disappearance due to large-scale promotion of high yielding varieties.

Key Social Issues/Risks/Challenges:

- Exclusion of landless/asset less, marginalised people and indigenous people because the mechanism in which people are selected and process of rooting funds through SHGs which may not necessarily include these people in their groups. The impact of a programme is more beneficial for people who have land rather than the landless. Usually a micro watershed of average size of 500 ha would receive about Rs.5 lakh 40 Thousands as fund for asset less families. With the above provisions there needs to be about 22 groups so that each group can receive Rs.25000.00. However, it would be difficult to find so many asset less families to form so many groups, which means, this portion will either be largely unspent, or non-asset less families will also get benefitted.
- Consultations at watershed level revealed grievances around partiality of the IWMP initiatives in favour of people owning land. Since ownership of land is in disproportionate ratio among Medium, Large farmer, Small and Marginal farmer, this proportion also gets reflected in accessing the benefits of IWMP. Medium and Large holding, i.e. about 60% of land gets the benefit of IWMP in that proportion.
- PIAs have limited knowledge and capacities to address issues around social capital such as livelihood generation, inclusion and identification of stakeholders which has an impact on project outcomes.
- Value addition to agriculture, horticulture produce and NTFP, collective bargaining and sale is not practiced and therefore in the absence of market linkages and storage provisions, people run a loss even if production/ collection is more. Further, for indigenous communities, seasonal livelihoods need to be understood and their livelihoods strengthened accordingly. No special efforts by the SLNA, WDCs, PIAs and their teams regarding interventions for the indigenous people, given that their needs are different from others. Lack of clarity on issues relating to indigenous community and their livelihood pattern, capacity building needs, special interventions for women and outreach given their geographical location.
- Activities like horticulture development, drip irrigation, etc., which requires more than Rs.50000.00 in execution of a hectare of area, is being difficult to implement because of ceiling limit of Rs.24000.00 per ha of land, as per the Common Guidelines-2008 for IWMP.
- Livelihood connect of NRM activities was found missing in almost all the states. With the ridge to valley system the treatment starts from top and by the time it reaches the agriculture land the project faces lack of fund.
- There is not much effort from the PIA to mobilize women of the area in the programme. The awareness generation efforts were carried out in the main villages, however, there were no

special efforts put in to reach out to women members of the society. The MPR or state MIS of all the states didn't have any system to track women empowerment related indicators, neither there were any system in any the State to appraise DPR from Gender or equity aspect for approving it. In the absence of any support system, appraisal system and proper sensitization exercise, chances are there that the gender aspect of the programme may be weak.

- Many assets-less/ landless were missed out from the wellbeing ranking because they were away during the survey for earning their daily wages. As a result, they are neither part of planning, nor implementation and are not even aware of the project.
- Cropping of sugarcane in rain fed areas post availability of water with IWMP intervention is alarming, and needs concentrated efforts. This was seen in Madhya Pradesh and Maharashtra.
- Tendency for having more milch cattle because of fodder availability owed to IWMP, although there are no chilling plants.
- Value addition to Non-Farm Timber Product (NTFP) as nonfarm livelihood activity not considered, although NTFP is largely available especially in States with large forest cover such as Andhra Pradesh and Odisha. Further indigenous people including the PTGs have a forest based economy, when living on hills rather than a farm based.

Key Institutional Issues/Risks/Challenges:

- Constitution of State Level Nodal Agency (SLNA) with professional support in each state is complete and so is the establishing of Watershed Cell-cum-Data center. Project supervised by Project Implementing Agency (PIA) with Watershed Development Team (WDT) comprising of 3 to 4 technical experts exists, however, there are issues relating to the HR Policy/administration/finance/convergence. High attrition rate and poor project implementation/performance is observed due to administrative limitations, limiting domain knowledge with multiple responsibilities etc. Training Needs Assessment is lacking to provide customized support to deployed staff. In most cases, Resource Agencies for skill development and training are not yet in place.

Opportunities

- Restoration of the vegetative cover for enhanced NRM and ecosystem services on the lines of watershed interventions that result in preventing further losses of biodiversity. Activities under IWMP focusing on increasing area under vegetation and grasses through afforestation, increase in availability of green and dry fodder both in quality and quantity, increase in availability of crop stalks as dry fodder and habitat improvement through soil and moisture conservation works.
- Providing a larger scope to farmers (marginal, small, medium and large) for increasing their agriculture production and that improve their income (economic condition) and enhance their wellbeing by providing soil and moisture conservation measures, availability of water and technical know for improved agricultural production.
- Effective use of wellbeing ranking for identifying need based interventions for the bottom 40% of the poor inhabitants in the watershed and effectively delivering agricultural interventions to the poor and marginal farmers.
- Addressing the increasing gap between required and available fodder for improving cattle productivity benefiting landless livestock owners. The soil conservation measures, watershed structures would benefit livestock keepers thereby increasing the beneficiary base.
- There is scope for short term employment of the landless people during construction of watershed structures and undertaking soil and moisture conservation measures. In addition there are livelihood generation opportunities for the landless by innovatively using natural resources and potential for increasing household incomes through value addition to the existing Non Timber Forest Produce (NTFP) trade.

- There is an opportunity to deepen programmes focusing on people’s involvement through a transparent, inclusive and sustainable process that not only covers the bottom 40% of the poor and marginalized, but also result in increased participation of watershed inhabitants. This could gradually shift people’s dependence on only Government programmes towards a higher level of ownership of watershed activities.
 - IWMP has provided a platform for convergence and dovetailing with other Government programmes for the benefit of people. MNREGS is one such successful convergence. However, convergence with other line departments (agriculture, horticulture, animal husbandry, forest, tribal development, women and child development, renewable energy and health) will provide further scope for varied need based and holistic intervention, be it for livelihoods, entry point activities or for the general wellbeing of people.
- 7. Compliance of the current IWMP interventions in sample States with overall IWMP guideline (policy level):** There are shortages in respect to complying with Government of India (GOI) policies and the Common Guidelines. For example, suitability of size and structures built are sometimes not in conformance with the topography. There is little understanding and/or awareness of various GOI policy details. The structures are largely as per engineering guidelines. The relationship of IWMP and weaker sections of the society, such as Women, Indigenous people, Poor and Asset-less people was not significant indicating poor participation of these sections. Some states (Maharashtra) are lagging in developing the livelihood plans whereas, some other states (Orissa) have undertaken wellbeing ranking but benefits flowing to IWMP beneficiaries may not be need based given that their livelihoods needs vary based on their geographical location. In some States irrespective of having DPRs and conducting wellbeing ranking there is mismatch in what is planned and that which is implemented and interventions limited to the elite, influential or those having access to functionaries of the project thus putting some projects at risk. Further, given that some of the IWMP interventions come under scheduled areas, compliance with the 73rd amendment, convergence with forest department and its policies and other Government of India policies needs to be explored.
- 8.** Neeranchal focuses on providing technical capacities and support to the IWMP initiative so that both environmental and social goals are achieved. However, to identify where technical support is required, environmental and social issues in four sample states were explored based on the methodology discussed earlier. Diversity in physical structures (watersheds) as well as social milieu is seen in the watersheds. Structures may vary from check dams to diversion weirs, percolation tanks, bunding and other soil measures, while people living there use water for agriculture and horticulture production, fisheries, water for livestock, domestic purpose and drinking. At the same time top soil cover, soil for cementing walls of homes, livelihoods such as pottery are essential for some of the people. Some livelihoods are forest based and seasonal. There are some people who are asset less and may be engaged in labour work/earthwork or nonfarm activities to eke out a living. Further practices of people may vary based on their traditions, culture and even castes. It was found that the needs of indigenous people were different from that of others.
- 9. With regard to project specific monitoring requirements gaps were noticed at all levels:**
- **Central Level:** Online MIS and steering committee meeting are the only mode of monitoring; GIS based monitoring system or ‘change detection analysis’ is not being used; Net Planning is compulsory for Detailed Project Report (DPR), achievement monitoring is not linked with Plot No. or Household.
 - **State Level:** Every state to have its own monitoring strategy; not all the monitoring systems are in place; MIS required by DoLR has been adopted at state level even if the monitoring needs of

each level are different; Systems like Social Audit, participatory Monitoring, SHG based monitoring, Poverty based monitoring, etc. are seldom used;

- **District Level:** Monitoring done as per the formats issued by SLNA; Review meetings get limited to physical and financial progress; For e.g. in Odisha open grazing was common problem reported by WDTs of all the projects of Kandhmal district individually; However, none of them discussed on this problem jointly among themselves; Social Auditors to be empanelled at the district level through transparent and participatory processes.
 - **Project level:** Social Audit is not being followed in any of the state except Andhra Pradesh; Monitoring is not linked with Net Planning or base line survey; Monitoring of women empowerment and other gender equity related issues is not maintained; Equity aspect of the project benefits are not assessed; Participatory monitoring system is not adopted; Sustainability monitoring is also not followed; Monitoring is not linked with action taken; Field visits are generally not linked with MIS. Good practices observed under the Sujala 1 (Karnataka) on monitoring are not being applied consistently under IWMP.
10. Given the issues and risks that have come to light the World Bank safeguards policies of Environmental Assessment (OP 4.01), Natural habitats (OP 4.04), Pest Management (OP 4.09), Indigenous Peoples (OP /BP 4.10), and Forestry (OP 4.36) have been triggered.
 11. Based on the environmental, social and institutional issues/risks/challenges identified, the SESA conducted for *Neeranchal* has developed an exhaustive Environmental and Social Management Framework (ESMF) that includes screening criteria for categorizing various potential sub-projects into three categories. Whereas, Category A sub-projects are unlikely to be supported under *Neeranchal*, if and when, these are proposed, a stand-alone Environmental Management Plan (EMP) for these would need to be prepared for these. Most sub-projects are likely to fall within Category B on for which a range of mitigation measures are provided that would address/contain any adverse impacts arising out of these. The category C sub-projects would not require any safeguards instruments, as these are largely restricted to training and similar capacity building activities.
 12. The ESMF further includes a detailed matrix identifying the potential impacts and their mitigation measures, specialized safeguards strategies covering the Pest Management Plan (PMP) that includes an IPM strategy, An Indigenous Peoples Development Plan and a Capacity Building Strategy. A monitoring and evaluation plan with key environmental and social indicators are also provided.
 13. Given that the support under *Neeranchal* is predominantly technical and exact physical locations of demonstrative investments are yet unclear, an Environment and Social Management Framework has been proposed. This when applied with technical implementation guidance available under the Mid Himalayas Watershed Project (Himachal Pradesh), Sujala II (Karnataka) and Uttarakhand Decentralized Watershed Development Project (Uttarakhand) for safeguarding any adverse environmental and social impacts, would readily address any issue arising out of *Neeranchal*.
 14. A second phase SESA would be undertaken as *Neeranchal* begins implementation that would look into mainstreaming of environmental and social safeguards into the overall IWMP cycle. The second phase SESA would be a policy centric one and would also explore where any policy reform or process change is required to enhance the IWMP outcomes.

15. Recommendations:

Key recommendations for consideration to ensure achieving objectives of Neeranchal are given below and further detailed out in chapter 6 of the SESA report:

- i) Build explicit convergence strategies for dovetailing with the ongoing programmes of the key Ministries, such as, the Ministry of Environment and Forest (MoEF), Ministry of Tribal Affairs (MoTA), Ministry of Panchayati Raj (MoPR), Ministry of Statistics, Planning & Implementation (MoSPI) for core IWMP activities and for EPA activities the Ministry of Women and Child Development, Ministry of Drinking Water and Sanitation, Ministry of health and Family Welfare.
- ii) Urgently develop a Human Resource and Gender Policy so as to ensure having in place key project people through the project period and to cut down the existing high level of attrition, further standardizing salaries for same deliverables across different States, clear terms of reference and contracts. A gender policy should also be in place to ensure inclusion of women and gender budgeting in the IWMP interventions.
- iii) Relook into the selection criteria for beneficiaries which is currently the Wellbeing Ranking that focuses on income and thus leaves/excludes groups of marginalised people such as indigenous communities, women headed households, assets less/landless people, thus insuring a more inclusive selection criteria and activities planned accordingly.
- iv) Having in place a guideline for special measures and approvals in Scheduled Areas because of the presence of Indigenous People especially Primitive Tribal Groups.
- v) Tie up at all levels with resource organisations for capacity building and training, livelihoods, gender, NRM, monitoring and evaluation

1. Strategic Environment and Social Assessment (SESA)

1.1 Neeranchal and the purpose of the SESA

Neeranchal National Watershed Development Project is initiated by the Department of Land Resources (Do/LR), Government of India in collaboration with World Bank to positively influence Integrated Watershed Management Outcomes (IWMP) by providing technical and financial support.

While IWMP aims at restoring ecological balance by harnessing, conserving and developing degraded natural resources such as soil and vegetative cover and water, Neeranchal aims at providing technical and financial support to ensure “Increased incomes through enhanced agricultural production and improved sustainability of natural resources through better watershed management among the people living in select micro-watersheds in eight states, by adding value to IWMP programs through institutional reform, capacity building, development and application of best practices, and convergence with other Government project.”

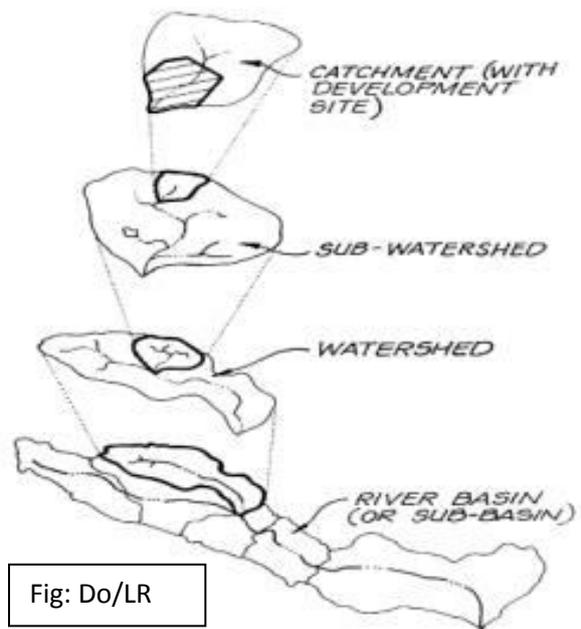
Given the fact that the outcomes of IWMP are prevention of soil run-off, regeneration of natural vegetation, rain water harvesting and recharging of the ground water table, thus enabling multi-cropping, diverse agro-based activities etc., which in turn give scope to sustainable livelihoods of community in the watersheds, Neeranchal proposes to provide support in the form of improved hydrological assessment, methods, tools, institutional development and capacity building, planning, project management, monitoring and evaluation, MIS, innovations, strengthened convergence and coordination and effective implementation thus justifying large public investments.

Importantly, people living in watersheds draw their livelihoods and other basic necessities from natural resources. This necessitates the identification of critical issues around people, socio-economic dynamics (indigenous people/ marginalised/ women, incomes, forward and backward linkages etc.), social issues and environmental issues (run off and erosion, pest management, etc.) in the light of the existing/ current status of the IWMP, its outcomes, impacts on the lives of people, productivity, environment and any other such challenges. Thus, Neeranchal would also provide support in identification of such environmental and social challenges/ issues, the perceived risks from there and suggest mitigation measures. Further, The geographical spread of Neeranchal is the rain fed and/or dry land areas of eight States including Andhra Pradesh, Chhattisgarh, Gujarat, Odisha, Jharkhand, Madhya Pradesh, Maharashtra, and Rajasthan. Each of these States are marked with varying geo-physical characteristics, undulating terrain, varying temperature, as well as the presence of forest cover, coastlines, agro-climatic zones and rainfall profile.

In the preparatory phase of the Neeranchal, Do/LR, Government of India (GoI) undertook the Strategic Environment and Social Assessment (SESA). The current report is the first phase of the two phased approach adopted for the SESA. It looks into the current state of affairs of IWMP, impact of ongoing and planned investments, institutional capacities and challenges as well as environmental and social risks, project specific monitoring measures and recommendations for a way forward. A policy level SESA will be undertaken once implementation of Neeranchal begins. Amongst other, this will help in informing the SESA on policy level changes/reforms based on the application of new tools and technology in the ongoing Neeranchal pilots. It will prepare a roadmap for full-fledged intervention and implementation in all Neeranchal districts and would identify potential mechanisms for mainstreaming the environmental and social safeguard measures into the overall IWMP implementation cycle.

1.2 Background of the Integrated Watershed Management Programme

Watershed is a basic hydrological unit, wherein the entry of water is followed by a well-defined route, the runoff resulting in from precipitation and the flow from catchment to ridge to valley. Further, although watersheds vary in size, shape, physiographic features, climate, soil and geography, social composition varies within watersheds leading to different practices and the need for standardised management of watersheds for benefit of the environment and people. Thus judicious watershed management is the need of the hour making watersheds productive from upper reaches to lower reaches and it includes protection, management and conservation.²The figure above indicates that micro watersheds are linked to higher level watersheds and therefore proper watershed



management is critical to maintain environmental balance as well as ensure people get the most benefits and neither the environment nor people are harmed in any way.

As informed by the 12th Five Year Plan, Planning Commission, the Parthasarthy technical committee was set up by the Ministry of Rural Development in January 2006 to draw lessons and inform on reforms to be undertaken in the watershed sector. There were concerns around impact on people, achievements and the way the watershed programmes were being implemented not resulting in expected outcomes. Thus from the learning's the committee made some recommendations. These included implementation of watershed programmes by professionals in three phases (preparatory, implementation and consolidation). The process was also to include building individual, organisational capacities, and engagement of voluntary organisations in all three phases, monitoring evaluation including participatory monitoring, and focus on livelihoods. It also suggested enhancement of per hectare norms from Rs.6000 per hectare to Rs.12, 000 per hectare. Further earlier, watershed works were carried out in 500-hectare micro watersheds, while it was suggested that watershed works be now carried out on clusters of micro watersheds from 4,000 to 10,000 hectares.

This was followed by the formation of the National Rained Areas Authority (NRAA) in November 2006, which in coordination with the Planning Commission came up with the Common Guidelines for Watershed Development Projects applicable to all watershed programmes. Finally, the Integrated Watershed Management Programme (IWMP) was designed by merging the Desert Development Programme (DDP), Drought Prone Areas Programme (DPAP) and the integrated Wastelands Development Programme (IWDP). IWMP programmes were sanctioned from 2009-10 onwards and therefore are fairly nascent. The coverage of this programme is an area of 15.13 million hectares across 23 States.

1.3 Implementation Mechanism of the IWMP

² Chatterjee, S.N. (2008): Water Resources, Conservation and Management

Another committee coined as the Mihir Shah Committee drafted the new guidelines for IWMP, which came into effect from 1st April 2013 onwards. A study conducted by Shah et. al (1998) indicates that poverty and distress in dry lands, especially in hilly and tribal tracts is high and has led to extreme backwardness. The key features of which are, that (1) the IWMP would be a five years programme keeping the three phases for implementing the programme; (2) given that programme was highly impacted by the lack of deployment of high quality professionals, an additional allocation of 10 percent was to be made for hiring the same; (3) need for a national strategy for capacity building was suggested so that expected outcomes may be achieved; (4) given that institutions involved in watershed processes need to be sustainable beyond the programme period, institutional building/strengthening was included in the guideline as a critical aspect; scope for civil society engagement in all processes is highlighted; (5) ensuring a ridge to valley approach so that both the catchment and water bodies in lower reaches are treated and not impaired with the participation and ownership of the community; (6) based on economies of scale the ideal size of watersheds was considered to be 3000-7000 hectares, which may be taken up in a contiguous patch to form a large cluster except in hilly areas or difficult terrains, where smaller sized projects were permissible; (7) fund release procedures to expedite work have been put in place. A Central Level Nodal Agency (CLNA) for managing the programme and its implementation and State Level Nodal Agencies (SLNAs) has been formed. It also talks about convergence with programmes such as that of the NRLM, NREGS, RKVY as well as forest departments especially in tribal dominated areas for smooth functioning.

Box (1): Other salient features of IWMP

- (i) Setting up of Dedicated Institutions with multi-disciplinary experts at State level - State Level Nodal Agency (SLNA), District level - Watershed Cell –cum- Data Centre (WCDC), Project level - Project Implementing Agency (PIA) and Village level - Watershed Committee (WC).
- (ii) Cluster Approach in selection and preparation of projects: Average size of project - about 5,000 ha.
- (iii) Enhanced Cost Norms from Rs.6000 per ha. to Rs.12,000/ha. in plains; Rs.15,000/ ha in difficult/hilly areas
- (iv) Uniform Funding pattern of 90:10 between Centre & States.
- (v) Release of central assistance in three installments (20%, 50% & 30%) instead of five installments.
- (vi) Flexibility in the project period i.e. 4 to 7 years
- (vii) Scientific planning of the projects by using IT, remote sensing techniques, GIS facilities for planning and monitoring & evaluation
- (viii) Earmarking of project funds for DPR preparation (1%), Entry point activities (4%), Capacity building (5%), Monitoring (1%) and Evaluation (1%).
- (ix) Introduction of new livelihood component with earmarking of project fund under Watershed Projects i.e. 9% of project fund for livelihoods for asset less people and 10% for production system & micro-enterprises
- (x) Delegation of power of sanction of projects to States.

Source: Department of Land Resources

As indicated by the Department of Land Resources (2013), actual physical work is yet to start in most of the States. Within a State, the IWMP projects may be in different phases based on whether they were sanctioned in 2009-10, 2010-11 or in 2011-12. As informed by Department of Do/LR projects have been sanctioned batch wise:

Batch-I	2009-10
Batch-II	2010-11
Batch-III	2011-12
Batch-IV	2012-13
Source: DoLR, Govt. of India	

The project duration would be of five years, wherein the first year would focus on preparation. The preparatory phase would include project appraisal, formation of institutions and putting human resources in place, preparation of DPRs, capacity building and entry point activities, evaluation; this would be followed by the work phase and then the consolidation phase, which would include measures for sustainability, operation and maintenance, ownership by the community and water users association etc.

1.4 Impact of investments made in IWMP

As discussed in earlier sections investments have been made in watersheds through various programmes such as the Desert Development Programme (DDP), Drought Prone Areas Programme (DPAP) and the integrated Wastelands Development Programme (IWDP) with the objective of reclaiming degraded land or dry land, augmenting increased agricultural production and livelihoods of people and by merger of these programmes the IWMP was initiated in 2009-10. *It is too early for an assessment of impact of investments on watersheds.*

The preparatory phase is over in the States of Jharkhand, Andhra Pradesh, Odisha, Madhya Pradesh, Rajasthan, Maharashtra, Gujarat and the work phase (implementation) has just begun since the projects were sanctioned in 2009-10. Projects sanctioned in 2010-11, 2011-12, 2012-13 are in preparatory phase. However, in Maharashtra evaluation of the preparatory phase is pending, while in Gujarat evaluation of the same has been completed. 50 percent of the projects in Chhattisgarh (2009-10) have completed the preparatory phase and evaluation will be initiated soon. The following section informs about the financial and physical achievements (current status) of the watersheds. The following table indicates the financial achievements of the IWMP for three consecutive years (2010-11, 2011-12 and 2012-13):

State Name	Year 2012-13 (01.04.2012-31.03.2013)		Year 2011-12 (01.04.2011-31.03.2012)		Year 2010-11 (01.04.2010-31.03.2011)	
	Funds Disbursed	Expenditure	Funds Disbursed	Expenditure	Funds Disbursed	Expenditure
Andhra Pradesh	125.137	219.7845	160.94	90.7156	119.8	8.713
Chhattisgarh	0	45.9005	62.37	20.9598	50.38	13.8961
Gujarat	329.237	156.4634	160.71	64.3371	161.73	20.7569
Jharkhand	48.1731	21.43557	15.7	18.52634	24.1	5.4795
Madhya Pradesh	128.3	346.6017	108.6	112.14	113.25	7.74
Maharashtra	501.6	362.61	378.69	82.6144	208.14	10.8752
Odisha	89.7	88.121	77.53	39.33	73.47	17.087
Rajasthan	424.53	217.8541	318.33	86.718383	257.47	36.0638
Other States	1073.8499		583.05		488.49	
Total						
Total	2720.527		1865.92		1496.83	

Source: : Neeranchal Results Framework Indicator Baseline

As indicated in the table above, in the current year, the highest expenditure has been in Maharashtra and Madhya Pradesh, while the lowest has been in Chhattisgarh. Expenditure varied between 50-90 percent for the four States. Among the sample states Madhya Pradesh has shown maximum expenditure in 2013 while Odisha has shown the lowest.

1.5 Scope and allocation of primary investments under IWMP

In the IWMP funds are invested in watersheds under different heads such as- Preparation of a Detailed Project Report (DPR), Entry Point Activities (EPA), Capacity Building and Training (CB &T), Administration Cost (AC), Work Force (WF), Livelihoods (LIV), Production System and Micro Enterprise (PS&ME), Monitoring (MON) and Evaluation (EVL) and Consolidation (CON). Of the total amount disbursed to any of the States and from the States to any of the Districts, and from any of the districts to the watershed level the proportion year marked for each head is as follows:

Proportion Marked for Different Heads	Expenditure Incurred as on November 2013 (Rs. Crores) for Four States			
	Maharashtra	Andhra Pradesh	Madhya Pradesh	Odisha
1%	28.24	20.41	12.4	6.59
4%	107.44	27.62	50.58	28.42
5%	31.02	17.61	16.44	9.5
10%	75.78	44.71	26.01	10.75
56%	529.62	165.94	114.38	22.1
9%	-	78.9	1.5	1.46
10%	-	15	5.9	1.41
1%	2.4	4.46	1.13	0.07
1%	0.23	0.15	0.05	0.26
1%	-	-	-	-
100%	774.73	374.8	228.39	80.56

Source: : DoLR, Govt. of India, Nov 2013

The table above indicates that for any project, 1 percent of the total amount will be earmarked for DPR. DPRs are prepared at the district level and include a wellbeing ranking, identification of NRM activities to be undertaken in the future, planning of the implementation etc. It was found that a total of 107.03 Crores was invested in making DPRs (M-28.8 Crores, AP-20.71 Crores, MP-20.71 Crores, O-12.79 Crores). From the total amount invested, 63 percent of the funds year marked for DPRs in Maharashtra is spent, similarly funds spent for this budget head in Andhra Pradesh is 70 percent, Madhya Pradesh-59.87 percent and Odisha-51 percent.

Similarly, for Entry Point Activities (EPAs) the budgeted total investment as of now has been Rs.411.56 crores (Maharashtra- 178.91, AP-96.91, MP-84.58, Odisha-51.16). From the total amount invested, 60 percent of the funds earmarked for EPA in Maharashtra is spent, funds spent for this budget head in Andhra Pradesh is 28 percent, Madhya Pradesh-60.9 percent and Odisha-56 percent. As on 1st Nov 2013, highest proportion of expenditure on EPA activities has been in Maharashtra and the lowest in Odisha.

With regard to CB & T, it was found that the total amount invested as on date is Rs.193.68 Crores (M-112.21, AP-43.62, MP-10.88, and O-26.97). From the total amount invested, 28 percent of the funds earmarked for CB & T in Maharashtra is spent. Funds spent for this budget head in Andhra Pradesh is 40 percent, Madhya Pradesh-99.82 percent and Odisha-35 percent. As on 1st Nov 2013,

highest proportion of expenditure on CB & T activities has been in Maharashtra and the lowest in Odisha. Rs.124.69 crores is the total unspent balance in this component.

10 percent of the total budget invested at any level is earmarked for administration cost. It was found that the total amount invested as on date is Rs.236.19 Crores (Maharashtra-133.35, Andhra Pradesh-45.6, Madhya Pradesh-38.5, Orissa-18.74). The expenditure under this budget head in Maharashtra is 57 percent, Andhra Pradesh- 98 percent, Madhya Pradesh- 67.56 percent and Odisha- 57 percent.

Maximum investment is on WF (HR)- 56 percent. As on date Rs.1090.28 Crores has been invested- (Maharashtra-713.77, AP-152.83, MP-161.95, Odisha-61.73. Total expenditure in Maharashtra was 74 percent, Madhya Pradesh-70.63 percent and Odisha-36 percent. Data for Andhra Pradesh was not available for this budget head.

While the total investment under the livelihood head has been Rs.130.76 Crores (Maharashtra-32.78, Andhra Pradesh-86.86, Madhya Pradesh-2.9, Orissa-8.22) between the periods from 2009 to 2013, no expenditures under this head have taken place in 2013. There was no expenditure in Maharashtra for this head as there was no investment made between 2009 and 2013, under this head. In Andhra Pradesh 91 percent of the funds were spent while in Madhya Pradesh and Odisha 51.72 percent and 18 percent of the funds were spent under this budget head.

With regard to PS & ME it was found that no expenditures have been made under this budget head in 2013; however there have been expenditures on this head for different batches of project at the initiation stage. The total investment till date is Rs.72.21 Crores (Maharashtra-32.78, Andhra Pradesh-20.34, Madhya Pradesh-10.87, Odisha-8.22). Expenditures till date- Maharashtra- Nil, Andhra Pradesh- 73, Madhya Pradesh-97.15, Odisha-17

In case of monitoring, total investment till date is Rs.72.21 Crores (Maharashtra - 32.78, AP-20.34, MP-10.87, O-8.22). As of now there has been no expenditure under this head in Maharashtra. In Andhra Pradesh 73 percent is spent, while in Maharashtra and Odisha 97.15 percent and 17 percent respectively, have been spent.

Analysis of the funds invested and expenditures thereof indicate that a small amount of funds have been spent on EPA activities and thereby evaluated post expenditure on EPA. Total funds invested till date on evaluation is Rs.22.18 Crores (Maharashtra -15.19, Andhra Pradesh -4.38, MP-0.15, O-2.46). As of now, 2 percent has been utilised for this budget head in Maharashtra, 3 percent in Andhra Pradesh, 35.71 percent in Madhya Pradesh and 11 percent in Odisha.

The last budget head is consolidation (CON). 1 percent of the total amount will be earmarked for this budget head. As of now, no investments or expenditures have been made either by the Do/LR or the SLNAs.

From the figures, it may be concluded that the project is still in a nascent stage and an assessment of impacts of the financial investments made would be challenging. However, based on the stakeholder consultations in sample states, observations on the impacts have been discussed in the following section.

1.6 Key challenges in environmental and social sustainability of these investments

Some key challenges with regard to the environmental sustainability and social sustainability are as given in the following sections:

a) Environmental sustainability of these investments:

Prominent environmental issues normally prevailing in the area may be generalized occurring at all the watersheds and also at the state level based on observations from the States visited. The individual parameters mentioned under each category of the natural resources vary from one another within each watershed and also may do so between different States.

- **Surface and Ground Water:** The manifestations of shortage of water are seen in the watersheds visited. In case appropriate scientific measures are not taken for implementation, and post implementation sustainability the risks involved may include the alteration of the stream's course because the project envisages short term benefits for people without looking at the bigger picture of the likely impact of the unscientific interventions; acute shortage of drinking water and water for irrigation from ponds and tanks; longer duration of dry spell after receding of rains till next season monsoon; continuous increase in depth to water table in dug wells due to irrigation drafts; drying up of streams; poor quality of drinking water either from ponds or ground water; dry dug wells or very less water column depth in summer.
- **Soil and Soil and moisture conservation:** Lack of sustainable soil erosion measures because of either limited funds or know how, may lead to loss of top soil and soil erosion, loss of soil nutrients, moisture loss and invasion by weeds. The soil cover together with its nutrients is a vanishing natural resource, which is only diminishing due to vagaries of nature coupled with indiscriminate anthropogenic activities. The soil erosion is a function of water and the greater the impact on it due to the latter results into higher the loss of it. But due to interventions of the IWMP project activities under various categories have together resulted into: Prevention of soil losses due to construction of various structures, Prevention of loss of soil nutrients. Increase in soil moisture for longer duration, improved soil veneers due to higher moisture. Such interventions have to be ongoing and sustainability needs to be ensured in the absence of which, post project, the situation may come back to what it was earlier.
- **Vegetation and Afforestation:** Observations from the field indicate quantitative and qualitative shortage of both green and dry fodder, shorter duration of availability of green fodder, loss of vegetation on fallow, waste lands and pastures supplying grass/fodder, lack forest or dense vegetation in neighborhood supplying fodder, lack of fire wood supply, thin canopy of natural forests with much lower tree density. These are areas that need to be addressed.
- **Agriculture and Horticulture:** Agriculture and horticulture go hand in hand and are largely dependent on nature of land cover existing due to prevailing conditions of water, soil, climate together with the facilities for farming such as bullocks, seeds, tilling etc. The lack of one or combinations of all may result into: increase in trend for fallow lands, tradition for mono crop/no multiple cropping throughout the year, lack of crop rotation, lack of intercropping pattern, lower productivity/lower crop yields, no coverage for fodder crop, absence or low horticultural crops, low/poor yield from horticulture /fruit bearing trees.
- **Land:** The absence of irrigation facilities together with lack of markets and getting of remunerative prices for the agricultural produce a degenerative effect. The absence of infrastructure facilities also plays a decisive role. It may further start resulting into fallow lands. If the trend continues, the lands remain permanently as fallow lands and face the threat that may develop as: Increase in barren lands, Increase in waste lands, Decrease in soil cover. A large tract of lands that may be categorized as wastelands or barren lands or fallow lands are seen around the villages especially the hilly regions of Odisha and Maharashtra. This is mainly due to lack of irrigation and reflects largely on the poor economic background of the farmers. For any of the reasons or combinations thereof, it may result into disuse of farmland. The major difference

between the places visited in Odisha and Maharashtra was of the climate. Odisha local climate is predominantly moist and humid while the place visited in Maharashtra is dry.

- **Water harvesting**

The impacts observed under this category are no doubt very less. Also the developments are in varying scales in all the watersheds and respective states visited due to many reasons. Though it may not be possible to demonstrate in visible manner directly in terms of quantitative achievements but the results indirectly prove their impacts in following manner:

- Increase in availability of quantity of water for irrigation
- Improvement in quality of water for drinking
- Increase in soil moisture retention period for longer duration.

- **Development of Carbon Sinks & Carbon Sequestration:** The development of afforestation and undertaking of social forestry measures has been lacking generally in all of the watersheds regardless of the state. However, in some of the DPR's of water shed, it is proposed to undertake social afforestation and re-vegetation through convergence in coming years.

In this context it is worth mentioning that under the aegis of Mo/EF (Ministry of Environment & Forests) Government of India, an ambitious step has been taken to establish the State Level Agency for development of CAMP (Compensatory Afforestation fund Management and Planning Authority). This state level CAMPA has been formed at each state (wef. 2 July 2009) to receive the funds from Mo/EF for undertaking afforestation and social forestry in the state. Therefore it is a welcome move for the SLNA to strike the convergence for initiating afforestation measures on a massive scale in IWMP projects, which has hitherto been lacking.

The vast tracts of wastelands, degraded forests and barren lands with sizeable area under recurring 'fallow land' category is increasing under some of the states mainly due to *mass exodus for employment and gaining livelihoods*. These wastelands need to be identified at EPA (Entry Point Activities) and brought out under the prevailing land use in each of the IWMP watershed area to take note of such lands.

This step is widely missing in all the watersheds in all of the states visited because of sheer ignorance of applicable policies of GOI namely the Forest policy 1988. Once this important missing link is established in all of the watersheds, a vast land under the 'waste lands', 'barren lands' shall be quantified to know the potential for undertaking afforestation efforts depending upon the prevailing soil thickness. The soil conservation measures need to be taken in these categories of land also in addition, so that further soil losses are averted and precious soil is conserved. It shall be further kept in place by planting floral species identified with the help of local forest office so that they are climatically adaptable. These floral species shall be of both fodder and firewood so that the UG formed may use it for mutual purposes on community levels. This shall be a beginning for a sustainable development in true sense.

This shall ensure development of a green belt all around in the vicinity of each watershed. It shall enhance an aesthetic look also to strengthen the ecological requirements. This greenbelt developed shall serve a dual purpose of (i) as carbon sink to claim later credits for carbon trading under CDM (Clean Development Mechanism) and (ii) serve as excellent zones for natural recharge areas for ground water (well documented by several researchers).

In later years, the watersheds all over the country may certainly have enough ground water to sustain the needs of drinking and irrigation water through use of drip irrigation systems. It shall catalyze the sagging economy of the watershed in multifarious ways. *The benefits of afforestation are manifold but need a modest beginning at the watershed levels.*

b) Social sustainability of these investments:

As discussed earlier- it is too early to discuss the social impacts of the IWMP given the investments as the project is still in its nascent stage. However, visits to sample States indicate the following:

- **Impacts on livelihoods of Landless people:** IWMP has special provisions of 9% of their budget exclusively for the improvement of the livelihood of landless people. Watershed development programme, by default will benefit land-holding families only; however, it can also benefit landless families, if some special mechanisms are made for rooting the benefit to them as well. This way, IWMP learned from the experiences of previous watershed development programmes and created special provision of reaching out to landless families directly. However, Do/LR has created some provisions for utilizing the component:

First, IWMP has made the provision of rooting this fund only through SHGs. This, in turn, means unless the landless or asset less family is part of some or other SHGs, the family won't receive the benefit of this component. Different states had their views on this. Among the four states visited, Odisha, AP and MP are following this strictly, Maharashtra seems to differ and has kept a portion of the component (about 30%) for individual funding as well. Secondly, the fund can be given in the form of revolving fund only to the SHGs, as loan, with the condition that the SHG shall return the loan to the watershed committee within 18 months, so that WC can lend this amount to another SHG. Thirdly, no SHG can receive more than Rs.25000 as revolving fund from IWMP. Fourthly, size of each SHG can be from 5 to 20 members. Fifthly, a contribution of 10% to 20% shall be charged for availing the benefit of this component. While the impact of livelihood is yet to come, impact of such provisions were already seen. Most of these impacts were adverse. Thus need to be looked into from a sustainability perspective:

- **Impact 1: It was found that** the stakeholders from state level to PIA level were clueless about the kind of livelihood activities that can be promoted/ undertaken in Rs.25000 for a group of 5 to 20 people. As a result, even though, DPRs are made, neither the PIAs nor the Watershed Committee and the community are, in general, confident about the plan for this component.
 - **Impact 2:** The provision of giving it as a loan and that too on the provision of 10% to 20% contribution, created doubt between both the PIA as well as community, vis-à-vis issues of 'equity', as mentioned in the guidelines. The general question raised was, on partiality between land owning families and asset less people in the project. The land of land owning people is being treated completely on grant basis with 5% to 10% of contribution element.
 - **Impact 3:** In some of the states, like in MP, groups are being formed with 4 to 5 members. Any other programme or bank(s) for credit linkages would hardly recognize such group.
 - **Impact 4:** Usually a micro watershed with an average size of 500 ha receives about Rs.5 lakh 40 Thousands as fund for asset-less families. With the above provisions, their needs to be about 22 groups so that each group can receive Rs.25000. However, it would be difficult to find so many asset less families to form so many groups, which means, this portion will either be largely unspent, or non-asset less families will also get benefitted.
- **Impact on Land-owners (Small and marginal farmers, Medium and large farmers):** Watershed development programme are designed to benefit land-owners, largely. IWMP too has about 56% of Natural Resource Management and 10% of productivity enhancement, which totals to 66% of its budget for land-owners. IWMP, being at such a nascent stage, is yet to create any visible impact through. However, with the methodology like net planning, wherein every plot of land gets planned and hence benefitted as per the plan, the portion is certainly designed to reach out to maximum population. Impacts seen were:

- IWMP has limited budget of Rs.6720 (56% of Rs.12000) per ha for the treatment of the land. With this little money one cannot make even a proper field bund on one ha of land. Thus, there are great chances that the PIA may not be able to implement entire net planning with IWMP fund. Therefore, 'prioritizing the plans' will be required. However, there were no priority parameters in most of the states for prioritizing among different net plans. Poor and marginal being least influential, are often left out.
 - Since ownership of land is in disproportionate ratio among Medium, Large farmer, Small and Marginal farmer, this proportion also gets reflected in accessing the benefits IWMP. Medium and Large holding about 60% of land gets the benefit of IWMP in that proportion.
 - As per the Common Guidelines-2008 for IWMP, there is a ceiling of Rs. 24,000 in per hectare of land therefore activities like horticulture development, drip irrigation, etc., which require more than Rs.50, 000 to execute in a hectare would be difficult to undertake.
 - Livelihood connect of NRM activities was found missing in almost all the states. With the ridge to valley system the treatment starts from top and by the time it reaches the agriculture land the project faces lack of fund.
- **Impact on livelihood of women:** It has been established that the needs of women are very different from that of men. Therefore it is essential that any participatory project take special effort in reaching out to women, seeking their participation and services to achieve its desired objective. Self-help group are one of the means by which women are involved in the project in large numbers. Additionally, Government of India has clearly expressed in the guidelines that women members are must in Watershed Committee. However, there is not much effort from the PIA to mobilize women in the programme. The awareness generation efforts were carried out in the main village, there were no special efforts put in to reach out to women members of the society. The MPR or state MIS of all the states didn't have any system to track women empowerment related indicators, neither there were any system in any state to appraise DPR from Gender or equity aspect for approving it. In the absence of any support system, appraisal system and proper sensitization exercise, gender disaggregated data and aspects may not have much importance in the project.
 - **Impact on Livelihood of Indigenous groups:** There were no special efforts by the PIA to include indigenous people. There was common methodology followed for all sections of the society except for asset less families. For asset less families IWMP carries a special component for promoting their livelihood, titled 'Livelihood for Asset less Families'. PIA makes the plan for every patch of land for developing a Natural Resource Management Plan. Additionally, PIA also strives towards involving every household in some or other Self Help Group (SHG). If indigenous people own land or if the women of the family are part of any SHGs, then the benefit of the project may reach out to these families through NRM or through Livelihood promotion plan. Sometime Indigenous people, given their family history, need extra effort to understand the entire spirit of the project. This becomes more essential when there are too many mainstream projects in the village. If the efforts for their inclusion are not properly carried out, chances are that they might be neglected and completely left out from getting the project benefits. The indigenous people also are the carriers of indigenous technical knowledge (ITK) about the various natural resource management aspects, since they have been closest to nature than any other group. Without proper participation of indigenous people the project also may not get benefit of the ITK.
 - **Impact on livelihood of other vulnerable sections:** Identification of poor families has always been challenge for the government. However, in any long-term project, which needs long-term relationship with the target community, identification of the poor families may not be difficult. However, before identifying such families it would essential to understand the entire socio-

economic and political environment of the project area. IWMP has one entire component of 'Livelihood for Assetless families', with 9% project funding earmarked only for poor families. PIA adopted household survey as one of the basis for identifying the asset less or poor families except in Odisha, where Wealth ranking exercise was carried out in all the villages. HH survey may not be enough to identify the poor families unless it is backed up by proper Participatory Rural Appraisal (PRA) exercises, like in Odisha. Since poor have to earn their livelihood daily their extended availability for gram-sabha or any other meeting will be difficult, unless the timing of such meeting get coordinated with their availability. However, no such special efforts have reported/recorded by the PIA. The mass awareness generation campaigns are also conducted only in main village of the gram panchayat, that too only one in the preparatory phase. Chances are that such campaign or awareness generation programme may not have reached out to the poor since they generally don't live in main village of the gram panchayat, rather they have separate hamlets situated outside the main habitations. Usually employment generations are one major means to benefit poor families in watershed programme. However, in Maharashtra about 80% of work was carried out by machine.

- **Impact on Crop yield & productivity:** The impact of developmental work in the watersheds visited in all of the 4 states is yet to be established quantitatively. Especially in Madhya Pradesh, the developmental work was taken up only during current season and as such the impact may be assessed only on qualitative aspects. However, public consultations and field visits revealed a marked improvement in the cropping pattern and related farm yields. The farmers reported encouraging conditions as regards availability of water for such crops such as legumes (pigeon pea and black gram). Most of the farmers had cultivated cotton and the expected a bumper crop particularly this year due to extended monsoon and availability of water through various measures. The crop yield and productivity due to many interventions such as contained in both ICP and IPM coupled with improved farming practices show a positive impact. Some of the farmers also have started to cultivate sugar cane, particularly in Maharashtra, seeing the better availability of water, *which certainly is an alarming trend in the context of the objective of Neeranchal project.*
- **Horticulture:** Some farmers have shifted to planting of pomegranate and mango trees visualizing favourable conditions in coming years after the construction of earthen structures. They seemed convinced about the longer availability of water. Some farmers also have started taking vegetables such as tomatoes, onions, chillies and ginger, which fetch cash returns immediately. This was common for all of the 4 states with little variations.
- **Farm based (Livestock, dairy development, fisheries etc.):** Regarding development related to livestock and fisheries, it may be said that farmers are tempted to keep more milch cattle in view of availability of fodder particularly the green fodder for a longer duration of the year and also the availability of dry fodder in massive quantities for the summer period. Milk cooperatives are in operation in the area in almost all of the states and the farmers deliver the milk at these cooperatives. There is lack of availability of milk chilling plant in the vicinity, which would further enhance the livelihood opportunities and income generating avenues to the poor and farmers. It is well documented that small and marginal farmers and particularly the landless keep smaller ruminant animals particularly goats, sheep etc. to supplement their family income. The site visits to the watersheds in all states pointed this fact. The overall availability of water and fodder/vegetation has increased the opportunities of livelihood for the poor people.
- **Fisheries:** activity is still in the nascent stage and may be taken up at a later stage, since relatively larger ponds are required with requisite funds. In light of prevailing drought conditions

and arid nature of climate, creation of plastic lined farm ponds would be recommended to conserve water for a longer duration. Also the plastic sheet would prevent losses through percolation of water into the soil. In order to prepare the plastic lined ponds prior preparation and treatment of ground and soil cover is necessary, which may need substantial availability of funds.

- **Non-farm based (NTFP, micro-enterprises):** The villages visited mainly lies in the drought prone areas, especially in Maharashtra. Ahmednagar district faces recurrent droughts. Owing to the peculiar climatic conditions with severe summer and falling of water tables, the vegetation predominantly is sparse and is mainly of shrubs. There is no forest cover. As such, the non-timber forests produce (NTFP) is also less. Some farmers are growing medicinal herbs and shrubs such as Nirgundi (*Vitex nigundo*), Tulsi (*Ocimum sanctum*), and Hareda (*Terminia chebula*) for personal use. The climate of the region is very harsh to grow vegetation on commercial terms. In all of the watersheds visited, the wastelands and the barren lands of the watershed may be considered for growing NTFPs, which are widespread in the area. However, these wastelands are distributed either to the landless on lease or they belong to farmers keeping the land in fallow conditions. It is anticipated that during the project period, and with intervention in the watershed under IWMP, after the availability of water on broader terms, it may motivate farmers to grow them. Presently only a few individuals are collecting honey from captive honey boxes distributed under other schemes. The other non-timber produces such as gums; resins and shellac etc. are not extracted due to lack of forest.

It is a remarkable feature of IWMP activities in Odisha that under the livelihood generation, it undertook broom tree cultivation on such fallow lands. The house-hold brooms are in great demand and a good proposition for employment generation.

1.7 Opportunities in environmental and social sustainability of these investments

Our field visit and consultations at the National, State, District and Watershed level indicate that although there are challenges to sustainability of the IWMP programme and the impact it aims to bring, however, the IWMP also puts forth opportunities that are important to mention:

- First and foremost the vegetative cover for ecological balance is possible. Further, biomass is an indicator of the symbiotic relationship of man and nature. The tilted balance results into vanishing of natural resources particularly vegetation and the availability of floral diversity. The weakening bio-diversity has been arrested due to the focused activities under IWMP umbrella and has started in rejuvenation of it. The implied changes are manifested in following observable improvements: Increase in area under vegetation and grass due to afforestation, Increase in availability of green and dry fodder both in quality and quantity, Increase in availability of crop stalks as dry fodder.
- IWMP gives scope to farmers (marginal, small, medium and large) to increase their agriculture production and thus improve their income and shift towards wellbeing by providing soil and moisture conservation measures, availability of water and technical knowhow for improved agricultural production.
- IWMP through its wellbeing ranking provides the scope for identifying need base in agricultural interventions and soil and moisture conservation methods.
- With increase in production there is scope for crop diversification and mixed farming to reap more.
- With availability of water and measures taken to retain top soil, scope for all season cultivation is also available i.e. cultivation during both Rabi and Khariff season in some places and Rabi, Kariff and summer in other places.

- Increase in availability of fodder would lead to more productivity from cattle, which would benefit people who own cattle and other livestock, but do not have land. Through soil conservation measures, watershed structures livestock keepers would be benefitted.
- There is scope for short-term employment of the landless people during construction of watershed structures and also when soil and moisture conservation measures are being undertaken.
- Growing broomstick trees in fallow land has led to increased income for families who are landless. Through value addition, broomstick is sold in the market for a good price. Such livelihood activities can be taken up in other places.
- In settlements near forest there is scope for value addition to NTFP and its sale fetching a higher price.
- IWMP provides people the opportunity of procurement and sale of agriculture, horticulture and NTFP based products.
- With user groups and self help groups in place, there is scope for collective bargaining of prices and value addition to agricultural produce, horticultural produce and NTFP, thus increasing incomes.
- The IWMP provides an opportunity to shift the dependence on the Government and its target oriented approach, to an approach that is focused on people and their needs by involving people in watershed planning processes, prioritizing their work, and improving the outreach to the most needy community. By institutionalizing these processes there is scope for the ownership of the watershed interventions by people and its sustainability thereof.
- Institutional processes such as payments and management of finances at the watershed level through an online financial system are working well in Andhra Pradesh and this may be replicated.
- People's involvement in auditing the progress of the interventions is successful in Andhra Pradesh and may be further replicated in others as a measure for transparency, accountability and governance.
- IWMP has provided a platform for convergence and dovetailing with other Government programmes for the benefit of people. MNREGS is one such successful convergence. However, convergence with other line departments (agriculture, horticulture, animal husbandry, forest, tribal development, women and child development, renewable energy and health) will provide further scope for varied need based and holistic intervention, be it for livelihoods, entry point activities or for the general wellbeing of people.

1.8 Compliance of the current IWMP interventions in sample States with overall IWMP guideline (policy level)

- a) **Compliance to Policies of GOI:** The IWMP common guidelines prescribe thorough study of the topography, terrain conditions and location specific peculiarities of each water-shed by the concerned line department experts and advising on the suitability of required design and size. This is complied with greater extent. But the locational suitability of structures vis-à-vis topographic peculiarities is ignored.

Certain shortfalls and gaps are observed in each watershed location with regard to the knowledge, capacity building aspects and overall applicability of GOI's policies. This is particularly true for all the watersheds at district and state level. The SLNA authorities and experts are ignorant about the guidelines for water-sheds and also on the provisions of afforestation and social forestry under the National Forest Policy 1988, especially the requirement of 33% area of the project area under afforestation and/or re-vegetation. This is due to lack of knowledge and was noticed in the 4 states. The requirement of base line, land use pattern at EPA level, etc. is necessary to know the extent of wastelands, barren lands and fallow

lands, which may be brought under re-vegetation or afforestation under social forestry so that requirement of fodder and fire wood is met on one hand and national policy principles are complied, on the other.

The same holds true for the provision of National Water Resource Policy 2002, which states that the provision of drinking water to all is must. The project staff lack information about this provision and hence requires knowledge, training and capacity building on the same. Imparting capacity building and training w.r.t. to policies of GOI, needs to be covered so that many of the shortfalls in planning stage are prevented from major shortfalls in the outcomes of the IWMP.

Similarly, there is absence of baseline data for the environmental parameters as mentioned under ESMF, which need to be bench marked at EPA levels. Without this, it is impossible to measure and quantify the impact to steer for corrective actions and measures. The periodic monitoring and evaluation of all the indicators (as mentioned in ESMF) shall result into temporal and spatial applications of field measures and technology interventions.

At the policy level, although the 73rd Amendment and the Watershed guidelines differ in their legal status, the guidelines are subordinate to the 73rd amendment, wherein all Panchayati Raj Institutions have statutory powers. However, convergence with Panchayati Raj Institutions for implementation of watershed works is not seen. Further in case of Scheduled Areas, convergence with Panchayati Raj Institutions and Gram Sabha is essential given the special needs of tribal and as recognised by the Constitution of India in para 6 of the Vth Schedule.

- b) **Compliance to Engineering Designs:** The physical progress of the various activities carried out in various watersheds visited across 4 states broadly indicates that the engineering interventions covering different earth structures built are in accordance with the engineering guidelines, however, do not completely comply by the project base requirements. In many locations, appropriate earth structures have not been constructed. The location specific earthen structures are required to suit the topography, space availability and /or combination of stream drainage line with adjoining land parcels or vice versa.
- c) **Compliances to livelihood:** The projects are at very nascent stage to make any dent on the livelihood aspects of the people. In Maharashtra, livelihood action plans have not been prepared. However, comment on the direction of the impacts can be made/seen. The relationship between IWMP and weaker sections of the society, such as women, indigenous people, poor and asset-less is not significant. Their involvement in the programme is insignificant. Unlike other states, Odisha has strong database of poor people in the villages. The state carried out 'wellbeing ranking' in almost all the villages of micro watersheds. However, there was no connect between DPR and the result of wellbeing ranking. The state didn't even monitor the impact on the lives of poorest of poor through the investments.

1.9 The SESA Report and its Methodology

As discussed in section 1.1 the objective of the SESA report is to understand the current status of the IWMP, the impact of ongoing and planned investments, institutional capacities and challenges as well as environmental and social risks, project specific monitoring measures and recommendations for a way forward for areas of intervention for Neeranchal, that focuses on technical and institutional capacity building. Three methods were adopted for undertaking the SESA: Stakeholder Analysis, Situation Analysis and Risk Analysis. These methods are described below:

- a) **Stakeholder Analysis:** This method was undertaken for identification of stakeholders, understanding their interests, influence and how their interests or influence may impact the project, mapping their expectations, issues and concerns. The Stakeholder analysis was based on stakeholder consultations at the Watershed level, PIA level, District level and State

level. At the watershed level consultation with the community, user groups and the water user association was undertaken. At the block level the PIA and its team was consulted on various subjects. Similar discussions took place at the district and state level. Stakeholders identified during the process include: farmers (marginal/small/medium/large), Women, landless or asset less, Agriculture labourers or daily wage workers, Livestock keepers, people practicing other traditional occupations such as pottery, weaving, leaf plate making (non-farm), Indigenous People, Villagers. At the watershed level stakeholders identified were-SHGs, User Groups and the Watershed Development Committee. At the project level stakeholders identified were the implementing agencies at the State, District and Block level. At the block level PIAs are in place which may be from the Government or may be Non Government Organisations. As the activities have not yet been identified, only consultations with aforementioned stakeholders were held, however, no consent was taken.

- b) **Situation Analysis:** Understanding the state and condition of people and the ecosystem/environment, identification of issues and concerns as a first step for developing the base for the project cycle for Neeranachal.
- c) **Risk Analysis:** Identifying the possible risks due to any of the watershed interventions either on the environment or people through discussions and field visits.

The tools used for stakeholder analysis and situation analysis include checklists, consultations, group discussions.

1.10 Selection of States and Districts

It is worth mentioning that the Government will be selecting 2 districts in each of the 8 States that will receive support from Neeranachal. In order to make an assessment of social and environmental issues an safeguards that could be triggered and for the identification of mitigation measures only one district in each of these States has been selected. The selected States and Districts are mentioned below:

State	District
Odisha	Kandhmal District
Andhra Pradesh	Mahbubnagar District
Maharashtra	Ahmednagar District
Madhya Pradesh	Dewas District
Source: DoLR and SESA Team	

The selection of States and Districts apart from being dry land or rain fed was also based on socio-economic factors, such as the presence of indigenous people and the Empowered Action Group Status of the State. Accordingly, two EAG (Empowered Action Group States) - Odisha and Madhya Pradesh and two Non EAG States- Andhra Pradesh and Maharashtra were selected.

1.11 Outline of sections covered in SESA

The findings from the SESA are presented in the following chapters:

Chapter 1: Strategic Environment and Social Assessment which is the current chapter covering the objective of the assignment, current status of IWMP and the expected impact of its investments, challenges and opportunities, compliance at the policy level and the methodology adopted for

undertaking the SESA as well as the districts selected. It presents an overview and analysis of the stakeholder consultations and their feedback. This chapter also highlights the key environmental and social issues and challenges identified at various levels. It also provides an assessment of the institutional capacities and challenges in the watershed, including a discussion on people's livelihoods in the watershed. Finally, it lists gaps, observed during the SESA work, in the area of monitoring and evaluation

Chapter 2: Environmental and Social Issues and Risks is the second chapter which covers the physical and social diversity of the watersheds, identifies beneficiaries and stakeholders, based on observations and the aforementioned methodology, and identifies the socio-economic and environmental issues and risks that may crop up in the IWMP and would need to be addressed. It also mentions the safeguard policies that may be triggered and hence, would need to be looked into/ complied with.

Chapter 3: Environmental and Social Management Framework (ESMF) provides a range of instruments and processes to address any potential risk to the environmental and social setting in the watersheds. It highlights the World Bank's safeguard policies that are triggered, provides a tabulated matrix of potential adverse impacts and mitigation measures to address these, details the safeguards implementation arrangements and plan and provides a range of specialized safeguard strategies (Indigenous Peoples, Pest Management and Capacity Building) to address key findings. The ESMF also includes a monitoring and evaluation plan giving indicators to track the implementation of the ESMF.

Chapter 4: Recommendations and Way forward is the last chapter and gives a sense of the key recommendations emerging from the first phase of SESA. Many of the recommendations made here would be further detailed in the second phase of SESA wherein, the current impact-centered approach would shift to policy-centric SESA exploring potential synergies and opportunities for mainstreaming safeguards into the IWMP cycle, as well as propose policy and process reforms and adjustments for enhancing the IWMP outcomes.

2. Environmental and Social Issues and Risks

As discussed earlier, a watershed is a geo-hydrological unit which drains into a common point. Thus the watershed approach is a ridge to valley approach covering soil and water conservation measures, afforestation etc. As indicated by the Department of Land Resources, the watershed area based on satellite images, land use pattern, and hydro geo morphology may cut across villages and blocks, as well as spill into forest cover. Given these physical characteristics of watersheds, any management measures for watershed development need to be well planned and in tandem with other line departments such as forest department to ensure that there are no environmental or social risks attached to it. Further, people living within the watershed boundaries have their lives and livelihoods connected with natural resources which include using water or soil for multiple reasons. At the same time the needs of people changes with the geographical terrain, where people living near forests or on hilly tracts are more dependent on forests for their livelihoods and those in the lower reaches, on agricultural practices. The following section covers these aspects as well as issues and risks that either exist or are likely to exist in light of the interventions.

2.1 Introduction

Diversity in both the structures and measures for watershed development as well as people living there and using natural resources within it exists and is a known fact. For example, structures may vary from check dams to diversion weirs, percolation tanks, bunding and other soil measures, while people living there use water for agriculture and horticulture production, fisheries, water for livestock, domestic purpose and drinking. At the same time top soil cover, soil for cementing walls of homes, livelihoods such as pottery, are essential for some of the people. Some livelihoods are forest based and seasonal. There are some people who are asset less and may be engaged in labour work/earthwork or nonfarm activities to eke out a living. Further practices of people may vary based on their traditions, culture and even caste. It was found that the needs of indigenous people were different from that of others. Given this diversity, in areas that are rain fed, dry, drought prone and desert like, terrains that are hilly, require special attention to recover the ecological balance by land, water and vegetation interventions. This in turn would help the community to attain sustained livelihood practices, more productivity and wellbeing. However, since the community is the final beneficiary of such interventions, they need to play a role in owning the watershed interventions, its operation and maintenance for further sustainability. Generally, in watershed projects there is no or limited land acquisition involved and hence the risk relating to acquiring land and resettlement accordingly is minimal or nonexistent. Further, 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. Criteria for selection of watersheds, planning, implementation of programme, monitoring etc. is well laid out in the watershed guidelines and in the IWMP guidelines specifically.

Neeranchal focuses on providing technical capacities and support to the IWMP initiative so that both environmental and social goals may be achieved. However, to identify where technical support is required, environmental and social issues in four sample tanks were explored. The current chapter focuses on environmental issues, social issues, risks and mitigation measures as identified in the study on Strategic Environment and Social Assessment. The purpose is to identify if there are any safeguards that need to be taken into account. The first part of this chapter focuses on

Environmental Risks and Mitigation measures while the second on social risks and mitigation measures.

2.2 Environmental Issues and Risks

The States of Maharashtra, Madhya Pradesh, Odisha and Andhra Pradesh were visited for stakeholder consultation and a situation analysis that would inform on environmental risks. During this process and post analysing the information gathered, it was found that in connection with environment there were some concerns around soil health, erosion and retaining moisture, forestry, ground water quality and quantity, water logging, bio mass, crop diversification and productivity, land use pattern and productivity, horticulture, livestock and agriculture, aquatic weeds and pest management, use of pesticides and fertilizers, which may have an impact on the environment. The following section outlines these issues.

- **Soil health, soil erosion and moisture:** Our observations in the watersheds visited indicate that there are risks associated with soil during un-planned farming and untreated area, leading to loss of both major and micro nutrients. Further the health of crops and plants also gets affected due to the non availability of these tissue building nutrients. This affects the farmer in the long run and reduces his income. The lack of availability of nutrients leads to poor generation of crop stalks which serve as dry fodder during dry days. It triggers general health of milch cattle and the milk yield as well. Reduction in water availability to downstream; Siltation in water harvesting structures; Pesticides & insecticides pollution in water harvesting structure with consequent effect on water quality; Check dam failures; Mosquito breeding in village ponds/farm pond-Water born diseases due to water contamination; Algal growth and eutrophication due to increased levels of nutrients in surface water bodies; Stagnation of water in streams resulting in change in taste & increase in odour and Possibility of water logging. The risks associated with soil during un-planned farming and untreated area, are loss of both major and micro nutrients. Further the health of crops and plants also gets affected due to the non availability of these tissue building nutrients. This affects the farmer in the long run and reduces his income. The lack of availability of nutrients leads to poor generation of crop stalks which serve as dry fodder during dry days. It triggers general health of milch cattle and the milk yield as well. Reduction in water availability to downstream; Siltation in water harvesting structures; Pesticides & insecticides pollution in water harvesting structure with consequent effect on water quality; Check dam failures; Mosquito breeding in village ponds/farm pond-Water born diseases due to water contamination; Algal growth and eutrophication due to increased levels of nutrients in surface water bodies; Stagnation of water in streams resulting in change in taste & increase in odour and Possibility of water logging. The linkage of soil erosion due to poor treatment of area and result is run off. The soil loss means loss of habitat to the microorganisms which control and fix the natural nitrogen into plant based tissues and roots. The increased load of soil and silt in the stream and river bed triggers over flow earthen structures such as LBS, CCT, CB constructed before the onset of monsoon in the initial phase of implementation or proper maintenance of structures in place to prevent wash out of structures – prevent there by resulting in ineffective structures and siltation – such mitigation measures are only possible with farmers / stakeholder voluntarily come forward or take up as a part of NREGA. Minor and temporary risks because of debris collection and waste disposal at the site of watershed physical structure construction do exist in all watersheds visited.

- **Forestry:**

Change in diversity of flora and fauna, Introduction of exotic species could have adverse impacts, Increase in vector born diseases, increased risk of forest fire, habitat and grazing resource loss. Some watersheds indicate this. Further, given that there is minimum or no convergence with the forest department, the impact of earthwork and structures may have impact on the flow of water and the catchment area. Therefore this necessitates close discussions between the IWMP programme and Forest department to avoid such risks. Further discussions with Forest Department on placement of watersheds structures need to be taken up as obstructing/diverting the flow of water may have an impact on the natural recharge catchment for other connected water management structures such as minor irrigation tank systems.

- **Ground Water Quality and Quantity**

Retention of moisture in the soil due to creation of contour bunds is witnessed during the interaction with the farmers. Moreover, prior to the intervention of the watershed activity the farmers who were cultivating millets and legumes- start growing cash crops such as sugarcane requiring large quantity of water. Such tendency has to be curbed as early as possible explaining well to the farmers of the likely situation and community losses. The mechanism of ground water recharge has been well established through retention of surface runoff and percolation of water to the ground water regime. There exists a threat or potential danger of leaching of residual insecticides and pesticides from the soil to the ground water which is a serious health threat in the long term - prone to drinking of water contaminated with residual toxic chemicals. To prevent the contamination of residual chemicals from insecticides and pesticides the concept of integrated crop management (ICM) covering pest management (IPM) be promoted along with regular monitoring of quality of drinking water be done by the PIA to know the prevailing levels of the toxic chemicals and their trend variation spatially and on temporal scale. The farmers need be trained in furrow method of cultivation perpendicular to the prevailing farm slope so that it effectively controls the runoff and slows down water movement thereby resulting in soil conservation. Wells and tube wells are the major source of irrigation covering almost 66% of net irrigated area.

- **Integrated Pest Management**

Imbalanced use of chemical fertilizers has resulted in soil degradation. Similarly indiscriminate use of chemical pesticides builds up resistance among insect pests and diseases. The technologies like INM, 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. The awareness about all these activities is increasing among farmers. However, for adoption of these technologies they are facing the problems of input supply and services. During the problem diagnosis it was observed that non-availability of the required inputs and services at local level was one of the major factors for poor adoption of these technologies and this could put other agricultural interventions at risk. Lack of knowledge regarding bio-pesticides and bio-fertilizers is another concern.

- **Water Logging**

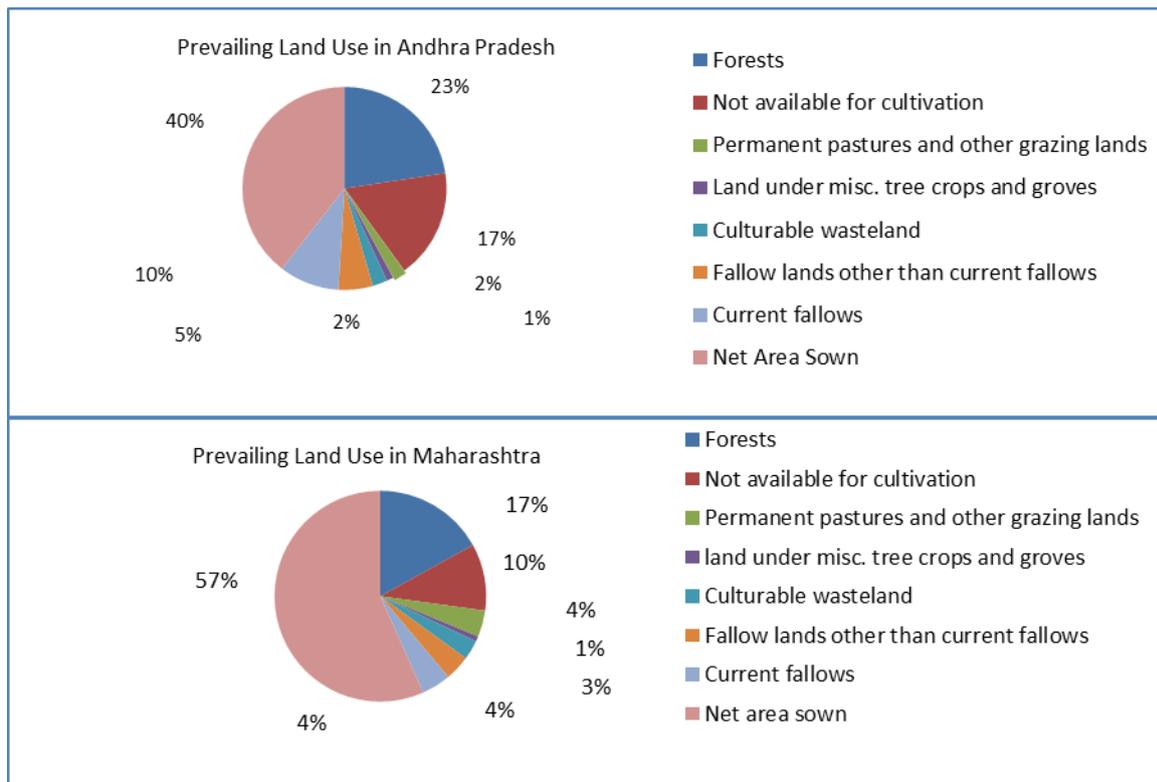
Water logging occurs due to steady rise of ground water table after introduction of irrigated agriculture without adequate drainage. Water logging causes deficient oxygen in the root zone due to filling of interstices with water. This can result in impaired growth and distress to the crop leading to disability of crop absorbing the nutrients. The worst effect of water logging is the development of

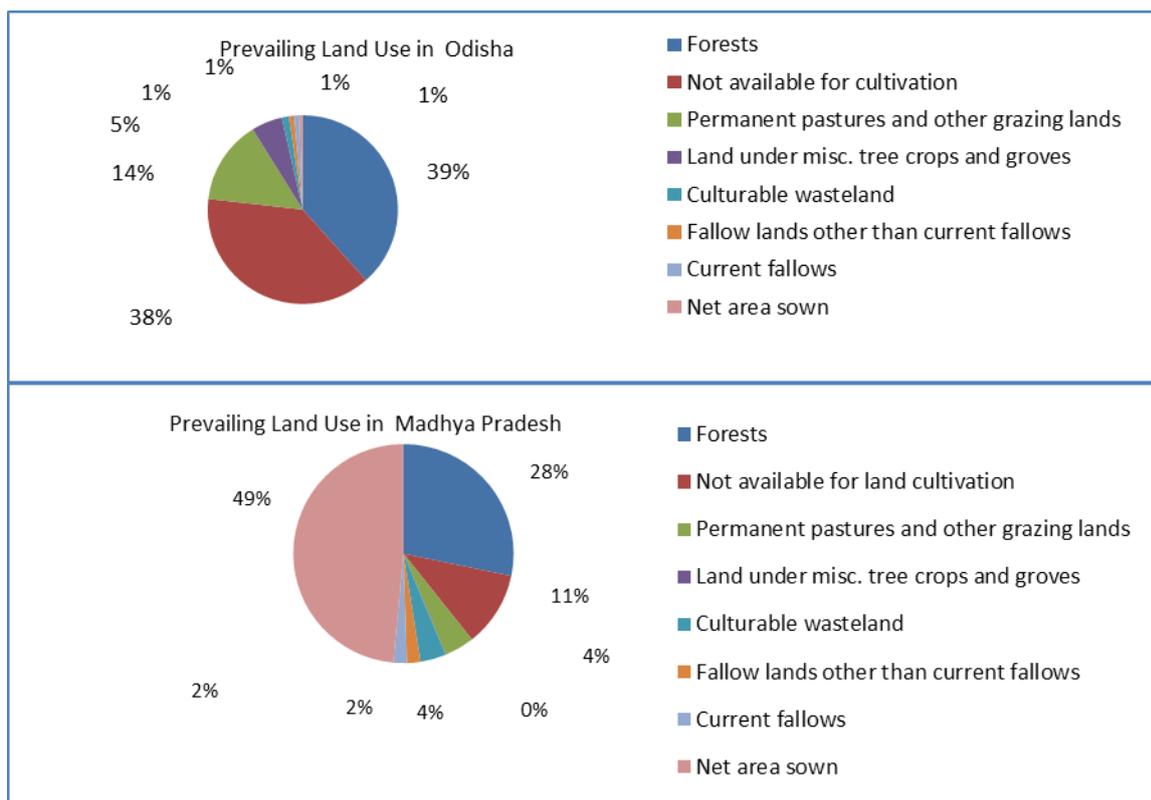
salinity. Salinity arises because of upward movement of soluble salts in the soil. This is caused due to concentration of chlorides and sulphates of sodium, calcium and magnesium in soil at a level that would affect the plant growth.

- **Land Use Pattern, Crop Diversification and Productivity**

The prevailing land use pattern in the states visited namely- Andhra Pradesh, Maharashtra, Odisha and Madhya Pradesh are represented in Figures given below:

Fig (1): Land Use Pattern in sample States





Source: "India State of Forest Report 2011" ([www. http://data.gov.in](http://data.gov.in))

The figures above indicate that in the visited sample states, the net sown area varied between 1 and 60 percent with the highest net sown area in Maharashtra (57 percent) followed by Madhya Pradesh (49 percent), Andhra Pradesh (40 percent and Odisha (less than 10 percent). At the same time States like Odisha have 39 percent forest cover and 38 percent of land which is not available for cultivation. Given these facts States like Odisha would need measures for increased agriculture production from less cultivable land available and at the same time such livelihood measures that are micro-enterprise or nonfarm, livestock linked and other need based sources of livelihoods, for enhanced income. IWMP would need to provide scope for the same which is currently limited.

With rapid urbanization and demand for more land, a threat looms large for the land use change. The major threat is distribution of common property resources especially the pastures and wastelands which are used by cow herds for grazing by the landless of the area. Once the common lands are lost to individuals the changes in land use are imminent. However, the planners have proposed for the development of pastures for growing fodder, which is certainly a good practice for the health of the ecosystem. The harvesting of fodder shall induce confidence amongst the farmers in reserving further land for production of fodder.

The farmers may be convinced by the PIA and other officials from relevant line departments to continue sowing crops in their respective fields may be with changed crops and changed cropping pattern. The continued use would result in better texture for the soil and easier workability for the farmers.

Remunerative prices to the farmers are made available for their farm produces lest they discontinue farming and stop from intended land use which may fetch higher price.

Warehousing facility for the storage of grains is currently not available for the farm produces. Small and marginal farmers have to store their farm produce in the open which is vulnerable to climate and is perishable. They often stand to lose their farm produce due to untimely rains which is stored in open near their huts.

During Kharif, crops were mostly millets (bajra and maize) and during Rabi, crops were jowar and wheat – which are less water requiring crops. Soil moisture retention and additional ground water availability lead to crop diversification. The farmers are inclined to go in for cultivation of cotton black gram, soyabean and other cash crops particularly vegetables and ginger, experimental basis pomegranate and papaya trees with drip irrigation system installation with intercrops such as pigeon pea (tur dal).

Improvement in the farm productivity and yield certainly shows upward trend - resulting in the changed psychology of the farmers - preferring over the conventional seeds which have inborn resistance to insects and pests, less requirement of water, higher output and/or prices fetched. In short, the preference for genetically modified crops and vegetables is on the rise and the natural link in the ecosystem gets permanently disturbed and lost.

The adoption of hybrid and genetically modified (GM) varieties be done with due diligence from regional agricultural universities and in association with local agricultural officials. The native cotton seeds used to be nutrient source for the milch cattle and its oil cake was much sought for the animal feed particularly for the poultry birds. Cotton seed is an important source for edible oil and forms an additional source to supplement the demand supply gap of oil seeds. Therefore judicious use of bt. cotton and other modified crops may be made.

The trend for going in for hybrid varieties especially for the bt. cotton has resulted in dependence of seeds from outside which are demand based and farmers have to buy the seeds at higher prices. The native cotton varieties are getting lesser demand and eventually the mother seed may vanish sooner given the popularity of hybrid varieties. This is true for other crops and vegetables also. In short, the preference for genetically modified crops and vegetables is on the rise and the natural link in the ecosystem may get permanently disturbed and lost forever.

The adoption of hybrid and genetically modified (GM) varieties need to be done carefully with due diligence from regional agricultural universities and in association with local agricultural officials.

The introduction of bt. cotton variety has resulted into massive disuse of its seeds which earlier used to supplement as cattle feed. The native cotton seeds used to be nutrient source for the milch cattle and its oil cake was much sought for the animal feed particularly for the poultry birds. This has reduced the opportunities and option available to the farmers in general. The bt. cotton seeds do not contain oil and as such the value for its seeds has lost. Cotton seed is an important source for edible oil and forms an additional source to supplement the demand supply gap of oil seeds. Therefore judicious use of bt. cotton and other modified crops may be made.

As explained above, with the augmented ground water - farmers are switching to change of cropping pattern and introduction of new and hybrid varieties of crops changing the land use and land scenario.

Given the trend of higher availability of water in coming years, the present land use is ought to change due to variations in demand for the land and subsequent use of it. Coupled with increased productivity, the existing crop lands may be reduced for some other intended use.

The PIA and agriculture extension officers need to convince farmers to continue with cropping pattern - would result in better texture for the soil. In the absence of remunerative prices / facility for the storage of grain the small and marginal farmers stand to lose their farm produce. Goat and sheep rearing practice by land less/small and marginal farmers are opting for the hybrid varieties for e.g. lambs and adults due to their adaptability to climate, lesser food requirement and higher demand for meat, jersey cows and murrah buffalo are in demand.

The animal husbandry department/ NGO need to take up a lead role in preserving the native varieties of cattle, goat and buffalos. The increased availability of water and success farmers are getting with change in cropping pattern and also with introduction of new and hybrid varieties of crops, the scenario associated with the land use is fast changing. During the recent field visit to the watershed, the otherwise culturable wastelands along the hill slopes, which used to be barren piece of land now stand allotted as patta to the landless people. With the many earthen structures constructed in the vicinity, the soil is retaining enough moisture to undertake cultivation in these fields. Even the other farm lands which had prevailing mono crop culture now are seen with changed cropping pattern and also adopting changed crops. Given the trend of higher availability of water in coming years, the present land use is ought to change due to variations in demand for the land and subsequent use of it. Coupled with increased productivity, the existing crop lands may be reduced for some other intended use.

The impact of developmental work in the watershed is yet to be established quantitatively on the crops and farm productivity. However, during the public consultations and also during the field visits to the farms revealed a marked improvement in the cropping pattern and related farm yields. The farmers reported encouraging conditions as regards availability of water to get good harvests for the traditional crops such as legumes (pigeon pea), soya bean and millets (jowar and maize). The farmers plan to take rabi crops of wheat, bengal gram and cash crops like onion and garlic. The villagers reported that a sizeable load of onions and garlic is dispatched to Delhi every year. They are expecting increase in yield due to higher availability of water and soil moisture over an extended period. The different technological interventions in the area shall certainly help the farmers generate additional income with better quality aspects. This shall activate their voluntary interests in the maintenance of the **structures erected and also shall induce a sense of ownership amongst themselves.**

- **Horticulture**

The farmers are not inclined to go in for horticulture immediately due to unsuitable soil conditions for fruit plantations. The soil is mostly brown and stony in many stretches. The requirement of water may also not be fulfilled immediately. In some watersheds horticulture has been introduced as EPA. In cases where there is rain fed horticulture, there may be a risk of fruit crops competing with food producing crops, reduced crop diversity, mono-cropping in horticulture leading to diseases and pest problems, disappearance of local varieties, competition for water, nutrient levels and increase in use of chemical fertilizers and pesticides.

- **Fisheries**

India has vast and variegated fishery resources in the shape of networks of rivers, streams, tributaries, sprawling reservoirs, natural lakes and ponds etc. Fisheries activity is not being done currently and may be taken up at later stage since relatively larger ponds are required with requisite funds too. Fisheries activity is lacking in the watershed owing to obvious reasons of dry climate and drought prone area. Fisheries being water intensive were not thought of earlier due to availability of water. With the encouraging results in the farm sector, farmers and fishermen may be attracted to adopt pisciculture with construction of farm ponds and ponds lined with plastic sheets. At present no fishery pond exists in the water shed. Fisheries activity has substantial importance as it will address to the income generation and livelihood support to the landless and other vulnerable groups. As a part of the watershed management village ponds would be of immense help for pisciculture. The fish feeds that are normally available are applied independently or along with cow dung. Application of excess amount of fish feeds - residues lies on the pond bed and pollute water because of its application procedure with other matters. The arising conflict resolution and environmentally sustainable pisciculture to be addressed through appropriate fishery management plan which at present is a deficiency. Skill gap is a common factor associated with the fisher men especially with regard to technical and managerial capabilities to handle pisciculture.

- **Aquatic Weeds**

The presence of excessive aquatic vegetation influences the management of water in natural waterways. Aquatic weeds often reduce the effectiveness of water bodies. Aquatic weeds can assimilate large quantities of nutrients from the water reducing their availability for planktonic algae. They may also cause reduction in oxygen levels and prevent gaseous exchange with water resulting in adverse fish production. Aquatic weeds create situations which are ideal for mosquito growth. The mosquitoes are sheltered and protected from their predators by aquatic weed roots and leafy growth and are responsible for the spread of Malaria, Yellow fever, river blindness and encephalitis. The decomposition of huge amounts of biological mass creates condition where CO₂ and carbon monoxide are produced and released to the atmosphere. The decomposition period is much less than decomposition of other vegetation on land. The decomposition creates emissions of foul smells which are unpleasant to public convenience. Aquatic weeds also affect quality of water.

- **Relation of Agriculture and Livestock**

The livestock particularly the cattle, buffalos and goats are increasing in demand from the farmers, especially the landless who were given patta land recently. The higher availability of green fodder for longer duration would reflect into better quality of milk and meat which would result into more financial benefits to the owners. The other advantage seen in the development of farming is growth of dairy industry and in turn would make available good manure for the farms. It becomes a self sustaining system with output of one becoming input of other. Introduction of exotic/ alien species of grasses and fodder crops is important to meet the demand of fodder dominating the local species.

- Hybrid animals are more prone to diseases and require intensive care and more provisions for health care.
- Limited breeding facility in case of hybrid animals.
- Loose/ moisturized feeding of urea-molasses brick may lead to poisoning.
- Increased returns from animal husbandry may trigger increase in livestock population result in stress on fodder resources.
- Better breed of livestock require better and more expensive fodder

- Lack of nutritious forage may decline the productivity of improved cattle
- Stress on pre and post natal care
- Post project maintenance of animal health program might be a problem
- Bacterial and parasitic diseases; Increase in tick, lice, etc.
- Need for preservation of vaccines in cryogenic conditions

- **Biomass**

Majority of the watershed are a part of dry arid zones often prone to drought conditions - no significant vegetation – few shrubs and bushes along the farm bunds. Promoting social forestry, afforestation, fodder/silvi-pasture and fuel wood in waste lands and culturable wastelands improve the biomass production. This shall enable to bridge the gap between demand and supply of firewood and also green fodder. The farmers may be encouraged and convinced to grow both the fodder and firewood trees which would serve dual purpose of supplying former and controlling soil erosion and also promote soil moisture retention. The farm boundaries may be cleared off the weeds which consume the soil nutrients and hamper the growth of crops. Removal of weeds is equally important. It attracts the insects and facilitates then growth of pests. Weeding shall also result in substantial conservation of soil nutrients and shall prevent loss through transpiration phenomenon. Physically no progress has been made so far under this activity. The plantations are proposed to be taken up through other convergence schemes such as MGNREGA.

2.3 Social Issues and Risks

The States of Maharashtra, Madhya Pradesh, Odisha and Andhra Pradesh were visited for stakeholder consultation and a situation analysis that would inform on social risks. During this process and post analysing the information gathered, it was found that social issues are mainly related with access, equity and livelihood. The following section outlines these issues along with the social diversity of the watersheds, beneficiaries, their expectations, risks expected because of any watershed intervention and the mitigation measures thereof.

2.3.1 Social Diversity of Watersheds

Stakeholder/beneficiary analysis was done to identify stakeholders/beneficiaries at the national, state, district, block and watershed level for the sample states along with their roles. The details of state wise stakeholders/beneficiaries are listed in *Annexure I*.

The state wise stakeholder/beneficiary analysis details out who the direct and indirect stakeholders/beneficiaries (both institutions and individuals) were at the state/district/block/watershed levels.

The direct beneficiaries are those who would directly be impacted by any decision making process or intervention at any of the levels.

Based on findings from all four sample States the following stakeholders/beneficiaries have been identified:

Levels	Direct Beneficiaries (Individuals)	Direct Beneficiaries (Institutions)	Indirect Beneficiaries (Individuals)	Indirect Beneficiaries (Institutions)
National	Director, IWMP team Neeranchal team	DoLR		
State	CEO, Subject Matter Specialists	SLNA, organisations that are involved in operations as tie-up / partnership for technical support		
District	PDs and APDs, Subject Matter Specialists	WCDC	Formal credit institutions, Marketing agencies	Line Departments
Block	Concerned staff WMTs, WCC, PIA Head	PIAs (govt and non-govt)		Extension offices of line departments
Watershed	Farmers (Marginalised Small, Medium, Large), Women, Landless, Indigenous people (Scheduled Tribe and Primitive Tribal Groups), Livestock keepers	Watershed Association, Water Users Association, Water Users Group	Sarpanch and head of Gram Sabha, Middlemen, AWW, ANM, Moneylenders, Retailers selling seeds and pesticides	Gram Sabha, Gram Panchayat SHGs

Source: Primary study, SESA team, DoLR
 *Details of institutions and issues around it are discussed in the chapter on institutions and capacity building.

As indicated above at the watershed level, farmers, women, the landless, indigenous people have been found to be direct beneficiaries of the programme. Although, these people have high stakes as their lives and livelihood is connected to the natural resources and thus the watershed; however, marginalised farmers, landless or asset less women and indigenous people do not have a large say in decision making processes. Further, in hilly areas the geographical terrain itself acts as a barrier to access services and information. It is found that on hilly tracts and areas with forest coverage, the population of indigenous people is higher. Given that their needs vary from others, and also vary based on location –upper lower reaches of hills, special measures would need

Box (2): PTG Population in Sample States:

Andhra Pradesh: Chencu, Bodo Gadaba, Gutob Gadaba, Dongri Khond, Kutia Khond, Kolam, Konda Reddi, Kondasavara, Bondo Paraja, Khond Paraja, Thoti

Madhya Pradesh: Baiga, Bharia, Sahariya

Maharashtra: Katkari/Kathodi, Kolam, Maria Gond

Odisha: Chuktia Bhunjia, Birhor, Bondo, Didayi, Dongria Khond, Lanjia sauria, Lodha, Makirdia, paudi Bhuyan, Saura

Source: Govt. of India, Ministry of Tribal Affairs

to be taken into consideration for them. ***In the State of Odisha the scheduled tribe covered in the sample were Kondhs and the Primitive tribal group covered were the Kutia Kondhs.***

Given this diversity it is imperative that the project interventions be planned accordingly so that the expected outcomes are achieved and ownership is fostered leading to sustainability of planned measures and impacts for a longer period of time. However, in some States although DPRs exist and a wellbeing ranking has been conducted, the implementation doesn't match with what is planned or in some cases planning is limited to the limited people who are either influential or accessible to functionaries of the project. This puts the Project at risk.

2.3.2 Stakeholder/ Beneficiary Influence

The degree of influence and importance of the stakeholders / beneficiaries was analysed (provided in Annexure II) to identify which of the stakeholders / beneficiaries influence the outcomes of the project and what should be the nature of engagement with them. This analysis would help in planning mitigation measures and for designing the project implementation plan:

<i>Stakeholder's Degree of influence</i>	Level	<i>Nature of engagement envisaged</i>
<i>The most important are those who may lose or gain significantly from the project and whose actions can affect the project's ability to meet its objectives. If not engaged properly, the project may be at risks</i>	National: CLNA, Director, Staff State: SLNA CEO and Staff District: WCDC, Director, Staff, contractual staff, technical team Cluster/ project/ Block: Dedicated PIAs, WDTs, Gram Sabha, Watershed Association, SHGs, UGs, CIGs VOs, Women Sabha Watershed level: Gram Sabha members, WA members, SHG members, UG members, CIG members, ST, SC and PTG, Women, Landless/Marginal/ Small landholders, etc.	<i>Planned and need based activities to be identified, different levels of engagement and contribution, involvement in the project to be identified and planned. Apart from being engaged they need to be sensitized and made aware of project objectives as well as nurtured through capacity building, facilitating and handholding measures.</i>
<i>Next are those who may not lose or gain significantly but whose actions can affect the projects ability to meet objectives</i>	National: Different ministries State: Technical organisations District and Block: District Administration, District level departments, Panchayati Raj Institutions and their functionaries, PIAs and extension officers of line department, Federations, CBOs Watershed : Village level institutions, Gram Sabha, Large Farmers, PRI functionaries	<i>It is essential to nurture relationships with such stakeholders as their actions may impact project outcomes. This necessitates the requirement of convergence , networking etc.</i>
<i>Next are those who may not lose or gain significantly but whose actions will not affect the projects ability to meet objectives. No risks are attached to such stakeholders.</i>	National/ State/ District/ Block: Resource organisations who focus on capacity building and training	<i>Such organisations may not impact the project if not engaged. However, they may be required for facilitating in achieving in project outcomes and hence this necessitates engagement with them in the beginning of the project itself.</i>
Source: Primary study, SESA team, DoLR		

As indicated above, different stakeholders/ beneficiaries would influence the project in different ways and therefore the nature of engagement with them has to be planned accordingly to ensure

that the project outcomes may be achieved without risks. Details from the sample States visited are in annexure II.

2.3.3 Expectations of the Stakeholders/Beneficiaries

The expectations of the stakeholders/beneficiaries, both institutions and individuals, were noted and vary depending on their degree of influence and importance in relation to respective activities. The expectations arising out of issues relating to IWMP team at state/district/block levels, as individuals or institutions, are given in the chapter/s on institutions and capacity building. The current chapter focuses on social issues and related expectations that are visible at the watershed level, where people are the direct beneficiaries of the programme.

Table (2.3): Direct beneficiaries at the watershed level and their expectations	
Direct Beneficiary/ Stakeholder	Expectations
Women	<ul style="list-style-type: none"> • Participation and influence in decision making processes • Scope for alternate livelihoods /IGAs with forward and backward linkages • Access to information
Landless or Asset less	<ul style="list-style-type: none"> • Engagement in watershed works • Other livelihood activities with forward and backward linkages • Building assets base • Access to information and services
Agriculture labourers or daily wage workers	<ul style="list-style-type: none"> • Engagement in watershed works • Other livelihood activities • Development of skills • Access to information and services
Marginalised farmers	<ul style="list-style-type: none"> • Increase in agricultural production • Other livelihood activities • Access to knowledge
Small farmers	<ul style="list-style-type: none"> • Increase in agricultural production and productivity • Market linkages • Access to knowledge
Medium farmers	<ul style="list-style-type: none"> • Increase in agricultural production and productivity • Market linkages • Access to knowledge
Large Farmers	<ul style="list-style-type: none"> • Increase in agricultural production and productivity • Market linkages • Access to knowledge
Livestock keepers	<ul style="list-style-type: none"> • Scope to increase the number of livestock • Access to livestock extension services • Enhancement of livestock health
Those following forest based livelihoods	<ul style="list-style-type: none"> • Value addition of forest products • Marketing facility
Other traditional occupations such as pottery, weaving, leaf plate making (non-farm)	<ul style="list-style-type: none"> • Financial support and credit to take up more activities • Value addition to skills • Market linkages
Indigenous People	<ul style="list-style-type: none"> • Access to better means of earning a livelihood • Scope for value addition to forest based products and its sale • Engagement in watershed works • Availing credit to take up new livelihood activities • Control of middle men • Increase in agriculture productivity • Better livestock rearing practices

Table (2.3): Direct beneficiaries at the watershed level and their expectations	
Direct Beneficiary/ Stakeholder	Expectations
Villagers	<ul style="list-style-type: none"> • Increased quantity and improved quality of water for drinking • Increased water for domestic purpose (cooking, bathing, washing)
Source: Primary study, SESA team, DoLR	

At the watershed level, the stakeholders / beneficiaries stand in the nature of receiving direct outputs and long term outcomes of IWMP. Therefore, at this level, the expectations of institutions and individuals manifest in the form of receiving services of the programme and the resultant impacts of it.

2.3.4 Issues of Significance/ Risks and Perceived Impact on Stakeholders/Beneficiaries

The perceived impacts (potential and extant) on stakeholders/beneficiaries vary across levels. At the state level, the impacts due to inadequate staff or core team, playing the role of supervision /management and also providing technical assistance, may manifest in difficulty in time management, reduced time for technical inputs and reduced efficiency. Low remuneration for staff at state/district/block level may act as a disincentive and result in lower motivation for work and lead to attrition. A lack of tie-ups with good resource organisations /persons for quality capacity building may result in poor capacity building. This in turn would reflect in execution of works, and finally in lesser benefits for community beneficiaries. At the watershed level, lack of coordination between WBR and DPR, may result in benefits not reaching out to those who are most needy among the watershed community. Also, a lack of validation of WBR may result in some vulnerable households being left out from the reach of suitable benefits. A lack of convergence with the Department of Tribal Affairs, or a lack of special measures for PTGs results in limited access to services and amenities as per their needs. Ineffective participation of women in planning and decision making may impact the women members of the community as their issues may be left out in planning. The following section highlights issues of significance or risks that came into light during stakeholder consultations. These include issues relating to inclusion of indigenous people, women, marginalised and other vulnerable groups, as well as issues relating to access to resources, rights, entitlements and equity. These are discussed in the following section and detailed in *Chapter 5*.

a) Social Inclusion

A need for Social inclusion was observed in relation to inclusion of indigenous groups, women and other marginalised/ vulnerable groups.

- **Indigenous Groups:**

- In some states, STs or PTGs form the dominant group in the respective district/watershed, whereas, in some they remain among the non-dominant /minority groups. In either of the cases, what was noted was that, special measures focusing on specific needs of these groups have not been designed and therefore, undertaken. Moreover, in areas where such groups are present, it was found that there is a lack of convergence / linking up with the Department of Tribal Affairs as a government department may be more tuned to addressing their specific needs.
- Furthermore, based on location, differences were found in the livelihood pattern of those who were living on hills and plains. For example Tribal Groups and PTGs living on hill tops were highly dependent on forests for NTFP, had marginal or no landholding, land was scattered and they practiced primitive or subsistence based agriculture, while those in the plains had consolidated land, subsistence agriculture, but practiced cultivation of major crops and vegetables and were less dependent on forests for their livelihoods. As a result of

the above, the groups stand a risk of limited access to services and amenities as per their needs.

- In Odisha, over 50 percent of the population in Kandhmal district, which was visited, is tribal. The district also has a presence of PTGs. The PTGs are generally located uphill while other tribal groups are located downhill or on plains. However, no special measures have been taken to look into their needs and requirements specifically. Even in Madhya Pradesh, which has the highest proportion of ST population than any other state in India, IWMP doesn't have any special strategy to involve the indigenous, although asset less families are identified and these groups may fall under this category.
- In order to mitigate the risks to these groups, owing to the above mentioned factors, the following is suggested. At both the National and State levels, there is a need to converge with the Department of Tribal Affairs and design Tribal Development Plan in consultation with it. At the watershed level, forest based livelihood activities need to be included in the DPR, so as to propose and channelize appropriate funds (from IWMP and other departments/schemes) for promoting and undertaking these.
- The indigenous people are known for their wisdom towards the management of natural resources. There is a need to study this Indigenous Technical Knowledge (ITK) that has simple and effective solutions on problems related to natural resources. Exclusion of these people would also mean denial of such ITKs, and leading to seeking solutions to local problems, that may not be very effective economically, socially or technically.

- **Women**

IWMP is capitalizing on the existing base of SHGs that were set up under other programmes in its operational area in the respective states. SHGs are undertaking credit and thrift activities, and inter-lending and have also availed of revolving fund benefit. Promoting women SHGs is an important means to their participation, empowerment, and also stake in decision making (collective village level and individual household level). Although SHGs are being promoted for micro-credit activities, they are not being promoted for the next level, namely, a) being mobilised to form Federation and b) for encouraging existing local IGAs (like sal leaf plate making in Odisha) for market linkages. The former, would give them greater bargaining, networking power to access more services and benefits and also to influence important decisions through collective power. While the latter, is necessary to increase economic benefits from a long term perspective. This is suggested, as IWMP already has a base that provides the potential for leveraging to the next level to increase and accelerate benefits accruing to women members of the watershed community. In Andhra Pradesh, SHGs are federated together at the village level, as Village Organisation (VO). The benefits of this were seen as good negotiating or bargaining power and also good network – for bank linkages.

Extending benefits for income generation to women members through SHGs is a tested significant step that has shown visible impacts; however, it also runs the risk of excluding those women who may not be members of such groups. In such a scenario, there is a need to expand SHG coverage base. The reasons and factors preventing other women to be a part of SHGs need to be assessed and suitable measures are to be undertaken for their inclusion. IWMP guidelines have dovetailed measures for women's involvement and membership in decision making for programme activities. Their involvement and membership is monitored through ground-truthing; however, the effectiveness of their participation and influence on decision making is not measured and monitored. A mere adherence to guidelines for membership may not be an indicator of women's empowerment and participation in decision making.

There is a need to look at qualitative aspects of their participation. In the state of Maharashtra, Women Sabhas (under the Gram Sabha) are constituted, so that they can discuss focused women's issues and put them forward and ensure they are taken up. However, this mandate has not translated into effective practice at the ground level. Even women's participation as members of Watershed Committee to ensure the same objective as above, may not have translated effectively

on ground. This leaves open the risk of women's issues being left out in DPR and watershed activities. A check needs to be made to identify the root causes / factors (social or execution related) leading to this scenario. Effective measures need to be introduced to ensure mobilisation of women and village community as a whole to initiate women's inclusion.

A lack of gender disaggregated data also makes it ineffective to measure impacts and benefits for women and plan for the subsequent years. Baseline data needs to be gender disaggregated like identification of female headed households, separate recording of number of days of employment generated for women etc. Furthermore, gender budgeting has not been taken up for the programme and needs to be done starting at the national level and to state and district levels to plan focused activities for women beneficiaries.

- **Marginalised/ Vulnerable Groups:**

One of the important gaps that came to notice, at the watershed level was in the development of wealth ranking / WBR and linking it for identification and selection of beneficiaries for DPR activities. First, certain households that may classify as vulnerable may stand the risk of being left out in WBR. The WBR stands the risk of being viewed from existing and dominantly accepted criteria, for example, income. Herein, the purpose of the WBR gets defeated. For instance, in Odisha, in the watershed visited area Kandhmal, it was found that many single women households were left out from the Poor or PoP categories, as they may have land ownership and may not be evidently asset less. The criteria chosen for doing WBR should be specific to the local situation and the objective. In Andhra Pradesh, in the watershed visited Mahbubnagar District, the wealth ranking was done only for SC/ST for the purpose of the schemes extending benefits to them. This again leaves out the vulnerable households that may not be SC/ST, but among BC / General Caste, that may be asset less or marginalised owing to poor asset ownership. The gap that was highlighted was that the livelihood / income generation benefits through SHGs are given to SC/ ST under various schemes. As a result, other vulnerable households that are non SC / ST get left out. Furthermore, as many schemes extend benefits in the form of providing financial capital like revolving fund, loans etc., this is also putting the SC/ST at risk of having a lot of loan to repay back.

b) Access to resources

Perceived issues, risks, impacts based on consultation with the community and other stakeholders are as given below:

- **Water**

Availability of drinking water (both quantity and quality) and access to its provision is a need of the hour to reduce drudgery of women folk, who mostly fetch water in addition to other house hold chores. The results associated with the activities to increase surface water and recharge ground water in the watershed, have provided a certain amount of relief. However, the priority for the provision of drinking water needs to be eked out on the agenda of IWMP, to reduce drudgery for womenfolk, who carry the heavy filled in containers from the available source/s.

- **Food**

The gap in the poor's access to food security by means of increasing income generation opportunity is being addressed through convergence schemes such as MGNREGA (which provides relief with the guarantee of income through wage employment), through skill based capacity building, through awareness generation and thereby increasing ability to access services, and through access to financial capital. Although the gap is addressed to a certain extent, supplementary income sources have to be provided for better sustenance, and efforts need to be made to build existing assets or build capacity or opportunity to procure new assets.

- **Health**

Availability of health and medical facilities in the villages of the watersheds is minimal. Mostly, Primary Health Centres (PHCs) exist at the village level, but good quality medical facilities are not available in the vicinity.

- **Education**

Most watershed villages have primary schools and in some cases high school and secondary school. However, degree level college facility is not available in the near vicinity of the watershed villages, and located at the Block/Taluk/Mandal/District headquarter.

- **Infrastructure**

The watershed villages are connected to the grid, however, electricity supply remains erratic. Road connectivity varied: in Maharashtra, the visited watershed village lies on the state highway and is connected to the Tahsil town. Other villages within the watershed are also connected with roads and to the Tahsil town. The network of public transport is well knit in the district and most of the villages are connected with Tahsil and District places. In Madhya Pradesh, the infrastructural conditions are poor and the watershed is not connected with an all weather road to the block and district. In Andhra Pradesh and Odisha, the watersheds visited are connected by road, but public transport to the watershed is not very good.

- **Access to Information**

The watershed community's access to information to various extension services remains in a project mode, that is when a programme covers the watershed villages, and staff of the programme visits the village/s and make them aware of it. Community's self initiated access to existing schemes remains weak. To increase access to information, Multi Service stations (Knowledge Hubs) need to be promoted that cater to various needs of the community and provide knowledge and information on all extension services of agriculture, animal husbandry, forest etc. These stations could also be equipped to be weather stations, as also have facilities (brochures and internet based) that would increase livelihood based knowledge of the community.

- **Forward and Backward Linkages**

Market linkages for livelihood activities of watershed community are weak and need to be promoted. Existing livelihood activities that have an established base, and therefore potential to be linked to the market, need to be connected in an organised manner through the medium of groups like Federation or Cooperative etc.

c) **Rights and Entitlements**

In the context of rights and entitlements for ownership and control rights to land, credit, housing and livestock (such as cattle, poultry, fisheries), most women farmers do not have secure land rights. This has negative implications on their capability to adapt agriculture to changing ecological conditions, as land cannot be used as collateral for accessing credit. Furthermore, security of land tenure is a basic incentive for undertaking sustainable agriculture investments, in terms of infrastructure and know-how. Women's productive assets are generally of lesser value than those of men. This can be due to various factors like inheritance rights, or division of agricultural activities of women and men. As both a cause and effect, women's economic activities are often less economically profitable than those of men. This limits their potential for expansion and increases their vulnerability in the face of adversities and stress such as sudden shortages in food supplies, income, crop failure, natural disasters, climate change etc. Furthermore, women's lower educational level vis-a-vis men hampers their access to information and know-how, and also reduces their chances for gaining wage employment. Women farmers' participation in farmers' organizations and commercial networks, which would allow access to markets and resources such as credit, tend to be mediated through male relations. Agricultural extension services and technology development also tend to target men. In regions where a distinction exists between agricultural activities of men (that focus on market-oriented production) and women (that focus on subsistence agriculture), it

indicates that extension services would benefit mainly male farmers. All these various factors and reasons contribute towards making access to financial services difficult for poor rural women. Credit, coupled with savings services and micro insurance, reduces vulnerability.

Women and men do not participate usually on an equal basis in community organizations. The absence of gender balance in decision-making instances for management of common natural resources, such as water, forests, fallow areas, can lead to women farmers' specific rights and needs to be overseen. These common property resources are important for groups, of which women form a significant percentage, and who do not own land in their names.

d) Risks to Culture

Cultural property includes sites having archaeological (prehistoric), palaeontological, historical, religious and unique natural values. Cultural properties, therefore, encompasses both remains left by previous habitants like middens, shrines and battle grounds and unique natural environmental features such as canyons and waterfalls. As per The World Bank OP 4.11, the general policy regarding cultural properties is to assist in their preservation and to seek to avoid their elimination. 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), palaeontological, historical, religious and unique natural values found in the watershed area. Overall, cultural aspects can be classified into community-oriented, caste oriented and individual oriented. No specific risks to any of the above cultural aspects were observed at present or as potential due to IWMP activity.

e) Resettlement and Rehabilitation

Resettlement and rehabilitation arises when communities living in a certain land area are moved owing to development works being undertaken on it. The physical works being undertaken in the watersheds are small structures that are mostly put up in land area that is non-residential. Hence, issues of resettlement and rehabilitation are not likely to arise.

f) Common Property Resources

Common Property Resources (CPRs) constitute an important component of the natural resource base of rural communities in India. CPR is defined as a resource that becomes common property only when a group of people who have the right to its collective use is well defined, and rules that govern their use of it are set out clearly and followed universally. The legal ownership of the CPRs rests with the Government (i.e. waste lands belong to the revenue department) and in a *de facto* sense they belong to the village community. Encroachment of CPR due to watershed activity was not observed during the field visits. But more generally, most of the CPR have been either degraded due to over use, e.g. pastures for grazing, have not been restored and in some cases encroached due to expanding agriculture or for other kinds of landuse.

g) Equity

The issue of equity was observed with regard to women. In some of the watersheds visited, it was found that although women were part of water user associations, they were aware up to a certain extent of different processes, however, when it came to voicing decisions, the decisions were those of men. Importantly although they were members, their participation was limited. In other watersheds, those who were living in the upper reaches, were often not invited for meetings or were rarely informed of the progress, plan of the project, beneficiary selection because it was difficult to approach their hamlet and therefore they were non participants in watershed activities. In some watersheds it was found that to ensure that the village owns and accepts the programme, major EPAs are planned for influential people like small, medium and large farmers on priority while

activities for the landless or asset less, women headed households, those living in far off distant difficult areas come later in the priority list. While in other watersheds, because of being small in number certain groups do not have access to benefits or a voice.

h) Decision making

It was observed that processes for decision making at the watershed level as outlined in the guidelines are being largely followed at the ground level. However, the approach adopted for involvement of community groups in decision making needs to take into cognizance 'informed' decision-making. Such an approach entails focused efforts for information dissemination, awareness generation and knowledge sharing, prior to decision making so as to equip the community to make decisions with knowledge and awareness of applicable information. This relates to qualitative aspects of decision making. However, there were some communities that were not part of the decision making process because of the geographical location of their homes/ hamlets, or for being small in number or being asset less. In order to have more attendance and quantitative presence of all heterogenous community groups, a fair amount of time should be spent on communication for meetings etc. where decisions are to be taken. Effective communication tools need to be used to ensure each and every household is informed.

i) Membership and Participation

The two main ground level issues that were found with regard to membership and participation are related to women and marginalised/vulnerable groups. Various measures to mandate women's participation and membership in local institutions like WC, Women's Sabha have not translated into effective practice in many places. This leaves open the risk of women's issues being left out in watershed activities, and the objective of women's empowerment and social inclusion does not get addressed. The factors (social or execution related) leading to this need to be identified and effective measures introduced to ensure mobilisation of women and village community as a whole to initiate women's inclusion. Similarly, in the case of vulnerable groups, effectiveness of their participation and contribution to influence decision making should be pro-actively encouraged. Their participation should not be left to marking up mere attendance, but has to be promoted in terms of qualitative involvement and voicing their opinions. In the state of Maharashtra, the model of funds disbursement, that is, of reimbursements to the WC post the completion of works, stands as a deterrent for the vulnerable group members to participate in WC, as they do not have the financial assets or means to invest. Such a funds disbursement wherever existent needs to be remodelled or redesigned.

j) Livelihoods Security

The livelihood activities under IWMP need to be designed keeping in mind entire life cycle of the activity adopted. At present, this is not the case. As a result, the vision for livelihoods activities lacks backward and forward linkages and therefore, these may not sustain in long term. Further, given the seasonality of livelihoods, especially in tribal areas, planning needs to be done based on their requirements. Also, specific planning for the upper, middle and lower reach people has to be need based as their needs differ.

k) Migration

One of the important impacts of cumulative watershed development over a number of years (IWMP and pre-IWMP) has been reduction in migration. Migration is one of the means of income generation for the poor. Ground water recharge has happened and resultant a lot of small and marginal farmers, who may have gone for wage labour, have stopped out migrating. The changes in migration pattern need to be monitored as a significant outcome impact.

l) Beneficiary Selection

The WBR needs to effectively map the poor and the PoP. Instances were found of vulnerable households being left out of these categories like single women headed households or others. The criteria for categorisation need to be carefully selected and suited to local situation. The WBR needs to be finalised only after validation and checking of errors like wrong categorisation of households due to same names of head of family or other in appropriate categorisation etc. Further, the WBR needs to be appropriately used for DPR preparation to select the beneficiaries for activities. The selection of beneficiaries for the targeted activity needs to be cross checked and verified in Gram Sabha or WA meetings.

m) Transparency

IWMP has several mechanisms to ensure transparency in project operations like approval of DPR and important decisions by the Gram Sabha, maintaining a display board at the village level showing watershed treatment targets and achievements that are to be regularly updated, organising social audits, financial auditing annually, maintaining online MIS that is accessible on public domain, maintaining records of meetings (attendance and minutes) etc..However, the transparency of funds was found to be a weak area in some places. Measures for funds transparency and sharing with the watershed community need to be made more vigorous and implemented effectively.

n) Accountability

A mechanism to enhance accountability at every level of execution would streamline the working and enable to achieve desired results in time. This is to be particularly noted for convergence activities and for capacity building. For example, in Maharashtra, in convergence it was seen that either the converging executive official or the host from PIA side is slack due to inherited weakness of knowledge, experience and training in particular area. This created hurdles in dissemination of information and delays in the implementation of the work. In Andhra Pradesh, although state level policy mandates convergence, however, sometimes at the district level and below, the PDs / APDs / PIAs face challenges to negotiate for convergence. A system of checks will ensure smoothening of operations for convergence. Similarly, accountability mechanisms need to be introduced for Capacity Building so as to keep a check not just on number of trainings undertaken but also to look at follow up and gauge quality of training imparted. In Maharashtra, the CB structure is parallel to existing operational organisational structure and lacks accountability. This needs to be introduced.

o) Operations and Maintenance

Area based UGs have been formed at the village / watershed levels. All the farmers falling in 100 acres of area form one UG. There are 15 to 20 members in a UG. As membership is area based, all caste groups like SC/ST are also included. There is a membership fees for the UG. After sometime, credit inter-loaning happens. The UGs are encouraged to form the WDF for utilisation of it after project. The potential risks for the use of WDF post project are risks of conflict, as to who would operate it and how they would ensure there is no misuse and only use for productivity enhancement and related activities. A clear strategy needs to be put in place, identifying the risks and devising appropriate resolution mechanism. Similarly, for EPAs operations and maintenance post project has to be worked out.

p) Sustainability

IWMP has a good base of institutions, namely SHGs and UGs that are operational and functioning consistently. However, the post project operations and functioning of these have not been thought of. The key suggestion for sustainability of these existing institutions is to federate them during the period of the project, so that the federations are well functioning, operational and self reliant by the time the project exits. Moreover, ground level efforts for linkage of GPs / PRIs with IWMP need to be

made more rigorous and tightened, that would ensure the GPs working closely with and overseeing the groups in future.

r) Consolidation and Post Project Mechanism

Clear guidelines and strategy needs to be developed for post IWMP operations. This is an area that is lacking at present and may result in ineffectiveness and loss of good practices in the state in IWMP if not devised during project cycle.

2.4. Institutional Issues and Risks

In context of watersheds, the institutional issues and risks center on their capacity to deliver IWMP. This translates into how effectively the core capabilities of administration, procurement, finance and management of natural resources are addressed so that the IWMP outcomes are realized. *Neeranchal* envisages imparting specialized training for strengthening technical and managerial skills to the various levels of stakeholders, namely the PMU of the DoLR, SLNAs and other designated agencies. In general, the current status of capacity building is discussed in Table 3.2.

Institutional support	Constitution of State Level Nodal Agency (SLNA) with professional support in each State	Creation of Watershed Cell-cum-Data Centre at RDA /ZP in all programme districts to supervise / coordinate IWMP projects in the district.	Project supervised by Project Implementing Agency (PIA) with Watershed Development Team (WDT) comprising of 3 to 4 technical experts.
Human Resources and Issues	Observed issues relating to the HR Policy / administration /finance/convergence /CB /O & M of structures /lack of grievance redressal mechanism etc in all states visited, resulting into lack of flow of information which is top to bottom and not vice -versa, high attrition rate and poor project implementation/performance	The main challenges are administrative limitations, limiting domain knowledge with multiple responsibilities etc. While the other issues and risks are lack of manpower and finance resources, lack of domain experts and powers to consult, influence of local politicians, lack of concern about corrective actions and wide neglect of site specific needs.	

2.4.1 Capacity Building at the Watershed level:

User at the watershed level is the main beneficiary of the project activities and the outcome of the project depends upon the quality and quantum of capacity building exercises targeted at this levels. Given that no capacity building and training exercise has been undertaken at the watershed level, trainings are not sporadic and are based on expenditures to be made under this head. Given these factors, capacity building and training has little or no impact on the user groups, Watershed Committee, Self Help Groups and individuals.

Different states follow different strategies for building capacities and training. While some states may have capacity building strategies in place for IWMP others don't. While some States have long term partnerships between resource organisations and PIAs others don't. Training calendars for watershed level activities are developed by few States and not all. In some states cluster level training centers and Project Training Organisations exist as a good practice. At the watershed level, WDTs are responsible for capacity building and training, with the overall responsibility of the PIAs.

However, it was found that the understanding of what capacity building and training actually means varies from person to person. A training need assessment is not undertaken because of lack of knowledge on how to conduct it. Thus the trainings organized are not need based. There is a shortage of resource persons as well as resource materials. There is no awareness of safeguard policies either. There is a mismatch between training requirements and training material.

2.4.2 Capacity Building at the PIA level:

Different states follow different strategies for building capacities and training. While some states may have capacity building strategies in place for IWMP others don't. While some States have long term partnerships between resource organisations and PIAs others don't. Training calendars for watershed level activities are developed by few States and not all. In some states cluster level training centers and Project Training Organisations exist as a good practice. At the watershed level, WDTs are responsible for capacity building and training, with the overall responsibility of the PIAs. However, it was found that the understanding of what capacity building and training actually means varies from person to person. A training need assessment is not undertaken because of lack of knowledge on how to conduct it. Thus the trainings organized are not need based. There is a shortage of resource persons as well as resource materials. There is no awareness of safeguard policies either. There is a mismatch between training requirements and training material. High attrition level and low salaries have also impacted a consistent effort being made towards building capacities and institutional strengthening. Project supervised by Project Implementing Agency (PIA) with Watershed Development Team (WDT) comprising of 3 to 4 technical experts.

2.4.3 Capacity Building at the District level:

At the district level the issues are the same. There is a dedicated technical expert for capacities building however the technical experts themselves lack know how on undertaking capacity building and training need assessments, planning out training programmes and calendars and then executing them. Further there is a mismatch in resource persons and the resource material available. The attrition level is high and therefore this component is not implemented uniformly. There also exists an absence of job specific training, structured training programmes and exposure visits. Watershed Cell-cum-Data Centre at RDA /ZP in all programme districts to supervise / coordinate IWMP projects in the district.

2.4.4 Capacity Building at the State level:

At the State level, issues are similar. Casual approach for assessment of training need and prioritization; lack of -preparation /regular up dation of training calendar; -monitoring, evaluation, learning –lack of CB team /or staff burdened with multiple functions. Lack of mechanism to share experiences amongst staff trained and mismatch between project requirements and training offered, lack of resources and poor quality training materials etc. Constitution of State Level Nodal Agency (SLNA) with professional support in each State exists. Observed issues relating to the HR Policy / administration /finance/convergence /CB /O & M of structures /lack of grievance redressal mechanism etc in all states visited, resulting into lack of flow of information which is top to bottom and not vice -versa, high attrition rate and poor project implementation/performance

2.4.5 Capacity Building at the National level:

At the national level the concerns around capacity building and training are the same. In the absence of a uniform guideline for capacity building and training, States follow different practices for capacity building and training. The focus at present is not on how skills and competencies of concerned stakeholders at all levels may be improved, how change will be brought about in target communities and ensuring capacity building is a continued process. These issues need to be addressed.

Further a monitoring mechanism needs to be in place for capacity building and training along with special measures taken for building capacities to identify safeguard issues and address them. Therefore, there is need to have dedicated people in place who will work on capacity building and training need assessment across all thematic areas that IWMP covers and first building their own capacities. Tie ups with key resource centers is also essential.

At all levels it is found that main challenges are administrative limitations, limiting domain knowledge with multiple responsibilities etc. While the other issues and risks are lack of manpower and finance resources, lack of domain experts and powers to consult, influence of local politicians, lack of concern about corrective actions and wide neglect of site specific needs.

Thus it may be concluded that there is a need for the following:

- Identification and Prioritization of Training Needs;
- Identification of Resource Individuals and Institutions;
- Preparation of Quarterly and Annual CB Calendar;
- Preparation of Specific Training Plan and Implementation;
- Monitoring Review, Follow up and Feed Back.
- Common guideline for capacity building and training
- Skills and competency focused training
- Training focusing on facilitation of change at the community level
- Continued efforts on capacity building and training
- Monitoring mechanism
- Training specific to safeguards

2.5 Project Specific Monitoring

The observations during the conduct of SESA revealed that none of the states follow all the monitoring systems proposed in the IWMP, but follow one or two based on available capacity and suitability. Internal Monitoring, physical and financial progress, web based online monitoring, and external monitoring or evaluation system is there in all the states. GIS based online monitoring, self-monitoring by communities, sustainability monitoring, social audits, process monitoring although mentioned in the IWMP guideline, is generally not practiced.

The social audit process is done in one or two states while there is no participatory monitoring across the others.

Some States have systems for auditing while others have mobile monitoring units. The frequency of the review meetings held at different levels is different in different states. Most of the state follows monthly frequency of the meeting while some may exceptionally follow weekly meetings.

2.5.1 Shortfalls / gaps, and needs / requirements (Central, state, district and local issues)

Shortfalls in the monitoring were identified and the following mechanism to be introduced appropriately to complete the monitoring system at different levels:

<p>District level</p> <ol style="list-style-type: none"> 1. Monitors as per the formats issued by SLNA. Monitoring needs of district is not covered in it. 2. Review meetings get limited to physical and financial progress. For e.g. in Odisha open grazing was common problem reported by WDTs of all the projects of Kandhmal district individually. However, none of them discussed on this problem jointly among themselves. 3. Social Auditors to be empanelled at the district level through transparent and participatory processes. 	<p>Project level</p> <ol style="list-style-type: none"> 1. Social Audit is not being followed in any of the state except Andhra Pradesh 2. Monitoring is not linked with Net Planning or base line survey 3. Monitoring of women empowerment and other gender equity related issues is not maintained 4. Equity aspect of the project benefits are not assessed 5. Participatory monitoring system is not adopted 6. Sustainability monitoring is also not followed 7. Monitoring is not linked with action taken 8. Field visits are generally not linked with MIS
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2.5.2 The way forward in Monitoring

In order to achieve the objectives of the project it is important that the project gets monitored as it progresses. There are certain gaps in the current monitoring system that is being followed at each level of the project from the national to the village level. First, the common guidelines-2008 (revised-2011) for executing IWMP states about 9 streams to be followed for monitoring the programme. However, it was found that only 4 or 5 of them were being followed in each of the four states visited. Second, the guidelines very specifically states seven end results of IWMP. The monitoring system doesn't capture all the data which is necessary in order to monitor all the end results mentioned. Third, it is seen that entire monitoring mechanism is operated in order to serve the monitoring need of DoLR only. None of the states, except Andhra Pradesh, have listed their own set of need of data to be collected along with the data to be collected to cater the need of DoLR. SESA highlighted the gaps and shortfall in the monitoring system individually at each level viz central, state, district and project. SESA also proposed some additional mechanism and system in order to strengthen the existing monitoring system. SESA also proposed additional indicators to meet the requirement of all levels. At every stage regular monitoring of the project will have to be carried out. Online monitoring includes process and outcome monitoring. Quarterly progress reports by PIAs/Watershed Committee forwarded to the DWDU for further submission to the SLNA. The SLNA has a critical role that below mentioned systems are followed at the appropriate levels:

- Remote sensing and GIS based monitoring
- PIA and DMDU level self progress monitoring community teams
- Social Audits
- Independent and External Monitoring by independent agencies - Process Monitoring

2.5.2.1 At the watershed level

According to IWMP: The state government shall introduce following monitoring systems at the watershed level

- Participatory Monitoring
- Process monitoring
- Social Audit and other Transparency mechanisms
- Apart from measuring the progress of physical and financial achievements the state shall provide following inputs
- Linking the Participatory monitoring, Process Monitoring and Social Audit results also with existing MIS
- Separate MIS shall be designed for tracking the progress of SHGs and other institutions.

Evaluation

DoLR will have a national panel of evaluation to conduct Impact assessment studies. The national level panel has to ensure objectivity as well as infuse a national perspective. The SLNA with a panel of approved evaluators includes institutions and agencies – whom the DWDU can select for evaluation. Evaluators are to be treated as facilitators for physical, financial and social audit of the work done – based on which funds are released.

Learning

The following methods are proposed to enable the WDT/WC learning process at different levels.

- The internal team has to conduct a Customised / regular analysis and monitoring all types of data and share the same with project authorities/ policy makers.
- DMDUs can take the help of academic and voluntary organizations can be involved in action research projects,
- pilots on new themes and innovative models.

Based on field experiences, monitoring exercises and academic/ research studies – district level/state level and national level workshops/seminars can be organized.

3. Environment and Social Management Framework

Based on the key environmental and social issues, challenges, risks and likely impacts highlighted in the preceding chapters this first phase SESA is developed as an impact-centered SESA focusing on potential environmental and social impacts and suggesting their mitigation measures. Consequently, the SESA has developed an Environment and Social Management Framework (ESMF) that includes the following:

- Safeguards Policies triggered and applicable GOI Policies World Bank
- and Categorization of Sub-Project activities Screening
- Impacts and their Mitigation Potential
- Implementation Arrangements Safeguards
- Safeguard Strategies Specialized
- Monitoring Plan Safeguards

3.1 World Bank Safeguards Policies triggered and applicable GOI policies

Based on: (i) consultations with key stakeholders who are implementing the IWMP and the community, including indigenous people; (ii) assessment of the participation and inclusion of women and other marginalised groups, such as, landless, asset less and marginal farmers; (iii) issues and risks that came to light through stakeholder consultations; (iv) gaps identified in institutional mechanisms; and (v) the physical setting of watersheds and the diversity of habitats and agro-climatic variations they display, some of the World Bank safeguard policies are triggered and Government of India policies are applicable on the project. These policies and their implications for the project are given in Table (5.1)

It may be noted that no private land acquisition for building small structures and other soil and moisture conservation measures is foreseen. Stakeholder consultations clearly indicated that these structures are/ will be built on Government land or Forest land. Given that the State Forest Departments themselves undertake work on legally classified forest areas, including the Reserve Forests, all due diligence for legal and procedural clearances are not seen as an issue. Further, Cultural properties if any are not affected by the watershed treatment activity and no excavation is proposed. Therefore the safeguard policies on resettlement and rehabilitation and cultural properties are not triggered.

Table (3.1): Safeguard Policies - World Bank and Govt. of India

World Bank Operational Policy Triggered	Remarks and Relevance for Neeranchal	Applicable Govt. of India Policies	Remarks and Relevance for Neeranchal
Environmental Assessment (OP 4.01)	A number of activities and approaches that <i>Neeranchal</i> would finance have the potential to influence both the environmental setting and social fabric within a given landscape and therefore, this is triggered. A range of mitigation measures proposed for identified impacts would be financed by Neeranchal during implementation.	i. National Water Resources Policy 2002 ii. National Environment Policy 2006 iii. National Forest Policy 1988 iv. National Agricultural Policy 2000	Elements of these policies are already being addressed under IWMP implementation. The second phase of SESA would explicitly map the ongoing synergy with these GOI policies and wherever required, will identify process and procedures for further increasing the synergy. Neeranchal would fully finance the second phase of SESA.
Natural Habitats (OP 4.04)	Many natural habitats, including forestland, non-forestland with tree cover, pastures/meadows, common property resource <i>etc.</i> may be involved and therefore, this policy is triggered for ensuring that 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 to.	i. National Environment Policy 2006 ii.. National Water Resources Policy 2002 iii. National Biodiversity Strategy and Action Plan (NBSAP)	- same as above –
Forestry (OP 4.36)	Some of the watersheds may include legally defined forest areas and therefore, this policy is triggered for ensuring that activities in forestlands are aligned with their management/working plans and do not result in any significant adverse impact on forest quality and quantity.	i. National Forest Policy 1988	The project would ensure that principles of sustainable forestry are applied if a final harvest is realized by the communities at the end of the growing cycle.
Pest Management (OP 4.09)	This policy is triggered to control the chance increased use of pesticides by farmers, which has implications for the quality of soil and water environment as well as public health	i. National Agricultural Policy 2000	The project would disallow procurement of any banned (Class IA & B and Class II of the WHO list) pesticides. IWMP would invest in training of farmers in procurement,

Table (3.1): Safeguard Policies - World Bank and Govt. of India

World Bank Operational Policy Triggered	Remarks and Relevance for Neeranchal	Applicable Govt. of India Policies	Remarks and Relevance for Neeranchal
	concerns. Neeranchal would support integration of an Integrated Pest Management Plan across multiple states.		storage, use and disposal of pesticides.
Indigenous Peoples (OP 4.10)	Tribal communities exist in some of the watersheds under the project and therefore, this policy is triggered. Neeranchal would ensure that these communities receive adequate benefits from the project and supported activities are not in violation of acceptable social norms and customs. An Indigenous Peoples Framework has been developed and included in the ESMF.	National Tribal Policy (Draft), Ministry of Tribal Affairs	Convergence with the Tribal Sub Plan (TSP) would be ensured during Neeranchal and the second phase of SESA would develop procedures for integrating the TSP in the IEMP cycle at the district level.

3.2 Screening and Categorization of Sub-Project activities

This is an impact centered SESA focusing on potential environment and social impacts and suggesting their mitigation measures. For proper implementation of the ESMF it is essential to screen all sub-project activities and then apply the ESMF provisions in the project. The following table gives the categorization of sub-project activities as per the criteria developed:

Table (3.2) : Screening Criteria		
Sub - Project Category	Screening Criteria	Remarks
Category A	<ul style="list-style-type: none"> • sub-projects involving significant construction activity (E.G. New Buildings, Village and Access Roads, Dams over 10 m high etc.) 	<ul style="list-style-type: none"> • would require location specific EMP) to be developed once activity is identified)
	<ul style="list-style-type: none"> • sub-projects requiring land acquisition 	<ul style="list-style-type: none"> • sub-projects involving land acquisition would not be supported under Neeranchal • no such activity is likely to be financed under the project that conforms to category A, however in future if any such proposal is approved, an EMP- site specific EMP would be prepared, which would be cleared and monitored by PMU, DoLR
Category B	<ul style="list-style-type: none"> • sub-projects involving minor construction activity (E.G. water diversion structures, small check dams, creation of water impoundment of up to 5 Ha, minor repairs to existing office buildings and soil stabilization works etc.) 	<ul style="list-style-type: none"> • the provided mitigation measures would be applied during the activity • available Environmental and Social Guidelines (ESG) from the Mid-Himalayan Watershed Project, Technical Guidance from Sujala 1 and 2 would be applicable and should be followed while undertaking category B sub-project activities
	<ul style="list-style-type: none"> • All agriculture related activities (pest management, IPNM, Integrated farming etc.) 	
	<ul style="list-style-type: none"> • All plantations sub-projects on forestlands and non-forestlands, involvement of CPR etc. 	<ul style="list-style-type: none"> • sub-projects would be monitored throughout the implementation and reported using the given monitoring indicators
	<ul style="list-style-type: none"> • creation of new community institutions (village level committees, SHGs), etc. 	
Category C	<ul style="list-style-type: none"> • All sub-projects involving training & capacity building, awareness workshops, purchase of minor agriculture, IT equipment etc. 	<ul style="list-style-type: none"> • no safeguards related monitoring is required

3.3 Potential Impacts and their Mitigation

Table (3.3): Identified Potential Environment and Social Issues/Risks/Impacts and their Mitigation and Management Responsibilities				
National Level				
	<ul style="list-style-type: none"> • Technical support from Neeranchal may focus more on activities which would directly benefit people who have land and not necessarily those who are landless or have no assets. • The use of IWMP wellbeing ranking criteria having a small budget for those who do not have assets, may not match with the beneficiary selection criteria of other social security schemes and could lead to many needy households being left out within the same watershed and also giving rise to discontent and disputes. • There also may be duplication of work because of lack of convergence with other flagship programmes and schemes, other departments. 	High	<ul style="list-style-type: none"> • Mandate for convergence with other Ministries or departments such as – Ministry of Panchayats/Tribal Affairs, Women and Child Development etc. should be fully exploited. Necessary National/State level Government orders/ circulars for convergence should be issued. • Harmonize criteria for selection of potential beneficiaries with other Departments and Ministries through use of wellbeing ranking. • Prepare a Transparency and Accountability Plan for the larger IWMP implementation during the second phase of SESA. • Focus livelihood activities that result in creation of new assets or income sources for the left out households, poor, vulnerable and marginal people. 	DoLR, PMU
	<ul style="list-style-type: none"> • Measures taken for soil conservation and groundwater recharge in most places is based on identified beneficiaries requirement for water and check of soil erosion so that their fields are not sand cast or to prevent removal of topsoil by constructing field bunds, diversion weirs and 	High	<ul style="list-style-type: none"> • Standard guidelines on dos and don'ts for reducing risks associated with erroneous structures, structures in wrong locations, proper soil and moisture conservation measures to be applied, including the use of a screening procedure. 	DoLR, PMU

	<p>check dams. These measures are often not based on hydrological assessment and studies indicating whether the structure is obstructing the natural recharge and feeding of the minor irrigation systems on which a large number of small, marginal farmers are dependent.</p> <ul style="list-style-type: none"> • Improper disposal of construction debris could block natural water courses and impact downstream beneficiaries. 		<ul style="list-style-type: none"> • Under the second phase of SESA, develop a mainstreaming process for integrating technical guidance available under the Mid Himalayas, Sujala I & II and Uttarakhand Watershed Projects. Include guidance on siting, constructing and waste disposal in IWMP cycle. 	
	<ul style="list-style-type: none"> • Opportunity to harvest increased crop yields could result in unregulated use of pesticides and other agrochemicals with potential downstream impacts on human health and pollution of sub-surface water, aquatic and soil ecosystems. • Some of the organic practitioners could start using pesticides once irrigation water is available and crop diversification is be adopted • Risk of procurement of banned pesticides and non-availability of commonly used pesticides • Non-Availability of selective pesticides, effective against crop pests but not against natural enemies of pests • Unplanned use of bio-control measures by employing bio-agents that have not been tested fully, especially when Economic Threshold Limits (ETL) are not well worked out • Lack of trained human resources to train large farmer base using pesticides 	High	<ul style="list-style-type: none"> • Apply the Pest Management Plan including the IPM strategy • Prepare and disseminate information (IEC material) on IPM and pesticide use with all SLNAs, WCDCs, watersheds and concerned stakeholders. • Circulation of banned list of pesticides and insecticides as well as guidelines for pesticide management to be shared from national to watershed/ user group level. • Provide IWMP support to develop ETL for pests that are not yet studied in detail. Ensure only well tested bio-control agents would be used under technical guidance from certified agencies. Use only ready to release and duly approved bio-control agents. • Identify and train community level extension workers on safe use and handling of pesticides who would further train farmers. • Identify special target groups, e.g. horticulture officers for training in procuring and applying 	DoLR, PMU

			<p>IPM packages for select crops.</p> <ul style="list-style-type: none"> • Awareness programs on using pesticides, exposure trips, demonstration plots/ research stations and annual refresher training workshops for a range of stakeholders • Emphasize convergence with relevant departments for providing access to biopesticides. 	
	<ul style="list-style-type: none"> • Special measures for inclusion of indigenous groups are non-existent resulting in inappropriate matching of needs and benefits received for these groups. • Limited access to services and amenities as per their needs though may not be directly linked to watershed programmes. • Indigenous Technical Knowledge (ITK) that has simple and effective solutions on problems related to natural resources, not taken into account. 	High	<ul style="list-style-type: none"> • Tribal Development Plan in consultation with Department of Tribal Affairs based on consultations with these groups. • Apply the Indigenous Peoples Plan developed under Neeranchal with full funding support from parallel implementation of the IWMP. • ITKs to be gathered and compiled (documented) and incorporated into watershed plans. • 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. 	DoLR, PMU, SLNA, Department of Tribal Affairs
	<ul style="list-style-type: none"> • Transparency and accountability system not uniform across states and could pose risk of mismanagement and misuse of funds while implementing the safeguards mitigation measures.. • Absence of clear guidelines on accountability at 	High	<ul style="list-style-type: none"> • Share beneficiary entitlements under the project (and other schemes with whom convergence is planned) through various means, including, among others, wall writings, sign boards and printed pamphlets. • Standardize online systems for fund and data 	DoLR, PMU

	each level and informed consent of everyone in the watersheds could put the poor, landless and marginalized population at higher risk of missing out on project benefits.		management, guidance note or government order on standard procurement processes for goods and services, transparency, governance action plan, especially when undertaking implementation of mitigation measures. Especially track poor, landless and marginal population through the beneficiary tracking system.	
Absence of a comprehensive M&E guideline or plan	<ul style="list-style-type: none"> Comprehensive M&E guideline or monitoring framework document is missing, especially for safeguard related work. Thus, qualitative and quantitative monitoring, performance etc. may not be possible leading to lack of information on impacts (positive and adverse) of the project. Low use of technology in M&E. Systems for GIS mapping not streamlined and not much in use at the State level. Thus, changes in watershed not mapped properly 	Moderate	<ul style="list-style-type: none"> Implement the M&E plan provided in this ESMF and include some of the key indicators in the online MIS for IWMP. Identify GIS requirements at the National, State and district level, allocate adequate budget from IWMP for monitoring as well as institutionalization of the same. 	DoLR, PMU
	<ul style="list-style-type: none"> Absence of a need based capacity building plan resulting in gaps in expertise reflected in execution of the programme in the absence of a capacity building plan Trained human resources not deployed as per training received Absence of capacity building strategy leads to low expenditure on training and capacity building at all levels (national/state/district/watershed) 	Moderate	<ul style="list-style-type: none"> Capacity Building plan developed based on CBTNA. Implement the Capacity Building Strategy presented in the SESA. Identify a pool of resource persons for IWMP at National and State level and tie ups with Resource Agencies for capacity building. Empanelment of resource persons/institutions for specific training including on safeguards implementation and monitoring. University/Research Institution experts etc. from reputed organizations need be invited for field demonstrations with hands on training. 	DoLR, PMU

			<p>Periodic interaction with site staff and villagers and other stake holders.</p> <ul style="list-style-type: none"> Rollout the capacity building strategy, as provided in the ESMF, especially to cover safeguards implementation. 	
Absence of guidelines on gender and inclusion	<ul style="list-style-type: none"> Absence of gender budgeting limiting the activities relating to women's empowerment to SHGs. Lack of gender-disaggregated data in tracking watershed outcomes impacting the quality of monitoring. 	Moderate	<ul style="list-style-type: none"> Initiate gender budgeting in pilot Neeranchal districts and gradually roll out to IWMP districts. Disaggregate baseline data for gender like identification of female headed households, separate recording of number of days of employment generated for women etc. Gender disaggregation of data to be incorporated in monitoring guidelines and protocol in IWMP. 	DoLR, PMU
	<ul style="list-style-type: none"> No plan for post project sustainability may lead to lack of ownership, operation and maintenance at the watershed level 	Moderate	<ul style="list-style-type: none"> Prepare a detailed post project sustainability plan under the second phase SESA in consultation with various States, and other stakeholders, such as NGOs/CBOs. Explore, beneficiary contribution as a means of securing asset ownership, especially for CPR; include a wide range of stakeholder participation in community based management committees. 	DoLR, PMU
	<ul style="list-style-type: none"> The watershed community's access to information to various extension services remains in a project mode, that is, when a project covers the watershed villages and project staff visits the village/s and make them aware of it. 	Moderate	<ul style="list-style-type: none"> To increase access to information, multi service stations (Knowledge Hubs) needs to be promoted that would cater to various needs of the community and provide knowledge and information on all extension services of 	DoLR, PMU, SLNA

	<ul style="list-style-type: none"> Community's self-initiated access to existing schemes remains weak resulting in limited access and resultant benefits. 		<p>agriculture, animal husbandry, forest etc.</p> <ul style="list-style-type: none"> Explore the use of community radio and other traditional and modern means of regular communication at the village level for disseminating information. 	
	<ul style="list-style-type: none"> Limited information on learning, best practices and information or innovations leading to limitations in up-scaling the project Risk of underutilization of existing best practices in watersheds and for small farmers 	Low	<ul style="list-style-type: none"> Exchange of Learning, documentation & dissemination of Best practices and Innovation across states, visits, workshops, and presentations. Adopt best practices from the ongoing and forthcoming SLEM projects across several states. Transmit best practices through the existing agriculture extension system rather than just using the project machinery. 	DoLR, PMU, SLNA
	<ul style="list-style-type: none"> M&E remaining a project centered activity, largely driven by Central Agencies through State level implementing agencies Low or no involvement of communities in monitoring watershed level sub-projects resulting in limitation of availability of real time data No social audits conducted and only instruments used are the third party audits 	Low	<ul style="list-style-type: none"> Provide training to Watershed Committees at the village and GP level in M&E for tracking sub-project progress Constitute watershed level social audit committees of community representatives 	DoLR, PMU
State Level				
	<ul style="list-style-type: none"> Low remuneration, limited training and capacity building, no grievance redressal for staff can result in high attrition of staff adversely impacting project performance. 	Severe	<ul style="list-style-type: none"> Develop and implement a HR Policy at state level. Encourage long term continuity of project in-charges, especially post technical and managerial training on watershed management approaches. 	DoLR, PMU, SLNA, PMU, WCDC

	<ul style="list-style-type: none"> • There is no HR policy for benchmarking or for resolving HR and staff issues. 		<ul style="list-style-type: none"> • Make remuneration attractive to attract retain quality staff rather than providing basic minimum.. 	
	<ul style="list-style-type: none"> • Supplementary income sources that would provide for better sustenance and access to food security are limited because of a lack of technical knowhow • Only typical livelihoods, mostly farm level and some non-farm ones supported with little or no integration of livelihood plans at the watershed and/or landscape level • Use of specialized resource agencies in skill building and livelihood generation is generally lacking 	High	<ul style="list-style-type: none"> • Initiate need based livelihoods assessment in IWMP based on food security needs, seasonality, resources, cost benefit analysis, value chain addition, forward and backward linkages and scope for marketing. • Compile a listing of potential livelihood, including job oriented skills that could be productive within the watershed. • Contract specialized resource agencies for improving livelihood training and employment. 	DoLR, PMU, SLNA, PMU, WCDC
	<ul style="list-style-type: none"> • The potential risks for the use of WDF post project are risks of conflict, as to who would operate it and how they would ensure there is no misuse and only use for productivity enhancement and related activities. 	High	<ul style="list-style-type: none"> • Guidelines to be in place for WDF fund management and informed consent of watershed people on it should be mandatory. 	DoLR, PMU, SLNA, PMU, WCDC
	<ul style="list-style-type: none"> • Lack of funds for O& M, e.g. de-siltation works 	Moderate	<ul style="list-style-type: none"> • Convergence with different schemes. • Periodic maintenance and organization of de-siltation works through beneficiary contribution funds. 	DoLR, SLNA
	<ul style="list-style-type: none"> • Engineering structures loose capacity and efficiency to perform for water and soil holding. • The quantitative impacts due to various engineering measures and technology interventions may not be measurable on periodic 	Moderate	<ul style="list-style-type: none"> • All the baseline data for all resources considered need to be benchmarked. • Seasonal fluctuations of water table in dug wells and surface structures holding water to be measured. 	DoLR, SLNA

	basis and available for comparative assessment.			
	<ul style="list-style-type: none"> Risk of limited participation in watershed activities, mistrust, elite capture, low equity and non-inclusiveness in decision making. 	Moderate	<ul style="list-style-type: none"> Guidelines and manual for transparency, accountability and governance to be in place along with designated staff at each level 	DoLR, PMU, SLNA, PMU, WCDC
	<ul style="list-style-type: none"> Agencies at watershed level are not used to working together and focus on achieving their targets Low or no prior knowledge of implementing environmental and social safeguards at the watershed level 	Moderate	<ul style="list-style-type: none"> Develop community visitation registers for line department staff to promote coordination between departments. Organize Convergence Days to promote cross sharing of beneficiary oriented schemes. Associate experts from MOEF-GOI early on at the watershed planning stage especially on forestry related issues. 	DoLR, PMU, SLNA, PMU, WCDC
	<ul style="list-style-type: none"> Impacts technology transfer from Universities /research Institutions etc. (not fully understood at SLNA level). There is also lack of interest for visiting sites. Besides, there are physical limits for multiple roles of staff. Limited knowledge and exposure of national policies, e.g. forest policy resulting in low emphasis on afforestation and social forestry 	Moderate	<ul style="list-style-type: none"> Frequent (informal) meetings at SLNA for exchange of views and organize regular exposure visit. The proposed Center of Excellence on Watersheds to organize various knowledge and solution oriented events at SLNA level. Impart policy and legal training to SLNA staff covering salient features of key policies and also track contribution from Neeranchal and IWMP towards supporting different national policies. 	DoLR, PMU, SLNA, PMU, WCDC
	<ul style="list-style-type: none"> Funds available through convergence may be limited. Given that the funds available for key activities like desiltation, operation and maintenance etc is also limited, necessary soil and moisture conservation measures may not be taken up as needed 	Moderate	<ul style="list-style-type: none"> Adequate budgetary provisions of IWMP should be utilized fully, as allocated. Convergence with MNREGS and other schemes of the Government would help make available funds for core watershed activities. 	DoLR, PMU, SLNA, PMU, WCDC

	<ul style="list-style-type: none"> • Underutilization of available IWMP funds 		<ul style="list-style-type: none"> • Guidelines for operation and maintenance and ownership by communities to be put in place for during the project, consolidation and post consolidation phase. • Use of new technology for planning and coordination should increase fund utilization. 	
	<ul style="list-style-type: none"> • Marketing facilities for some of the items produced at SHG level and cottage industry levels are lacking thus limiting increase in income and loss of interest over a period of time • There exists a gap for the need of warehousing facilities for the storage of perishable and non perishable goods from farms. 	Moderate	<ul style="list-style-type: none"> • Link with marketing institutions at State and watershed level. • Promote perishable produce where warehousing and storage facilities are available. • Explore convergence with Central/State schemes that promote local level storage facilities (watershed level). 	DoLR, PMU, SLNA, PMU, WCDC
	<ul style="list-style-type: none"> • The existing base of SHGs not being capitalized to be taken to the next level, namely: (a) mobilized to form Federation(s); and (b) encouraging local IGAs for market linkages. • Low women participation in decision making despite their primary role in agriculture and livestock sector • Risk of leaving behind uncovered households and ignoring old SHGs who may have defaulted years ago 	Moderate	<ul style="list-style-type: none"> • Mobilise SHGs and facilitate formation into Federation; Federate SHGs during the period of the project, so that the federations are well functioning, operational and self reliant by the time the project exits. • Promote taking up IGAs with forward and backward linkages. • Credit, coupled with savings services and micro insurance, will reduce vulnerability. • Expand SHG coverage base by revisiting the criteria for inclusion of old SHGs as per NRLM guidelines for covering left out households • Market development for and assisting SHG 	DoLR, PMU, SLNA, PMU, WCDC

			groups and individual vocational practitioners' needs intervention of help of corporate and NGO's through their availability of networks.	
	<ul style="list-style-type: none"> Drinking water availability (both quantity and quality) and access to its provision is a need of the hour to reduce drudgery of women folk who carry drinking water containers from available source/s often located at long distances 	Moderate	<ul style="list-style-type: none"> Convergence with Ministry of Drinking water and sanitation and respective departments is essential to address this issue. Make drinking water as a focal area for convergence in IWMP. Explore new and innovative solutions for restoration and protection of degraded water sources through plantation. 	DoLR, PMU, SLNA, PMU, WCDC
	<ul style="list-style-type: none"> The watershed community's access to information to various extension services remains in a project mode, that is, when a programme covers the watershed villages and staff of the programme visits the village/s and make them aware of it. Community's self initiated access to existing schemes remains weak resulting in limited access and resultant benefits. 	Moderate	<ul style="list-style-type: none"> Guidelines, orientation and training to be in place. Mechanisms for accessing information and convergence with various line departments to be in place. Resource persons to be hired for imparting knowledge, technical knowhow and information 	
	<ul style="list-style-type: none"> In the wake of the fact that some of the districts may be scheduled districts or partially scheduled areas, it is noticed that steps such as approval of gram sabha and convergence with PRIs is missing which may lead to loss of rights of the indigenous people. On the other hand, convergence with schemes at every level may not be possible 	Moderate	<ul style="list-style-type: none"> Ground level efforts for linkage of GPs / PRIs with IWMP need to be made more rigorous and tightened, that would ensure the GPs working closely with and overseeing the groups in future. Under take M&E focusing on schedule areas. 	DoLR, PMU, SLNA, PMU, WCDC
	<ul style="list-style-type: none"> Ownership of operation and maintenance by respective department implementing the IWMP and the community as well is weak. 	Moderate	<ul style="list-style-type: none"> Develop and deploy a clear strategy identifying the risks and devising appropriate resolution mechanism. 	DoLR, PMU, SLNA, PMU, WCDC

	<ul style="list-style-type: none"> • Clear guidelines and strategy for post IWMP operations not in place. Ineffectiveness and loss of good practices/impacts of IWMP if not devised during project cycle. • Strategy for post project sustainability of institutions not in place. Institutions will weaken / defunct and impacts of project not sustained. No strategy for post project sustainability 		<ul style="list-style-type: none"> • Similarly, a strategy, at the local level, for EPAs operations and post project maintenance should be developed and implemented by IWMP. 	
District/Block/Watershed Level				
	<ul style="list-style-type: none"> • In general the behavior and social practices amongst village communities, indigenous people, women, marginalized farmers and the asset less/landless have limited or no awareness and concern for equity and inclusion • Risk of leaving out vulnerable households and tribal hamlets from project coverage or low coverage • Low transparency measures for works on village level activities 	High	<ul style="list-style-type: none"> • Sensitization of participating communities, Capacity Building and Training of the Staff on equity and inclusion should be undertaken within the first year of Neeranchal. • The selection of beneficiaries for the targeted activity needs to be cross-checked and verified in Gram Sabha or WA meetings. Focus on inclusion of vulnerable and tribal irrespective of wellbeing ranking results. • Include culturally and socially acceptable livelihood activities suited to communities. E.G. include forestry and related activities for tribal hamlets. • Especially track participation of vulnerable and tribal population in project activities as well as in decision making. • Lay out clear procedures for fund utilization for community level works. Share fund availability information with all in the villages. 	DoLR, SLNAS, WCDC, PIA

	<ul style="list-style-type: none"> The livelihood activities under IWMP need to be designed keeping in mind entire life cycle of the activity adopted. At present, this is not the case. As a result, the vision for livelihoods activities lacks backward and forward linkages and therefore, these may not sustain in long term. 	Moderate	<ul style="list-style-type: none"> Life cycle based approach to be adopted for livelihood activities. Given the seasonality of livelihoods, especially in tribal areas, planning needs to be done based on their requirements. Also, specific planning for the upper, middle and lower reach people has to be need based as their needs differ. Participation of beneficiary to be ensured during planning. 	DoLR, SLNA, WCDC, PIA
	<ul style="list-style-type: none"> Environmental and social safeguards issues and their mitigation may be new for participating communities 	Moderate	<ul style="list-style-type: none"> Organize awareness programmes for participating communities on safeguards and mitigation measures. 	DoLR, SLNA, WCDC, PIA
Source: Analysis based on consultations, SESA Team, DoLR				

3.4 Safeguards Implementation Arrangements

Given that there is presently low capacity at the national, state, district and watershed level on issues related to environmental and social safeguards, an Environmental and Social Cell (ESC) would be proposed with dedicated environmental and social specialist who would be involved in building capacities, providing guidance, monitoring and evaluation, documentation and communication. However, as and when required they could contract additional human resources (individual and/or institutional) for additional technical support, monitoring and evaluation, special focused studies on safeguards and training. The ESC would be either located within the DoLR or housed in the proposed Watershed Centre of Excellence. The second phase of SESA would evaluate the institutional placement of the ESC and recommend accordingly. Until that is formalized, ESC would continue to operate from DoLR.

The role of the ESC:

- During Phase-II, opportunities would be explored whereby safeguards can be integrated within the regular IWMP
- ESC would undertake training and capacity building of related watershed Departments from time to time to ensure mainstreaming of safeguards into IWMP implementation
- The ESC would undertake regular but sample based monitoring of ESMF implementation under Neeranchal and for this purpose may undertake specialized assessments, studies or depute additional staff, as needed
- In addition to the above, any Third Party Monitoring and during different stages of the project, e.g. Mid Term Review (MTR), would include tracking the monitoring indicators and evaluating the performance of ESMF implementation

A draft EMP is suggested in annexure II.

Budget for implementing ESMF

Given that the sub-project details are not available at this point, a dedicated budget cannot be developed or earmarked now. Neeranchal would fully finance the cost of hiring personnel at the ESC, imparting training and capacity building on safeguards, including development of specific modules. The Monitoring and Reporting on safeguards would be fully financed by the project. It is envisaged that this cumulative cost could be up to 2% of the total project budget.

Specialized Safeguard Strategies

In order to cover the key shortfalls and gaps identified during SESA and to address potential risks, three specialized safeguards strategies have been developed that would be implemented during the project implementation. These are:

1. Pest Management Plan and Integrated Pest Management Strategy
2. Indigenous Peoples Development Framework and Plan
3. Capacity Building Strategy

3.5 Pest Management Plan (PMP) and Integrated Pest Management (IPM) Strategy

Technical support from Neeranchal could lead to increased use of pesticides with increased attention to improving crop yields through watershed level activities. A PMP is prepared to deal with chance increased uses of pesticides and other agrochemicals. The plan consist of two parts:

1. Guidance on proper management of pesticides. The already developed and under implementation guidance from the Sujala II project-Final Environmental Assessment, Karnataka is to be adopted that provides detailed guidance on procuring, storing, use and management as well as disposal of pesticides.

2. Integrated Pest Management Strategy. Detailed procedural IPM strategy would be adopted as given under the Mid-Himalayan Watershed Project (Himachal Pradesh). Key elements of IPM are given as under:

All the methods (cultural, mechanical/physical, genetic, regulatory, bio-control and chemical) would be employed as per requirements. The chemical methods would be employed only when the pest attack exceeds the Economic Threshold Limit (ETL) and stand to cause severe damage to crops and selection of relatively environmental friendly pesticides would be undertaken. In any case, banned would not be used and restricted pesticides would be used only as per state/national laws and provisions.

Activity	Years					Action Points
	1	2	3	4	5	
Training of Agri/Hort/AH staff (project and line department) in IPM						Train at recognized national/state institutions and state universities
Training of Facilitators/ Paravets in IPM for livestock						Will be useful for inclusion and orientation of women stakeholders in IPM approaches, as they are the main agricultural workers and attend to livestock needs
Developing relevant literature and pamphlets for distribution with list of banned chemicals (update lists as required)						Should be in local language and appealing visually. Distribute these during awareness camps. Involve Panchayats in distribution and local practitioner level training in IPM
Farmer and livestock owners awareness building						Organize awareness camps in villages on latest technology in production, organic farming, IPM concept, safe use and disposal of insecticides/pesticides, fumigation of shelters, identification and distinction between predators and pests. Aware livestock owners for keeping animals in hygienic conditions
Provide technical inputs and support to identified farmers and later use them as models for replication by other interested farmers						Arrange inputs in form of bio-pesticides, bio-weedicides, bio-fungicides, bio-fertilizers, bio-control agents (predators) etc. Converge with relevant departments of Agriculture, Livestock and Horticultural for this purpose
Develop and distribute guidelines on safe use of pesticides/insecticides						Emphasize avoiding use of broad-spectrum pesticides, chemicals that wipe out useful insects etc. Use recommended dose and concentration of pesticides. Do not support sale and use of banned fertilizers, pesticides, insecticides etc.
Conduct bench-mark survey and prepare checklist of pests/pathogens						Use local research institutions, agricultural universities and extension system workers for identifying major area-specific pests
Training and Tie-up for supply of vermi-compost						Will be required for farmers to immediately switch over to bio-fertilizers, as absence may diminish interest

Activity	Years					Action Points
	1	2	3	4	5	
Legume plantations in farm bunds and fields, promoting use of mulch, setting up of vermi-compost units						Link with other arable land development programmes. Plantations be raised simultaneously with vermi-compost units so that increase in productivity can be seen in fields. Long-term availability of vermi-compost is needed to sustain IPM
Set up demonstration plots						Set up demonstration plots once farmer awareness and training has initiated and after setting up of vermin-compost units. This will reduce delays in adopting IPM and will lead to quick results encouraging others to follow suit
Introduce and provide readily available IPM packages						Available IPM packages be provided to farmers for immediate adoption.
Provide, as required, available bio-control agents						Use existing provisions of line departments or state bio-control labs for this purpose.
Introduce organic farming						Organize training and exposure visits, supply bio-fertilizer mini-kits etc and identify and select at least two bio villages for demonstrating organic farming
Document progress						Record changes in inputs and outputs and develop economic gains table for popularizing it among farming community

The following milestones would be observed:

Activity	Milestones
Awareness building	<ul style="list-style-type: none"> ▪ Cover at least 10% of total watersheds targeted in first year from project start ▪ Cover 10% every year
Identification of potential farmers	<ul style="list-style-type: none"> ▪ Identify at least three farmers in each village (which have been selected under the project) within 15 days of awareness building for training and taking up IPM as demonstration
Training	<ul style="list-style-type: none"> ▪ Staff and line department training completed in 1st and 2nd year ▪ Farmer training completed within three months of identifying potential farmers ▪ Training for other interested farmers completed within one year after awareness building
IPM coverage	<ul style="list-style-type: none"> ▪ Provide IPM package to trained farmer within 30 days of training ▪ Cover all farmers in a village – adopt IPM village/watershed approach
Monitoring and evaluation	<ul style="list-style-type: none"> ▪ Formation of joint monitoring team (staff and community) within one year from project start ▪ Monitoring schedule for each quarter prepared and implemented ▪ Monitoring reports be prepared for each monitoring visit and compiled annually to show progress
Process documentation	<ul style="list-style-type: none"> ▪ Annual progress reports on IPM status prepared giving coverage, replication and sustainability ▪ Knowledge, practice and coverage change documented

For further details, please also refer to Annex IV and V.

3.6 Indigenous People Development Framework and Plan

In the sample states, engagement in the primary sector was found, which included involvement in agriculture and horticulture, fisheries, livestock rearing. Further, some areas were close to forests while others were not located near them. As a result, some communities had forest-based livelihoods while other engaged in nonfarm activities. Seasonal livelihood pattern was also noticed. Among the communities consulted, it was found that special attention needs to be given to the tribal community, who are dependent on natural resources for the purpose of drinking water and water usage for domestic purpose – such as cooking, cleaning, bathing, rituals, ceremonies, cultivation of vegetables, staple crops, fodder and other traditional activities and dependence on forests for NTFP collection, processing and sale.

While in some states there is a large proportion of the general caste, other castes and scheduled caste, in others a large proportion of the Scheduled Tribe or Primitive Tribal Groups were found. Even in non-tribal areas there were traces of the Scheduled Tribe. However, as of now, the focus for the development of this caste group has been from a wellbeing ranking (income based) perspective in places where large number of tribals are present or no importance given to them as their population is negligible in areas dominated by other castes and not on the basis of their specific needs and requirements, geographical accessibility to information, communication, and basic amenities and services. Further differences were also found in the livelihood pattern of those who were living on hills and plains. For example Tribal Groups and PTGs living on hill tops were highly dependent on forests for NTFP, had marginal or no landholding, land was scattered and they practiced primitive or subsistence based agriculture, while those in the plains had consolidated land, subsistence agriculture, but practiced cultivation of major crops and vegetables and were less dependent on forests for their livelihoods.

These tribes fall under the tribes mentioned in article 342 of the constitution. According to the paragraph 6 of the Fifth Schedule of the Indian Constitution, certain areas have been declared as 'Scheduled Areas' in consultation with State Governments based on preponderance of the tribal population, size of the area and their under-developed socio-economic status. Further within states, districts may be completely Scheduled Areas or Partially Scheduled Areas.

Given that in Scheduled Areas or Partially Scheduled Areas, Panchayats Extension to Scheduled Areas- PESA Act, 1996 (Part IX of the Constitution) is applicable for the safeguard and special benefits to the Scheduled Tribes and Primitive Tribal Group, it calls for adherence to the PESA Act, during the project identification, design, implementation and consolidation phase. Although the positive aspect of the project is that there is no land acquisition involved, however, once projects are identified through satellite or other means, the list of identified projects needs to be further categorized in terms of whether they fall under Scheduled Area or Partially Scheduled Area. In case any, if these two categories are identified, then adherence to PESA is triggered, which involves key steps such as sharing of information on identified watersheds, consequently the plan for implementation and identified works, livelihood activities, monitoring etc., which needs to be informed to the Zila Parishad at the district level for which the Gram Sabha may or may not be consulted. Further, at the block level the Panchayat Samiti would need to be consulted during supervision of different activities, convergence with different programmes, work or support required from different office bearers, control or supervision etc.

At the Gram Panchayat level the DPR along with all the lists of activities that have been finalized, beneficiaries, wellbeing ranking should be shared with the GP and then approved by the Gram Sabha. The Indigenous People Development Framework and Plan are given in *the following section*:

	Framework	Project identification and Design Stage	Plan Implementation	Consolidation
National Level	Mitigation Measures			
	Policy or Mandate at the National level for convergence for Neeranchal with other ministries for the benefit of the community concerned.	Consultation with different ministries and drafting of the policy.	-	-
	Overall Tribal Development Framework and Plan at the National Level	Overall Tribal Development Framework and Plan at the National Level Social Expert in place		
State Level	Advocating for State level policy or mandate for ensuring convergence with Department of Panchayats and department of SC/ST	Consultation with different departments and drafting of the policy.	-	-
	Tribal Development Plan at the State level	Developing need based, local specific tribal development plan based on study	-	-

<p>Identification of micro watersheds and the coverage in terms of whether it is within a Scheduled Area or a partially scheduled area thus ensuring whether adherence to PESA is required or not</p> <p>Data disaggregation based on gender and tribes, prioritization of activities based on need assessment and geographical location within the overall Tribal Development Plan, part of which will be reflected in concerned districts.</p>	<p>Identification of micro watersheds and the coverage in terms of whether it is within a Scheduled Area or a partially scheduled area</p> <p>Data disaggregation based on gender and tribes, prioritization of activities based on need assessment and geographical location within the overall Tribal Development Plan, part of which will be reflected in concerned districts.</p>	-	-
		Data disaggregation based on gender and tribes, prioritization of activities based on need assessment and geographical location within the overall Tribal Development Plan, part of which will be implemented in concerned districts.	Data disaggregation based on gender and tribes, prioritization of activities based on need assessment and geographical location within the overall Tribal Development Plan, part of which will be implemented in concerned districts.

District Level

<ul style="list-style-type: none"> - Conducting a baseline to ensure that the Scheduled Tribe and primitive Tribal Groups are included in the Project - Need Gap Analysis specifically for Scheduled Tribe and primitive Tribal Groups - Identification of livelihood needs - Identification of needs of women 	-Same as mitigation measures	Convergence with Line Departments Allocation of funds for implementation Technical Support for implementation of special livelihood programmes of ST and PTGs	- Convergence with Line Departments
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- Convergence with Line Departments
- Sensitization of staff on tribal needs, planning for them, PESA etc.
- Developing an independent Indigenous People Development Plan at the State Level
- Capacity Building Plan
- Monitoring Plan
- Human Resources- Having a Social Expert in place
- Implementation Plan
- Allocation of funds for implementation
- Technical Support for implementation of special livelihood programmes of ST and PTGs
- Livelihood programmes (farm/ nonfarm)
- Thrift and Micro Credit activities
- Special convergence with health and rural water supply department for improving health indicators and access to safe drinking water, understanding good practices
- Monitoring implementation (Impacts and Evaluations, including participatory methods)
- Providing resources for capacity building and Training (Technical/Financial)
- Capacity Building and Training
- Watershed Development Fund in

Livelihood programmes (farm/ nonfarm)
 Thrift and Micro Credit activities
 Special convergence with health and rural water supply department for improving health indicators and access to safe drinking water, understanding good practices
 Monitoring implementation (Impacts and Evaluations, including participatory methods)
 Providing resources for capacity building and Training (Technical/Financial)
 Capacity Building and Training
 Watershed Development Fund in place where ST members are also contributing
 Refresher training programmes
 Regular Gram Sabha approvals
 Inclusion of Scheduled Tribe and Primitive Tribal Groups during

- place where ST members are also contributing
- Refresher training programmes
 - Regular Gram Sabha approvals
 - Inclusion of Scheduled Tribe and Primitive Tribal Groups during Baseline Data Collection for the DPRs
 - Region specific planning for Scheduled Tribe and Primitive Tribal Groups based on location of villages within the watershed
 - Capacity Building and Training Need Assessment of STs and PTGs
 - Livelihood need assessment and benchmarking for STs and PTGs along with cost benefit analysis
 - Special measures for tribal women such as specific micro credit activities, livelihood activities based on seasonality, differentiating and prioritizing activities for hills and plains
 - Convergence with various departments for increase in productivity and income
 - Developing a monitoring plan
 - Developing a Capacity building plan

Baseline Data Collection for the DPRs
 Region specific planning for Scheduled Tribe and Primitive Tribal Groups based on location of villages within the watershed
 Capacity Building and Training Need Assessment of STs and PTGs
 Livelihood need assessment and benchmarking for STs and PTGs along with cost benefit analysis
 Special measures for tribal women such as specific micro credit activities, livelihood activities based on seasonality, differentiating and prioritizing activities for hills and plains
 Convergence with various departments for increase in productivity and income
 Developing a monitoring plan
 Developing a Capacity building plan

Block

Same as district

Same as district

PIA and team

Sharing DPR and identified watersheds in scheduled or partially scheduled areas with panchayat samiti to ensure benefits to tribals and convergence	Same as mitigation measure	Same as mitigation measure	Same as mitigation measure
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Watershed Level (Watershed User Association/ Watershed Committee Members/User groups/Common Interest Groups)

Further categorization of households and vulnerable groups on different criteria such as -location of household is accessible or not -Assets such as livestock ownership, ownership of agricultural equipment to be taken into account; family size to be taken into account; form of financial transaction (money/barter) to be taken into account among others - Placing DPR in Gram Sabha for approval and sharing with Gram Panchayat for convergence	Same as mitigation measure		
Ensuring the count of STs/PTGs and their special needs irrespective of the size of the population to avoid further marginalization and for inclusion and mainstreaming.	Same as mitigation measure	Same as mitigation measure	
Clear identification of who is more vulnerable than the other in case	Same as mitigation measure		
Special capacity building and learning modules and plan for the STs and PTGs in local language and based on a need assessment	Same as mitigation measure		
Sensitization of WUA and its members to be bias free and prioritize activities based on need and geographical accessibility of households	Same as mitigation measure		

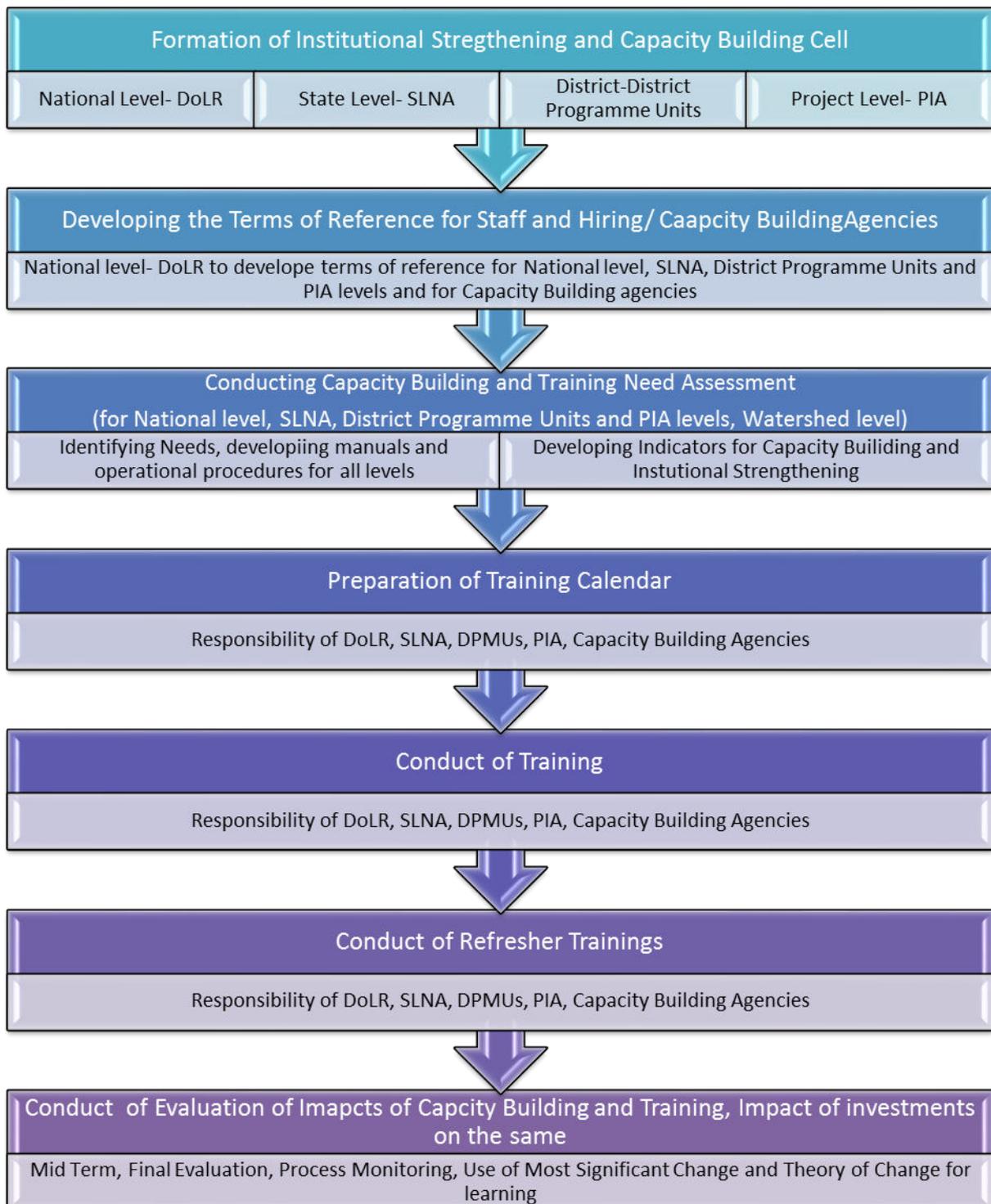
Ensuring project information reaches out to everyone in the community	Same as mitigation measure	Same as mitigation measure	Same as mitigation measure
Plans based on geographical location of hamlets	Same as mitigation measure		
Watershed Development Fund/ O & M expenses- plan for community acceptance and contribution	Same as mitigation measure	Same as mitigation measure	Same as mitigation measure
Identify capacity building needs	Same as mitigation measure	Same as mitigation measure	Same as mitigation measure
Identify livelihood needs	Same as mitigation measure	Same as mitigation measure	
Participatory monitoring using social audit or score card or any other method	Same as mitigation measure	Same as mitigation measure	Same as mitigation measure

Community (ST, PTGs, ST women, ST landless/marginal/small/large farmers)

Understanding the Project objectives, design and agreeing to participate in it	Same as mitigation measure		
Participating in Gram Sabha for approval of plan	Same as mitigation measure		
Participation in baseline and micro planning processes	Same as mitigation measure	Same as mitigation measure	Same as mitigation measure
Specifying needs and requirements	Same as mitigation measure	Same as mitigation measure	Same as mitigation measure
Capacity Building and Training		Participating and undertaking training	Refresher training
Taking up livelihood /micro credit activities		Same as mitigation measure	Same as mitigation measure
Participating in monitoring processes such as social audits and use of score cards etc.		Same as mitigation measure	Same as mitigation measure
Contributing to the Operation and Maintenance Fund	Same as mitigation measure	Same as mitigation measure	Same as mitigation measure

3.7 Capacity Building Strategy at the State/District/Watershed level

While the capacity building plan included here takes into account the key SESA findings on the capacity and training across the watersheds, a focus on safeguards implementation is to be retained when imparting such training. It would be important to explore partnering with a specialized agency for providing the range of both technical and managerial skills and training to staff at various levels.



	Monitoring and Evaluation	<ul style="list-style-type: none"> Design & implementation of participatory monitoring & evaluation system; Project cycle management; Process documentation with a special focus on monitoring of safeguards.
	Technical Capacity Building (watershed level and safeguards)	<ul style="list-style-type: none"> Identification of capacity building needs of various stakeholders Integrated Nutrient Management/Pest Management, Participatory planning, Integrated Farming Systems, Livelihood Planning and Action Plans, Water Use Efficiency, Gender, Equity and Participation, Community Mobilization, Establishing and Managing Grassroots Organizations/Committees (at village level), Financial Management, Conflict Resolution, Micro Credit, Financial Inclusion Screening of sub-projects and limited/rapid EIA
State Level	Livelihoods and Natural Resources Management/Social Mobilization	<ul style="list-style-type: none"> Livelihood analysis & enhancement; Gender – concept, issues and impact monitoring; Gender equity and mainstreaming; SHG Formation , management and development; Formation of clusters and federations; cooperatives, federations and other legal entities for collective marketing; Training of Trainers – facilitation skills Cropping practices and productivity improvement- Extension Services; Land , water and soil management; Post-harvest management and processing for value-addition etc.
	Agriculture/Horticulture	
	Hydrogeology	<ul style="list-style-type: none"> Hydrogeological assessment (for planners) and monitoring, Surface and groundwater conservation and development; Community based ground water management through conjunctive use practices
	Information Technology/MIS	<ul style="list-style-type: none"> Participatory MIS system development & Data management
	Remote sensing and GIS applications	<ul style="list-style-type: none"> GIS usage for NRLM , Data Creation and interpretation ,Land use Mapping
	Finance /Accounts Officer	<ul style="list-style-type: none"> Financial management and accounting
	Civil Engineering	<ul style="list-style-type: none"> Participatory watershed planning and development through Land, Water & soil Management, Engineering Design of structures for land and water management.
District /PIA Level	Agriculture	<ul style="list-style-type: none"> Integrated pest management/Integrated Nutrient Management; Dry land technology and Alternate cropping Crop post-harvest management; Organic agriculture production – concepts, certification, scope and evaluating market potential; Fundamentals of agriculture produce processing & packaging;
	Forestry	<ul style="list-style-type: none"> Tribals and natural resources; Participatory forest and natural resource management; Managing forests for multiple objectives ; Shifting cultivation – pros and cons (only where <i>Jhum</i> is practiced)
	Livestock	<ul style="list-style-type: none"> Rearing and managing small ruminants in rural household economy; Animal products and their market value and Livestock insurance, strategies for tapping of potentials
	Enterprise development	<ul style="list-style-type: none"> Rural financial services; micro-credit and micro-insurance; Women, microfinance and empowerment; Self Help Groups – their formation, strengthening, and clustering; Networking and federation building From micro-credit to micro-enterprise establishment; Entrepreneurship development; Value-chain analysis and market

Watershed level	Social Development	<p>study; Collective marketing: prospects and problems; Business plan development & business counselling and Group enterprise management</p> <ul style="list-style-type: none"> • Orientation to community and watersheds, DPMU, SLNA, Non Govt. PIAs on gender and gender mainstreaming in decision making processes and watershed activities, Capacity Building and Training to most vulnerable including women, landless/asset less, marginalised farmers, indigenous people on different livelihood options .Livelihoods and Microcredit related training • Training on conservation, water usage, operations and maintenance. Financial training, Capacity Building and Training to PRIs on watershed processes, gender mainstreaming, monitoring, planning, convergence ,Grassroots management; Right to entitlement; Tribal laws and customary laws; Group dynamics; Conflict management and mediation; Community mobilisation; Participatory planning; Participatory monitoring and Learner focused training methodology. • Orientation to community and watersheds, on gender and gender mainstreaming in decision making processes and watershed activities. Capacity Building and Training to most vulnerable including women, landless/asset less, marginalised farmers, indigenous people on different livelihood options Livelihoods and Microcredit related training Training on conservation, water usage, operations and maintenance, Training on planning based on PESA, Planning for people in different reaches of watershed. • Value addition and value chain establishment. Capacity Building and Training to PRIs on watershed processes, gender mainstreaming, monitoring, planning, convergence • Grassroots management; Right to entitlement; Tribal laws and customary laws; Group dynamics; Conflict management and mediation; Community stabilization; Participatory planning; Participatory monitoring and Learner focused training methodology.
	Orientation and Training on various subjects	
Source: Analysis based on consultations, SESA Team, DoLR		

Implementation Mechanism for Capacity Building Activities

The following Table displays the broader responsibilities at various levels starting from National level Nodal agency downwards to the Watershed level for the effective implementation of the watershed activities under the IWMP. This is indicated in the table in the following section:

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National level	National Nodal agency housing Multi-domain experts representing domains under NRM, Institutional and capacity building. M & E specialist, social development expert, MIS etc. would be responsible for budget allocation, interaction with SLNAs, IEC activities with modern IT inputs, monitoring, audits, reviews, assessment studies, facility for extending, storing and generating watershed and land resource information, equipped with various GIS thematic layers for cadastral, watershed, soil, land use, socio-economic parameters and habitation, data and knowledge formulate panel of evaluators, study tours, research/field studies information sharing, convergence of activities with other ministries. The domain experts under Environment Management need to be specially inducted into the steering committee to oversee the requirements meeting objectives under various National Policies(Forest/Water/Environment & Agriculture)
State level	SPIU to be headed by full time Director assisted by subject specialists representing NRM subjects with staff for Accounts along with support staff. The responsibilities include Monitoring & Evaluation, ensuring transparency, accountability and financial discipline. SPIU shall also have GIS applications center for the gainful transfer of data and project based interpretations. The State level Livelihood Resource Center (SLRC) would also be there. Experts representing Environment Management need to be on the advisory capacity at SLNA level to take care of the hitherto unrepresented area.
District level	<p>DPIU with Asst. Project Directors and experts representing NRM constituent subjects . It would have a dedicated unit for GIS needs with support from State and NRSC team, develop transaction based software for various components & electronic mode of payment systems, web based MIS for day to day monitoring.</p> <p>The District/Cluster level Livelihood Resource Centers (D/CLRCs) would be equipped with latest audio-visual aids and better amenities. The DPIU would provide support role to the D/CLRCs, cater to the CB needs of target groups etc.</p> <p>The PIA would be responsible for DPR preparation through participatory approach, community training, activity supervision-monitoring and review, build indigenous technical knowledge, post project operation and maintenance of project assets. The WDT would be at this level and responsible for use of maps while preparing DPRs / action plans, use GIS for execution and monitoring the activities as required for NRM, social and institutional building, constitution of WC, guidance to WC, organize UG and SHGs, mobilization of woman, baseline survey, training and capacity building, management of CPRs, submit DPR for consideration of Gram Sabha, facilitate livelihood opportunities to landless, post project planning for management of assets. Responsible for R & D and evaluations, thematic short studies etc to bring in new approach to watersheds. Multi Service stations (Knowledge Hub/extension services/weather station) may also be located at this level.</p>
Watershed Level	Watershed Committee would be responsible for wellbeing ranking, planning of works, capacity building and other activities, prioritizing, informing all households/hamlets, execution, participatory monitoring, placing plans in gram sabha, planning with panchayats for convergence, operation and maintenance, financial management , ensuring inclusion, equity and special measures for indigenous people

3.8 Safeguards Monitoring Plan

Whereas the Common Guidelines -2008 for Watershed development Programme emphasizes participatory Monitoring, Evaluation and Learning (MEL) in IWMP, there are gaps in the system as well as varying requirements for monitoring at different levels and for different social and environmental setting. The impact centered SESA proposes monitoring indicators to track the improvement (or reverse) of key watershed outcomes. It also includes indicators to follow up on the implementation of the ESMF. These are in addition to the indicators that the project would be monitoring as part of its overall programme.

Proposed Indicators for Environment:

Carbon Sequestration	<ul style="list-style-type: none"> Annual Increment in area under afforestation and social forestry for fodder fuel wood 	<ul style="list-style-type: none"> DoLR, WCDC 	<ul style="list-style-type: none"> SLNA, Bi annual
Soil Organic content	<ul style="list-style-type: none"> Annual testing for % increment in organic carbon in soil Annual increment in area under irrigation from IWMP sources 	<ul style="list-style-type: none"> DoLR, WCDC 	<ul style="list-style-type: none"> SLNA, Bi annual
Ground Water			
Quality of water-Taste and turbidity	<ul style="list-style-type: none"> Annual samples for drinking water sources as per IS: 10500 parameters. Compliance to desirable limits as per the standards 	<ul style="list-style-type: none"> DoLR, WCDC 	<ul style="list-style-type: none"> SLNA, Bi annual
Ground Water Recharge	<ul style="list-style-type: none"> Increment in no. of adopting artificial ground water recharge through disused dug wells /bore wells, scientifically dug deep trenches 	<ul style="list-style-type: none"> DoLR, WCDC 	<ul style="list-style-type: none"> SLNA, Bi annual
Land Environment			
Soil Erosion - Quantitative	<ul style="list-style-type: none"> Decrease in total annual volume of soil deposited at various earthen structures 	<ul style="list-style-type: none"> DoLR, WCDC 	<ul style="list-style-type: none"> SLNA, Bi annual
NRM	<ul style="list-style-type: none"> Annual increment in no of various loose structures, check Dams & gully plugs Annual Increment in area under afforestation, social forestry & pastures 	<ul style="list-style-type: none"> DoLR, WCDC 	<ul style="list-style-type: none"> SLNA, Bi annual
Crop productivity			
Pest Management	<ul style="list-style-type: none"> Increment in cropping area using integrated Crop management practices Increment in cropping area using integrated pest management practices Increment in cropping area using bio-pesticides 	<ul style="list-style-type: none"> DoLR, WCDC 	<ul style="list-style-type: none"> SLNA, Bi annual

Proposed indicator for social assessment

Participatory Processes	<ul style="list-style-type: none"> Percentage Increase of membership of indigenous people, women, marginalised farmer, landless and asset less in watershed level institutions Percentage Increase in participation of indigenous people, women, marginalised farmer, landless and asset less in watershed processes Percentage Increase in decision making processes by indigenous people, women, marginalised farmer, landless and asset less in watershed processes 	<ul style="list-style-type: none"> DoLR, SLNA, WCDC 	<ul style="list-style-type: none"> Bi annual
Gender Inclusion	<ul style="list-style-type: none"> Increase in Proportion of women office bearers in GP, WC Increase in attendance and participation of women office bearers in GP meetings Increase in attendance and participation of women office bearers in WC meetings Increase in attendance and participation of women in Gram Sabha meetings Increase in attendance and participation of women in Watershed Association meetings Increase in functioning status of Women Sabha Increase in percentage of activities in DPR targeted at and benefiting women as part of gender budgeting 	<ul style="list-style-type: none"> DoLR, SLNA, WCDC 	<ul style="list-style-type: none"> Bi annual
Inclusion of Marginalized Groups	<ul style="list-style-type: none"> Increase in proportion of marginalised and vulnerable people as office bearers in GP, WC 	<ul style="list-style-type: none"> DoLR, SLNA, WCDC 	<ul style="list-style-type: none"> Bi annual

Indicators for tracking the implementation of the ESMF

The environmental and social indicators given above would track the management of key risks identified as part of SESA, the following indicators provide a direct measurement of implementing the ESMF.

ESMF implementation	<ul style="list-style-type: none"> ESC fully staffed Field visits undertaken for monitoring ESMF implementation Technical indicators measured and reported in the annual project progress reports 	<ul style="list-style-type: none"> ESC, DoLR, SLNA, WCDC 	<ul style="list-style-type: none"> Annual

4. Recommendations

4.1 Recommendations Environment:

Central Level Nodal Agency

- i. Recognize the domain of Environment Management with various sub themes for considering its induction as a mainstream activity in the various activities considered under the IWMP. Undertake awareness generation activities towards recognizing this.
- ii. Demarcating and delineate watershed boundaries to boost up afforestation activities for vegetation cover improvement. Also start monitoring the role of natural resources in providing livelihood opportunities to watershed inhabitants.
- iii. The Land Use categories as prescribed by MOSPI (Ministry of Statistics, Planning & Implementation) need to be considered at DPR stages of IWMP implementation to know beforehand the extent of waste lands/barren lands/ recurring fallow lands to consider for afforestation/social forestry measures in each watershed.
- iv. To avoid losing the gains made in arresting soil erosion from farmlands, the waste lands/barren lands/ recurring fallow lands in village boundaries needs better coverage under IWMP through the use of MOSPI standard land use categories.
- v. Activities in relation to Soil Conservation, Rain Water Harvesting and Artificial Ground Water Recharge need to be redefined and reintroduced as activities of IWMP from SLNA level downwards.
- vi. Since household fuels are major sources of respiratory diseases particularly for women, promotion of concept of clean fuels needs to be introduced at watershed levels. Propagating use of smokeless *chulhas* shall directly result into drastic lowering of drudgery of women folk on many counts. This would also help retain vegetation cover due to reduced use of firewood collected from the nearby forests.
- vii. Important issues such as Global Warming and Green House Gases to be brought under the *Neeranchal* umbrella down the hierarchy up to the SLNA levels. Farm and animal factors contributing to global warming and climate change need to be discussed in details to take cognizance of it.
- viii. Introduction of CDM (Clean Development Mechanism) bankable activities as an important concurrent domain of activity at SLNA levels for mobilizing massive support to afforestation and social forestry to get qualified for '*carbon credits*' which shall further boost up economy at watershed level and bring it on world map.
- ix. Specifically with regard to Natural Resource Management:
 - There should be a technical cell at the national level to assist the states in having its own '*Automated Estimate and Design System*' for preparing the design and estimates for NRM activities complete with a related livelihood plan.
 - There should be a separate fund for Revival of old water bodies, and existing structures. Such work shall have proper link with GIS based '*change detection system*'.
 - The centre shall assist state in bring convergence between different centrally sponsored schemes of similar nature like RKVY, MGNREGA, etc. with IWMP.
 - Some of the states like Andhra Pradesh have rich baseline information like land records, digitized cadastral maps, availability of different GIS layers. The centre shall assist states in making such baseline available to other states as well.

- The GIS layers shall also have proper linkages with the MIS system.

State Level Nodal Agency

- i. Develop indicators such as relative air borne dust and smoke in air to denote quality of clean Plan farm based watershed activities and support in areas where provisions of warehousing facilities for farm produces and perishable goods are available at the cluster level.
- ii. Afforestation and social forestry needs to be promoted more on voluntary basis than on policy requirements. This is essential to introduce sense of ownership amongst the farmers/landless but with land allotments so that they get fodder and fuel wood on sustainable basis. They may be provided with seeds/saplings and may be allotted area for afforestation on community basis to serve mutual interests.

Watershed Level

- i. Undertake crop planning at the watershed level to defeat the trend to go in for water intensive crops (sugar cane) after the encouraging results of IWMP activities is seen in some areas. This shall result in defeating the basic purpose of IWMP and needs to be curbed in the initial stages of developing such tendencies. The water availability is increasing on one hand but getting depleted on the other due to wrong practices.
- ii. Pilot the development of buffers of wild fruit bearing trees/flowering trees which serve as excellent food for wild animals such as monkeys, wild boar and blue bulls in areas where wildlife induced crop depredation is high. Reintroducing native species for foraging by wildlife should be prioritized in afforestation programmes.
- iii. Promoting entrepreneurship skills together with development of strategies for marketing amongst women folk and poor individuals would boost up livelihood options and generate supplementary family income.
- iii. Promotion of plantation of medicinal herbs, fragrant /aromatic herbs, NTFPs especially on waste lands/ barren lands would serve dual purpose of afforestation and avenues of income generation.

4.2 Recommendations- Social

Central Level

Administration related recommendations

1. To setup a National Project Management Unit (NPMU) for IWMP. The project unit shall technically assist its counterparts at State, District and project level in cascade approach. The NPMU shall consist of different coordination cells on Capacity Building, Monitoring & Evaluation, Natural Resource Management, Micro Planning, GIS, Livelihood Promotion and Social Mobilization.
2. Institutional fund support to the states shall be on the basis of project area. Currently institutional fund support is equal for all the states. Provision for extra funds to better performing states.
3. The Centre shall support the states in formulating its own HR policy.

Capacity Building

1. Formation of Capacity Building Strategy at the national level. Within the strategy, scope for creation of a national level 'Capacity Building Cell' for the coordination of rolling out the capacity building strategy.
2. Resource Organizations to be empanelled at the National level with long-term partnership. The resource organizations shall identify and formulate participatory modules for imparting trainings and other capacity building methodology.
3. The capacity building strategy to have special focus on women and weaker sections of the society. The strategy to suggest specific tools for enhancing the outreach of the programme to these weaker sections.
4. The MIS to have scope for monitoring the execution, quality, follow up plan, and output of each Capacity Building events. This could be an On-line MIS.

Monitoring and Evaluation

1. The national level project management unit to clearly define the objectives of the programme. Currently the IWMP doesn't have any statement, which could define its objective.
2. The NPMU to design comprehensive MIS system. The inputs/data to be fed at the all levels, and monitored at the National level. Data-operators to be in place at all levels.
3. MIS to be linked with wealth ranking of the poor, women and other special target groups to measure the outreach of the programme.
4. Participatory processes like Social Audit, Participatory Monitoring System, Community self assessment, Public display of the physical and financial targets and achievements, beneficiary cards/tickets showing the list of benefits for each household (as was followed in NWDPPRA for NE states) would be needed to ensure transparency, accountability, governance.

Livelihood Promotion

- A dedicated cell/unit at the centre for promoting livelihoods in the project area. This cell/unit can have two separate divisions on Farm and non-farm based livelihood interventions.
- These cells shall document and share the good practices related to their core areas from different places in the country. The same to be disseminated at state and district levels for information and capacity building.
- The cell shall also plan for the capacity building and exposure of similar cells at different levels on livelihood issues.
- Separate strategy shall be formed by these cells for the livelihood promotion in the project area. The strategy shall include Institutional mechanisms, monitoring system, CB systems, backward and forward linkages, etc.
- MoU shall be signed between IWMP and NRLM for its convergence. The MoU shall clearly layout the role of NRLM and IWMP and its essentials at each level for materializing the convergence.

- Partnership shall be encouraged with different resource organizations for their services in executing livelihood plans at the appropriate levels.

State Level

Capacity Building

1. National level 'Capacity Building Cell' to coordinate capacity building activities at the state level.
2. Empanelled resource organizations to identify and formulate participatory modules for imparting trainings and other capacity building methodology at all levels.
3. The capacity building strategy (to be formulated at the national level) to have special focus on women and weaker sections of the society. The strategy to suggest specific tools for enhancing the outreach of the programme to these weaker sections.

Monitoring and Evaluation

1. MIS to get data based on wealth ranking of the poor, women and other special target groups to measure the outreach of the programme.
2. Participatory processes like Social Audit, Participatory Monitoring System, Community self assessment, Public display of the physical and financial targets and achievements, beneficiary cards/tickets showing the list of benefits of for each household (as was followed in NWDPR for NE states)

Livelihood Promotion

- The SLNA to have dedicated nodal officers for promoting livelihoods in the project area. There could be two separate nodal officers for on Farm and non-farm based livelihood interventions. Nodal officers to report to the livelihood cell at the centre.
- Nodal officers to document and share good practices related to their core areas from the field and the same to be shared with the livelihood cell for wider dissemination.
- Nodal officers to plan for the capacity building and exposure and program execution of livelihood activities in coordination with livelihood experts at the District level.
- Separate strategy shall be formed by these officers for the livelihood promotion in the project area. The strategy to include Institutional mechanisms, monitoring system, CB systems, backward and forward linkages, etc.
- Partnership to be encouraged with different resource organizations for their services in executing livelihood plans at the appropriate levels.
- Ceiling of assisting SHG with Rs.25000 only shall either be revisited or shall be accompanied with provisions of multiple doses of credits from the banks. The RF shall have the sole objective of strengthening the group rather than financing the business plan of the group.

District Level

Administration related recommendations

1. The Watershed-cum-data centre (WCDC) to have Monitoring & Evaluation, Natural Resource Management, Micro Planning, GIS, Livelihood Promotion and Social Mobilization experts.
2. There should be dedicated institutional structure at the district level under WCDC instead of PIA based implementation system. Government and non-government agencies shall be empanelled and shall be encouraged to enter into partnership with WCDC for providing dedicated services to DPMU.

Capacity Building

1. Formation of Capacity Building Strategy at the district level.
2. Resource Organizations to be empanelled at the district level with long-term partnership. The resource organizations shall identify and formulate participatory modules for imparting trainings and other capacity building methodology. The state level or national level modules shall be contextualized to the district reality with participatory methods.
3. The capacity building strategy to have special focus on women and weaker sections of the society. The strategy to suggest specific tools for enhancing the outreach of the programme to these weaker sections.
4. The MIS to have scope for monitoring the execution, quality, follow up plan, and output of each Capacity Building events.

Monitoring and Evaluation

1. Monthly meetings with the community, reporting and data –feeding on the MIS

Livelihood Promotion

- The WCDC to have at-least one livelihood expert/officer for promoting & monitoring livelihoods activities, in consultation with the state level livelihood experts.
- The officer to identify training needs in the district and organize training accordingly with the resource organisations.
- Coordination and liasoning with the district level resource agencies for livelihood promotion
- Ceiling of assisting SHG with Rs.25000 only shall either be revisited or shall be accompanied with provisions of multiple doses of credits from the banks. The RF shall have the sole objective of strengthening the group rather than financing the business plan of the group.

Project Level

Administration related recommendations

1. There shall be a separate watershed committee for livelihood promotion with at-least 30% women representation
2. There should be clear guidelines on the formation of user groups and other Community Owned institutions.

3. Resource organizations to be involved in providing handholding support to the project team for the formation of such institutions.

Capacity Building

1. Formation of Capacity Building plan at the project level shall also be accompanied with the Follow up plan.
2. Resource Organizations to be empanelled at the district level with long-term partnership. The resource organizations to identify and formulate participatory modules for imparting trainings and other capacity building methodology. PMU at the project level shall contextualize the modules as per the needs at the project level.
3. The capacity building strategy shall have special focus on women and weaker sections of the society. The strategy shall suggest specific tools for enhancing the outreach of the programme to these weaker sections.
4. The MIS shall have scope for monitoring the execution, quality, follow up plan, and output of each Capacity Building events.

Monitoring and Evaluation

1. The Watershed committee at the project level to meet on monthly basis to review the progress, identifying gaps, and follow-up mechanism.
2. This committee to identify area specific training needs for livelihood promotion, watershed management and NRM.
3. Committee level project staff to gather project related information and report the same to the district level nodal officer, in the prescribed MIS format.

Livelihood Promotion

- The WCD committee to have one project representative (govt./project funded officer), to carry out the entire livelihood related activities at the project level.
- The cell shall also plan for the capacity building and exposure of watershed committee and other CBOs at different levels on livelihood issues.
- Partnership shall be encouraged with different resource organizations for their services in executing livelihood plans at the appropriate levels.
- Ceiling of assisting SHG with Rs. 25000 only shall either be revisited or shall be accompanied with provisions of multiple doses of credits from the banks. The RF shall have the sole objective of strengthening the group rather than financing the business plan of the group.

Annexes

Annexure I: Stakeholder / beneficiary identification, mapping and roles- Current Status

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
State								
Odisha	SLNA – OWDM (Odisha Watershed Development Mission) <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP	Directorate of Water Management, Bhubaneswar Odisha University of Agriculture & Technology, Bhubaneswar Central Soil & Water Conservation Training & Research institute, Koraput (CSWCTRI) State Institute of Rural Development Xavier Institute of Management Odisha Space Application Center Marketing and Research team (MART), Bhubaneswar Odisha Milk Federation (OMFED) IMAGE, Bhubaneswar Central Institute of	Resource Organization for Technical Support; Convergence; Capacity Building and Training	CEO, SLNA – Director, OWDM <i>(Direct Beneficiary)</i> Managers, Assistant Managers <i>(Direct Beneficiary)</i> Subject Matter Specialists <i>(Direct Beneficiary)</i> Support Staff <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP Management and Technical Support; Capacity Building and Training; Monitoring and Evaluation; Data Management; MIS; Support Services for programme management	Technical Experts <i>(Direct Beneficiary)</i> Support Staff <i>(Direct Beneficiary)</i>	Technical Support; Capacity Building and Training; Monitoring and Evaluation; Data Management; MIS; Support Services for programme management

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
			Fresh Water Aquaculture (CIFA)					
			Central Tuber Crop Research & Training Institute (CTCRI), Bhubaneswar					
			International Potato Center(CIP), Bhubaneswar					
			Central Rice Research Institute(CRRI), Cuttack					
			Water & Land Management Institute (WALMI), Cuttack					
			Central Avian Research Institute(CARI), Bhubaneswar					
			National Research Center for Women in Agriculture, Bhubaneswar					
			Veterinary officers training Institute(VOTI), Bhubaneswar					
			Central Horticulture					

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
			Research & Extension Center, Bhubaneswar (All Indirect Beneficiaries)					
Madhya Pradesh	Panchayat and Rural Development Department, MP (Direct beneficiary) Rajiv Gandhi Mission for Watershed Management - SLNA (Direct beneficiary) Other line departments (Indirect beneficiary)	To in house SLNA and to monitor it as one of its wing To anchor the project in the state, Implement IWMP, Prepare PPR for MP, Technical assistance to PIAs, Capacity Building in the state, evaluation of project, fund release, etc Member of GB and EC, convergence	ICAR Institutes, Agriculture Universities, Resource Organisations, etc who are empanelled as Resource Organisation for CB. (Direct beneficiaries) Organizations empanelled for MEL in the state by SLNA	Preparing training calendar, preparing training modules, imparting trainings Monitoring, Evaluation and Learning	Chief Minister, MP (chairman GB of RGMWM) Chief Secretary, MP CEO-RGMWM Government employee on deputation to SLNA Head of the Department of Government PIAs	Final; approval authority on IWMP in the state as chairman GB. To chair EC. Anchor RGMWM Assist CEO, RGMWM Implement the project assigned	Professional team at SLNA Head of the department of NGO PIAs Head of the department of NGO Resource Organizations	Provide Technical assistance to PIAs, Implement the assigned project Anchor the task assigned
Andhra Pradesh	SLNA – under DoRD (Department of Rural Development) MGNREGS Agriculture Department	Plan, monitor, supervise, implement IWMP Convergence for funds; staff; works	SAPNET SSAAT NREDCAP NRSC/APSAC	Resource Organization for Technical Support; Convergence; Capacity Building and Training	CEO, SLNA – Special Commissioner, Rural Development Managers, Assistant Managers Subject Matter	Plan, monitor, supervise, implement IWMP Technical Support; Capacity Building and Training;	Technical Experts	Technical Support; Capacity Building and Training; Monitoring and Evaluation; Data Management; MIS

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
	Animal Husbandry Department Forest Department <i>(All Direct Beneficiaries)</i>		Smart Aqua Pvt Company <i>(All Direct Beneficiaries)</i>		Specialists Support Staff <i>(All Direct Beneficiaries)</i>	Monitoring and Evaluation; Data Management; MIS Support Services for programme management	Support Staff <i>(All Direct Beneficiaries)</i>	Support Services for programme management
Maharashtra	VWDA (Vasundhara Watershed Development Agency) <i>(Direct Beneficiary)</i> YASHADA SIRD (CBT), Pune <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP Coordinate with the training institutes	SRO (State Resource Organisations) <i>(Direct Beneficiary)</i> MELD empanelled organizations <i>(Direct Beneficiaries)</i>	Technical Support; Capacity Building and Training; Training and Capacity Building MELD	CEO, VWDA Members, VWDA Support Staff <i>(All Direct Beneficiaries)</i>	Plan, monitor, supervise, implement IWMP Technical Support; Capacity Building and Training; Monitoring and Evaluation; Data Management; MIS Support Services for programme management	Professional team and assistants (Technical and Support) <i>(Direct Beneficiaries)</i>	Plan, monitor, supervise, implement IWMP; Technical Support; Capacity Building and Training; Monitoring and Evaluation; Data Management; MIS; Support Services for programme management
District								

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
Odisha	WCDC (Watershed Cell Cum Data Center) <i>(Direct Beneficiary)</i> Line Departments <i>(Indirect Beneficiary)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Technical Support; Convergence; Training and Capacity Building	NGO PIAs (Direct beneficiaries) Other NGOs working in the project area <i>(Indirect Beneficiaries)</i>	Technical Support; Convergence; Capacity Building and Training	PD- Soil Conservation Officer, Agriculture Department and APDs Other/Support Staff <i>(All Direct Beneficiaries)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Support Services for programme management	Technical Experts CBTs (Community Based Trainers) <i>(All Direct Beneficiaries)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Training and Capacity Building
Madhya Pradesh	District panchayat <i>(Indirect beneficiary)</i> WCDC (Watershed Cell Cum Data Center) <i>(Direct Beneficiary)</i> Line Departments <i>(Indirect Beneficiary)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Technical Support; Convergence; Training and Capacity Building	NGO PIAs <i>(Direct beneficiaries)</i> Corporate PIAs <i>(Direct Beneficiary)</i> Empanelled Resource organizations Other NGOs working in the project area <i>(Indirect Beneficiaries)</i>	Project Implementation Project implementation and provide backstop to the project. Capacity building support in the district Support villagers in accessing benefits of IWMP	PD- Soil Conservation Officer, Agriculture Department and APDs Other/Support Staff <i>(All Direct Beneficiaries)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Support Services for programme management	Individual PIAs Technical Experts CBTs (Community Based Trainers) <i>(All Direct Beneficiaries)</i>	Project Implementation Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Training and Capacity Building
Andhra Pradesh	DWMA (District Watershed Management Association)	IWMP; Data compilation, management, analysis, reporting; MIS			Commissioner, Rural Development PDs-Watershed and APDs	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis,	Technical Experts <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis,

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
	DRDA (District Rural Development Agency) DLRC (District Livelihood Resource Centre) <i>(All Direct Beneficiaries)</i>	Technical Support; Convergence; Training and Capacity Building Training and Capacity Building			Support Staff <i>(All Direct Beneficiaries)</i>	reporting; MIS Support Services for programme management		reporting; MIS
Maharashtra	Soil Conservation Department of the district WCDC/DWDU District Resource Organization	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Training and Capacity Building	Other NGO PIAs of the district		District Collector as Chairperson WCDC Chief Executive Officer Zilla Parishad as Co-Chairperson WCDC Divisional Joint Director Agriculture District Superintendent Agriculture Officer ³ as Project Manager, WCDC Deputy Project Manager Assistant A/c	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS	System administrator Civil engineers Data Entry Operators Office Assistant Other support staff	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Support Services for programme management

³ Not dedicated for IWMP, S/he has other responsibilities as well.

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
					Officer Sub Divisional Agriculture Officer ⁴			
Block/ Taluka/ Mandal/ Cluster								
Odisha	PIA- Agriculture Department/ Soil Conservation <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS	PIA-NGOs <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS	JSCO (Junior Soil Conservation Officer) <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS	WMT (Watershed Management Team) <i>(Direct Beneficiary)</i> Livelihood Support Team (LST) <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Training and Capacity Building
Madhya Pradesh	IWMP doesn't have this level in the state.							
Andhra Pradesh	WCC (Watershed Computer Centre) CLRC (Cluster Livelihood Resource Centre) <i>(All Direct</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Training and Capacity Building	PIAs <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS	MPDO (Mandal Parishad Development Officer) WDT (Watershed Development Team) Support Staff <i>(All Direct</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Support Services	WDT (Watershed Development Team) <i>(Direct Beneficiary)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS

⁴ Sub divisional Agriculture officer would generally be responsible for Monitoring, coordinate Design and Estimate preparation of Watershed physical structures and giving Technical Sanction to DPRs

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
	<i>Beneficiaries)</i>				<i>Beneficiaries)</i>			
Maharashtra	PIAs – Agriculture Department	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS	PIAs – Voluntary Organisations <i>(Indirect Beneficiaries)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS	Circle Agriculture Officer - PIA WDT Support staff <i>(All Direct Beneficiaries)</i>	Plan, monitor, supervise, implement IWMP; Data compilation, management, analysis, reporting; MIS Support Services		
	PTO (Project Training Organisations) <i>(All Direct Beneficiaries)</i>	Capacity Building						
Watershed								
Odisha	Gram Panchayat Gram Sabha <i>(Indirect Beneficiaries)</i>	Convergence Approve DPR; EPA selection; WBR; Watershed Programme awareness; selection of WC	WC (Watershed Committee) WA (Watershed Association) SHGs (Self Help Groups)	Consultation for DPR preparation and WBR; planning, proposing, prioritizing and execution of DPR works annually; monthly review meetings Approval of works Credit and thrift, inter-lending; beneficiaries of training and capacity building	Sarpanch of GP GP Members and Office Bearers Gram Sabha Members <i>(Direct Beneficiaries)</i>	Member of WC and nodal point between WC and GP Convergence Approval of DPR	WC Members and Office Bearers WA members (all adult members living in watershed area) SHG Members and Office Bearers	Consultation for DPR preparation and WBR; planning, proposing, prioritizing and execution of DPR works annually; monthly review meetings Approval of works Credit and thrift, inter-lending; beneficiaries of

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
			UGs (User Groups)	Savings for Watershed Development Fund (WDF); beneficiaries of productivity intensification activities; training and capacity building			UG members	training and capacity building Savings for Watershed Development Fund (WDF); beneficiaries of productivity intensification activities; training and capacity building
			CIGs (Common Interest Groups) <i>(All Direct Beneficiaries)</i>	Beneficiaries of training and capacity building; livelihood activities			CIG Members	Beneficiaries of training and capacity building; livelihood activities
							ST, SC and PTG	Beneficiaries of training and capacity building; livelihood activities
							Women Landless/ Marginal landholders/ Small/Large <i>(All Direct Beneficiaries)</i>	Direct Beneficiaries
Madhya Pradesh	Government PIAs (direct beneficiaries) Gram Panchayat (indirect beneficiary)	Project Implementation Supervise the project and safe	Gram Sabha (Indirect Beneficiary)	Supervise the project and safe guard the interest of natural resources, and other weaker	Go coordinators PIA	Project Implementation	Individual PIAs PIA coordinator (organization head of the PIA for the	Consultation for DPR preparation and WBR; planning, proposing,

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
	Other Line department active in the area <i>(Indirect beneficiaries)</i>	guard the interest of natural resources, and other weaker sections of the society, ensure transparency and participation, ensure cooperation Extend their support in convergence and reaching out to proper beneficiaries.	Watershed Committee <i>(Direct Beneficiary)</i> SHGs and UGs <i>(Direct Beneficiary)</i> NGO PIAs <i>(Direct beneficiary)</i> Resource Organizations hired for their services by PIAs <i>(Direct beneficiary)</i>	sections of the society, ensure transparency and participation, ensure cooperation Project Execution Project Execution, enhance participation Project Execution Awareness generation activities and CB support			project) Team Leader of WDT Watershed Development Team members Secretary, Watershed Committee Chairman/ President of Watershed Committee Members of Watershed Committee Leaders of Federations or any other CBOs Members of SHGs Members of UGs	prioritizing and execution of DPR works annually; monthly review meetings Approval of works Credit and thrift, inter-loaning; beneficiaries of training and capacity building Savings for Watershed Development Fund (WDF); beneficiaries of productivity intensification

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
							Village leaders <i>(Direct Beneficiaries)</i>	activities; training and capacity building Beneficiaries of training and capacity building; livelihood activities
Andhra Pradesh	Gram Panchayat Gram Sabha <i>(Indirect Beneficiaries)</i>	Convergence Approve DPR; EPA selection; WBR; Watershed Programme awareness; selection of WC	WC SHGs VOs (Village Organisations) UGs <i>(All Direct Beneficiaries)</i>	Consultation for DPR preparation and WBR; planning, proposing, prioritizing and execution of DPR works annually; monthly review meetings Credit and thrift, inter-loaning; beneficiaries of training and capacity building Federate Village SHGs, act as nodal for bank and other benefits / services for SHGs. Savings for	Sarpanch of GP GP Members and Office Bearers Gram Sabha Members <i>(Direct Beneficiaries)</i>	Chairman of WC and nodal point between WC and GP Convergence Approve DPR; EPA selection; WBR; Watershed Programme awareness; selection of WC	WC Members and Office Bearers SHG Members and Office Bearers VO Members and	Consultation for DPR preparation and WBR; planning, proposing, prioritizing and execution of DPR works annually; monthly review meetings Credit and thrift, inter-loaning; beneficiaries of training and capacity building Federate Village SHGs, act as nodal for bank and other benefits / services for SHGs.

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other	Role
				Watershed Development Fund (WDF); beneficiaries of productivity intensification activities; training and capacity building			Office Bearers) UG members WPP (Water Point Persons) WRPs (Water Resource Persons) O&M Manager of Drinking Water Plant ST, SC Women Landless/ Marginal landholders/ Small/Large (All Direct	Savings for Watershed Development Fund (WDF); beneficiaries of productivity intensification activities; training and capacity building Village nodal persons for information and communication Watershed level community trainers (ToT) for further training to community Operation and maintenance of DW plant Direct beneficiaries

Stakeholder / beneficiary identification, mapping and roles								
Stakeholder Level	Stakeholders / Beneficiaries Identified							
	Institutions				Individuals			
	Govt.	Role	Non Govt./Other Institutions	Role	Govt.	Role	Non Govt./Other Beneficiaries)	Role
Maharashtra	Gram Panchayat <i>(Indirect Beneficiaries)</i>	Convergence	WC	Consultation for DPR preparation and WBR; planning, proposing, prioritizing and execution of DPR works annually; monthly review meetings	Agriculture Supervisor Agriculture Assistant	Technical support	WC Members and Office Bearers	Consultation for DPR preparation and WBR; planning, proposing, prioritizing and execution of DPR works annually; monthly review meetings
	Gram Sabha <i>(Indirect Beneficiaries)</i>	Approve DPR; EPA selection; WBR; Watershed Programme awareness; selection of WC	SHGs	Credit and thrift, inter-loaning; beneficiaries of training and capacity building			SHG Members and Office Bearers	Credit and thrift, inter-loaning; beneficiaries of training and capacity building
	Women Sabha <i>(Indirect Beneficiaries)</i>	Organise separate meetings, and ensure women related issues addressed	UGs <i>(All Direct Beneficiaries)</i>	Savings for Watershed Development Fund (WDF); beneficiaries of productivity intensification activities; training and capacity building			UG members <i>(All Direct Beneficiaries)</i>	Savings for Watershed Development Fund (WDF); beneficiaries of productivity intensification activities; training and capacity building

Source: Field Visit, SESEA Team, DoLR

Annexure II: Environment and Social Management Plan

Environment and Social Management Plan				
Stakeholder level	Component	Project identification and Design Stage	Implementation	Consolidation
National	<ul style="list-style-type: none"> i. Convergence ii. M & E Plan iii. Documentation iv. Capacity Building v. Post project sustainability vi. GIS related activities vii. Gender Budgeting and Data viii. Inclusion of Tribal Groups/PTGs ix. Transparency and Accountability x. Food Security xi. Access to information xii. Migration 	<ul style="list-style-type: none"> i. Convergence plan and policy or mandate/government orders. Essentially, relooking at the criteria used for different schemes or push forward for wellbeing ranking to be used in other schemes as criteria for selection ii. To design comprehensive M&E document detailing definitions, disaggregated baseline data , qualitative and quantitative indicators. iii. --- iv. Capacity Building plan developed based on CBTNA, identify a pool of resource persons for IWMP at National and State level and tie ups for capacity building. v. Plan for detailed post project sustainability plan in consultation with various States vi. To identify GIS requirements at the National, State and district level and budgeting, institutionalization of the same. vii. Gender budgeting to be initiated. And baseline data 	<ul style="list-style-type: none"> i. Convergence with departments to be ensured at State and district Convergence of wellbeing ranking with other department schemes to be ensured ii. Implementation of M&E plan iii. Exchange of Learning, Best practices and Innovation across states through documentation, visits, workshops, presentations iv. Implementation of capacity building plan v. Revision of post project sustainability plan vi. GIS to be made functional and utilized at the State and district level vii. Implementation of gender budgeting viii. Inclusion of needs of indigenous community and Primitive Tribal groups and special measures for them to be put in place. ix. Implementation of Fund management and data 	<ul style="list-style-type: none"> i. Implementation of post project sustainability plan

		<p>needs to be gender disaggregated like identification of female headed households, separate recording of number of days of employment generated for women etc. Gender disaggregation of data to be incorporated in monitoring guidelines and protocol.</p> <p>viii. Tribal Development Plan in consultation with Department of tribal affairs, based on studies and consultation in different states</p> <p>ix. Standardize online systems for fund and data management, guidance note or government order on standard procurement processes for goods and services, transparency , governance action plan</p> <p>x. Measures to be devised to build existing assets of beneficiaries or build capacity or opportunity to procure new assets.</p> <p>xi. Design Multi Service stations (Knowledge Hubs) that cater to various needs of the community and provide knowledge and information on all extension services of agriculture, animal husbandry, forest etc. These stations could also be equipped to be weather stations, as also</p>	<p>management system, Transparency and accountability plan to be implemented</p> <p>x. Activities for asset building implemented</p> <p>xi. Implement and start Knowledge hubs</p> <p>xii. Data collection for migration trends</p>	
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		<p>have facilities (brochures and internet based) that would increase livelihood based knowledge of the community.</p> <p>xii. Monitoring guideline and protocol to include changes in migration.</p>		
State	<ul style="list-style-type: none"> i. Employee friendly HR Policy ii. Forest Policy -1988 of GOI iii. National Water Resources Policy-2002 iv. Tie up with RO's v. Planning for Baseline Data generation for the environmental parameters as mentioned in the Environmental Matrix for monitoring under broad domains such as-air environment, water environment, vi. land environment, vii. biological environment, socio-economic environment, health& sanitation. viii. Quantifying and mapping present land use at EPA 	<ul style="list-style-type: none"> i. Follow up action for each stated component both horizontally and vertically. ii. Ensuring the applicable policy principles under Component are considered iii. Calendar for visits of RO's to WS and meetings with WC and WDT and UG. iv. Ensuring plan of action to take up details of activities to be covered under the broad domain of various sub environments v. Action Plan for baseline data generation of all enlisted environmental parameters at EPA levels. vi. Plan for mapping of waste lands, fallow lands and barren lands for afforestation /social forestry under CAMPA schemes. vii. Action plan for preparation of static level contour plan for ground water in the watersheds. viii. Identification of designated observation wells for monitoring 	<ul style="list-style-type: none"> i. Regular monitoring of the engineering, agricultural /horticultural interventions and carrying environmental audits at periodic intervals. ii. Mandatory field visits of RO's, organizing training and CB measures to be followed. iii. Organising field visits of WC /WDT /UG/ SHG to other model IWMP WS projects. iv. Explaining the plan of action to the participating farmers, landless, UG members and SHG about the importance and necessity of same. v. Organising manpower for follow up plan for implementation of various action plans enumerated in design stage. 	<ul style="list-style-type: none"> i. Implementation of post project sustainability plan ii. Taking inventory of all engineering measures carried, checking for working efficiencies. iii. Corrective plans to be implemented for O & M of same. iv. Inventory of all engineering structures constructed and technological interventions carried out. Enlisting of all defunct structures and

	<p>level to identify the land under barren lands, waste lands and fallow lands for taking up under afforestation /social forestry sectors to meet the provisions of National Forest Policy (1988) guidelines & National Water Resources Policy 2002.</p> <p>ix. Orientation Programme of all SLNA Officials on applicability of Policies of GOI-Forest, Drinking Water & CAMPA (Compensatory Afforestation Fund Mgmt & Planning to Authority) to take stock of convergence schemes under these policies.</p> <p>x. Induction of representatives of MoEF, MoRD MoA for drawing experts on Environment, forestry, ground water and land use planning to effectively steer the SLNA for meeting policy objectives</p> <p>xi. Planning for base line data generation at EPA</p>	<p>of ground water regime conditions</p> <p>ix. Action plan for desiltation activities.</p> <p>x. Action plan for ICM and IPM and organizing hands on experience for technology interventions at farmer/ UG / landless people levels.</p> <p>xi. Action plan for construction of structures for rain water harvesting (roof top) and surface flow, structures for artificial ground water recharge</p> <p>xii. Action Plan for O & M of defunct structures and repairs and servicing for ensuring operational conditions</p>		<p>defects observed</p> <p>Ensuring of carrying O & M of all engineering and defunct structures.</p>
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	<p>level for all the parameters of environment enlisted under Matrix for ESMF.</p> <p>xii. Training calendar and CB activities of PIA, DCDU, MDT on regular intervals for meeting policy goals.</p> <p>xiii. Organising funds under various convergence schemes.</p> <p>xiv. Plan for O & M of engineering measures and rejuvenation of defunct structures</p>			
District / Block	<p>i. HR Policy</p> <p>ii. Administrative limitations</p> <p>iii. Expertise related</p>	<p>i. Suggestions for HR Policy</p> <p>ii. Plan for frequent informal meetings undertaken with project officials at SLNA for exchange of views and for corrective actions and also for steering purposes;</p> <p>iii. Plan for discretionary powers to executive officials to call domain experts from within and outside. University/Research Institution experts etc. from reputed organizations need be invited for field demonstrations with hands on training.</p>	<p>i. HR Policy implemented</p> <p>ii. Undertake frequent informal meetings undertaken with project officials at SLNA for exchange of views and for corrective actions and also for steering purposes; Corrective actions undertaken Corrective actions undertaken.</p> <p>iii. Discretionary powers are exercised by executive officials to call domain experts from within and outside. University/Research Institution experts etc. from reputed organizations need be invited for field demonstrations with hands on training. Periodic</p>	<p>i. Implementation of post project sustainability plan</p>

			interaction with site staff and villagers and other stakeholders.	
Watershed	<ul style="list-style-type: none"> i. Importance of Environmental parameters and man-nature symbiotic relationships for sustainable conditions. ii. Importance of engineering measures and location specific requirements. Importance of environmental parameters as components of nature and maintenance of symbiotic relationship with nature for sustainable development. iii. Inclusion of women iv. Inclusion of Tribal Groups/PTGs v. Inclusion of vulnerable groups vi. Livelihoods security vii. Transparency 	<ul style="list-style-type: none"> i. Importance of base line data at EPA levels for bench marking. ii. Importance of monitoring & evaluation of environmental parameters and methodology to be followed. iii. Importance of record keeping of all identified environmental parameters datewise. Training of individuals for taking up responsibilities for identification, observation, monitoring and evaluation of environmental parameters. iv. Design mechanism for to identify the root causes / factors (social or execution related) leading to this scenario; Effective measures to be planned to ensure mobilisation of women and village community as a whole to initiate women's inclusion. v. Plan to include forest based livelihood activities in the DPR, so as to propose and channelize appropriate funds (from IWMP and other departments/schemes) for promoting and undertaking these. 	<ul style="list-style-type: none"> i. Organising site visits with trained manpower and undertaking construction of engineering measures. ii. Monitoring and evaluation of environmental parameters at specified intervals/frequencies. iii. Record keeping of the observations and field notes and any specific occurrence such as earth quake, cloud burst, cyclone, drought etc. Involving all farmers, land less and UG in monitoring and evaluation of environmental parameters. iv. Record keeping practices and observed site conditions. vii. Ensure criteria chosen for doing WBR should be specific to the local situation and serve its objective. The WBR needs to be finalised only after validation and checking of errors like wrong categorisation of households due to same names of head of family or other in appropriate categorisation etc. 	<ul style="list-style-type: none"> i. Inventory of all engineering structures constructed and verifying of all such locations ii. Site visits for noting physical conditions of all structures and performance efficiency. iii. Plan for monitoring and evaluation of environmental parameters and record keeping of same iv. Involving of all concerned farmers and landless individuals in site visits to every engineering measure and ensuring explain importance of

		<p>vi. Life cycle based approach to be adopted and livelihood activities accordingly designed. Specific planning for the upper, middle and lower reach people.</p>	<p>WBR needs to be appropriately used for DPR preparation to select the beneficiaries for activities. The selection of beneficiaries for the targeted activity needs to be cross checked and verified in Gram Sabha or WA meetings.</p> <p>viii. Measures for funds transparency and sharing with the watershed community need to be made more vigorous and implemented effectively.</p>	<p>maintaining good operating efficiencies for community benefits and maintaining ecological harmony.</p>
<p>Source: SESA Team, DoLR, Field Visit</p>				

Annexure III: Current IWMP Institutional Arrangements

Table (5.9): Institutional Arrangements				
Location	Institution	Designation	Area of Specialization	Responsibility
Ministry	National Nodal agency	Multi-domain experts	Water management, Agriculture, Institutional and capacity building, M & E specialist, Hydrologist, NRM Specialist. MIS specialist	Budget allocation, Interaction with SLNAs, IEC activities with modern IT inputs, monitoring, audits, reviews, assessment studies, facility for extending, storing and generating watershed and land resource information, equipped with various GIS thematic layers for cadastral, watershed, soil, land use, socio-economic parameters and habitation, data and knowledge formulate panel of evaluators, study tours, research/field studies information sharing, convergence of activities with other ministries.
State level	State Project Implementing Unit (SPIU): Special Commissioner (Watersheds) as full time Director shall function for the State Project implementing Unit (SPIU)	Special Commissioner (Watersheds) as full time Director shall function for the State Project implementing Unit (SPIU)	Subject matter specialists for Hydrology, GMIS, Social, M&E, Research, documentation, Accounts along with support staff. Monitoring & Evaluation unit	Ensure transparency, accountability and financial discipline. Geospatial data centre to utilize the information technology and remote sensing inputs in planning, monitoring and evaluation of the programme.
	State level Livelihood Resource Center (SLRC)			
District level	District Project Implementing Units (DPIU)	Asst.Project Directors	Water resources, Agri.resource and capacity building, PSI, LH & GMIS etc.	Dedicated unit for GIS needs with support from State and NRSC team, Develop transaction based software for various components & electronic mode of payment systems, Web based MIS for

Table (5.9): Institutional Arrangements				
Location	Institution	Designation	Area of Specialization	Responsibility
				day to day monitoring.
	Cluster level Livelihood Resource Centers		Equipped with latest audio-visual aids and better amenities.	Provide support role to the D/CLRCs, cater to the CB needs of target groups etc. -Pri.and Sec. level stakeholders
				Model sites depicting NRM works, exposure to the trainees. Exposure visits to senior and middle level officials / staff Specialized trainings to primary & secondary level stakeholders on various thematic areas, national level workshops / seminars etc.
		Production systems Improvement (PSI)	Agriculture and Animal Husbandry sectors with convergence strategy	Farm Mechanization, Agri service demo centers, Agriculture machinery, agro processing units, promotion of indigenous technologies etc.
PIA level		Technical guidance	DPR preparation through participatory approach, community training, activity supervision-monitoring and review, build indigenous technical knowledge, post project operation and maintenance of project assets.	Use of maps while preparing DPRs / action plans, Use GIS for execution and monitoring the activities. Innovations & Best Practices
	Watershed Development Team (WDT)		Water management, agriculture-soil, social and	Constitution of WC, Guidance to WC, organize UG and SHGs, mobilization of woman, baseline

Table (5.9): Institutional Arrangements

Location	Institution	Designation	Area of Specialization	Responsibility
			institutional building	survey, training and capacity building, management of CPRs, submit DPR for consideration of gram sabha, facilitate livelihood opportunities to landless, post project operation of assets
			Research & Development	Research studies, evaluations, thematic short studies etc to bring in new approach to watersheds
				Multi Service stations - Knowledge Hub/extension services/weather station
Village level		SHGs	Poor, small and marginal households, agri. labours, women, shepherds and SC-STs	Livelihoods enhancement activities for asset less
		UG	Land holders	Operation and maintenance of assets
	WC		Representatives of SHGs, UG, SC,ST,women, landless	Watershed Secretary – conduct gram sabha,panchayat,WC, coordinate-followup of decisions, documentation and fund account transaction
Source: SESA team, DoLR				

Integrated Pest Management Strategy

Components of IPM

Cultural Methods: With knowledge of crop production, biology and ecology of pests and their natural enemies, cultural methods of pest control innovatively improvise regular farm operations to either destroy the pests or prevent them from causing economic losses. These may include, but not limited to the following:

- Preparation of nurseries or main fields free from pest infestation e.g. removal of plant debris, trimming of bunds, treating of soil and deep summer ploughing which kill various stages of insects.
- Testing of soil deficiencies for micronutrients on the basis of which fertilizers should be applied.
- Selection of clean and certified seeds and treating of seeds before sowing for seed borne diseases.
- Selection of seeds of relatively pest resistant/tolerant varieties.
- Crop rotation for pest suppression.
- Synchronized sowing and proper plant spacing.
- Proper water management (alternative wetting and drying to avoid water stagnation).
- Harvesting as close as to ground level.
- Proper weed management.
- Educate farmers with the ecology of crops and pests for adjusting of time of sowing and harvesting to escape peak season of pest attack. Explore and use traditional knowledge banks (old farmers) in the villages.

Mechanical and physical methods: In this process manual labour and tools are used:

- Collection of egg masses, larvae, pupae and adults where possible and either destroy them or place them in cage-cum-bird perches for conservation of natural enemies and withholding of pest species.
- Removal and destruction of diseased or pest infested portion of plant parts.
- Use of light traps and destruction of trapped pests.
- Use of pheromone traps for monitoring and suppression of pest population.

Genetic methods: This involves both use of genetically superior crop varieties that are resistant to various pests and also methods used to increase competition between pest populations.

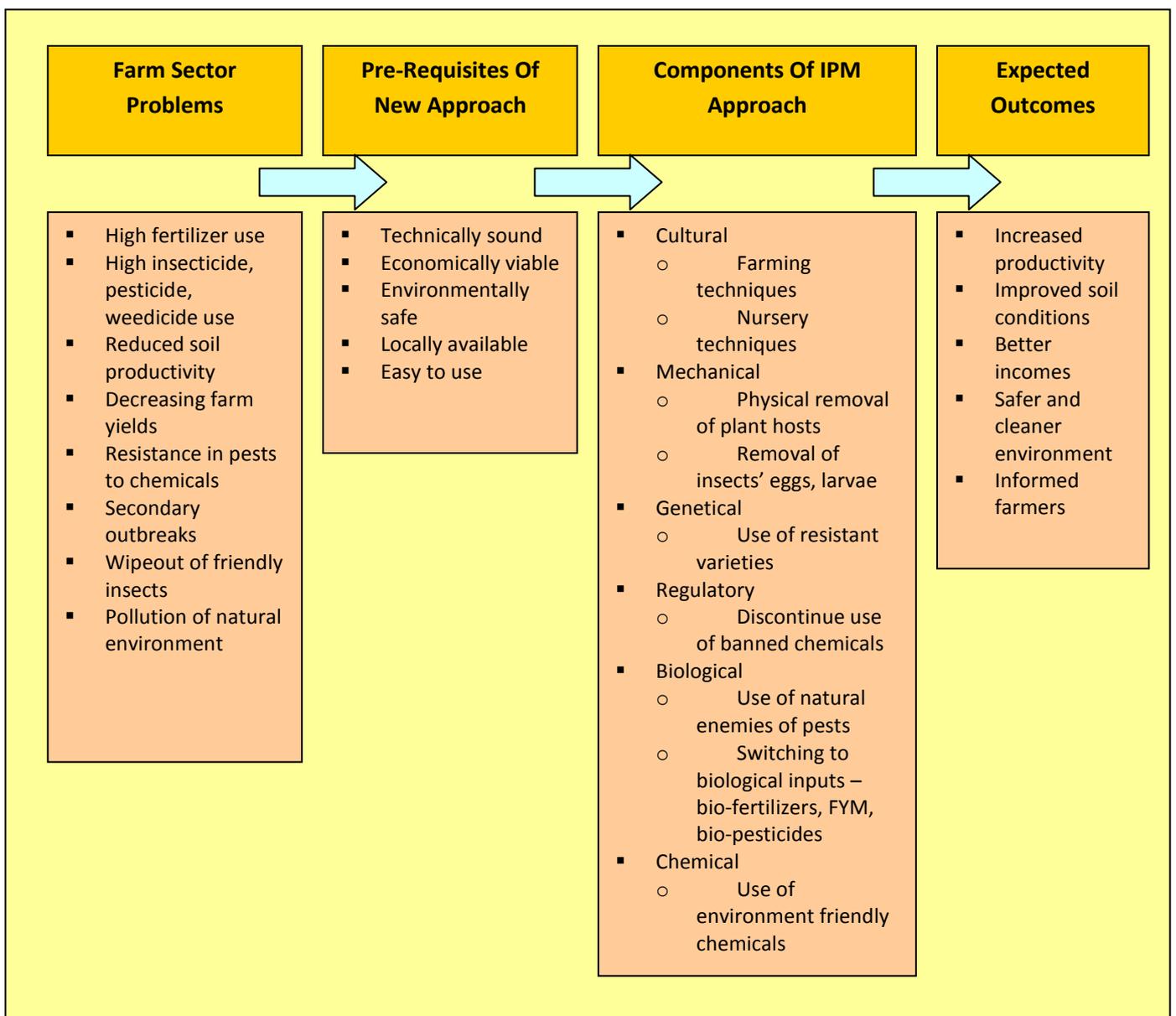
Regulatory methods: Rules formed by various agencies and Government are implemented under this method. Quarantine rules are enforced strictly disallowing infected materials to be imported and transported to other parts where there is no pest problem. Ban on certain dangerous chemicals is also enforced and regulated.

Bio-control methods: Control of insect pests and diseases through biological means is one of the most important components of IPM. Use of parasites, predators and pathogens to maintain pest population at a level below those causing economic losses either by introducing a new species into the environment or by increasing the effectiveness of those already present. The different types of biocontrol practices are grouped as under:

Chemical methods: Use of chemical pesticides is the last resort when other methods fail to keep the pest population below ETL. Although there is advancement in pest management research, pesticides would continue to play an important role in crop protection. Therefore, use of pesticides should be judicious, based on pest surveillance and ETL to minimize not only the cost but also reduce the associated problems. While going for chemical control the following points must be strictly followed:

- Economic threshold level should be observed.
- Selection of relatively environmental friendly pesticides.
- Ensure that farmers are sensitized to the use and safe disposal of insecticides, fertilizers etc and that these harmful chemicals are not used beyond their expiry.
- If the pest is present in strips or in isolated patches, whole field should not be sprayed.
- Pest and defender ratio must be observed. If ratio is 1:1, there is no need of pesticide spray.

Flow Diagram of Problems, IPM Approach and Expected Outcomes



Annexure V : List of banned Pesticides, Pesticides Refused Registration in India and WHO Class 1A and B and Class II

List of pesticides banned by Government of India			
A. Pesticides Banned for manufacture, import and use (28 Nos.)			
1.	Aldrin	15.	Pentachlorophenol
2.	Benzene Hexachloride	16.	Phenyl Mercury Acetate
3.	Calcium Cyanide	17.	Sodium Methane Arsonate
4.	Chlordane	18.	Tetradifon
5.	Copper Acetoarsenite	19.	Toxafen
6.	Cibromochloropropane	20.	Aldicarb
7.	Endrin	21.	Chlorobenzilate
8.	Ethyl Mercury Chloride	22.	Dieldrine
9.	Ethyl Parathion	23.	Maleic Hydrazide
10.	Heptachlor	24.	Ethylene Dibromide
11.	Menazone	25.	TCA (Trichloro acetic acid)
12.	Nitrofen	26.	Metoxuron
13.	Paraquat Dimethyl Sulphate	27.	Chlorofenvinphos
14.	Pentachloro Nitrobenzene	28.	Lindane ⁵
B. Pesticide / Pesticide formulations banned for use but their manufacture is allowed for export (2 Nos.)			
29.	Nicotin Sulfate	30.	Captafol 80% Powder
C. Pesticide formulations banned for import, manufacture and use (4 Nos)			
1.	Methomyl 24% L	3.	Phosphamidon 85% SL
2.	Methomyl 12.5% L	4.	Carbofuron 50% SP
D. Pesticide Withdrawn(7 Nos)			
1.	Dalapon	5.	Paradichlorobenzene (PDCB)
2.	Ferbam	6.	Simazine
3.	Formothion	7.	Warfarin
4.	Nickel Chloride		

⁵ (Banned vide Gazette Notification No S.O. 637(E) Dated 25/03/2011)-Banned for Manufacture, Import or Formulate w.e.f. 25th March 2011 and banned for use w.e.f. 25th March,2013.

List of Pesticides Refused Registration			
1.	Calcium Arsonate	10.	Azinphos Ethyl
2.	EPM	11.	Binapacryl
3.	Azinphos Methyl	12.	Dicrotophos
4.	Lead Arsonate	13.	Thiodemeton / Disulfoton
5.	Mevinphos (Phosdrin)	14.	Fentin Acetate
6.	2,4, 5-T	15.	Fentin Hydroxide
7.	Carbophenothion	16.	Chinomethionate (Morestan)
8.	Vamidothion	17.	Ammonium Sulphamate
9.	Mephosfolan	18.	Leptophos (Phosvel)

Pesticides Restricted for Use in India			
1.	Aluminium Phosphide	8.	Monocrotophos
2.	DDT	9.	Endosulfan
3.	Lindane	10.	Fenitrothion
4.	Methyl Bromide	11.	Diazinon
5.	Methyl Parathion	12.	Fenthion
6.	Sodium Cyanide	13.	Dazomet
7.	Methoxy Ethyl Mercuric Chloride (MEMC)		

List of pesticides not permissible (WHO classes Ia, Ib and II)

List of pesticides not permissible (WHO class Ia)			
Common name	Pesticide	Common name	Pesticide
Aldicarb	Ethoprophos	Chlormephos	Phenylmercury acetate
Brodifacoum	Flocoumafen	Chlorophacinone	Phorate
Bromadiolone	Hexachlorobenzene	Difenacoum	Phosphamidon
Bromethalin	Mercuric chloride	Difethialone	Sodium fluoroacetate
Calcium cyanide	Mevinphos	Diphacinone	Sulfotep
Captafol	Parathion	Disulfoton	Tebupirimfos
Chlorethoxyfos	Parathion-methyl	EPN	Terbufos
List of pesticides not permissible (WHO class Ib)			
Common name	Pesticide	Common name	Pesticide
Acrolein	Oxydemeton-methyl	Butoxycarboxim	Strychnine
Allyl alcohol	Paris green	Cadusafos	Tefluthrin
Azinphos-ethyl	Pentachlorophenol	Calcium arsenate	Thallium sulfate
Azinphos-methyl	Propetamphos	Carbofuran	Thiofanox
Blasticidin-S	Sodium arsenite	Chlorfenvinphos	Thiometon
Butocarboxim	Sodium cyanide	3-Chloro-1,2-propanediol	Triazophos
Coumaphos	Vamidothion	Edifenphos	Furathiocarb
Coumatetralyl	Warfarin	Ethiofencarb	Heptenophos

Common name	Pesticide	Common name	Pesticide
Zeta-cypermethrin	Zinc phosphide	Isoxathion	Methiocarb
Demeton-S-methyl	Famphur	Lead arsenate	Methomyl
Dichlorvos	Fenamiphos	Mecarbam	Monocrotophos
Dicrotophos	Flucythrinate	Mercuric oxide	Nicotine
Dinoterb	Fluoroacetamide	Methamidophos	Omethoate
DNOC	Formetanate	Methidathion	Oxamyl
List of pesticides not permissible (Class II)			
Common name	Pesticide	Common name	Pesticide
Alanycarb	Endosulfan	Cyhalothrin	Metam-sodium
Anilofos	Endothal-sodium	Cypermethrin	Methacrifos
Azaconazole	EPTC	Alpha-cypermethrin	Methasulfocarb
Azocyclotin	Esfenvalerate	Cyphenothrin [(1R)-isomers]	Methyl isothiocyanate
Bendiocarb	Ethion	2,4-D	Metolcarb
Benfuracarb	Fenazaquin	DDT	Metribuzin
Bensulide	Fenitrothion	Deltamethrin	Molinate
Bifenthrin	Fenobucarb	Diazinon	Nabam
Bilanafos	Fenpropidin	Difenzoquat	Naled
Bioallethrin	Fenpropathrin	Dimethoate	Paraquat
Bromoxynil	Fenthion	Dinobuton	Pebulate
Bromuconazole	Fentin acetate	Diquat	Permethrin
Bronopol	Fentin hydroxide	Phenthoate	Quizalofop-p-tefuryl
Butamifos	Fenvalerate	Phosalone	Rotenone
Butylamine	Fipronil	Phosmet	Spiroxamine
Carbaryl	Fluxofenim	Phoxim	TCA [ISO] (acid)
Carbosulfan	Fuberidazole	Piperophos	Terbumeton
Cartap	Gamma-HCH , Lindane	Pirimicarb	Tetraconazole
Chloralose	Guazatine	Prallethrin	Thiacloprid
Chlorfenapyr	Haloxypop	Profenofos	Thiobencarb
Chlordane	HCH	Propiconazole	Thiocyclam
Chlorphonium chloride	Imazalil	Propoxur	Thiodicarb
Chlorpyrifos	Imidacloprid	Prosulfocarb	Tralomethrin
Clomazone	Iminoctadine	Prothiofos	Triazamate
Copper sulfate	Ioxynil	Pyraclufos	Trichlorfon
Cuprous oxide	Ioxynil octanoate	Pyrazophos	Tricyclazole
Cyanazine	Isoprocarb	Pyrethrins	Tridemorph
Cyanophos	Lambda-cyhalothrin	Pyroquilon	Xylylcarb
Cyfluthrin	Mercurous chloride	Quinalphos	
Beta-cyfluthrin	Metaldehyde		

Guidance on Safe Use of Pesticides

Introduction

- When handling the pesticides product during opening of the package, mixing and preparation of the spray.
- When spraying the pesticides.
- When disposing the pesticides solution and containers General precautions:
 1. The operator should also wear a protective hat and face shield or goggles.
 2. Do not eat, drink or smoke while working.
 3. Wash hands and face with soap and water after spraying and before eating, smoking or drinking.
 4. Shower or bath at the end of every day's work and wear new clean clothes.
 5. Wash overalls and other protective clothing at the end of every working day in soap and water and keep them separate from the rest of the family's clothes.
 6. If the insecticide touches the skin, wash off immediately with soap and water.
 7. Change clothes immediately if they become contaminated with pesticides.
 8. Inform the supervisor immediately if one feels unwell.
- Broad-rimmed hat (protects head, face and neck from spray droplets).
- Face-shield or goggles (protects face and eyes against spray fall-out).
- Face mask (protects nose and mouth from airborne particles).
- Long-sleeved overalls (worn outside of boots).

Exposure to pesticides may occur when handling and spraying pesticides. The exposures to pesticides may occur in following situations:

General safety precautions while handling pesticides and guidelines for proper storage, transportation and safe disposal of pesticides and pesticides containers are mentioned below for further reference.

General safety precautions while handling pesticides

Protective clothing and equipment

Absorption of pesticides occurs mainly through the skin, lungs and mouth. Specific protective clothing and equipment given below must be worn in accordance with the safety instructions on the product label.

- Rubber gloves.
- Boots

Storage

1. Pesticides storehouses must be located away from areas where people or animals are housed and away from water sources, wells, and canals
2. They should be located on high ground and fenced, with access only for authorized persons. However, there should be easy access for pesticides delivery vehicles and, ideally access on at least three sides of the building for fire-fighting vehicles and equipment in case of emergency.
3. Pesticides must NOT be kept where they would be exposed to sunlight, water, or moisture which could affect their stability
4. Storehouses should be secure and well ventilated.
5. Containers, bags or boxes should be well stacked to avoid possibility of spillage. The principle of first expiry first out. should be followed.
6. Stock and issue registers should be kept upto date. Access to the pesticides should be limited to authorized personnel only.
7. The store room should have a prominently displayed mark of caution used for poisonous or hazardous substances. It should be kept locked.
8. Containers should be arranged to minimize handling and thus avoid mechanical damage which could give rise to leaks. Containers and cartons should be stacked safely, with the height of stacks limited to ensure stability.

Transportation

1. Pesticides should be transported in well sealed and labeled containers, boxes or bags.
2. Pesticides should be transported separately. It should NOT be transported in the same vehicle as items such as agricultural produce, food, clothing, drugs, toys, and cosmetics that could become hazardous if contaminated.
3. Pesticides containers should be loaded in such a way that they will not be damaged during transport, their labels will not be rubbed off and they will not shift and fall off the transport vehicle onto rough road surfaces.
4. Vehicles transporting pesticides should carry prominently displayed warning notices.
5. The pesticides load should be checked at intervals during transportation, and any leaks, spills, or other contamination should be cleaned up immediately using accepted standard procedures. In the event of leakage while the transport vehicle is moving, the vehicle should be brought to a halt immediately so that the leak can be stopped and the leaked product cleaned up. Containers should be inspected upon arrival at the receiving station. There should be official reports to the national level and follow-up enquiries in the event of fires, spills, poisonings, and other hazardous events.

Disposal of remains of pesticides and empty packaging

1. At the end of the day's work during IRS activities, the inside of the spray pump should be washed and any residual pesticides should be flushed from the lance and nozzle.
2. The rinsing water should be collected and carefully contained in clearly marked drums with a tightly fitted lid. This should be used to dilute the next day's tank loads or disposed properly by the supervisor at disposal sites like pits or dugs.
3. Never pour the remaining pesticides into rivers, pools or drinking-water sources.
4. Decontaminate containers where possible. For glass, plastic or metal containers this can be achieved by triple rinsing, i.e. part-filling the empty container with water three times and emptying into a bucket or sprayer for the next application.
5. All empty packaging should be returned to the supervisor for safe disposal according to national guidelines.
6. Never re-use empty insecticide containers.
7. It shall be the duty of manufacturers, formulators of pesticides and operators to dispose packages or surplus materials and washing in a safe manner so as to prevent environmental or water pollution.
8. The used packages shall not be left outside to prevent their re-use.
9. The packages shall be broken and buried away from habitation.

Disposal of Expired Pesticides

1. Adequate measures should be undertaken to avoid expiry of stocks in storehouses.
2. First Expiry First Out. principle should be strictly followed during stock movements.
3. The expired stock should be returned to manufacturer for disposal as per guidelines preferably through incineration process.
4. The chemical efficacy should be tested before disposal of expired pesticides to find out possibility of usage. The efficacy and active ingredient percentage of pesticides is tested and certified by the authorized testing laboratory.

Health Monitoring

1. In case of accidental exposures or appearances of symptoms of poisoning, medical advice must be sought immediately.
2. In case of organophosphorus (Malathion), regular monitoring of cholinesterase (CHE) level should be carried out and spraymen showing decline in CHE to 50% should be withdrawn and given rest and if needed medical aid

Annexure VII: Team Members and SESA Terms of Reference

Team Leader: Sonali Patnaik
Environmental Expert: GVK Ramakrishna
Environmental Expert: Mohan Bhagwat
Social Expert: Neelesh Singh
Social Expert: Sirisha Indukuri

Neeranchal National Watershed Project

Terms of Reference for

Strategic Environmental and Social Assessment (SESA) Consultants

Background

The Department of Land Resources (DoLR) Government of India is currently preparing the World Bank supported Neeranchal National Watershed Development Project. Neeranchal is expected to positively influence the IWMP outcomes through technical and financial support for better delivery and impacts through improved planning approaches, capacity building, coordination and convergence, and supportive research and development. The main objectives of the IWMP are to restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water. The outcomes are prevention of soil run-off, regeneration of natural vegetation, rain water harvesting and recharging of the ground water table. This enables multi-cropping and the introduction of diverse agro-based activities, which help to provide sustainable livelihoods to the people residing in the watershed area. In addition, there is a Scheme of Technology Development, Extension and Training (TDET) is also being implemented to promote development of cost effective and proven technologies to support watershed management. Whereas, Neeranchal is not expected to invest in field based investments and is likely to provide technical capacity building support, it is expected to positively influence the outcomes of IWMP through addressing its shortcomings that would also include environment and social related challenges of watershed programs. It is therefore, critical to closely look at the current state of affairs in the watershed sector and identify potential environmental and social issues, assess the effectiveness of the ongoing watershed programs including the IWMP, especially their outcome focus and impact on people's lives and productivity, and identify the key challenges in sustaining the investments made on watersheds. Issues related to environmental and social sustainability of these investments also need to be considered.

Project Description

The preliminary **Project Development Objective** is: *Neeranchal aims to increase incomes through enhanced agricultural production and improve sustainability of natural resources through better watershed management among the people living in selected micro-watersheds in eight States, by adding value to IWMP programs through institutional reform, capacity building, the development and application of best practices, and convergence with other Government projects.*

Project Components

There are four proposed project components⁶:

1) Institutional Reform and Capacity Building, in DoLR and across all states

The component would be delivered across all states and strengthen the capability of key national watershed institutions, particularly the DoLR and NRAA to more effectively plan, coordinate, deliver, and monitor integrated watershed programs; undertake relevant policy and economic analyses; develop national watershed strategies; and report on national progress. Specialized training would also be provided to State Level Nodal Agencies (SLNAs), other designated watershed implementing agencies, village level extension agents, community institutions, Gram Panchayat members, watershed committees, and farmers around improved watershed management practices.

2) State IWMP Support and Post Project Sustainability in Focal States

In the proposed eight focal states, the component would provide intensive support for improved IWMP operations and convergence/integration with other relevant sectors and schemes. The component would strengthen the lead nodal agency responsible for integrated watershed management; pilot integrated catchment assessment and planning processes; develop comprehensive digital databases for improved and integrated watershed management planning; develop strong internal M&E tools, including MIS in the state nodal agency; pilot community-based monitoring and documentation; and support incremental costs of state PMUs related to project implementation.

3) National Innovation Support

The component would support: applied research studies across key thematic areas including integrated landscape management and agricultural intensification, climate smart agriculture and agriculture value chains; applying best practices and tools for basic and advanced hydrological assessment; better demand-driven technology transfer; strengthening the institutional arrangements for coordinating and delivering longer-term needs-based research identification, technology transfer, research quality assurance, and dissemination of rainfed agriculture and watershed management research.

4) Project Management/Implementation Support.

This component would support the operation of a national Project Management Unit (PMU) in DoLR; a comprehensive communication program; 3rd party M&E support directly tied to project activities, including baseline surveys, input and output monitoring, process monitoring, impact assessments, acquisition of necessary remote sensing images, and case studies to guide project implementation.

The project would concentrate on providing specific technical support activities, goods and incremental costs and would generally not finance major physical works. The Neeranchal investments in technical assistance would complement IWMP and its own investments in watershed planning, physical works for soil and water conservation, and alternative livelihoods through ongoing operations. Component 1 in Neeranchal addresses capacity building at central, state and local levels in addition to what IWMP already delivers. Component 2 potentially focuses on issues that have not been considered at scale in most ongoing watershed programs and as such it may be necessary to ensure that their anticipated environmental and social impacts are included and also addressed. Component 3 is largely supporting research, development and technology transfer to support IWMP delivery, farmers, and other stakeholders. Given the technical assistance focus of the project, as at this stage it does not entail Bank direct investments on the ground (such as, water and soil conservation works, constructing check dams, erosion prevention structures etc.), there may be only minor environmental and/or social safeguards issues to be mitigated. At the same time, the project

⁶ Refer to Annex 1 for more details

is designed to improve the capacity of DoLR and watershed institutions in participating states to better address safeguards in their IWMP.

Project Location

The project would predominantly focus on dryland areas in eight states: Andhra Pradesh, Chhattisgarh, Gujarat, Odisha, Jharkhand, Madhya Pradesh, Maharashtra, and Rajasthan. The states present a wide range of physical characteristics ranging from hilly terrain and forested highlands of central India on one hand to drier landscapes of the western India as well as four states with fairly long coastlines. The eight states also vary in terms of agro-climatic and/or agro-ecological zones with widely varying temperature and rainfall profiles. Broadly, all the states have small and marginal farmers with small sized farmlands facing the challenges of climatic variations with current low levels of resilience to climate change.

Major Components and Outcomes of the SESA

Four Broad Themes for the SESA

There are **four broad themes** proposed to be covered under the SESA: 1) the current state of affairs; 2) impact of the ongoing and planned investments; 3) institutional capacity and challenges, and 4) managing environmental and social risks.

1. *Current state of affairs in the watershed sector – a status check:*
 - The key priority environmental and social issues in watersheds;
 - What baselines on environmental and social issues are currently available for the project states? Gaps in these baselines for key environmental and social issues relating to watersheds would have to be filled during the status check exercise;
 - The scope and allocation of primary investments under IWMP in the project states;
 - Identifying the key challenges in environmental and social sustainability of these investments.
2. *Measuring the impact of investments made in watersheds:*
 - Assessing the effectiveness of the ongoing IWMP watershed program and how its outcomes and impacts on people and productivity are now being measured (including the periodicity and nature of outcome monitoring);
 - Summarize available secondary data reflecting the planned outcomes of IWMP in the project states - restoration of degraded natural resources, improvement of vegetative cover through regeneration, groundwater recharge and surface storage of water (rain water harvesting), soil moisture content, soil erosion, stream sedimentation, prevented soil runoff, improved livelihoods. Where data might be lacking on IWMP, refer to Bank-supported projects in other states for indicative results from similar watershed programs;
 - Evaluate how effectively IWMP works have been carried out in forestlands, especially where ridges are under forest cover;
3. *Institutional capacity and challenges in the watershed sector:*
 - Identify options to enhance capacity and systems in DoLR and Panchayat Raj Institutions (PRIs) for more effective incorporation of social and environmental issues in IWMP or other watershed programs.
4. *Managing potential environmental and social risks of watershed programs:*
 - Identify the actual (observed) and potential/probable environmental and social risks that could arise out of investing in watershed programs (with a special focus on IWMP);
 - Suggest reasonable mitigation measures and Environmental and Social Management Plans for addressing the identified issues arising out of activities/sub-projects funded under watershed projects and also provide an assessment on how these are currently addressed in IWMP;
 - Given the fact that some of the selected states contain tribal populations, the team will ensure the borrower prepares an Indigenous People Development Framework (IPDF)

including guidance to ensure and monitor Free, Prior and Informed Consultation based on broad community support in project areas.

- Based on the available Environmental and Social Management Frameworks (ESMF) under ongoing Bank-funded State level watershed projects in Himachal Pradesh, Uttarakhand, and Karnataka, prepare a generic ESMF and Environment and Social Management Plan (ESMP) for government financed watershed investment activities. For any identified impact that is not covered under available ESMFs, suggest mitigation measures and indicators for monitoring. The ESMP would particularly focus on measures to help the IWMP mitigate and monitor Environmental Health and Safety (EHS) aspects during construction of works in line with the World Bank EHS guidelines;
- Suggest a national level monitoring mechanism within MoRD for ensuring better environmental and social sustainability of watershed investments and also to ensure that any identified and potential environmental and social risks are properly identified and monitored in the implementation of national watershed schemes;
- Based on their EA experience, the consultants will develop environmental and social guidelines for inclusion in a future IWMP operational field manual. These guidelines would help the communities, and watershed agencies to supervise and implement environmental and social aspects of the project as part of the micro-watershed planning process.
- The SESA would also be supported by development of an Environmental Codes of Practice to improve overall environmental sustainability for the anticipated project sub-activities.

Project Specific Monitoring Requirements:

- The project will also pilot landscape level integrated catchment planning based on hydrological information. The SESA should proposed potential environmental and socio-economic inputs that may need to be considered in these larger scale assessments;
- Component 3 of the project focuses on applied research, technology transfer and innovations. Depending on which technologies and approaches are identified the broad ESMF should allow the client be able to progressively address these;
- The project is likely to support piloting of some innovations including implementation support in some of the most environmentally and economically challenged regions which could well include habitations of indigenous populations. While this could well be covered through existing ESMFs the currently unidentified nature of the interventions should be taken into account.

Proposed Methodology

General Approach

- The consultants would employ a range of tools and approaches for working on the four broad themes proposed to be covered under the SESA;
- A significant volume of the information required for the SESA is available from secondary sources through DoLR, states implementing IWMP, and the World Bank supported watershed projects in Karnataka, Uttarakhand, and Himachal Pradesh. In addition, the World Bank has supported lending operations in all of the project states where the environmental and social assessments will yield important background data. A meta-data approach will involve desk reviews and synthesis of this information;
- Three to four sample States would be selected for actual field work taking into account diversity of agro-ecological, socio-economic conditions. The field work would fill in gaps in the secondary meta-data base analysis. The process would involve creating an environmental and social baseline, limited household sample surveys (where necessary) to get beneficiary feedback, and stakeholder consultations (different levels from central government and down up to village level stakeholders). The consultants would undertake structured focus group discussions, community consultations, and interviews of watershed

experts and implementers for identifying key environmental and social issues and potential mitigation measures for managing these risks.

Suggested Structure of the SESA Report

1. Executive Summary
2. Section 1: Introduction and Methodology
3. Section 2: Current State of Affairs in the Watershed Sector
4. Section 3: Measuring the Impact of Investments made in Watersheds
5. Section 4: Institutional Capacity and Challenges in the Watershed Sector
6. Section 5: Managing Potential Environmental and Social Risks of WS Programs
7. Section 6: Project Specific Monitoring Requirements
8. Section 7: Training / Capacity Building Plan for both Environmental and Social Impact Augmentation and Mitigation
9. Conclusion and Recommendations
10. Annexes
 - I. Study areas – state, watershed, village
 - II. List of persons met and dates
 - III. Survey formats
 - IV. Study Team
 - V. Safeguard Policies

Status of Watershed Programs in the States

Despite the fact that the IWMP is an improvement over the previous watershed initiatives such as DDP, DPAP, IWDP, etc, it has not been able to generate the level of participation, ownership and transparency in its delivery. IWMP has also not delivered anticipated results on the ground, especially with farmers and communities. The Draft Document for the Twelfth Five Year Plan speaks of some new innovations in the methodology of implementation of IWMP. Picking from this thread, it is important to study the gaps in the implementation of IWMP at field level.

IWMP was only started from 2009-10. In most of the states, the actual physical work is yet to start. A typical IWMP project is of 5 years duration, out of which 1-2 years is for preparatory phase (for project appraisal, formation of institutions as WDT, WC, preparation of DPR, capacity building, EPA, evaluation etc) and Work Phase. For the states of Jharkhand, A.P., Orissa and MP, Projects of 2009-10 (1st year of implementation of IWMP), the projects have completed the preparatory phase and work phase has just started. Projects of 2010-11, 2011-12 & 2012-13, the projects are still in preparatory phase.

As an example, in the Rajasthan & Maharashtra IWMP Projects of 2009-10 (1st year of implementation of IWMP), the projects have completed the preparatory phase. Evaluation report is yet to be completed and work phase has not started. For Projects of 2010-11, 2011-12 & 2012-13, the projects are still in preparatory phase.

For the state of Gujarat, Projects of 2009-10 (1st year of implementation of IWMP), the projects have completed the preparatory phase. Evaluation report is completed and work phase has not started. Projects of 2010-11, 2011-12 & 2012-13, the projects are still in preparatory phase.

For the state of Chhattisgarh, Projects of 2009-10 (1st year of implementation of IWMP), only 50% of the projects have completed the preparatory phase. Evaluation report is yet to be started and work phase has not started. Projects of 2010-11, 2011-12 & 2012-13, the projects are still in preparatory phase.

Coordination with other Studies and Information

It will be useful to refer to other salient work during the planning and execution of the Neeranchal SESA, including the following:

- Institutional assessment being undertaken in Gujarat, Odisha and Chhattisgarh;

- SESA studies undertaken for other Bank studies in the 8 project states;
- Environmental and social assessment work from the new Karnataka Watershed Development Project-II;
- Poverty and Social Impact Assessment conducted for Karnataka Watershed Development Project-II;
- World Bank safeguards policies (Annex 2)

Consultants and Competencies Required

Team Leader

Key Responsibilities

- Overall planning and delivery of the SESAs to the client within the stated time period;
- Planning and coordinating work tasks and field visits of social and environmental specialists, based on deployment of two teams (each with one social and environmental specialist) to ensure that the four key themes for the SESAs are well covered within the allotted time for completion and across the selected focal states;
- Joining in the field work as required, particularly to provide gender inputs to the SESAs;
- Drawing on input from team members and self to develop the draft SESAs;
- Revising the draft SESAs based on comments from the DoLR and World Bank, and making necessary revisions;
- Ensuring a final draft is also translated into Hindi.

Competencies Required

The key competencies are:

- a. Minimum 10 years of demonstrated experience in related consultancy services including for externally aided projects of a similar nature including World Bank assisted projects, preferably with at least one watershed management project/program;
- b. Minimum of 5 years demonstrated experience managing technical teams for similar studies;
- c. Have gender specific training and at least 5 years of experience in undertaking gender - related assessments;
- d. Post-graduate degree in any Environment-related discipline or Social Studies

Environmental Specialists (x2)

Key Responsibilities

Under the guidance and direction of a SESAs team leader:

- Assist in gathering relevant secondary information and reports as part of developing a meta-data base to support the SESAs;
- Review and synthesize relevant information to address the environmental aspects of the SESAs across the four thematic areas;
- Undertake field visits to assigned states, along with a social specialist to fill in gaps as needed across the four key themes for the SESAs in the selected focal states;
- Draft relevant material for the draft report, related to environmental inputs;
- Help revising the draft SESAs based on comments from the DoLR and World Bank, and making necessary revisions;

Competencies Required

The key competencies are:

- e. Minimum 8 years of demonstrated experience in delivering environmental technical services for similar assignments, including for externally aided projects, and in particular World Bank assisted projects, preferably with at least one watershed management project/program;
- f. Post-graduate degree in any Environment-related discipline

Social Specialists (x2)

Key Responsibilities

Under the guidance and direction of a SESA team leader:

- o Assist in gathering relevant secondary information and reports as part of developing a meta-data base to support the SESA;
- o Review and synthesize relevant information to address the social aspects of the SESA across the four thematic areas;
- o Undertake field visits to assigned states, along with an environment specialist to fill in gaps as needed across the four key themes for the SESA in the selected focal states;
- o Draft relevant material for the draft report, related to social inputs; and
- o Help revising the draft SESA based on comments from the Do/LR and The World Bank, and making necessary revisions.

Competencies Required

The key competencies are:

- g. Minimum 8 years of demonstrated experience in working as social expert for large infrastructure projects, preferably with at least one watershed management project/program. Familiarity with the World Bank's related guidelines and operational directives and adequate experience of sampling, handling large scale surveys and qualitative data collection and analysis. Experience of working in similar region and local language will be advantageous.
- h. Post-graduate degree or equivalent qualification in social sciences or in related disciplines.

Key Deliverables and Milestones

Key Deliverable	Time From Contract Signing (Weeks)
On approval of inception report, work plan and survey questionnaires including sampling methodology	3
On presentation and acceptance of initial findings	8
On submission of first draft	10
On submission of final draft	12
On submission of Hindi translation	16

Estimated Inputs and Costs

Consultancy Description	Person Work-Days	Rate/Day (INR)	Total Fees (Lakh)	Field Travel (Days)
Team Leader	60	8,000	4.80	20
Environmental Specialist I	40	6,500	2.60	15
Environmental	40	6,500	2.60	15

Specialist II				
Social Specialist I	40	6,500	2.60	15
Social Specialist II	40	6,500	2.60	15
Other Costs	Hindi translation	Lump Sum	0.30	

The Individual Consultants would be paid on the basis of actual working days as per work plan for the individual consultant or changes thereof approved by DoLR. Further, for field visits, the individual Consultant would be eligible for receiving reimbursement of First AC Train fare/ Apex Air fare (economy class) by Air India; reimbursement for boarding and lodging up to Rs. 3000/- per day as per actual; and reimbursement of local travel charges up to Rs. 500/- per day.

Review of Consultants' Services

The DoLR Project Director – Neeranchal, will have overall responsibility for the consultancy. A designated PIU member may be assigned for management of the consultancy. The consultant will provide a brief update of progress every two weeks and join any meetings or discussions as required, with sufficient notice being provided by DoLR. The consultant will make a presentation of findings for feedback. Any written feedback required will be provided to the consultant within five working days.

SELECTION CRITERIA FOR INDIVIDUAL CONSULTANTS

The successful Individual Consultant will be chosen based on the following criteria.

Selection criteria

Sl. No.	Evaluation Criteria	Maximum marks
Part A	Evaluation Criteria for Short- listing of Applications	
a)	Qualification	20
i)	Additional Academic Qualification beyond the minimum required	10
ii)	Any Additional Professional Qualification beyond the minimum required	10
b)	Experience (relevant expertise justifying adequacy for the assignment)	60
i)	Year-wise tasks completed in last three years of similar nature	15
ii)	Experience of working with Government of India and various State Governments	10
iii)	Experience of working with World Bank	20
iv)	Works currently in hand	5
v)	Experience of working for any similar programme of Government of India with Multilateral Bodies	10
Part-B	Interview - Assessment of Capability of candidate for the assignment through Interview	20
	Total	100

Annex 1. Project Description

Concept/Description

The proposed project has four components with a total estimated cost of US\$521 million over seven years. The project would be co-financed by the GoI (US\$276 million or 53%) and the Bank (US\$245 million or 47%).

1. Component 1: Central Institutional and Human Capacity Building (US\$25 million). The component would strengthen the capability of key national watershed institutions, particularly the DoLR and NRAA. Capacity building will focus on specialized technical, fiduciary, and management skills to more effectively plan, coordinate, deliver, and monitor integrated watershed programs; undertake relevant policy and economic analyses; develop national watershed strategies; and report on national progress. Capacity building will include training and exposure visits to other countries. Institutional building will support the development of a single body within MoRD to facilitate coordination between IWMP and other national schemes impacting on watershed development, particularly MGNREGS. Legal and policy support will include reviewing and reforming existing legal/policy frameworks to better enable community based organizations (CBOs) to play a stronger regulatory role in the use of natural resources. It also includes support for regular review, analysis, and revision of relevant policies and guidelines governing watershed management, for example the Common Guidelines for Watershed Development. The component would also strengthen monitoring and evaluation (M&E) systems, including management information systems (MIS) and Geographic Information Systems (GIS) within DoLR and NRAA for tracking the national performance of IWMP and other watershed related programs.

In all states implementing IWMP, specialized training would be provided to State Level Nodal Agencies (SLNAs) and other designated watershed implementing agencies to strengthen technical skills around more holistic watershed and broader natural resource management, and rural livelihoods. Capacity building would also strengthen procurement, financial, administrative, and management capabilities. Incremental training (beyond what is currently offered in IWMP) would also be provided to village level extension agents, community institutions, Gram Panchayat members, watershed committees, and farmers around improved watershed management practices, intensified agriculture, surface and groundwater management, climate change adaptation, value addition and marketing, etc. The component will help establish a national training program to develop certified watershed professionals at the state and community level. Within communities, special emphasis would be given to lead farmers to become certified watershed practitioners as champions and peer-to-peer mentors to other farmers. Capacity building would encompass a range of approaches including classroom training, formal courses, mentoring, and exposure visits within India and to other countries as appropriate, based on needs assessments and followed by impact assessments.

2. Component 2: National Innovation Support (US\$44 million). The component would support improved coordination and networking of relevant government scientific

institutions (for example, the Indian Council of Agricultural Research – ICAR), NGOs involved with research and development (R&D), and other national R&D organization related to watershed management, both from within India and globally. This would underpin development and adoption of innovative knowledge, tools and systems to improve watershed planning, program implementation, agricultural intensification, water management, and livelihoods. Specific support would include: i) strategic planning to identify and generate a consensus on: critical research priorities for improved watershed development and agree on a pathway forward; individual agency contributions to the R&D agenda from both within the ICAR network and externally; institutional arrangements for coordinating and delivering necessary watershed-related R&D knowledge and products, technology transfer and dissemination systems; and maintaining research quality; ii) financing applied “action” research across agreed, key thematic priority areas⁷; iii) developing a national level data center in DoLR or NRAA, linked with emerging state data bases (see component 4); and iv) improving in-house M&E systems in each state that could then be networked at the national level.

3. **Component 3: IWMP Implementation Support in Focal States (US\$363 million).**

In the proposed eight focal states, the component would provide intensive support for improved IWMP operations and convergence/integration with other relevant sectors and schemes. It would be linked directly to planned and sanctioned IWMP field operations in specific areas. Component assistance would include: i) strengthening a single nodal agency responsible for integrated watershed management, which would facilitate convergence of schemes and programs; ii) implementation of integrated catchment assessment and planning processes with a particular focus on broader hydrology and integrated catchment development⁸ at a scale of up to 25,000 ha; strengthening micro-watershed planning and implementation under IWMP to incorporate larger-scale catchment assessment/planning guidance; developing and piloting forest and soil carbon financing schemes that would benefit communities and farmers⁹; piloting the use of new decision-support models for more holistic planning at both landscape-scale catchment and micro-watershed scales, and better site selection; iii) developing comprehensive digital data bases for improved integrated watershed management planning, pulling together available state-level data, images, and map layers, and establishing a land resources portal for wider data access by stakeholders such as other state government departments and universities. The state level data bases would be linked to the proposed national data base in DoLR; iv) develop strong internal M&E tools, including MIS in the state nodal agency; v) piloting community-based monitoring and documentation through simple water monitoring equipment and IT tools as well as training

7 While not pre-empting the results of a strategic planning process, these could include integrated landscape management, agricultural intensification, climate smart agriculture, greenhouse gas footprints, and agriculture value chains, identifying and applying best practice approaches and tools for basic and advanced hydrological assessment and monitoring to deliver downscaled hydrological data to sub-catchment and micro-watershed scales, etc. The applied R&D may be conducted through existing government research institutions and/or external agencies.

8 Would cover more unified development of land and water resources (including private land), production systems, inputs, market access and marketing, institutions and governance, sustainable use, regeneration and management of commons, aquifer based planning for sustainable groundwater use, management and regeneration, institutional development/strengthening, planning and skill building.

9 For soil carbon financing, a recent and successful example is from the Kenya Agricultural Carbon Project that is benefiting smallholder farmers.

on participatory M&E and water management¹⁰; and vi) incremental costs of state PMUs related to project implementation.

4. **Component 4: Project Implementation Support (US\$49 million).** This component would support: i) incremental, specialized staff costs (full and part-time) in the national Project Management Unit (PMU) in DoLR; ii) incremental administration costs for travel, creating and managing an integrated project website and improved communications; financial management and internal/external audit, and procurement; and equipment to support overall project implementation; iii) a comprehensive communication program to ensure wide awareness about the project objectives and lessons, and foster stakeholder engagement in the continuous improvement of the project; iv) 3rd party M&E support directly tied to project activities, including baseline surveys, input and output monitoring, process monitoring, impact assessments, acquisition of necessary remote sensing images, and case studies to guide project implementation.

¹⁰ For example, the Bank-supported Andhra Pradesh Drought Adaptation Initiative for groundwater management.

Annex 2. - List of the World Bank Operational Policies and Guidelines

<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEPO L/0,,menuPK:584441~pagePK:64168427~piPK:64168435~theSitePK:584435,00.html>

Operational Policies (OP) /Bank Practices (BP) / Operational Directives (OD)

OP / BP 4.01 Environmental Assessment

OP / BP 4.04 Natural Habitats

OP 4.09 Pest Management

OP 4.11 Cultural Property

OP / BP 4.12 Involuntary Resettlement

OD 4.20 Indigenous Peoples

OP / BP 4.36 Forestry

OP / BP 7.60 Projects in Disputed Areas

BP 17.50 Disclosure of Operational Information