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(USD60.0 MILLION EQUIVALENT)

TO THE

REPUBLIC OF INDIA

FOR A

KARNATAKA WATERSHED DEVELOPMENT PROJECT - II

JULY 31, 2012

Sustainable Development Department
Rural Development and Livelihood Support Unit
India Country Management Unit
South Asia Region

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CURRENCY EQUIVALENTS
(Exchange Rate Effective June 30, 2012)

Currency Unit = INR
INR 55 = USD1
USD 1.5176 = SDR 1

FISCAL YEAR
April 1 – March 31

ABBREVIATIONS AND ACRONYMS

AG	Accountant General	ESMF	Environmental and Social Management Framework
AO	Agricultural Officer		
ATI	Administrative Training Institute (Mysore)	FD	Finance Department
		FM	Financial Management
ATMA	Agriculture Technology Management Agency	FMM	Financial Management Manual
		FMPC	Finance Management and Procurement Cell
C&CA	Principal Accountant General	FRR	Financial Rate of Return
CA	Chartered Accounting	GAC	Governance and Anti-Corruption
CAA&A	Controller Aid, Accounts and Audit	GDP	Gross Domestic Product
CAG	Comptroller and Auditor General of India	GIS	Geographic Information Systems
CAO	Chief Accounts Officer	GO	Government Order
CAS	Country Assistance Strategy	GOI	Government of India
CBO	Community Based Organization	GOK	Government of Karnataka
CN	Concept Note	GP	Gram Panchayats
CQS	Consultant Qualification Selection	HOPCOMS	Horticulture Producers Cooperative Marketing Society
CRORE	10 Million India Rupees		
CVC	Central Vigilance Commission	IBRD	International Bank for Reconstruction and Development
DA	Designated Account		
DEA	Department of Economic Affairs	ICAR	Indian Agricultural Research Institute
DDO	Drawing and Disbursement Officers	ICB	International Competitive Bidding
DGS&D	Directorate General of Supply and Disposal	ICRISAT	International Crops Research Institute for the Semi-Arid-Tropics
DOA	Department of Agriculture	ICRR	Implementation Completion and Results Report
DoH	Department of Horticulture		
DLC	District Level Committee	ICT	Internet Communication Technology
DOLR	Department of Land Resources	IDA	International Development Association
DPR	Detailed Project Reports	IEC	Information, Education and Communication
DSS	Decision Support System		
DWDO	District Watershed Development Officer	IEG	Independent Evaluation Group, World Bank
DWDT	District Watershed Development Team	IGA	Income Generating Activity
EA	Environmental Assessment	IIHR	Indian Institute of Horticulture Research
EAP	Externally Aided Project		
EFA	Economic and Financial Analysis	IISc	Indian Institute of Science
ERR	Economic Rate of Return	INR	Indian Rupees
		IRR	Internal Rate of Return

ISP	Implementation Support Plan	PMSC	Project Management Support Cell
IUFR	Interim Unaudited Financial Report	PP	Procurement Plan
IWMP	Integrated Watershed Management Program	PPM	Project Procurement Manual
KSAD	Karnataka State Accounts Department	PPMU	Project Planning and Management Unit
KSNDMC	Karnataka State Natural Disaster Monitoring Centre	PRI	Panchayat Raj Institutes
KSRSAC	Karnataka State Remote Sensing Application Centre	PTC	Project Technical Cell
KSWAN	Karnataka State Wide Area Network	PVB	Present Value Benefits
KWDP	Karnataka Watershed Development Project	PVC	Present Value Costs
KVK	Krishi Vigyan Kendra	R&D	Research and Development
LIB	Limited International Bidding	REC	Research and Extension Cell
M&E	Monitoring and Evaluation	RBI	Reserve Bank of India
MTR	Mid-Term Review	RDPRD	Rural Development and Panchayat Raj Department
MIS	Management Information System	RIDF	Rural Infrastructure Development Fund
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Act	ROG	Right of Grievance
MOU	Memorandum of Understanding	RSK	Raith Samparka Kendra
MWS	Micro-Watershed	RTI	Right to Information
NABARD	National Bank for Agriculture and Rural Development	SBD	Standard Bidding Documents
NBSSLUP	National Bureau of Soil Survey and Land Use	SAR	Synthetic Aperture Radar
NCB	National Competitive Bidding	SC	Scheduled Caste
NGO	Non-Government Organization	SHG	Self-Help Group
NPV	Net Present Value	SLNA	State Level Nodal Agency
NREGS	National Rural Employment Guarantee Scheme	SSS	Single Source Selection
NRLM	National Rural Livelihood Mission	ST	Scheduled Tribe
ORAF	Operational Risk Assessment Framework	SWOT	Strengths-Weaknesses-Opportunities-Threats
PC	Procurement Cell	SWS	Sub-Watershed
PDA	Personal Digital Assistant	TP	Technical Partners
PDO	Project Development Objective	UAS	Universities of Agricultural Sciences
PEC	Project Empowered Committee	UNDP	United Nations Development Program
PFS	Project Financial Statements	UG	User Group
PIP	Project Implementation Plan	UHS	University of Horticultural Sciences
POH	Project Officer (Horticulture)	WAVES	Wealth Accounting and Valuation of Ecosystem Services
PMC	Project Monitoring Cell - Horticulture	WDD	Watershed Development Department
PME	Participatory M&E	WDT	Watershed Development Team (Taluka Level)
PMRP	Prime Minister's Relief Package	WOP	Without Project
		WP	With Project
		WSM	Watershed Management
		ZREAC	Zonal Research and Extension Advisory Council
		ZP	Zilla Panchayat

Regional Vice President:	Isabel Guererro
Country Director:	Roberto Zagha
Sector Director:	John Henry Stein
Sector Manager:	Simeon Ehui
Task Team Leader:	Grant Milne

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Map – IBRD 38916

India
Karnataka Watershed Development Project - II

PROJECT APPRAISAL DOCUMENT

South Asia
Agriculture and Rural Development

<p>Date: July 31, 2012 Country Director: Roberto Zagha Sector Director: John Henry Stein Sector Manager: Simeon Ehui Team Leader(s): Grant Milne, Jacqueline Julian Project ID: PE- P122486-LEN Lending Instrument: SIL</p>	<p>Sectors: General agriculture, fisheries, forestry sector (50 percent); Agriculture extension and research (50 percent)</p> <p>Themes: Other environment and natural resources (45 percent); Water resource management (35 percent); Participation and civic engagement (20 percent).</p> <p>EA Category: B</p>
Project Financing Data:	
Proposed terms: Bank/ GOI financing at 70/30. IDA Credit is USD60.0 million	
[] Loan [X] Credit [] Grant [] Guarantee [X] Other:	
Source	Total Amount (USD Million)
Total Project Cost:	85.7
Borrower:	25.7
Total Bank Financing:	
IBRD	
IDA	
New	60.0
Recommitted	

Borrower: Government of India, Government of Karnataka

Responsible Agencies:

1. Watershed Development Department (WDD), Government of Karnataka (GOK)

Contact Person: Mr. M.S. Goudar, Commissioner

Telephone No. 91 080 22129601

Fax No. 91 080 22100665

Email: Sujala@vsnl.net

2. Department of Horticulture (DoH), Government of Karnataka (GOK)

Contact Person: Dr. B.C. Jaffar, Director - Horticulture

Telephone No. 91 080 26571925

Fax No. 91 080 22385687

Email: Dohlabagh@gmail.com

Estimated Disbursements of Credit (Bank FY/USD m)

Bank FY	2013	2014	2015	2016	2017	2018
Annual	2.0	12.0	20.0	16.0	8.0	2.0
Cumulative	2.0	14.0	34.0	50.0	58.0	60.0

Project Implementation Period: 6 years

Expected effectiveness date: January 1, 2013

Expected closing date: December 31, 2018

Does the project depart from the CAS in content or other significant respects? *Ref. PAD I.C.* Yes No

If yes, please explain:

Does the project require any exceptions from Bank policies? Yes No
Have these been approved/endorsed (as appropriate by Bank management)? Yes No NA
Is approval for any policy exception sought from the Board? Yes No

If yes, please explain:

Does the project meet the Regional criteria for readiness for implementation? Yes No

If no, please explain:

Project Development Objective: is to demonstrate more effective watershed management through greater integration of programs related to rainfed agriculture, innovative and science based approaches, and strengthened institutions and capacities. *Ref. PAD II.A., Technical Annex 2*

Project description: The project would be implemented through five components: *Ref. PAD III.A., Technical Annex 2*

Component 1: Support for Improved Program Integration in Rainfed Areas (USD22.1 million), would demonstrate the successful integration of programs in watershed development, using a science-based approach in project areas.

Component 2: Research, Development and Innovation (USD19.6 million), would establish a coordinated research approach to provide practical knowledge and tools to support integrated watershed management.

Component 3: Institutional Strengthening (USD9.1 million) would strengthen the institutions and human resources of key stakeholders to improve effective delivery of services for integrated watershed management.

Component 4. Strengthening Horticulture in Rainfed Areas (USD27.6 million), would strengthen the knowledge base regarding horticulture potential in rainfed areas, and demonstrate and build the capacity of institutions and communities to improve production and value addition of horticulture in project areas.

Component 5. Project Management and Coordination (USD7.3 million), would ensure effective and efficient project management.

Safeguard policies triggered? *Ref. PAD VI.E-F., Technical Annex 3*

Environmental Assessment (OP/BP 4.01)	<input checked="" type="radio"/> Yes	<input type="radio"/> No
Natural Habitats (OP/BP 4.04)	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Forests (OP/BP 4.36)	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Pest Management (OP 4.09)	<input checked="" type="radio"/> Yes	<input type="radio"/> No
Physical Cultural Resources (OP/BP 4.11)	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Indigenous Peoples (OP/BP 4.10)	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Involuntary Resettlement (OP/BP 4.12)	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Safety of Dams (OP/BP 4.37)	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Projects on International Waters (OP/BP 7.50)	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Projects in Disputed Areas (OP/BP 7.60)	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Financial Intermediary lending (OP 8.30)	<input type="radio"/> Yes	<input checked="" type="radio"/> No

Conditions and Legal Covenants:
Description of Condition/Covenant
<p>The Government of Karnataka shall:</p> <ul style="list-style-type: none"> a) not later than three(3) months after the Effective Date, issue a Government Order to grant WDD and DOH access to the proceeds of the Financing necessary to implement the Project at the district level. b) not later than twelve (12) months after the Effective Date, appoint and thereafter retain throughout Project implementation, internal auditors for the Project operating in accordance with terms of reference acceptable to the Association.

INDIA

Karnataka Watershed Development Project II

I. Strategic Context

A. Country Context

1. As noted in the India Country Assistance Strategy (CAS) 2009-12, national Gross Domestic Product (GDP) grew at more than 9 percent per annum from 2004-2007. High rates of investment and savings and strong export growth generated substantial public and private resources for investment and development programs. During the global recession, growth declined to 6.7 percent, quickly picked up thereafter to over 8.0 percent, but has recently moderated. More than 400 million people still subsist on under USD1.25/day, with the majority living in rural areas and dependent on agriculture or other land-based resources.

B. Sectoral and Institutional Context

2. Agriculture¹ accounts for around 16 percent of Indian GDP. Approximately 60 percent of India's population depends on agriculture for primary livelihood, largely from rainfed agriculture. Out of a net sown area of 141 million hectares in India, approximately 68 percent are under rainfed cultivation, mostly in arid and semi-arid areas. Thirteen states, including Karnataka, account for about three-quarters of total rainfed area². Generally, these areas receive less than 750 mm rainfall annually and have less than 30 per cent land under irrigation (from both surface and ground water). To maintain current nutritional requirements under moderate forecasts of population growth, an additional 102 million tons of food grains need to be produced by 2020. While perhaps 64 million tons of this food could come from increasing the area under irrigation and improving irrigated productivity, the balance (38 million tons) can only come from rainfed lands or imports. Poverty rates are higher in rainfed areas, often with large variability in water availability, affecting agriculture, livestock and household needs. Lower population densities and topography often make access to markets, employment, and other services difficult. Karnataka's dry regions paint a similar picture; they are among the state's poorest, have low agricultural productivity³, and are susceptible to drought and deepening environmental stress and degradation. Longer-term climate change adds another worrying dimension. Nevertheless, the relative potential of rainfed areas to contribute to poverty reduction and growth has been considered important⁴.

¹ Agriculture as used in the PAD includes crops, horticulture, livestock and agro-forestry, all components of rural land-use in India.

² Karnataka has the fourth largest area with 7.46 million ha.

³ Aggarwal PK, Hebbar KB, Venugopalan MV, Rani S, Bala A, Biswal A and Wani SP. 2008. Quantification of Yield Gaps in Rain-fed Rice, Wheat, Cotton and Mustard in India. Global Theme on Agroecosystems Report no. 43. Patancheru 502 324, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics.

⁴ See for example on findings for India and China in Fan, Shenggen, and Connie Chan-Kang, 2004. Returns to investment in less-favored areas in developing countries: a synthesis of evidence and implications for Africa. Food Policy 29 (2004) 431-444

3. The Government of India (GOI) and the key States are addressing these issues by a range of schemes. Over the past two decades GOI has financed a range of watershed⁵ programs in the states, including Karnataka, the latest being the Integrated Watershed Management Program (IWMP). The IWMP forms the cornerstone of the GOI support to watershed development. Through the 2008 and 2011 Common Guidelines for Watershed Development Projects, State Level Nodal Agencies deliver a comprehensive package of micro-watershed⁶ planning and implementation with communities of small-scale water harvesting structures such as check dams and farm bunds, crop and horticulture plans, as well as agro-forestry and livelihoods support – often through self-help groups. While the program has only been under implementation for three years and impacts cannot yet be fully assessed, as IWMP resources gradually increase over time, it would be critical to ensure that states have the capacity and tools for its effective implementation in conjunction with other key programs in rainfed areas. Convergence with key programs such as agriculture and horticulture assumes significance in rainfed areas for productivity enhancement of natural resources.

4. There are a number of other central and state schemes for agriculture⁷, which to varying degrees address development needs in rainfed areas. In Karnataka for example, there are over 35 central and State agriculture schemes (with over INR174 Crore budget), many of which cover rainfed agriculture. The largest central scheme is the Mahatma Gandhi National Rural Employment Guarantee Act (also known by the operational program, the National Rural Employment Guarantee Scheme or NREGS⁸)⁹, implemented through Self-Government Bodies (Gram Panchayats - GPs). The GOI budget for the scheme in FY 2010-11 is INR 40,100 crores (USD10 billion), of which an estimated 30 percent to 40 percent is allocated for soil and water conservation works. Karnataka accounts for about 10 percent of the current national NREGS program allocation. The GOI has also recently launched the National Rural Livelihoods Mission (NRLM), which is expected to support financial and livelihoods inclusion of poorer rural women’s self-help groups (SHGs), including in Karnataka.

5. From discussions between the Bank, GOI and Government of Karnataka (GOK) officials, a new model for watershed development is needed to help strengthen the IWMP and its links to other programs, particularly NREGS. Such a project model would contribute to deeper and more sustainable improvements in productivity and livelihoods of small farmers in rainfed areas, and also improve the effectiveness of public expenditures. In moving forward, Karnataka is well-positioned to pilot this approach as it can build on the success of the earlier Bank-supported Karnataka Watershed Development Project I (KWDP I, also known as, and referred to hereafter as “Sujala”), which closed March 31, 2009. Sujala generated many significant positive lessons

⁵ For more information on watersheds and watershed development see Annex 10.

⁶ In Karnataka, a micro-watershed is approximately 500 ha.

⁷ Agriculture in the context of this document encompasses annual and perennial crops, horticulture, forestry, livestock and fisheries. In particular, horticulture is a key part of the agricultural sector in the state and improved productivity can increase the competitiveness of farmers, build resilience against potential climate change shocks, increase crop diversification and intensification.

⁸ The term NREGS will be used throughout the PAD

⁹ Endorsed by the Mahatma Gandhi National Rural Employment Guarantee Act the NREGS finances 100 days of annual employment to adult members of rural households willing to do unskilled, manual work in various sectors at the statutory minimum wage of INR100 per day.

and award winning¹⁰ best practices around integrated watershed management, agricultural intensification, rural livelihoods, and monitoring and evaluation. Some of these lessons have influenced other watershed programs particularly the National Bank for Agriculture and Rural Development (NABARD) and Rural Infrastructure Development Fund (RIDF) assisted Prime Minister's Relief Package (PMRP) in Karnataka, which is currently under implementation in six districts (known as Sujala II), as well as programs at the national level (particularly IWMP), and in other countries. Drawing on a range of lessons (see section III-C), a project design has emerged into a model that complements the ongoing IWMP mainly through technical support and facilitates convergence¹¹ between IWMP other key programs, including NREGSs. The new project would address three key areas as follows:

- First, there is a need to better integrate watershed development, agriculture programs, and related research. This will help small farmers take up innovations and key schemes, have better access to a range of information tools and support mechanisms, improve value addition, and diversify crop, horticulture and livestock productivity, within their particular farming systems.
- Second, while the previous Sujala project and current watershed programs indirectly address surface and groundwater management, the hydrological dynamics need to be better understood based on good science, and integrated into watershed plans. This will help watershed management responses account for downstream effects, and lead to better targeted interventions.
- Third, while GOI has issued guidelines for convergence between NREGA and IWMP¹², there is a need to demonstrate more effective convergence of the science-based IWMP approach with the employment-based NREGS-financed soil and water conservation. There is considerable scope for harnessing these resources; in the current fiscal year, the NREGS budget in Karnataka is over several hundred million USD, with an estimated 25 to 30 percent of disbursements directly linked to soil and water conservation. So far, although some provisions for NREGS resources have been made in watershed Net Plans¹³ in the state such interventions have to be a part of planned watershed development. Also, there are concerns about the capacity of local authorities to effectively integrate NREGS watershed interventions, addressing correct positioning, and technical quality. There is a considerable need to shift the focus of local government Gram Panchayat (GP) members and communities' priorities towards science-based land

¹⁰ National Productivity Awards 2007 and 2009; National Water Award 2007; Earth Care Award 2008; and National E-Governance Award 2009; International Globe Sustainability Research Award – 2010 (awarded to Antrix Corporation in Stockholm for Sujala work); Geospatial Excellence Award 2010, presented at the 9th Annual Asian Conference on Geospatial Information, Technology and Applications in Malaysia; World Bank Internal Evaluation Group 2011 Good Practice Award for Monitoring and Evaluation.

¹¹ Convergence of NREGS resources with IWMP will be through a common planning framework at the micro-watershed level, better targeting of NREGS soil and water conservation investments to address broader watershed issues in the plans; and adoption of IWMP quality standards. Refer to Annex 11 for more details.

¹² No.J-11019/2/208-NREGA of Department of Land Resources (DOLR) Dtd 29 May 2009

¹³ Land treatment plans for individual land parcels, under the Detailed Project Report (DPR) for comprehensive watershed development at sub-watershed level (which includes additionally institutional development and livelihoods aspects).

based management, and link them into better planning tools, which would provide a more strategic approach to using NREGS resources.

6. The emphasis on GOK partnering with the Bank is now clearly focused on a project model that would lead to innovations and piloting of new approaches for watershed management, and improved effectiveness and leveraging of public financing of watershed operations. These points closely mirror the GOI “Finance Plus” criteria for selection of multi-lateral supported projects. A successful pilot project would have significant potential to be scaled-up across the state with IWMP as the foundation, and also provide valuable lessons for possibly wider implementation throughout India.

C. Higher Level Objectives to which the Project Contributes

7. The Approach Paper to the 12th Five Year Plan¹⁴ gives an assessment of implementation of the 11th Five Year Plan, and provides the outline to GOI policy and program priorities in the near future, in an overall context of inclusive growth through increasing agricultural production and food security. For rainfed agriculture, the 12th Plan stresses the convergence between livelihoods, availability and access to food, ecosystem and human health, where water management plays a key role. The proposed project is closely aligned with these priorities by: i) supporting the implementation of IWMP in selected districts¹⁵ through better planning, capacity building, incremental monitoring and evaluation, and post-harvest value addition; ii) research for rainfed agriculture to shift from a focus on technology generation to greater understanding of local needs, like location-specific soil-crop-water interactions and the institutional capacity to support this; iii) expanding the scope of rainwater harvesting and groundwater recharge, to be partly done by converging the NREGS with the IWMP, through a scientific participatory NREGS planning on an aquifer basis in micro-watershed level; and iv) developing agro-climatic zone specific technology to enable rural communities to better adapt to the effects of climate change.

8. Similarly, the proposed project would address the three key pillars of the World Bank’s India CAS: i) helping achieve rapid, inclusive growth in poor rural rainfed areas through improved agricultural productivity and rural livelihoods; ii) ensuring sustainable development through improved natural resource management (especially water), and resilience to climate change; and iii) increasing the effectiveness of service delivery, focusing on key elements of integrated watershed management being implemented by local authorities.

¹⁴ Draft Approach Paper for the Twelfth Five Year Plan 2012-17 [<http://planningcommission.nic.in/index.php>]

¹⁵ The project will complement IWMP operations in seven districts: Bidar, Gulberga, Yadgir, Koppal, Gadag, Chamarajanagara, Davangere.

II. Project Development Objectives

A. PDO

9. The **Project Development Objective (PDO)** is to demonstrate more effective watershed management through greater integration of programs related to rainfed agriculture, innovative and science based approaches, and strengthened institutions and capacities.

10. The project would strengthen the science base of watershed management in IWMP by enhancing the understanding of hydrological dynamics and climatic variability, and developing tools for measuring them within the planning process. It would also merge innovations and decision support information to help address the needs of rainfed farmers and feed these into the watershed planning and implementation system. The project would strengthen the bottom-up engagement of small farmers in existing delivery extension systems, agriculture schemes and value chains, to increase opportunities to adopt new technologies. The project would also strengthen the financial and technical convergence between IWMP and NREGS through more integrated watershed planning and monitoring, and developing innovative tools and processes in sub and micro-watersheds. Better convergence is expected to result in more science-based targeting and higher quality of soil and water conservation interventions. While the project would not have direct control of soil and water conservation investments under IWMP and NREGS, the adoption of enhanced systems and new tools should result in measurable incremental investments and subsequent benefits in watershed development outcomes in project areas. It is expected that the systems and tools could be mainstreamed into the overall IWMP in the State, and in time, throughout other IWMP operations in India.

B. Project Beneficiaries

11. As the project is mainly aimed at strengthening the institutions that implement integrated watershed planning and management, the actual direct primary beneficiaries of the project (in terms of capacity development) would be the key agencies responsible for watershed programs in the state, which in the first instance is the Watershed Development Department (WDD) and Department of Horticulture (DoH) under the Government of Karnataka. Also benefiting would be other agriculture related departments, including Agriculture, the local watershed teams and committees, and community institutions such as the GPs, farmer groups and SHGs. Secondary beneficiaries gaining from participating in the project would be other partner institutions such as the Rural Development and Panchayat Raj Department (RDPRD), including Local Self Government Bodies, which implements the NREGS, state research institutions, other local government offices and staff, Watershed Committees, and various support agencies such as Non-Government Organizations (NGOs) and the private sector.

12. The project, through new tools, strengthened planning, and capacities, would only provide indirect support to IWMP beneficiaries. These IWMP beneficiaries are mainly small and marginal farmers, including women farmers, households from scheduled castes and tribes (SC/ST), asset-less villagers and poorer artisans, some of whom may also be NREGS beneficiary laborers. They would gain from the enhanced services, and ultimately for incremental improvements in rainfed agriculture and employment in approximately 930 micro-watersheds

covering 465,000 ha. In these areas, the project is expected to indirectly benefit around 160,000 farm households, 66 percent who are small and marginal farmers, and a large proportion of whom are from the scheduled caste and tribes; project support would include tools and services useful to their needs.

C. PDO Level Results Indicators

13. The PDO level results indicators would be the following:

- New science based approaches and tools adopted into wider watershed operations;
- Improved M&E capability in Watershed Development Department (WDD);
- Percentage of micro-watersheds with improved convergence and integration; and
- Incremental change in agricultural and horticultural productivity in project areas for selected crops

III. Project Description

A. Project Components

14. **Component 1: Support for Improved Program Integration in Rainfed Areas (USD22.1 million).** The component would support the following: i) developing and piloting new decision-support models for integrated watershed management and site selection; ii) development of a spatial digital library for an integrated landscape approach for watershed management planning in the National Bureau of Social Survey and Land Use Planning (NBSS-LUP), pulling together a range of data and map layers, initially focusing on pilot watersheds, and establishing a land resources portal for wider data access by stakeholders; iii) development and piloting of integrated sub-watershed assessment and planning, with a particular focus on broader hydrological dynamics of the 93 pilot sub-watersheds. The activities would include mapping, ground water planning and modeling, and dissemination of recommendations for micro-watershed planning; iv) strengthening integrated micro-watershed master planning under IWMP by providing incremental support to the WDD and communities for more effective linkages with agricultural development programs, including horticulture and agro-forestry. The enhanced micro-watershed plans would facilitate science-based convergence between IWMP and NREGS for soil and water conservation. Key areas for convergence would be on developing a common awareness and local plan for watershed interventions, better targeting of interventions, and harmonized technical quality and social accountability mechanisms; and v) strengthening community-based monitoring and documentation by providing technical support for local M&E systems including simple water monitoring equipment and IT tools as well as training on participatory M&E. The component would finance eligible expenditures for goods, consulting services, training and workshops, and incremental operating costs.

15. **Component 2: Research, Development and Innovation (USD19.6 million).** The component would develop important knowledge and tools for use in components 1 and 3, as well as for eventual scaling-up in the state and beyond, through the following: i) applied research studies across key thematic areas including integrated landscape management and agricultural intensification, climate smart agriculture, and agriculture value chains. The studies would

generate comprehensive knowledge and lessons to support improved integrated watershed management, evaluations and guidelines for strengthening agriculture value chains, and syntheses and adaptive research for strengthening climate smart agriculture; ii) developing best practice approaches and tools for basic and advanced hydrological assessment and monitoring by financing development of systems to deliver downscaled hydrological data to sub-and micro-watershed scales based on appropriate models, remote sensing of evapotranspiration and precipitation, and new field-based sensors and data-loggers¹⁶. The component would also pilot community based management of groundwater based on experiences from other regions; iii) demand-driven technology transfer strengthened through the development/adaptation of best practice models and tools for increased adoption by end-users. This would include planning and training tools at micro-watershed levels, maps and climate information for use by farmers in decision making, agro-climatic advisory risk systems, improved web-based information on markets, post-harvesting and value addition, and on-farm participatory field trials and demonstrations for specific technologies, for example conservation farming; and iv) research management to strengthen the institutional arrangements for longer-term needs-based research identification, technology transfer, research quality assurance, and coordination of rainfed agriculture and watershed management research. The component would finance eligible expenditures for goods, consulting services, training and workshops, and incremental operating costs.

16. **Component 3: Institutional Strengthening (USD9.1 million).** There is a need to make a range of tools (some identified under component 2) and rainfed agriculture schemes more accessible to enhance farmer adoption, strengthening information and extension systems to help farmers improve integrated watershed management practices and sustain rainfed productivity and incomes. To address these issues, the sub-component would provide: i) training and capacity building that would assess the needs of end-users in terms of extension, integrated watershed management and value addition, and then develop and deliver training modules, awareness raising activities, and structured exposure visits. Specialized and experienced training NGOs are likely to deliver most of the trainings. Training would be provided to village level extension agents (Jala Mitras), community institutions, GP members, and farmers. Special emphasis would be given to lead farmers who would form a core group as champions and peer-to-peer support to other farmers; training at state level, institutional strengthening would include training to implementing agencies, particularly to strengthen the development of in-house M&E systems, supporting relevant national and international exposure visits¹⁷ and improving capacities in farmer contact centers in project areas; and ii) upgrading existing training centers servicing key project areas, and strengthen their information technology (IT) and communication systems. The component would finance eligible expenditures for goods, consulting services, training, minor works, and incremental operating costs.

¹⁶ Computer modeling allows us to better organize, test, and refine our thinking about watershed management problems and potential solutions. Typically, following the flow of water leads modeling to be organized into the following areas: a) Precipitation and climate models; b) Precipitation-runoff models; c) Stream and aquifer models; d) Infrastructure operations models; e) Economic, agronomic, social, environmental demand and performance models; and f) Decision-making models. Selecting the right model to apply to specific problems requires that several factors be considered along with the objectives for modeling in the context of the field decision problem. Key factors include understandability, development and application time, resources required, transferability and maintenance. Data availability can be a limiting factor in selecting certain models.

¹⁷ Possibly including some supported through the Bank's South-South Knowledge Exchange program

17. **Component 4. Strengthening Horticulture in Rainfed Areas (USD27.6 million).** Horticulture is an important part of watershed development as it plays both a nutritional and income generating role for rainfed communities. Building on the successful experiences under Sujala I, which saw considerable expansion of horticulture, the component would support: i) extension and demonstrations for productivity improvement in annual and perennial crops, nutrition gardens, crop diversification and crop-soil-water relationships in improving the productivity of horticulture crops; ii) strengthening model nurseries in the existing farms of the DoH to ensure a more continuous supply of quality seed and planting material to farmers; iii) promoting horticulture soil and crop monitoring through enhanced laboratory facilities and facilitating farmers in project areas to use these facilities for soil and leaf tissue analysis through training and literature; iv) strengthening horticulture post-harvest management, value-addition and market linkage support through feasibility studies and participatory value chain investigations, field demonstrations of low-cost equipment, and expanding DoH skill development programs for Sanghas; v) improving market linkages for farmers through establishment of producer companies in project areas; and vi) supporting incremental costs of DoH to implement the component. The component would finance eligible expenditures for goods, consulting services, training, and incremental operating costs.

18. **Component 5. Project management and coordination (USD7.3 million).** The component would support incremental specialized staff (both full and part-time) in headquarters and field offices; incremental administration costs for field travel, creating and managing a project website, improved communications, financial management activities and internal audit, procurement, and equipment to support overall project implementation, etc. The project would have a comprehensive communication and review strategy to ensure wide awareness about the project purpose and lessons, and ensure stakeholders engage in the continuous improvement of the project. The component would finance 3rd party monitoring and evaluation requirements directly tied to project activities, incremental to M&E taking place under IWMP, and would strengthen the internal M&E of the WDD under Component 3. The project would primarily fund baseline, input and output monitoring, process monitoring, impact assessments, and case studies to guide project implementation (see also section IV-B, and Annex 3 for details). The component would finance eligible expenditures for goods, consulting services, training, and incremental operating costs.

B. Project Financing

1. Lending Instrument

19. The project would be supported through a Standard Investment Loan (SIL). The estimated total project cost is USD 85.7 million, financed on a 70/30 basis with the Bank through an International Development Association (IDA) Credit (USD 60.0 million) and GOI/GOK (USD 25.7 million). The project would be seeking retroactive financing not exceeding USD 1 million for critical work undertaken by the borrower during preparation, in advance of project effectiveness. This includes preparation studies such as the environmental and social

assessments, Project Implementation Plan (PIP), procurement plan, FM manual, a brainstorming workshop on sub-watershed planning approaches, etc.

Project Cost by Financiers (including contingencies)

Project Components	(INR Crore)			(US\$ Million)			% of Base Cost
	Gov't	Bank	Total	Gov't	Bank	Total	
1. Improved Program Integration in Rainfed Areas	36.5	85.1	121.6	6.6	15.5	22.1	25.8
2. Research, Development and Innovation	32.4	75.4	107.8	5.9	13.7	19.6	22.9
3. Institutional Strengthening	15.0	35.1	50.1	2.7	6.4	9.1	10.6
4. Horticulture	45.5	106.2	151.7	8.3	19.3	27.6	32.2
5. Project Management and Coordination	12.0	28.1	40.1	2.2	5.1	7.3	8.5
Total Project Cost	141.4	329.9	471.3	25.7	60.0	85.7	100

C. Lessons Learned and Reflected in the Project Design

20. The proposed project builds extensively on lessons learned under Sujala that were captured in the Implementation Completion and Results Report (ICRR, 2009) and largely reinforced and strengthened in a World Bank learning note on global experiences in watershed projects¹⁸, a recent IEG report reviewing natural resource programs in India¹⁹, a draft report collating good practices in ongoing Bank-supported watershed projects in India²⁰, and a major Bank review of its global watershed projects²¹. The strengths of the Sujala approach were also assessed in relation to other donors and government programs in a series of studies by the International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT 2008). These lessons and concerns are echoed in analyses of watershed programs in other States, for example Maharashtra²². The key lessons relevant to the current project and taken into account are:

- **Combining watershed and livelihoods interventions is a positive step.** Implementing projects that address both aspects can create strong multiplication effects in terms of equity and livelihoods linkages, but it needs clear articulation and structured processes, which favor

¹⁸ Rural Watershed Management - The Power of Integration. February 2009, Issue 28 Water Sector Board Practitioner Notes (P-Notes) series published by the Water Sector Board of the Sustainable Development Network of the World Bank Group [www.worldbank.org/water] 47358

¹⁹ Independent Evaluation Group, 2011. Project Performance Assessment Report India - A Cluster Assessment of Forestry and Watershed Development Activities. Report No.: 61065. Washington, DC

²⁰ World Bank 2011. Watershed Development in India – Evolving an Approach Through Experience. South Asia Agriculture and Rural Development (Draft Report). Washington, DC.

²¹ Darghouth, S., Ward, Christopher, Gambarelli, Gretel, Styger, Ericka, and Julienne Roux. 2008. Watershed Management Approaches, Policies, and Operations: Lessons for Scaling Up. Water Sector Board Discussion Paper Series. Paper No. 11. World Bank. Washington, DC.

²² Samuel et al, 2007. Watershed development in Maharashtra. Society for Promoting Participative Ecosystem Management (SOPPECOM), on behalf of the Forum for Watershed Research and Policy Dialogue (ForWaRD) [http://www.indiawaterportal.org/node/484]

small farmers, the landless, and women. The project would strengthen the rural livelihoods component of IWMP through training, tools and improved extension services to increase incomes from higher agricultural productivity in watersheds, and post-harvest value addition.

- **Hydrology and a larger watershed context are important.** Watershed projects need to be framed around basin or sub-basin hydrology, with a related understanding of underlying geology and soil systems. A preparatory study²³ recommended hydrological modeling, strengthening local monitoring systems, and community participation in groundwater management. These recommendations have been adopted into the project design.
- **Sustainability.** Systems need to be in place for monitoring and support for post-intervention periods. Sustainability requires more interconnections with other sectors, engaging the right level of agencies, and making services accessible and demand-led rather than prescribed. The project will strengthen the participation of communities in the M&E process. The scientific planning approach and program integration supported by the project, especially with ground water, would also improve agricultural sustainability.
- **Scaling up ensures new approaches operate beyond a project mode.** There needs to be a concerted focus on institution building and process development where adequate time and resources are allocated to develop project implementation capabilities at all levels. Initial pilot projects benefit from a phased approach that allows for adequate testing of methodologies, and maintaining the relevance of accompanying research. The project design would use a phased approach and gradual scaling up over the project period.
- **Robust monitoring, evaluation and learning system is central to success.** The M&E approach of the earlier Sujala project has been recognized globally for responsiveness and comprehensiveness, leading to management changes. Independent 3rd party support was critical to provide timely and critical recommendations, and technical analysis and planning support. This model has been incorporated into IWMP. However, with increasing scale and mainstreaming of successful processes, it is also central that primary government agencies begin to handle the core information flows in a more systematic manner, and engage communities more closely in M&E. The project would strengthen WDD's capacity for M&E with additional support from a 3rd party M&E agency.
- **Strengthen incentives for farmers to engage in improved technologies, and identify and work with and empower lead farmers as local champions.** Many experiences of agriculture extension in India and worldwide have shown that farmer sharing of ideas and monitoring on-farm demonstrations have played a key part in technology adoption. The project would strengthen the lead farmer concept in IWMP, capacities of farmer contact centers, and improves links between researchers and farmers.

²³ Jan Hendrickx, June 2011. Study report on hard rock aquifers and hydrological monitoring in Karnataka. World Bank / FAO Cooperative Program.

IV. Implementation

A. Institutional and Implementation Arrangements²⁴

21. **Project Oversight.** The WDD and DoH under the GoK would be the implementing agencies for project and be responsible for ensuring that the project development objectives are met. Oversight would be provided by the Project Empowered Committee (PEC). The PEC would review progress and approve yearly plans and budgets, and provide policy guidance. The PEC comprises of Secretaries from relevant departments in the GoK, but under the project would also have members from the RDPRD and Department of Mines and Geology, to ensure guidance for the more integrated and convergence approaches that the project will pilot and promote. The PEC would closely work with the SLNA, which monitors the implementation of IWMP. At this oversight level, the project would thus be implemented largely within existing structures presently guiding watershed management in the state.

22. **Project Management – Watershed activities.** A Project Planning and Management Unit (PPMU) would be set up within the WDD, which would assume direct responsibility for day-to-day project management, coordination and implementation. The PPMU, made up of key Departmental directors from WDD and partner GOK agencies, would take the lead role in planning, coordination and monitoring of the project performance in line with the project implementation schedule, and facilitate regular decision making for implementation of various components of the project, and be responsible for inter-institutional coordination. It would also ensure resources are budgeted and disbursed, and that project accounts are audited.

23. The PPMU would be led by a full-time Project Director assigned from the WDD, supported by i) a Project Technical Cell (PTC) with full-time technical contracted or deputized specialists, who would provide advice and project related support on technical matters for integrated watershed planning and monitoring and hydrology, and overall M&E and reporting; ii) a Research and Extension Cell (REC), with designated officers from WDD and the Departments of Agriculture and Horticulture, and training coordinator who would guide and coordinate project activities relating to delivering research outputs, technology transfer and strengthening local institutions; and iii) a Financial Management and Procurement cell (FMPC) which would be responsible for the accounting, procurement, and financial control of the project.

24. The PPMU would be responsible for approving all contracting and procurement across all watershed components, as advised by technical staff, consultancies and specialized agencies²⁵. The WDD would develop formal agreements with respective agencies for the handover and ownership and maintenance of any equipment procured.

25. At District and Taluk levels, the project would provide incremental support staff, training and equipment to build capacity and strengthen the arrangements already in place, mainly the existing District Watershed Development Teams (DWDTs) and Taluka-level Watershed Development Teams (WDT) under the IWMP, and agriculture extension units, especially farmer

²⁴ Refer to Technical Annex 3 and flow charts (attachment 2) for more details on implementation arrangements.

²⁵ Detailed financial management and procurement arrangements are described in Section VI-C and D and Annex 3.

contact centers (also known as RSKs), so that the local units can access and use a greater range of information products, decision tools, and manage field demonstrations.

26. **Project Management – Horticulture activities.** The implementation of horticulture activities will be managed and monitored by an exclusive Project Monitoring Cell (PMC) headed by a Project Coordinator under DoH at State level, and the cell will ensure the flow of technical support to Districts and micro-watersheds through the WDTS. The PMC will also facilitate coordination of post-harvest and marketing support to micro-watersheds and ensure the convergence of departmental programs with that of IWMP. The PMC will also be responsible for getting the studies conducted on marketing and related subjects including concurrent evaluation of the project.

27. At District level, horticultural activities will be implemented by the Project Implementation Team (PIT) headed by a Project Officer and the supporting staff. The PIT will establish close coordination with the DWDTs at District level and the WDTs at Taluk level under IWMP and the RSKs (Farmer Contact Centers).

28. **Component arrangements and project partners.** The PPMU will be working with a range of project partners and existing institutional systems across the different components.

29. **Component 1:** The project would have agreements with the NBSS-LUP, Indian Institute of Science (IISc) and regional agricultural universities within Karnataka to advise on and oversee the development and use of technical decision tools, Geographic Information System (GIS) databases, monitoring systems and the gathering of soil and land use information. For piloting sub-watershed assessments and more integrated planning and monitoring at micro watershed levels the PPMU/PTC will coordinate and contract with specialist technical institutions and experienced NGOs to provide training and technical support to the existing DWDTs, WDTs, and community institutions, including GPs. For the project areas, the RDPRD has already issued Government Order 26 to designate WDD as a Project Implementation Agency for NREGS. This would help channel NREGS funds for watershed interventions through the WDD, and the PPMU.

30. **Component 2.** Guided by the REC, the project will build on existing agricultural research identification and approval processes under the Department of Agriculture (DOA), for initiating and monitoring applied research and studies through a competitive approach (see annex 3 for details). The private sector, NGO and community representatives would form part of the research identification and selection process. The IISc will advise on the purchase of equipment and the piloting of advanced integrated hydrological monitoring in one district, and training four regional agriculture universities in rolling out the system in the six other Districts. Specialist technical agencies, closely coordinated by the PTC, and REC and working in consultation with DOA and end users, would be contracted to develop appropriate information decision tools. These agencies would also work with the DOA and State agriculture universities' field research and extension units – particularly Raitha Samparka Kendra (RSKs) and Krishi Vigyan Kendra (KVKs) –for priority identified field demonstrations (see also component 3).

31. **Component 3.** The REC would plan, oversee and monitor the comprehensive needs identification, training and exposure program for the project stakeholders, both for State, District and field level. They will do this with assistance of a contracted training agency that has experience in participatory agriculture extension, and management specialists for strengthening the WDD management and M&E systems.

32. **Component 4.** The research, demonstration and extension activities under the component will be implemented by a team of dedicated horticulture staff at the State, District and Taluk level, who will be working under DoH and with the guidance of PTC and REC. Project coordination and accessing technical support, such as from the Indian Institute of Horticulture Research (IIHR), and the University of Horticultural Sciences (UHS) based in the State will be the responsibility of the PMC. Additional horticulture staff will be assigned at District level to carry out field activities with the support of DWDTs at District level and WDTs at Taluk-level. These staff will be directly supported by a contracted NGO experienced in extension and strengthening of farmer institutions.

B. Results Monitoring and Evaluation

33. The project M&E system would focus on tracking and regularly assessing project specific outputs, outcomes and impacts, in a participatory manner and provide recommendations to improve performance, and encourage learning from project lessons. The M&E system would consist of the following elements: i) concurrent progress monitoring; ii) process monitoring and pathway analysis; iii) results monitoring, including performance assessments; iv) participatory monitoring and evaluation; v) thematic studies and case-studies; and vi) impact evaluation. Input-output monitoring and regular reporting would be supported by a web-enabled computerized management information system (MIS) which would be an integral part of the M&E system, integrated into the overall MIS systems in WDD.

C. Sustainability

34. Overall, the project would improve the targeting and quality of soil and water conservation works within micro-watershed that are financed through NREGS/IWMP, resulting in more effective and enduring structures. Sustainability has been an important factor in project design, through: i) strengthening M&E capacities in WDD and DoH and communities; ii) building technical capacities in key government departments at state and field levels, and in communities; iii) financing studies to examine operational and thematic sustainability, such as identifying community institutions which best serve integrated watershed management, and mechanisms to address long term climatic effects on agriculture, and iv) developing various tools to underpin longer-term and scaled up watershed management, agricultural intensification, and hydrological assessment and monitoring.

35. Demonstrations of borrower commitment include: i) agreeing to fund the initial preparation studies with internal resources on a retroactive financing basis to speed up project preparation; ii) WDD and DoH being designated as a Project Implementing Agencies; iii)

Government Order 26 designating WDD as a Project Implementation Agency for NREGS, and agreement by RDPRD to facilitate field convergence between IWMP and NREGS; iv) WDD and DoH establishing strong institutions for project implementation, comprising of experienced senior staff, supported by contract specialists where needed; and v) WDD and DoH agreeing to use a 3rd party agency to support internal M&E activities.

V. Key Risks and Mitigation Measures

36. Implementation risks at the project level are rated as Medium-I (low risk/high impact - see Annex 4 for more details). Key risks and proposed mitigation measures are:

Key Risks	Proposed Mitigation Measures
Multiplicity of implementation partners may lead to coordination problems and delays in implementation.	A PPMU with a dedicated multi-disciplinary team is being established to coordinate and manage day-to-day activities of the project.
Governance implications related to the indirect linkage with NREGS	An analysis on institutional/governance arrangements and capacities, as part of the social assessment, has been carried out. GoK Results Framework Documents now being operationalized in Agriculture Department.
Strengthening the existing financial management systems	Simplified FM arrangements, following core state government systems for all key functions of FM. WDD and DoH would handle all the funds, accounting and reporting.
Procurement may be an area vulnerable to fraud and corruption	The project involves procurement of remote sensing images, hydrological monitoring equipment and other simple goods /works and consultancies. To improve competition, measures such as broad technical specifications, realistic post qualification criteria, would be adopted supported by competent technical staff at PPMU.
Overburdening of field staff with new program and procedures	The project is being implemented in a phased manner; lessons learnt in phase I would guide necessary modifications in the design. Appropriate technical staff will be hired by WD D. Also additional staff sanctioned for implementation of Horticulture component.

VI. Appraisal Summary

A. Economic and Financial Analysis (EFA)

Financial: NPV = INR 2.3 billion; Financial Rate of Return (FRR) = 17.2%

Economic: NPV = INR 2.9 billion; Economic Rate of Return (ERR) = 19.7%

37. Annex 7 summarizes the economic and financial analysis for the project. The project focuses science-led watershed management planning and convergence of resources, together with the integration of programs to improve the productivity of natural resources in selected micro-watersheds. The project will complement IWMP activities in 935 micro-watersheds covering 465,000 ha for science-led integrated planning and development to increase the productivity of rainfed agriculture and horticulture. All physical structures for these watersheds

will be taken up with IWMP/NREGS funds. The project interventions will benefit 319,550 ha of cropped land area operated by 160,000 farmers. Small farm holders account for 66 percent of the project farmers. The project area has 39,400 landless families in the project villages. Rainfed agriculture in 278,000 ha in the project area experiences at least two water deficit years in a five year cycle due to prolonged dry spells during crop season and/or delayed onset of monsoon rains.

38. *Description of project benefits:*

- **Component 1:** Improved program integration in rainfed areas involves development of digitized database and decision support systems while strengthening participatory sub-watershed and micro-watershed planning for effective watershed management;
- **Component 2:** Research, development and innovation involves integrated assessment and monitoring of soil and water conservation, ground water recharging and soil moisture status while transferring best conservation practices for effective rainfed agriculture management under diverse soil moisture conditions;
- **Component 3:** Institutional strengthening targets watershed management training and capacity building for extension agents and community institutions for integrated and efficient service delivery;
- **Component 4:** Horticulture targets area expansion and productivity enhancement and strengthen market linkages for diversification;

39. Components 1 and 2 will support other components, while reducing the cost of future R&D, planning and development of watershed management. Main benefits quantified for the EFA are institutional and capacity development impacts, and strengthened institutions at all levels in the watershed management with better resource convergence and greater program integration. This will increase the size of project benefits besides improving the sustainability of project benefits. The size of project benefits will increase due to: increased irrigated area by 5 percent, cropping intensity by 5 percent, agriculture productivity by 9 to 17 percent and area under horticulture crops from 7.5 percent to 20 percent; reduced productivity fluctuations by 57 percent; improved adoption rate of best conservation based production technologies from 35 percent to 61 percent; enhanced sustainability of soil and water conservation services from 25 percent to 65 percent; all arising from efficient conservation-based agriculture management. All quantified benefits as above are incremental over the “without project” (WOP) scenario of IWMP. At full development, annual average incremental financial benefits from the project are projected at Rs 1.5 billion, contributed by efficient use of natural resources (78 percent) and enhanced sustainability of project interventions (22 percent) in the selected micro-watersheds.

40. *Project cost*, including contingencies is INR4713 million. The project will additionally leverage NREGS funds to supplement the IWMP investments by about 35 percent which is included in the cost-benefit analysis. Financial analysis is done at market prices. Economic analysis is conducted after making appropriate adjustments to financial benefits and costs. The adjustments include; (a) netting out price contingencies, taxes and subsidies (20 percent), (b) using appropriate parity prices for traded items, and (c) using SCF varying from 0.80 (labor cost) to 0.90 for other non-traded items. Project costs and benefits are estimated at 2012 prices over 20 years with 12 percent opportunity cost of capital.

41. *Project Analysis:* When evaluated against all project costs, the FRR for the project is estimated at 17.2 percent with a financial net present value (NPV) of INR 2.3 billion. The

undiscounted average annual incremental economic benefits from project investments are INR 1.4 billion, of which crop production contributes 20 percent, horticulture production 34 percent, drought mitigation 25 percent, and sustainability impacts 21 percent. When evaluated against all project costs, the ERR for the project is estimated at 19.7 percent with an economic NPV of INR 2.9 billion. The projected rate of return is for the project investments including incremental NREGS funds over the IWMP investments. In the absence of NREGS funds, the projected ERR comes down to 17 percent with a substantial fall in NPV by 56 percent.

42. *Sensitivity and Risk Analyses.* The project can sustain significant decreases in benefits or increases in costs. A 73 percent increase in costs, or a 42 percent decrease in benefits, or a combined 27 percent change both in costs and benefits, reduced the project ERR close to 12 percent. Implementation delay by two years will delay the realization of benefits, and reduce the ERR to 14.6 percent. If sustainability impacts are limited to only 50 percent, project ERR comes down to 16.2 percent. In general, ERR is more sensitive to changes in benefits than costs. Simulated ERRs based on joint variability in project costs (up by 50 percent) and benefits from major sources (fall by 50 percent) ranged from 14.5 percent to 18.7 percent with an expected ERR of 16.5 percent and coefficient of variation of 6 percent. Sensitivity tests and risk analysis indicated that the project is able to absorb substantial negative impacts yet still generate robust ERRs.

43. *Efficient use of public funds:* The project-led development, maintenance and sharing of comprehensive database in digital format and tested and validated decision support systems for guiding integrated planning and investment decisions will have system wide impact on efficient use of public funds in WSD. The project, by leveraging additional public funds from NREGS, will not only relax the investment constraint for micro-watershed development, but enhance their overall effectiveness by utilizing them based on science-led prioritized watershed investment activities. With the annual NREGA budget of INR 20 billion, mainstreaming such resource convergence strategies for future watershed development activities will have significant system wide impact on the efficient use of public funds in the state.

B. Technical

44. With the expanding scale of the NREGS, and resources for soil and water conservation activities through local authorities being increased, the GOK indicated a need for a Bank-supported project that would improve the effectiveness of the IWMP in selected rainfed areas of Karnataka by: i) facilitate convergence with other programs including NREGS (*to leverage additional financial resources and improve targeting and quality of these investments*); ii) piloting new tools and models for planning (*to improve planning quality and integration with watershed management, water management, and agriculture*); and iii) financing innovative research and development, and building better capacities for extension and technology transfer (*to contribute to increased agricultural productivity*).

45. In addressing these needs, the project design builds on lessons learned from the earlier and highly successful Bank-supported Sujala watershed project, other donor-supported projects in India, and international best practice (see section 3-C on lessons learned). The project design is also influenced by an analysis carried out during preparation of potential benefits from

financial and technical convergence between IMWP and NREGS as well as possible implementation options (see Annex 11).

C. Financial Management

46. Overall, the financial management arrangements at WDD and DoH, after taking the indicated steps below, can be considered satisfactory to support the use of Bank funds. From a FM perspective, the project would be implemented by the WDD and DoH, who would handle funds, accounting and reporting. WDD successfully managed the earlier Sujala project and is aware of the Bank's FM requirements. The required budget heads for WDD and DoH have been created and funds for the FY 2012/13 have already been allocated. The DoH is required to issue a Government Order (GO with Finance Department concurrence) to designate the Project Officer (Horticulture) as the DDOs for the project at district level so that the funds can be passed through treasury to these offices directly. This action should be completed within three months of effectiveness. This project would follow the state treasury system for funds release and usage. The overall accounting for expenditure would be carried out by treasury while the details of the expenditure would be maintained by the WDD and DoH at headquarters and the DWDO and Project officer (Horticulture) at District level. These offices would maintain a separate cash book to record project expenditure. WDD and DoH have prepared the FM Manual (FMM) for the project. The WDD and DoH has agreed to hire FM staff (commerce graduates) both at HO and District levels. Quarterly interim unaudited financial reports (IUFRRs) will be submitted based on actual expenditure, which would be basis for disbursement. IUFRR formats have been prepared as a part of the FMM and would be agreed by negotiations. The statutory audit would be carried out by Accountant General (AG) office as per the standard ToR while internal audit would be carried out by a Chartered Accountant (CA) firm as per the agreed ToR with the Bank. From an FM perspective the project is simplified and totally based on the state government existing systems (further details are provided in Annex 3). There are no outstanding audit reports or ineligible expenditure for these implementing entities.

47. A Designated Account (DA) would be maintained in the Reserve Bank of India (RBI) for the project and would be operated by the Controller Aid, Accounts and Audit (CAA&A) in accordance with the Bank's operational policies. There would be a one-time fixed advance of USD 3 million, which would be maintained throughout the project life and adjusted towards the end of the project. The project would submit withdrawal applications supported by IUFRRs to CAA&A in Department of Economic Affairs (DEA) for onward submission to Bank for replenishment of the DA or reimbursement. The Bank would replenish DA equivalent to the amount claimed on eligible expenditure by the project and as reported in the IUFRRs. Disbursements would be made based on quarterly Interim IUFRR²⁶ submitted by the project. These IUFRRs would reflect the actual expenditure for the project components. Any advances given by the project would be separately shown in the IUFRRs. All expenditures reported in the IUFRRs would be subject to confirmation/certification by the annual audit reports. Any difference between the expenditure reported in the IUFRRs and those reported in the annual audit reports would be analyzed and those expenditures which are confirmed by the Bank as being not eligible for funding (refundable to IDA), would be adjusted in the subsequent disbursements.

²⁶ To be submitted within 45 days from end of quarter.

D. Procurement

48. **General:** Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non-Consulting Services under International Bank for Reconstruction and Development (IBRD) Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Procurement Guidelines); and "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Consultant Guidelines) and the provisions stipulated in the Financing Agreement.

49. **Procurement Risk Assessment and Mitigation:** The implementation responsibility of the proposed project lies with WDD and DoH. Fresh procurement capacity assessment of WDD has not been carried out by the Bank considering the simple and small procurement requirements and its experience in the earlier Bank-supported watershed project. A procurement risk assessment of DoH has been carried out and it is confirmed they will be able to handle simple and small procurements. Further, the existing e-Procurement system of GOK will be used, which has been found acceptable when assessed for another project. The WDD Procurement Cell and the DoH Procurement Cell at PMC and districts would be supported by a competent consultant associated with the earlier Sujala project and other Bank funded projects in Karnataka. The cell at WDD will make efforts to re-induct staff who had handled procurement in the earlier project. The summary of risk mitigation measures to address the residual risks are: i) Training of procurement staff in "Procurement in Bank financed Projects" at the cell to bring them up to current practices; ii) Improving and publishing a complaints handling mechanism; iii) Use of Standard Bidding Documents (SBDs) agreed with GOI for procurement of goods and works following NCB and consulting services; and iv) a Project Procurement Manual (PPM) in line with Bank Procurement Guidelines has been prepared and agreed with the Bank.

50. **Procurement Plan:** The procurement plan for procurement to be taken up during the first 18 months of project implementation has been prepared and is available in the project files. The procurement plan would be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

E. Social (including safeguards)

51. Stakeholder Analysis. The project stakeholders include farmers in the rainfed area, including small and marginal farmers, women SHGs, water user associations, watershed committees, PRIs, NGOs and government line departments and agencies. As part of environmental and social assessments, wide ranging stakeholders' consultations were undertaken. These consultations were held at individual, household and village/community levels in the field and also with PRIs. The assessment reports highlights the key feedback that emerged from these consultations.

52. The social assessment enquiry identified the following as key social development issues/principles which should underpin the project's strategy and implementation:

- Participation- mobilizing relevant stakeholders at different levels (both horizontally and vertically across a sub- watershed) for a group action with well defined arrangements for coordination is critical to ensure enmeshing technical and social considerations; and
- Inclusion and equity- given the highly diverse socio-economic characteristics of the watershed communities, special and human and institutional development efforts are essential to ensure that none of the sub-groups get ‘excluded’ and that everyone has an equal access and opportunity to participate in the project.

53. Towards ensuring the above, following arrangements will be adopted:

- Sector related institutions would be strengthened or, if necessary, established, at different levels with an explicit capacity, composition and a definite mandate, with strong emphasis on accountability and service delivery performance. Due considerations will be given to provide adequate representation for women, poor and other vulnerable sections of the society;
- Nutrition garden intervention will be chiefly aimed at government schools and Anganwadis²⁷, and other public lands: and
- An Information, Education and Communication (IEC) campaign would be developed and implemented not only for publicizing the rules of engagement for project partners, but also for establishing a communication platform thus enabling exchange of ideas and shared learning.

54. Convergence: The project preparation also conducted an independent Poverty and Social Impact Analysis (PSIA)²⁸ of the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA), India’s major rural employment program, to draw policy insight for its convergence and integration with a science based and investment oriented watershed management development program, for improving livelihoods of the poor and vulnerable by developing social and economic infrastructure in rural areas. This analytical enquiry has enabled exploring the potential for enabling convergence between NREGS and IWMP (sponsored by GOI) and formulates alternative models of convergence. A couple of models will be piloted during the implementation.

55. No Social Safeguard Policies are triggered. No lands are to be acquired for any of the proposed activities, nor any impacts on the tribals expected as there are no Indigenous Peoples in the project area. However, some risks are possible for example in convergence activities, which involve new processes, and direct engagement with political bodies. These would be addressed by providing for participation by Panchayat Raj Institutes (PRIs), their capacity building, and establishment of a grievance process to address any disputes²⁹. Government Department personnel too will be trained in the systems and procedures governing NREGS.

²⁷ These were introduced under the Integrated Child Development Scheme to combat child hunger and malnutrition. They are pre-school-like structures providing nutritious food to children.

²⁸ The convergence study is financed by Bank’s PSIA Trust Fund.

²⁹ These actions are elaborated in the Governance and Accountability Framework (Annex 9).

F. Environment (including safeguards)

56. The project is rated as Category B and triggers the Environmental Assessment (OP 4.01) and Pest Management (OP 4.09) safeguards policies. The project design largely emphasizes technical assistance activities, but some on the ground investments related to promotion and adoption of horticulture in the participating watersheds would be undertaken. These would include establishing modern nurseries (including upgrading existing facilities), availability of quality seedlings, modern laboratory facilities and post harvesting technologies. Large construction related works, such as, water and soil conservation works, constructing multiple check dams, erosion prevention structures, etc, are not planned under the project. The project intends to support institutional capacities, use of new and innovative technology for watershed planning and training and capacity building of stakeholders. The strengthened planning processes along with better knowledge sharing among line departments would in fact increase environmental sustainability of watershed investments. Consequently, no potential large scale, significant and/or irreversible impacts are anticipated. The project stakeholders include farmers in the rainfed area, including small and marginal farmers, women SHGs, water user associations, watershed committees, PRIs, NGOs and government line departments and agencies. As part of environmental assessment, wide ranging stakeholders' consultations were undertaken. These consultations were held at individual, household and village/community levels in the field and also with PRIs. The environmental assessment report highlights the key feedback that emerged from these consultations.

57. During project preparation, an experienced and independent consulting agency was contracted by the WDD to undertake an environmental assessment for the project investment. The assessment undertaken for the current project has identified a range of mitigation measures, but more importantly measures to enhance the potential positive environmental impacts that the project investments would result in. A project-level Environmental Management Framework (EMF) as well as a supplementary EMF (specifically for horticulture) has been prepared that would guide the implementation of the project investments for addressing any safeguard issues. As part of the project design, new decision-support tools would be developed and piloted to improve selection of priority watershed sites that combine biophysical, hydrological, socio-economic, and environmental criteria. Deployment of such tools is likely to facilitate sustainable harnessing of natural resources, accurate investment plans to improve the natural resource base.

Technical Annex 1: Results Framework and Monitoring

Project Development Objective (PDO): *is to demonstrate more effective watershed management through greater integration of programs related to rainfed agriculture, innovative and science based approaches, and strengthened institutions and capacities.*

PDO Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1	YR 2	YR 3	YR 4	YR 5	YR 6				
Indicator One: New science based approaches and tools adopted into wider watershed operations	<input type="checkbox"/>	Number of new tools and approaches adopted	0				1	1		Periodic reviews and end of project (EOP)	<ul style="list-style-type: none"> Project reports from regular implementation support missions M&E agency 	WDD, supported by M&E agency	Two new approaches and tools emerging out of the project and adopted into WDD operational manual/ guidelines: (1) Hydrological assessment as part of sub-watershed assessment , and (2) Decision support models used for site selection
Indicator Two: Improved M&E capability in WDD	<input type="checkbox"/>	M&E cell established and functioning	No formal cell in WDD			Fully staffed and operating			Cell produces M&E reports on regular basis	Mid-term review (MTR) and EOP	<ul style="list-style-type: none"> Project reports from regular implementation support missions 	WDD, supported by M&E agency	Permanent staff in place, equipment acquired, and operation and maintenance taking place
Indicator Three: Incremental ³⁰ change in agric/horticulture productivity in project areas for selected crops: <ul style="list-style-type: none"> Cereals Pulses Vegetables fruits 	<input type="checkbox"/>	Tonnes/ha	Cereals (1.70) Pulses (0.54) Veg. (15.00) Fruits (12.00)						Cereals (2.08) Pulses (0.65) Veg. (18.15) Fruits (15.00)	Baseline and EOP	<ul style="list-style-type: none"> Data from ongoing M&E for IWMP plus additional data acquisition as required 	WDD, supported by M&E agency	Weighted average yield of three major crops (based on area) for cereals, pulses, vegetables. The targets are incremental (over IWMP watersheds) and would be measured for Phase I sites. Without project values are estimated at cereals (1.85); pulses (0.58); vegetables (16.50); fruits (13.50)
Indicator Four: Percentage of micro-watersheds with improved convergence and integration. ³¹	<input type="checkbox"/>	Percent of MWS	0			30			70	Mid-term and EOP	<ul style="list-style-type: none"> Quality control reports for micro-watershed plans. Annual budget allocations in WDD, NREGS 	WDD and DWDO supported by M&E agency	The quality rating would be based on assessment of: level of integration, targeting of key soil and water conservation civil works in relation to micro-watershed master plan, and stakeholder satisfaction.

³⁰ Expansion of incremental benefits will come from incremental crop productivity and cropping intensity due to efficient SM conservation based crop management, incremental irrigated area due to efficient water conservation based WSM planning, improved adoption rate of conservation based production technologies and minimizing productivity fluctuations due to longer dry spells in the cropping seasons.

³¹ Quality would be rated on (a) improved convergence of NREGS resources for soil and water conservation works with IWMP programs and outcomes in project areas (improved targeting and quality of NREGS investments); and (b) better integration of agriculture, ground water, forestry, horticulture, livestock activities into micro-watershed master plans.

INTERMEDIATE RESULTS

Intermediate Result (Component One): Support for Improved Program Integration in rainfed areas :

Demonstrate successful integration of rainfed agriculture and watershed development programs, within a science-based approach

Intermediate Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)	
				YR 1	YR 2	YR3	YR 4	YR5	YR 6					
<i>Intermediate Result indicator One:</i> Micro-watershed master plans are integrated with larger scale sub-watershed assessments	<input type="checkbox"/>	Number of micro-watersheds	0			335				935	Yearly	Report reviewing sub-watershed and micro-watershed plans and implementation	WDD, DWDOs, M&E agency, KVKs, with Technical agencies peer reviewing quality of plans on a sample basis	Scientific recommendations from watershed plan taken up in micro-watershed plan. Key results include ground water assessment, land-use, agriculture potential
<i>Intermediate Result indicator Two:</i> Digitized database library fully operational covering all project watersheds	<input type="checkbox"/>	Number of MWSs	0		335		935				Yearly	MIS	WDD/ NBSS-LUP	Digitized library to be in place as per design and fully operational means all nodes are linked and database accessed on real time basis for planning

Intermediate Result (Component Two): Research, Development and Innovation													
<i>Establish a coordinated research approach to provide practical knowledge and tools to support integrated watershed management</i>													
Intermediate Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1	YR 2	YR3	YR 4	YR5	YR 6				
Intermediate Result indicator One: New hydrological monitoring systems installed and functional <ul style="list-style-type: none"> • Advance monitoring • Community monitoring 	<input type="checkbox"/>	Number of: <ul style="list-style-type: none"> • MWSs • SWSs 	0		30	60	90	120	150	Yearly	Project reports State reports and policies	WDD, IISc and Partner Universities , M&E agency and communities	Hydrological monitoring and modeling adopted within regular watershed planning Fully functional means the system should generate data at specified intervals
Intermediate Result indicator Two: Improved information for farmers on climate change and risk management	<input type="checkbox"/>	Number of Farmer Contact Centers (RSKs) distributing information	0		20	43	0	58	73	Yearly	<ul style="list-style-type: none"> • Information system regular reports and user data • Process monitoring • Annual end user surveys • Independent assessments 	WDD, DOA and research agencies 3 rd party study agencies, NBSS-LUP	Underlying studies completed, delivery systems designed and functional through RSKs, providing information to farmers
Intermediate Result indicator Three: Value addition and marketing system improved	<input type="checkbox"/>	No. of commodities (incremental)	0	1	3	3	3			Yearly	Project reports.	WDD and other IAs , M&E agency	Value addition identified and marketing system improved as demonstrated for the targeted commodities.

Intermediate Result (Component Three): Institutional Strengthening													
<i>Strengthen the institutions and human resources of key stakeholders to improve effective integration of watershed management</i>													
Intermediate Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1	YR 2	YR3	YR 4	YR5	YR 6				
Intermediate Result indicator One: New aquifer user groups/CIGs functioning	<input type="checkbox"/>	Number	0	0	0	150	300		450	Yearly	<ul style="list-style-type: none"> End user survey and scorecards Process monitoring Service delivery studies, baseline, mid-term and end of project 	WDD, DOA, DoH, DWDO, and research agencies. 3 rd party study agencies	Aquifers identified and then aquifer user groups/CIGs established and functional
Intermediate Result indicator Two: Adoption of improved conservation practices and production technologies	<input type="checkbox"/>	Percent of farmers	0	0	0	0	30	60		Yearly	MIS reports, drawing from process monitoring, Agriculture Technology Management Agency (ATMA), and farmer center data.	WDD, DOA, DoH, KVKs, and M&E agency	Based on studies and demonstrations. Adoption of key scientific resource conserving, productivity-enhancing technologies that are disseminated. Targets are incremental (over IWMP) for Phase-I MWSs and same applies for Phase-II MWSs
Intermediate Result indicator Three: Improved capacity of farmer contact centers/RSKs	<input type="checkbox"/>	Percent of offices	0	0	30	50	75	90		Yearly	MIS reports, drawing from process monitoring, ATMA and farmer center data.	WDD, DA, DoH, KVKs, and M&E agency	percent offices in project areas operating with full staff (GoK and contract) complement and linked with functional ICT to digital library, market information , etc.

Intermediate Result (Component Four): Horticulture													
<i>Strengthen the knowledge base regarding horticulture potential in rainfed areas and watershed development, and improve the production and value addition of horticulture in project areas</i>													
Intermediate Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1	YR 2	YR3	YR 4	YR5	YR 6				
<i>Intermediate Result indicator One:</i> Adoption of improved horticulture techniques	<input type="checkbox"/>	Percent of farmers	0	0	0	10	30	60		Yearly	MIS reports, drawing from process monitoring, ATMA, and farmer center data.	DoH and M&E agency	Adoption of productivity-enhancing technologies that are disseminated. Targets are incremental (over IWMP) for Phase-I MWSs and same applies for Phase-II MWSs
<i>Intermediate Result indicator Two:</i> Improved technologies for processing and value chain improvements in selected horticulture crops	<input type="checkbox"/>	Number of demonstrations	0	0	30	90	108			Yearly	MIS, surveys	DoH, M&E agency	Number demonstrations related to pack houses, low-energy storage, pre-cooling units, and ripening units

Intermediate Result (Component Five): Project Management													
<i>Ensure effective, efficient and responsive project management</i>													
Intermediate Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1	YR 2	YR3	YR 4	YR5	YR 6				
Intermediate Result indicator One: Effective project management	<input type="checkbox"/>	Percent of project units meeting agreed standards	n/a	n/a	25	40	60	70	80	Yearly, to start in year 2	Project management report, 3 rd party process monitoring report, MIS system, and stakeholder performance scorecards	WDD and M&E agency	Project management delivering project according to agreed standards. At state level, key PMUs would set up standards during start-up. Could include: delivery indicators, responsiveness to clients and partners, quality of support, transparency, complaints redress, adoption of processing monitoring recommendations

*Please indicate whether the indicator is a Core Sector Indicator (see further <http://coreindicators>)

**Target values should be entered for the years data would be available, not necessarily annually.

Technical Annex 2: Detailed Project Description

1. The **Project Development Objective** is to demonstrate more effective watershed management through greater integration of programs related to rainfed agriculture, innovative and science based approaches, and strengthened institutions and capacities.

Project Location and Beneficiaries

2. The project would be implemented in seven districts, which have been identified by the WDD based on biophysical and socio-economic criteria³². The Districts are semi-arid and have a high incidence of poverty, a large proportion of the Taluks in the District have been classified as 'Backward' by the Najundappa Committee set up to look at regional imbalances in the State. The areas are similar in character to the KWDP I with a range of semi-arid characteristics from North to South in State: with rainfall average between 595 mm to 890 mm per year. For most activities such as improved planning and capacity building, and local capacity building, the project would finance the piloting of new approaches and tools initially in 33 sub-watersheds (approximately 335 micro-watersheds) in Phase I. The project area in Phase I covers 108 GPs. Drawing from lessons learned, the project would then scale up in Phase II to cover an additional 60 sub-watersheds (600 micro-watersheds) and more than 200 GPs. The total project would effectively cover approximately 465,000 ha and 160,000 farmer households. For other activities such as research and development, many of the results would be applicable state-wide.

Project Links with IWMP and Phasing

3. The project would be implemented over six years and link with the centrally financed IWMP planned for the selected project districts. IWMP is an ongoing GOI program that supports participatory watershed management, preparation of soil and water conservation "net plans", livelihood development through Self-Help Groups, and monitoring and evaluation of implementation performance and impacts. Bank financed activities would focus on project resources on improved planning, R&D, and institutional strengthening to promote better integration between agriculture and watershed management, and convergence with NREGS. The GOK wants to further improve its capacity to better integrate a range of programs related to rainfed agriculture with the IWMP (see Annex 11), and harness the resources for soil and water conservation from other initiatives such as the NREGS program in a more rational and science based approach with particular attention on ground water recharge and management. In particular, greater attention to hydrological assessment and monitoring has been identified as a priority in the new project. The project would not be funding actual watershed physical works or rural livelihoods. These investment costs would be financed by IWMP with additional resources leveraged from NREGS programs and implemented based on the micro-watershed master plan³³.

4. The project has five components: Component 1 would test and demonstrate new planning and M&E approaches around the IWMP, with greater integration with other rainfed agriculture and horticulture programs, better informed convergence with NREGS in terms of planning and monitoring, and incorporate more science-based approaches especially hydrological modeling and decision tools in the planning. In preparation for this, approaches and tools would be

³² Bidar, Gulberga, Yadgir, Koppal, Gadag, Chamarajanagara, Davangere

³³ See attachment 1 to this annex for a schematic of IWMP/NREGS convergence and project support.

developed under Component 2 through a more coordinated program of research and development for rainfed agriculture in the State. The capacity to use the tools and information systems, including enhancing key extension systems, and the capacity of the Karnataka WDD to manage and monitor the programs, would be strengthened under component 3 and Horticulture productivity improvement and market linkage activities under Component 4. Component 5 on Project Management would provide incremental support to WDD to strengthen the IWMP coordination and management systems already in place, and ensure the additional activities of the project are effective.

5. The project would have the following phasing and links with IWMP and NREGS:

- **Year 1.** *Institution strengthening, initiate key Research and Development (R&D) studies, data base development.* The IWMP would engage with participating communities through group formation, social mobilization and training in its Year 1. The Bank would simultaneously support the activities around sub-watershed and micro-watershed planning to broaden the focus of IWMP micro-watershed net plan preparation processes through component 1, by strengthening the land resource inventory and GIS database input including hydrology.
- **Year 2.** *Link with IWMP Batch III and IV and NREGS field activities through planning and training.* In Year 2, the effectiveness of IWMP would be enhanced by better integration with agriculture, horticulture, agro-forestry and NREGS operations.
- **Year 3.** *Post-harvest support, R&D, follow-on capacity building in IWMP Batch III areas.* In Year 3, Bank supported initiatives would focus on incremental activities to improve agricultural intensification across a range of products, market development, value addition, etc, drawing on R&D results from component 2 through strengthened extension services supported by components 3 and 4.
- **Year 4 and Year 5.** *Repeat of Phase I sites.* A similar phasing approach would be used with Phase II sites in the Bank project and IWMP Batch IV operations.
- **Year 6.** *Consolidation and withdrawal phase from project sites*

Component 1: Support for Improved Program Integration in Rainfed Areas

6. A key outcome of this component would be more effective and coordinated public investments in watersheds through improved, integrated watershed planning at both sub-watershed and micro-watershed levels, and supported by a comprehensive digital data base and new decision-support tools. The activities would be implemented through five sub-components.

1.1. Development of Decision Support Systems (DSS)

7. The sub-component would finance the development and piloting of new decision-support systems to assist WDD in leading integrated watershed programs. In the first year, a consultancy would help WDD identify/clarify needs, thematic areas, and potential tools that could be applied.

The consultancy would include a review of modeling applications for similar needs that are used elsewhere in India and other regions. The consultancy would also review past and current site selection and planning processes for watershed planning in Karnataka, identify gaps where new tools could benefit these processes, and identify potential local technical partners. Possible thematic areas could include site selection, water budgeting, setting investment priorities and interventions based on site conditions, linking improved planning processes with contour mapping, and impact assessment. With site selection for example, a GIS-based model could help select priority sites for watershed development at a district and sub-watershed-level, using a range of criteria such as biophysical (topography, soils, land cover, hydrology, etc), socio-economic (population density, poverty levels, land use, etc), and potential for linkages with NREGS (number of job card holders, etc). Integrated decision-support models for scenario building and analysis could also help prioritize land and water interventions at a sub-watershed level that can then be downscaled to guide micro-watershed level planning. With technical assistance from consultants and service providers, appropriate existing models and tools would be adapted and calibrated from to fit local conditions and identified needs. Over time, the models and tools would increasingly draw on the data available from the new digital library developed through the project (see component 1.2 below). In addition, a web-based Land Resources Portal for public access would be designed, tested and launched. This would promote more independent research and development on Karnataka land use/water problems by local, national and international scientists, in addition to providing a central window for data by local government departments, NGOs and public.

1.2. Development and maintenance of a digital library for WSM planning

8. The sub-component would support the establishment of an IT and GIS-enabled land resource inventory and data base in the NBSS-LUP, building on their core competencies, existing systems and relevant experience. The digital library would support improved sub-watershed assessment, more integrated micro-watershed master planning, monitoring and evaluation, and relevant research and development. The digital library would include comprehensive historical and current data sets such as classification of land, run-off and erosion, soil properties (soil nutrients, fertility, crop suitability), land cover and land use, and geographic distribution of crop types and varieties geo-hydrology (geology, surface water, ground water), meteorology (precipitation, temperature, soil moisture, radiation, evapotranspiration), water usage (current and projected), water harvesting structures, carrying capacity, zoonotic and vector born animal diseases. The data base would be populated by secondary data sets and remote sensing images from other agencies where possible. As needed, remote sensing images of sufficient resolution³⁴ to capture specific parameters would be procured and updated within the project period. The project would finance the design of a suitable architecture for the integrated digital data base through technical support. The design stage would also define the approach for compiling data from line departments (maps, layers, remote sensing) and other sources, with appropriate protocols for data sharing, definitions, use etc. The NBSS-LUP would be strengthened with equipment and training to support the information structure and data, and national/international exposure to manage the updated system. The project would assist with purchase of state-wide databases and layers, and digitizing. In addition, NBSS-LUP would be supported by regional universities and technical consultancies. This support would also be

³⁴ Examples include Synthetic Aperture Radar (SAR) images for soil moisture, IKONOS – 1m resolution images for cropping patterns, and mapping existing and new soil and water conservation works, etc.

extended to develop networked GIS facilities in the partner universities to broaden the scope of application of the digital library for research, teaching and modeling.

1.3. Integrated sub-watershed assessment

9. This sub-component would support the development and piloting of new approaches and processes for higher-level analyses within selected catchments comprising of one or more contiguous sub-watersheds. This follows emerging global best practice in watershed management of using readily available data and models for sub-watershed assessment and then down-scaling the results to guide lower-level micro-watershed development. A central focus of the sub-watershed assessment would be to develop a better understanding of broader hydrological issues and potentials, particularly for groundwater. Water availability maps would be developed to highlight areas most sensitive to water balance pressures and disturbances. The assessment would also review general land resources and land use, especially around agriculture, potential impacts of climatic variability, etc. The sub-watershed assessments would provide valuable information to help set priorities and strategies for watershed development in lower-level integrated micro-watershed master plans in the IWMP (sub-component 1.4). The assessments would also provide useful information for regional GOK development and agriculture plans, and draw on District Plans where necessary. Project support would be provided to the NBSS-LUP who would manage the overall planning process and training with assistance from contracted technical specialists and/or NGOs. The process would include development of thematic base maps at 1:12,500 scale, stakeholder participation by relevant line departments and others at the district and Taluk level, and applying appropriate models/tools, especially for hydrology as these emerge from sub-components 1.1 and 2.2. Reports and other media products capturing analysis and decisions in user-friendly formats would be produced and disseminated to users at various levels within the sub-watershed, and guide development of training modules.

1.4. Participatory micro-watershed master planning

10. Based on guidance from the higher-level sub-watershed assessments, this sub-component would provide incremental support to the WDD and communities to develop micro-watershed master plans through the IWMP process that would promote more effective integration of watershed management and agricultural development. These enhanced master plans would also promote increased convergence between the six-year IWMP and annual NREGS programs, particularly around better targeted and higher quality soil and water conservation investments. The plans would also promote better integration between watershed planning and agricultural crop planning. It is recognized that convergence with NREGS would be essentially piloted initially in areas where there is a clear labor demand, and based on examining four different options outlined in Annex 11, Bank-supported incremental planning activities would be integrated with the ongoing IWMP participatory planning process by:

- Incorporating key recommendation from the larger scale sub-watershed assessments, especially around hydrology, through a GIS platform to support better decisions with respect to surface water usage and groundwater recharge in micro-watersheds that supports agriculture and agriculture intensification;
- Drawing on the digital data library (sub-component 1.2) for thematic maps and information to help define options for improved integration and coordination of watershed, agriculture, horticulture, forestry, and livestock programs, and identifying general priorities for post-harvest, marketing, and income generating activities within the micro-watershed plan;

- Using simple tools for watershed planning, groundwater assessment, water budgeting tools/educative games developed in components 1 and 2 to bolster local understanding of watershed management and hydrology and links with land-use decisions. This would help stakeholders make more informed micro-watershed planning decisions that include hydrological objectives and outcomes;
- Developing an incremental training module that can be integrated into IWMP planning processes with communities and GPs, which includes material on applying new approaches and tools for more integrated planning, better accommodation of hydrology into decision-making, and promoting a rationale for more NREGS convergence;
- Financing technical support to WDD field teams and local NGOs to deliver the training material as well as on guidance to GPs to ensure the new material is incorporated into subsequent annual NREGS field plans;
- Guiding more effective convergence with NREGS – particularly with spatial targeting of physical soil moisture conservation works within a science-based watershed plan that can be built with manual labor; and
- Supporting revision of the field manual in year 1 to incorporate new processes for watershed planning, and again after Phase II to draw in lessons learned from project implementation and to support wider scaling up of more integrated planning approaches.

1.5. Intensive monitoring and documentation at local level

11. To support the implementation of more integrated micro-watershed plans (incorporating some level of NREGS investment) and tracking of performance, the sub-component would finance pilot approaches to incorporate greater community input for field level monitoring and documentation, incremental to normal IWMP monitoring activities. The new approaches would be tested in 1/3 of the micro-watersheds in Phase I and then scaled up in Phase II based on lessons learned. This sub-component would build capacity of local implementers and community stakeholders in gathering and sharing specific monitoring data on physical works, stream flow and water level, groundwater levels, etc. This would be done through incremental training and technical support for data collection, and provision of simple tools such as GPS enabled cameras, manual stream gauge recorders, ground water level recorders, soil moisture probes and data recorders. It would follow successful experiences from other Bank financed projects in Karnataka (for example Health) and elsewhere in India. This participatory monitoring initiative would also be an important point for converging IWMP and other schemes such as NREGS with regards to social accountability and assessing service delivery performance.

Component 2: Research, Development and Innovation

12. A key outcome of this component is that together with strengthened extension and information systems, rainfed farmers would be in a better position to adopt new technologies to help in decision making regarding crop selection, planting timing, water management, harvesting, and value addition. It is expected that many of the outputs would have wider applicability across the state and throughout India with respect to rainfed agriculture and watershed management. Activities would be implemented through four sub-components.

2.1. Research for integrated landscape management and agricultural intensification

13. The sub-component would finance a significant number of applied research studies across three main thematic areas that were identified through a structured process with stakeholders during project preparation. Specific studies would be identified through further highly structured stakeholder consultations. For the most part, studies would be advertised through a competitive process to ensure that the best science is brought to bear on priority issues. Where these encompass farming systems more broadly, the studies would also cover horticulture aspects, but where specific concerns of horticulture are involved, for example on horticulture value chains or horticulture crop management, they would be dealt with under component 4. The three key thematic areas and possible studies³⁵ include:

Integrated landscape management and agricultural intensification;

- Survey and documentation of indigenous knowledge and best practices for community-based water budgeting and links to cropping patterns from season to season in drought-adaptive agriculture production;
- Lessons learned in mixed farming systems and development of a set of comprehensive “Lessons Learned” reports to guide the design of more sustainable and equitable Agriculture Intensification and Watershed Management systems that can be scaled up state-wide;
- Draw comprehensive lessons on integration and convergence aspects considered under the project, and assist WDD and related departments to apply their M&E/MIS systems to support detailed analyses;
- Examine issues of participation and local institutional arrangements for integrated watershed management, including the role of women, and specific social groups such as scheduled castes or tribes. Understand the processes and systems which strengthen more equitable outcomes in watershed management;
- Status of soil resources in watersheds, their constraints and gaps in achieving yield potentials for key agriculture products;
- Best management practices for achieving potential yields and addressing yield gaps;
- Best-practice institutional arrangements for more sustainable common land management, drawing from experiences in Sujala I, project pilot areas, and other experiences in India;
- Policy analysis and recommendations for sector reform to support more integrated landscape and agricultural management;
- Site specific fertilizer recommendation for selected agriculture products and identify approaches for minimizing fertilizer misapplication;
- Mixed farming and livestock management and input use and yield patterns;
- Integrated pest and nutrient management options;

Strengthening agriculture value chains and support;

- Evaluation of promising new farm enterprises and farming systems;
- Assessment of off-farm employment and income potentials;
- System-based guidelines for post-harvest management and value addition;
- Policy research on agricultural marketing.

³⁵ These possible studies were identified during preparation missions. These would be confirmed/revised/dropped based on a priority setting process to be implemented by the WDD with key stakeholders (sub-component 2.4).

Climate smart agriculture, adaptation and mitigation;

- Potential for soil carbon sequestration and accessing carbon credits in Karnataka;
- Identify the most appropriate integrated farming system models for each Agro-Climatic zone in the state for targeted socio-economic groups;
- Comprehensive synthesis of climate variability and agriculture production in the region;
- Synthesis of climate sensitive animal and crop diseases.

2.2. Integrated Hydrological Assessment and Monitoring

14. The sub-component would support: strengthened hydrological monitoring; surface and groundwater research and development; and piloting advanced monitoring systems. This would be done through research and adaptation of best practice models and tools for improved hydrological assessment and monitoring that would serve to design effective water conservation structures in a watershed. This component would focus on assessing the water availability prior to implantation and impact of soil and water based interventions, and identify effective structures for future replication. The project would finance four approaches to hydrological monitoring and assessment:

- i. A basic approach for hydrological assessment and monitoring in all project sub-watersheds. Hydrological assessment would be done with available information and simple tools. For monitoring, communities would measure a small set of indicators supported by training and simple IT based data acquisition tool. This basic setup would allow regular, low-cost monitoring of groundwater levels, key weather parameters, runoff volumes, and changes in water levels in open water bodies (tanks, farm ponds, etc) to support improved, integrated sub-watershed and micro-watershed planning and monitoring. This would complement community hydrological monitoring under component 1.5 (participatory monitoring and documentation). The hydrological assessment work would feed into decision support systems to prioritize watersheds for soil and water based interventions and guide the design of required water conservation practices;
- ii. Piloting an advanced field-based hydrological assessment and monitoring approach in two micro-watersheds in each project district using integrated models and decision-support tools, cutting edge equipment, and IT based data acquisition system. Sensors would be installed to monitor weather, water flowing out (runoff) of the selected watershed streams, soil physical properties (soil moisture infiltration capacity), soil nutrient, crop growth, groundwater levels and usage in wells, and water storage and usage in various water harvesting structures;
- iii. Piloting a remote sensing application and simple modeling setup to upscale the field based assessment. The remote sensing imageries would be used to better understand and validate the field-based measurements of land use, and soil moisture, and also help estimate evapo-transpiration to further understand the impact of development in the watershed;
- iv. Demonstrating an assessment of groundwater potential/recharge based on aquifer mapping that could be used to guide community-based groundwater management.

2.3. Technology transfer

15. To a large degree drawing on the knowledge products developed under components 2.1 and 2.2, this sub-component would finance the development/adaptation of best practice models and tools for end-users, including: i) planning and training tools at micro-watershed levels, for

example land and water suitability maps for farmers and decision makers at various levels as a simple and low-cost planning tool for evaluating technically feasible and profitable options for specific crops and farming systems; ii) decision support systems for integrated watershed planning and site selection to improve selection of priority watershed sites that combine biophysical, hydrological, socio-economic, and environmental criteria with indicators of potential success for NREGS convergence with IWMP; iii) agro-climatic advisory risk tools and systems for farmers to include range of farmer decision support information such as Agriculture Drought Reference Index, Pesticide Application Advisory, Crop Planting Advisory, and Pest and Diseases Information; iv) tools for delivering improved market information to farmers such as market demand, supply, and price data bases and dissemination systems to support farmers and women led SHGs with decisions related to crop planning, value-addition, marketing, and managing food supply and food price volatility; v) technical support for participatory design, establishment and initial maintenance of a web-based information system for use by farmers and extension agents, and vi) adoption of new knowledge and innovations for integrated land use management in rainfed areas through on-farm field trials and demonstrations for specific research and/or technologies, for example conservation farming, post-harvest improvements, etc. A major aim is to identify with farmers optimal soil moisture conservation techniques. The sub-component would also support incremental technology and knowledge transfer to farmers primarily through farmer contact centers and associated activities such as farmer field schools and field days, which have a solid track record in Karnataka. The specific needs and support to women's farmers would be taken into account where possible. This component would be delivered in very close coordination with component 3.1 and 4.2 and 4.3 below.

16. The sub-component would provide technical support for participatory design, establishment and initial maintenance of a web-based information system for use by extension agents and where possible, farmers. It would also fund production and dissemination of a range of other materials: field notes, toolkits, videos, fact sheets, posters, etc, to inform stakeholders at different levels and backgrounds. The information systems would build access to "Sustainable Agriculture Intensification Tool Kits" to include options for higher yielding varieties, pest tolerant/resistant varieties, input use efficiency (fertilizers, water, resistance traits, etc), improved input use efficiency (nutrient, energy, water, land, agrochemical), use of precision technology (water, nutrients), Integrated Pest Management, forestry and agro-forestry, conservation agriculture (e.g., low tillage, mulching, crop rotation, fertilizer management, conservation corridors, etc.).

2.4. Strengthening research management

17. This sub-component would strengthen the institutional arrangements for longer-term research identification, technology transfer, and research quality assurance. The primary focus here is on making sure the research addresses the needs of science based and equitable watershed development, and that it is responsive to, and feeds smoothly into the extension systems and end user capacities, building on existing priority setting systems in the DOA. The sub-component would finance periodic processes to set research priorities with stakeholders³⁶, and workshops to review progress and share results. It would also support quality assessments of research projects.

³⁶ Including appropriate government agencies, researchers and universities, research-oriented NGOs, and relevant private sector institutions (for example major agric-business companies).

Component 3: Institutional Strengthening.

18. Currently there are a number of schemes, information, and extension systems to support the transfer of relevant knowledge to stakeholders to improve integrated watershed planning management practices and productivity in rainfed areas³⁷. Nevertheless, there is a need to strengthen these systems to improve low adoption rates outside the groups of farmers directly involved. In addition, stakeholders in communities, and implementing and partner agencies require further learning opportunities to gain new knowledge and expertise to improve integrated planning, productivity in rainfed areas, etc, including from the outputs and lessons of components 1 and 2. The component would lead to improved knowledge and skills for a range of stakeholders that would contribute to more effective integrated watershed management and agriculture production. The component would be implemented through two sub-components.

3.1 Training and capacity building

19. This sub-component would assess the needs of end users in terms of extension and integrated watershed management and deliver awareness raising activities and training modules to strengthen the skills and knowledge of stakeholders at community level and state level. The sub-component would finance training needs assessments and preparation of relevant training modules for use at various levels.

20. At the community level, the sub-component would augment the technical and institutional training already offered through IWMP. Specialist NGOs with prior experience in watershed planning, and preferably with program convergence and integration, and participatory agricultural extension would lead the training, either directly to farmer groups or through a lead farmer trainer. Training would be provided to village level extension agents (Jala Mitras), community institutions, Gram Panchayat members, and farmers on the benefits of integrated watershed planning and the importance of effective convergence between IWMP and NREGS operations. With farmers, advanced training would be provided on integrated land to improve crop planning, water management, farming intensity and yields, environmental management, soil and soil moisture management, adapting to climate change, etc. Producer groups operating in project areas would be supported through incremental training on market potential and access, improving post-harvest practices and value addition, etc. building on options identified under component 2 for crops. Awareness training would be provided to participating communities through women's groups (Self-Help Groups) on other government programs and schemes for agriculture, horticulture, livestock, etc. For production and post-harvest aspects, more specific support to horticulture would be provided through Component 4. The sub-component would also finance highly targeted exposure visits by community members to other villages across project areas and to other sites in the state.

21. At the state level, the sub-component would build institutional capacities in implementing and partner agencies for the project. Communication equipment would be provided to farmer contact centers to support more effective technology transfer. Technical and management staff

³⁷ As an example, the State Bhoochetana scheme aims at increasing yields in rain-fed and dry land areas through micro-nutrient soil testing and extension support for better soil and water conservation. The scheme has its origins in the Sujala project, where it was implemented by ICRISAT, and considerable production gains were achieved in on-farm demonstrations.

would be supported for study tours within India and overseas to selected countries to share appropriate experiences. Technical and management staff would be supported for study tours within India and overseas to selected countries to share appropriate experiences. This would include exposure visits supported by the Bank's South-South Knowledge Exchange around key topics of mutual interest. A training program would be developed for WDD headquarters staff on planning processes and tools for integrated watershed management. These approaches were used with great success in the earlier Bank-supported Sujala watershed project, and form an important part of management capacity building. There would also be support to program management through training to strengthen the development of in-house M&E systems in WDD – which would complement 3rd party and community-based M&E activities under IWMP. An important part of this work would be to support strengthening of the MIS system for IWMP within the WDD. Specialist technical agencies would provide inputs.

3.2 Infrastructure improvements

22. The project would finance upgrading of existing training centers servicing key project areas, and strengthening of management information systems, computer facilities, communication systems, and internet access to provide improved training support to project beneficiaries.

Component 4. Strengthening Horticulture in Rainfed Areas

23. Horticultural crops provide excellent opportunities to raise the income of the farmers even in the dry tracks. Building on the successful experience of Sujala-I, production and productivity improvement, the project would finance direct market linkage and value chain support activities through: i) establishment of demonstrations on dry land production technologies for annual and perennial crops, nutrition gardens, improving the water management practices, crop diversification and crop-soil-water relationship for productivity improvement in horticulture crops; ii) facilitating farmers to carry out soil, water and leaf analysis to identify nutrient deficiencies and to make amendments for maximizing production through creating facilities for testing, training and demonstrations; iii) facilitating farmers in availing quality seed and planting material; iv) supporting horticulture farmers to improve post-harvest handling and marketing of the produce by establishing suitable facilities and demonstrations of latest technical know-how and; v) building innovative knowledge by installing studies to assist the farmers in crop diversification and participatory value chain. Dissemination of research knowledge to farmers would be through field demonstrations, assistance to procure low-cost equipments, and organizing programs for farmer groups or Sanghas. The project would also support upgrading the DoH to build improved service support systems and incremental costs for specialist staff, travel, equipment and materials, etc.

24. The project would support increasing the coverage under new and high yielding plantations, rejuvenation of old and senile orchards and establishment of nutritional gardens as per the land-use capability. It would also finance building the knowledge base and assisting the farmers through training and demonstrations on new practices and packages suitable for rainfed areas will be taken up on priority. Farmers in micro watersheds will be mobilized to adopt collective approach for harnessing the benefits of scale up production, as well as better post

harvest and value addition practices. The integrated nutrition and pest management will be the major component of management practices. The project has programs to provide incremental management support and training by complementing the current interventions to improve productivity of existing perennial and annual crops and promote diversification through building the capacity of farmers. The sectoral staff would organize the horticulture farmer groups in the watershed areas and will be trained on input production on farm, skill development in dry land horticulture production technology, post harvest handling and establishment of direct market linkages including value additions.

25. The project planning and implementation will be concentrated broadly on the following four areas:

1. Extension and demonstrations to Farmer Groups on annual and perennial horticulture crops, nutritional gardens and crop water management.
2. Establishment of soil, water and leaf analysis facilities and monitoring the nutritional status through training and capacity building programs.
3. Strengthening post-harvest management, marketing and value addition through technical support by instituting the studies for generating scientific know how.
4. Strengthening horticulture sector through service support for meeting the above requirements.

4.1. Extension and Demonstration for Productivity Improvement

26. The productivity of horticultural crops in dry land areas is generally low as farmers are adopting low investment cropping systems to avert the risk of crop failures. This sub-component would build capacity of farmers, individually as well as in groups by providing the required production package and practices for perennial and annual crops. The design of these interventions would follow the schedule of training, demonstrations on adoption of Good Farming Practices (GFP) including integrated nutrition, pest and disease management, in-situ water conservation, weed control, intercropping, organic mulching for conserving moisture and enriching soil fertility. Better management of rain water and adoption of GFP for sustainable production of safe and nutritional food would be taken up through demonstrations with perennial and annual crops in farmer's fields and establishment of nutritional gardens in public schools. The sub-component would also support field days, training facilitators, and development of crop specific literature to provide horticulture farmers with suitable reference material on productivity improvements.

4.2. Farmer Horticulture Soil and Crop Monitoring

27. Testing the soil for nutrient deficiencies and taking appropriate measures to maintain soil health and fertility on regular basis is a critical part of sound nutritional management programs for horticultural crops. To overcome such practices, build capacity of farmers to take timely decisions, and suggest application of nutrients based on appropriate scientific knowledge, the sub-component would establish laboratory facilities for soil, water and leaf tissue analysis and support farmers in accessing these services. The DoH staff will coordinate testing and analyzing soil and plant nutrient status, and suggest suitable quantity of nutrients to maintain a good health of crop-soil-humus ratio. Farmers would be provided with low cost in-situ soil and water testing equipment and trained on the use of such equipment in the field.

4.3. Strengthening Model Nurseries:

28. Seed and planting material are an integral component of good horticulture harvest. Farmers in rainfed areas are generally deprived of the required planting material in the right season, resulting in crop loss. In order to bridge this gap, the sub-component will strengthen model horticulture nurseries of the DoH for production of seed and planting material required in the project micro-watersheds.

4.4. Post Harvest Management:

29. In India, large quantity of fruits and vegetables are lost due to lack of scientific harvest and post harvest handling facilities and practices and the loss is estimated at 30 percent of the quantity produced. Farmers often resort to distress sales of produce due to inadequate storage and processing facilities. Tomato, onion, chilli and potato growers are frequent victims of inadequate post harvest and market linkages in the state. The sub-component would support farmers to adopt more effective harvest and post-harvest handling practices for different horticulture crops grown in project areas.

30. In order to assess and recommend processing requirements for horticultural crops grown in the project area, the sub-component would finance studies by public and private sector experts. The results of the studies would be demonstrated through establishment of small-scale, model post-harvest handling infrastructure facilities like pack houses, low cost storage structures/preservation units, pre-cooling units, fruit ripening units, and primary/ minimal processing units.

4.5. Providing Market Linkages to Horticulture Farmers:

31. Horticulture farmers, particularly small and marginal farmers, are often at the mercy of middlemen for marketing their produce; direct access to consumers is limited. This sub-component would support the establishment of Horticultural Farmer Producer Companies (PCs) in project areas, registered under the provisions of the amendments brought to Companies Act 1965 of India. These organizations would assist member producers from seed to value chain management of agribusiness enterprises. The sub-component would finance appropriate infrastructures for each PC, staffed by DoH officers. The PC members would be trained on sustainable utilization of natural resources, production of inputs on farm, post harvest management and marketing of horticulture produce. Further, the sub-component will facilitate bringing both farmers and market functionaries to a common platform wherein produces and market functionaries' relationships would be strengthened through establishment of scientific collection/aggregation centers and dissemination of market and value chain information.

4.6. Horticulture Service Support

32. Component 4 is aimed at improving the production, increasing productivity, and minimizing post-harvest losses in the horticulture sector in project areas. To achieve these goals, a dedicated Project Monitoring Cell (PMC) would be established at the Directorate of Horticulture in Bangalore and project offices at district levels to function as an extended arm for implementation and monitoring of component activities. This sub-component will support incremental costs within the DoH, including positioning of staff at the PMC, procurement and financial management, equipments, transport, office space, technical services, and capacity building of staff.

Component 5. Project Management and Coordination

33. The component would ensure effective and efficient project management. It would support the WDD project management unit to put in place appropriate incremental human resources, deliver necessary management and coordination activities, including financial management and procurement, and to provide project-specific M&E to ensure effective implementation of activities, and achievement of expected outputs and outcomes from the project. Support would be through three sub-components.

5.1 Project management and coordination

34. The sub-component would support incremental specialized technical staff (both full and part-time) in headquarters and field offices, covering various fields including agriculture, hydrology/meteorology, GIS/MIS, environment, training, documentation, procurement and financial management, and legal services. These staff would be mainly located in the support cells at the state level, which would support the PPMU and in the augmented DWDTs (see Annex 3 on Implementation Arrangements). The sub-component would also support incremental administration costs including field travel, communications and equipment such as rental cars, computers, office furniture, etc, to support overall project implementation. The sub-component would cover costs of external audits and other relevant financial management activities. It would also support the setting up and maintenance of a project website (built into updated the existing WDD website) and other project information material. The project would have a comprehensive communication and review strategy to ensure wide awareness about the project purpose and lessons, and ensure stakeholders engage in the continuous improvement of the project. This would have include specific information events and workshops, but largely build on the projects M&E and learning system and products, as well as a wide range of knowledge products arising from the research and development component.

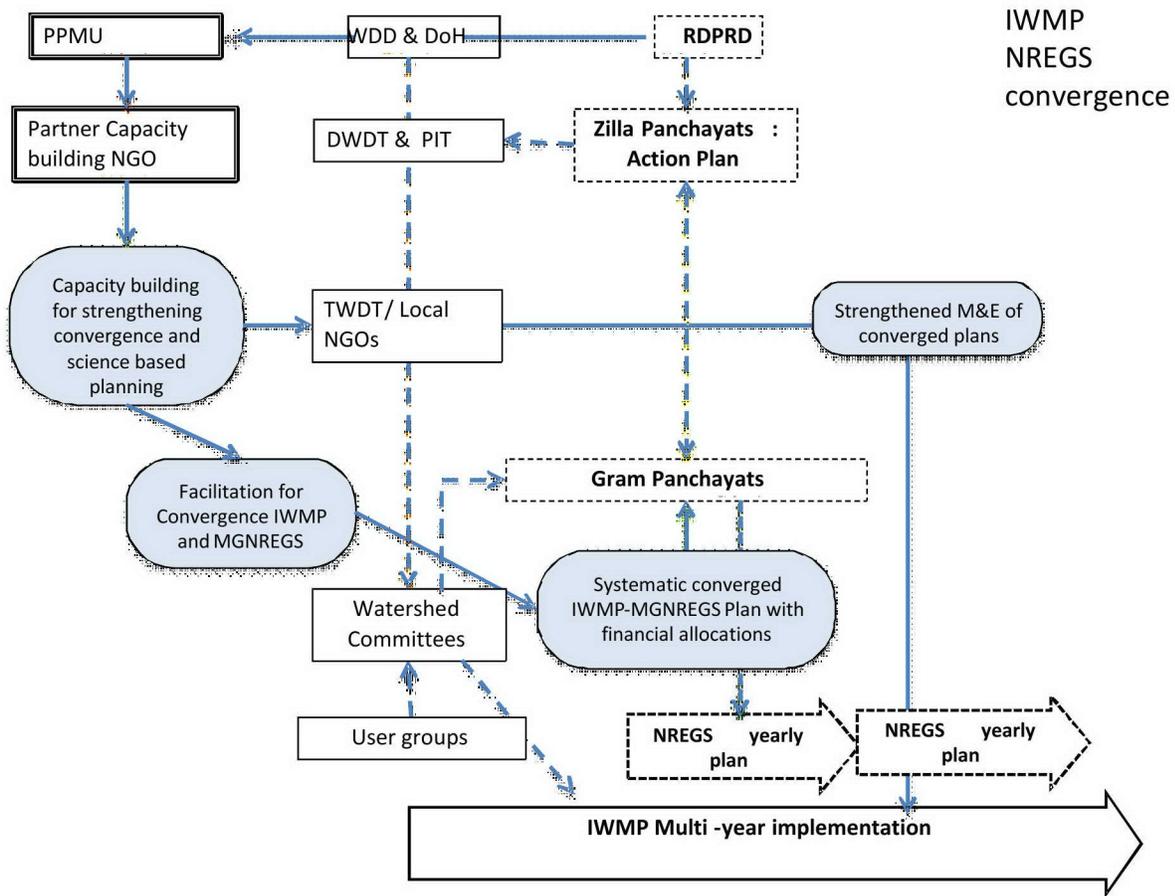
5.2 Financial management and procurement

35. The sub-component would support consultancies for financial management, procurement, and internal audit to augment internal WDD capabilities and systems. Costs for staff training in Bank procurement and financial management would also be supported.

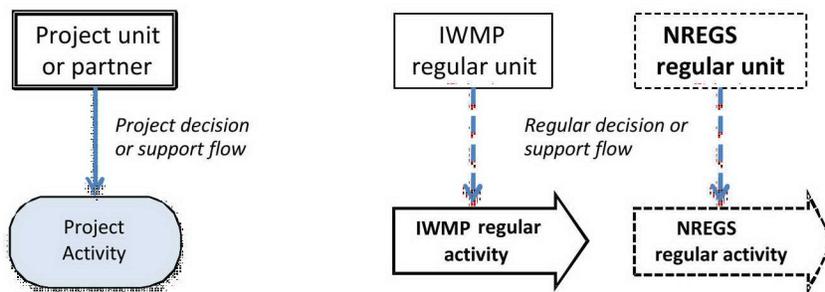
5.3 Project monitoring and evaluation

36. The sub-component would finance the incremental 3rd party monitoring and evaluation requirements relevant to project activities specifically, complementing the overall M&E system operating under IWMP, which in turn would be further strengthened under component 3.2. The M&E system would consist of the following elements (for more details see Annex 3): baseline studies; ii) concurrent progress monitoring; iii) process monitoring and pathway analysis; iv) results monitoring, including performance assessments, with regular local and state project planning and review workshops; v) participatory monitoring and evaluation; vi) thematic studies and case-studies, with learning and policy oriented workshops; and vii) impact evaluation. Input-output monitoring and regular reporting would be supported by a web-enabled computerized MIS which would be an integral part of the M&E system, wherever necessary integrated into the overall WDD MIS systems.

Figure A2-1. Flow of project support in relation to IWMP and NREGS processes



Legend and acronyms:



- WDD Watershed development Department
- PPMU Project Planning and Management Unit
- RDPRD Rural Development and Panchayat Raj Department
- IWMP Integrated Watershed Management Programme
- MGNREGS National Rural Employment Guarantee Scheme
- DWDT District Watershed Development Team
- TWDT Taluka Watershed Development Team
- GPs Gram Panchayats
- DoH Department of Horticulture
- PIT Project Implementation Team

Technical Annex 3: Implementation Arrangements

1. Project institutional and implementation arrangements

Introduction

1. The Watershed Development Department (WDD) under the GoK will be the lead project implementing agency and be responsible for ensuring that the project development objectives are met. The Department of Horticulture (DoH) will implement component 4 (Horticulture). The project would largely be implemented through the existing structures of the IWMP and for local agricultural extension. Convergence with NREGS would be implemented at District and Taluk levels through local governments, with a key planning role played by the GPs.³⁸

Project Oversight

2. The Project Empowered Committee (PEC) at the apex level will guide, monitor and supervise the implementation of the Bank project. The PEC is chaired by the Additional Chief Secretary, and Development Commissioner GOK. In view of the extended requirements for broader sector integration and convergence with NREGS, under the project the PEC would be constituted with the Secretaries of Agriculture, Horticulture, Planning, Finance, Animal Husbandry, Rural Development and Panchayat Raj plus the Additional Principal Chief Conservator of Forests. The PEC would also include the Vice-Chancellors of SAUs Director of Mines and Geology and Line Departments representatives. There would also be representation by civil society experienced in participatory and integrated watershed management, as well as the private sector with successful experience in agriculture value chains in rainfed areas. The Commissioner - WDD would be the member Secretary. The PEC will coordinate with the SLNA which monitors the IWMP.

3. The PEC would provide overall guidance on policy aspects relating to watershed development, integration between departments, and on convergence. The PEC would review progress and approve yearly plans and budgets, and provide policy guidance. It would also look into mid-course correction, and issuing guidelines for smooth implementation of the project. This would complement the ongoing IWMP responsibility of the PEC to approve the perspective and strategic plan for watershed development on the basis of block and district plans. The PEC presently also acts as a link between the state and the Central Nodal Agency at GOI level for appraisal and clearance of watershed programs, and would thus provide a channel to raise wider policy issues relating to the project. Also, the PEC has the powers of the State Cabinet in matters relating to financial and administrative sanctions, recruitments, and entrustment of works and assignments. It would approve the overall annual implementation plan, and procurement of goods (by the line departments) exceeding INR 10 million (US\$217,400), and works and services (required by the line departments) exceeding INR 1 million (US\$21,739).

³⁸ Refer to attachment 2 to this annex for flowcharts of implementation arrangements for the overall project and for each component.

Project Management

4. At the state level, a **Project Planning and Management Unit (PPMU)** would be set up within the WDD and assume direct responsibility for project management. The Commissioner - WDD in Bangalore would be the Project Director responsible for overall project implementation and reporting. For effective day-to-day coordination of project implementation, the Commissioner would be assisted by a full-time Executive Project Director, designated and paid for by the WDD. The members of the PPMU would be the sectoral heads of Agriculture, Forestry, Horticulture and Animal Husbandry in WDD headquarters, the Director of Mines and Geology, Director of Horticulture (Department of Horticulture), Director of NREGS as well as Director of the Disaster Management cell GOK would be members. An expert on groundwater would also be a member. The Executive Project Director would be the member Secretary.

5. The PPMU would take the lead role in planning, coordination and monitoring of project performance in line with the project implementation schedule, and facilitate regular decision making for implementation of various components of the project, and be responsible for inter-institutional coordination. It would also ensure resources are budgeted, oversee all project procurement, manage disbursements, and ensure that project accounts are audited. Specific responsibilities of the PPMU would be:

- Ensuring timely implementation according to the Project Implementation Plan (PIP) and according to the specifications of the Project Implementation Manual (PIM);
- Preparing annual work programs, budgets, annual procurement plans and providing quality control;
- Preparing procurement packages and overseeing the technical quality of contracts;
- coordinating and providing technical support to field implementation teams at in pilot Districts;
- Informing, supporting, coordinating and interacting with key project partners, and ensuring key stakeholder participation;
- Coordinating and reporting on the results of monitoring and evaluating all aspects of project input, outputs and outcomes, and facilitating the learning process of the project;
- Implementing and monitoring project risks and accountability mechanisms;

6. The detailed financial management and procurement arrangements are described in Section VI C and D, and later in this Annex. The PPMU would approve procurement of goods by the WDD and DoH up to INR10 (USD217, 400) million, and works and services required by the WDD and DoH up to INR1million (USD21,739). The WDD and DoH would develop agreements with respective agencies for the handover and ownership and maintenance of any equipment purchased under the project.

7. The Executive Project Director would be supported by: i) a project technical cell (PTC); ii) a Research and Extension Cell (REC); and iii) a Financial Management and Procurement cell (FMPC). The PTC, REC and FMPC would in turn be supported by specialist consultancies in the development of appropriate management systems and related training to ensure PPMU staff can deliver their required tasks.

8. A **Project Technical Cell (PTC)** would be established in the WDD and comprise of experts in hydrogeology, groundwater, agriculture meteorology, agriculture engineering, economist, an M&E specialist, and GIS/MIS and documentation support. This cell would assist the WDD and PPMU in dealing with the day-to-day technical aspects of project implementation. The PTC would have responsibility over coordinating with technical agencies and universities on technical matters for integrated watershed planning and monitoring and hydrology, and ensuring their outputs are useful to District, sub-watershed and micro-watershed teams. It would work closely with the research and extension cell (see below) for integration of research and development products into the IWMP planning processes. It would also be the unit primarily responsible for overseeing the project M&E and reporting.

9. A **Research and Extension Cell (REC)** would be established under the PPMU to coordinate all aspects of research and extension. The REC would guide and coordinate project activities relating to delivering research outputs, technology transfer and strengthening local institutions. The REC would be headed by a senior research technical advisor, with two deputized experienced staff from the Department of Agriculture: from the Planning unit for research, and from Extension and Training for extension. Additionally an officer from the Department of Horticulture would be assigned to this cell. A training coordinator and documentation officer would support them. The REC would be responsible for the overall management guidance for a competitive research process (see Attachment 1 for details), advising on the procurement of contracted research agencies, facilitating coordination and partnerships with research agencies, universities, and government departments, capacity building NGOs and private sector; and provide quality assurance and evaluation of research products and their use, and ensuring links to technology transfer and dissemination (mainly delivered under component 3). As there would be a considerable number of training packages to be developed and delivered, the REC would be supported by a lead NGO specialized and experienced in agriculture research/ training and participatory extension.

10. **Financial Management and Procurement Cells (FMPC)** would be established in the WDD and DoH under the PPMU for financial and procurement control and reporting of the project. The project would have a full time qualified Financial Manager at State level staff in each of the seven project Districts, including dedicated staff to assist with the accounts under the horticulture component. Financial management and procurement consultants would be hired on consultancy/staff basis to assist the PPMU in designing, establishing, and monitoring the FM systems, software installation, and processes for handling finance and procurement issues under the Bank project.

11. **Project management at District to community level.** At District and Taluk levels the project would provide support staff, training and equipment to build capacity and strengthen the arrangements already in place, mainly the existing DWDTs and WDT under the IWMP. The REC supported by outsourced specialized NGOs would build capacity of existing agriculture and horticulture extension units, especially RSKs (more on these below), so that the local units can access and use a greater range of information products, decision tools, and manage field demonstrations.

Component arrangements and project partners

12. The PPMU would be working with a range of project partners and existing institutional systems across the different components.

Component 1. Improved Program Integration in Rainfed Areas

13. The WDD would develop Memoranda of Understanding (MOUs) with the State level branches of the National Bureau of Soil Survey and Land Use Planning (NBSS-LUP) and Indian Institute of Science (IISc), two national level mandated and highly experienced technical agencies in the fields of land use and hydrology. They would advise and oversee the adaptation and use of technical decision tools, GIS databases, monitoring systems and the gathering of soil and land use information. The IISc would develop of an information infrastructure and adaptation of existing scientific decision making tools and models that would inform sub-watershed assessment and integrated micro-watershed planning. These activities would be started early in the project, particularly for the field soil and land use survey. The adaptation of decision tools would start with an independent review of existing decision tools and models available worldwide under similar environmental an institutional contexts, and an assessment of the capacity to use them in the state.

14. On a contract basis, the NBSS-LUP would set up an information infrastructure on a GIS platform, which would be distributed over four regional university centers. The NBSS-LUP would provide training and guidance to these centers to facilitate local information input and processing. The regional universities would also be part of regular monitoring of physical soil and hydrological parameters (see sub-component 2.2). The PPMU, with the advice of NBSS-LUP and IISC, would purchase the necessary equipment, software and data. The NBSS-LUP would receive institutional charges under Indian Centers for Agricultural Research (ICAR) norms for rendering the above services.

15. For piloting sub-watershed assessments the PPMU/PTC would work closely with the NBSS-LUP and the DWDTs, using thematic maps and tools developed through the above activities, and further processed into user-friendly tools (under subcomponent 2.3 on technology transfer). For this work, the DWDT would have would have expanded membership from the District Geologist (Department of Mines and Geology). The DWDT would also be provided additional training and technical support from a specialized contracted agency (familiar with the use of hydrological models), and an experienced NGO to provide stakeholder facilitation.

16. The PMC-Horticulture (DoH) will actively coordinate with the WDT at sub-watershed level in terms of watershed assessment, prioritizing research and development issues, identifying land-use potential for horticulture, generation of a land-use plan in collaboration with technical partners, and its community approval. During this process, the PMC-Horticulture (DoH) will identify potential farmer groups to constitute Producer Companies, HOPCOMS, etc, and develop suitable capacity building modules for these identified farmers. In this process, both the WDD and DoH will strive to integrate horticulture into the sub-watershed participatory plans as a means of land-use change beyond subsistence agriculture. The PMC-Horticulture (DoH) will implement the participatory watershed plans under component 4 as far as it concerns development of horticulture in project watersheds. The master plans will have community

approval in the IWMP process and DoH will implement them as component 4 activities. The PPMU will monitor the implementation of the sub-watershed master plans for IWMP covering all sub-components and activities including horticulture, agriculture, forestry, water, etc.

17. The PTC would lead the transition to more integrated micro-watershed planning and participatory monitoring. The PTC would coordinate closely with the technical agencies involved in developing decision support tools and rainfed agriculture information systems, the lead training NGO, and the watershed development teams. The PTC would carefully plan, pilot and monitor a program of testing new tools and processes in the first batch of MWS, engage stakeholders closely in review of these at mid-term and identify changes and refinements. To facilitate capacity building for this activity, there would be a cascade of trainings overseen by the experienced lead NGO, which would develop an incremental training program to the IWMP to be delivered to the expanded DWDTs. The lead NGO would also train WDTs and local NGOs hired under the IWMP to support watershed communities. For community monitoring of surface and groundwater levels the PPMU would procure simple equipment for use by community members, which would be owned and maintained by the WDD.

18. With regards to convergence between IWMP and NREGS, the WDD/PPMU would establish agreements through the RDPRD for the process of piloting and implementing convergence models. For the project areas, the RDPRD has already issued a GO to channel NREGS funds for watershed interventions through the WDD and the PPMU. The main objective of program convergence would be to ensure NREGS-financed soil and water conservation works are targeted in the right areas as per the micro-watershed master plan, and that the works are of similar quality as with IWMP.

Component 2. Research, Development and Innovation

19. Under this component, the PPMU/REC would be responsible for setting up close collaboration between with local universities and research organizations, in particular the three Universities of Agricultural Sciences (UAS) and the Horticultural Sciences and other Indian Council of Agricultural Research (ICAR) institutions currently working in partnership with the Department of Agriculture. It would also ensure collaboration with other research institutions in India, such as International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT, under the CGIAR), and where local/national expertise is not available, from specialized research institutions and researchers overseas.

20. For implementing research under this component, the project would build on existing agricultural research identification and funding processes in the DOA. This includes District level bi-monthly workshops, and bi-annual Zonal Research and Extension Advisory Council (ZREAC) meetings in each of the regions, both of which involve university research and department extension staff. The DOA also has a Research and Development Scheme for funding research, directed towards the three UAS Institutions. The project would complement these processes through a more competitive research process (see attachment 1 at the end of this annex for details). This would augment the resources dedicated to rainfed agriculture and the range of stakeholders involved with specific interests in watershed management. For example, the REC would ensure that the private sector, NGO and community representatives form part of the identification and selection process.

21. For the piloting of advanced, integrated, hydrological monitoring, the IISc through a consultancy would advise the PPMU on the purchase of equipment across the project and in one micro-watershed where best practice monitoring methodology would be demonstrated, which can be scaled up in the project areas. They would use the pilot experiences to train the three UAS institutions in rolling out the advanced system in 13 carefully selected micro-watersheds across all seven project Districts. There would be close coordination on hydrology and groundwater monitoring through the Department of Mines and Geology, which has an existing low density network of groundwater monitoring points. An MOU would be made with the Karnataka State Natural Disaster Monitoring Centre (KSNDMC) under the State Department of Science and Technology, for processing and sharing of data on for agro-climatology, which this component would generate.

22. For technology transfer specialist technical agencies, closely coordinated by the PTC, REC and working in consultation with DOA and end-users, would be contracted to develop information decision tools for end users. For prioritizing and coordinating field demonstrations and field schools for the adoption of new technologies, the REC would coordinate closely with the DOA's and UAS field research and extension processes mentioned above. The REC would ensure that extension units such as district agriculture offices and particularly RSKs and KVKs in project watersheds are closely involved to feed research results into the extension training programs (under component 3).

23. The RDPRD would be closely involved in the selection and implementation of research studies related to IWMP/NREGS convergence under component 2, in the drafting of mechanisms for close coordination with local government at District level and with GPs, and in the development of appropriate training modules

Component 3. Institutional development

24. The REC would plan, oversee and monitor the comprehensive needs identification, training and exposure program for the project stakeholders, both for State, District and field level. They would do this with assistance of a contracted training agency, most likely an NGO with extensive experience in participatory watershed management and agricultural extension. Karnataka has some of these NGOs with nationwide and even worldwide repute. Management specialists would be hired for strengthening the WDD management and M&E systems, including the upgrading of the WDD's existing MIS system.

25. In terms of strengthening extension systems and outreach to rainfed farmers, the REC would build strengths and links of the existing agriculture extensions system. This would be coordinated with the District Agriculture Training Centers through the KVK under the Agriculture Universities found in most Districts, but particularly the RSKs (or Farmer Contact Centers) which form the main field extension units of the DOA, which are located at the Hobli level. The RSKs are managed by the Agriculture Officer at the Taluk level, and form a contact point for farmer facilitators and farmer groups for agriculture inputs, information on agriculture schemes and technologies. One farmer facilitator, with an allowance from the DOA, provides support on technologies and advice on schemes to farmers in an area of 500 ha, roughly

equivalent to a micro-watershed³⁹. These farmer facilitators would be provided further training on integrating agriculture and watershed activities, and guidance on accessing the knowledge products developed under the project. While the RSKs would have IT upgrading under separate DOA funds, the PPMU would contract a consultant to work closely with the REC and extension units to develop interactive kiosks on a pilot basis, which extension agents and farmers can use to access a range of information. Based on the utilization and feedback on the kiosks, these kiosks would be rolled out in the second phase project micro-watersheds.

Component 4. Horticulture

26. At the state level, the Director - DoH in Bangalore would be responsible for overall project planning and monitoring of the horticulture component 4. The Director-DoH would nominate a horticulture expert to the REC in WDD, who would be supported by technical staff specialized in horticulture crop planning and production, and post-harvest handling. Overall financial management and procurement for this component would be handled by the FM and Procurement Cells in DoH. The project would recruit accountants at state and district level to assist with the additional reporting and fund processing under this component. At district and field level, additional horticulture staff would be assigned within DWDT and WDTs for managing field activities. Extension activities would be coordinated through the RSKs shared with the DOA extension system.

27. The implementation of horticulture activities in component 4 will be monitored by an exclusive Project Monitoring Cell (PMC) headed by a Project Coordinator under DoH at State level, and the cell will ensure the flow of technical support to Districts and micro-watersheds through the WDTS. The PMC will also facilitate coordination of post-harvest and marketing support to micro-watersheds and ensure the convergence of departmental programs with that of IWMP. The PMC will also be responsible for getting the studies conducted on marketing and related subjects including concurrent evaluation of the project.

28. At District level, horticultural activities will be implemented by the Project Implementation Team (PIT) headed by a Project Officer and the supporting staff. The PIT will establish close coordination with the DWDTs at District level and the WDTs at Taluk level under IWMP and the RSKs (Farmer Contact Centers).

29. Partner Institutions. The Indian Institute of Horticulture Research (IIHR), Bangalore; University of Horticultural Sciences, Bagalkote; and KVKs in the jurisdiction of the concerned districts would be taken as technical partners for strengthening the knowledge under component 4. Through KVKs and RSKs they would provide support to farmer extension in improving the horticulture productivity and reducing the post harvest losses including value addition and better market linkages. The Technical modules required for training and demonstrations for various horticultural crops on production, harvest and post harvest management including marketing aspects would be developed by outsourcing the services of competent agencies at State level.

³⁹ They are provided 4500 Rs /mo during main planting seasons, particularly under the Bhoochetana scheme for rainfed areas, which is based on a model developed under Sujala I.

30. The services of a competent NGO experienced in extension and strengthening of farmer institutions would be outsourced for training and capacity building of horticulture based farmer groups (Sanghas) proposed to be established in some of the micro watersheds. The REC together with the DoH would develop agreements and contract with various private and public sector partners engaged in post harvest management of horticulture produce would be linked to the project sites for providing technical guidance and market support in particular to the HOPCOMS. Any demonstration materials or equipment under this activity would be procured by the PPMU on behalf of the DoH who would maintain it.

2. Financial Management, Disbursements and Procurement

A. Financial Management

31. **Implementing Entity and Implementation Arrangements:** Watershed Development Department (WDD) and Horticulture Department (DoH) of Government of Karnataka (GoK) would be the implementing agencies for the project. The Project Directors would be assisted by Chief Accounts Officers (CAO) of respective department who would be responsible for all matters relating to project financial management.

32. **Budgeting: WDD:** The proposed IDA funds would flow through budget head 2042-00-800-0-80 Sujala Watershed Project III – Externally Aided Project (EAP) which has been created. To capture DWDO-wise flows the project would work with State Treasury to create DDO wise codes which would help in providing funds through treasury to these offices directly as well as account for the expenditure based on bills submitted in the Treasury. This action needs to be carried out within three months of effectiveness.

33. **Budgeting: DoH:** The proposed IDA funds would flow through budget head 2401-00-800-2-80 Sujala Watershed Project III – Externally Aided Project (EAP) which has been created and an allocation of INR 10 crores has been made for the FY 12-13. To capture Horticulture division expenditure, the project would work with State Treasury to create Project Officer (Horticulture) (POH) wise codes which would help in providing funds through treasury to these offices directly as well as account for the expenditure based on bills submitted in the Treasury. This action needs to be carried out within three months of effectiveness

34. **Fund flow:** WDD and DoH would use the treasury system for all payments. The budget allocation at the state level would be done for the project by Finance Department (FD) and the sub-allocation for the divisions would be done by the respective department (i.e. WDD/ DOH). For operating the budget head, POH are to be provided authorization, for which a G.O. needs to be issued by the Finance Department (FD). For DWDOs, the G.O. has been issued. This action needs to be carried out within three months of effectiveness. Once this authorization is provided, DWDOs/POH can access the funds directly from the state budget which would reduce the time in funds transfer.

35. **FM Staffing and capacity building:** WDD: The FM unit in WDD would be headed by the CAO who would be a senior Karnataka State Accounts Department (KSAD) officer. The CAO would be supported by accounts and audit officers from KSAD. Apart from them, the

project is expected to appoint two commerce graduates (with experience in computerized accounting) after effectiveness at Head Office (HO) level. The detailed staffing structure would be outlined in the FM Manual. In case of DWDO office, one commerce graduate (with experience in computerized accounting) for each office would be appointed within three months of effectiveness.

36. **DoH:** The FM cell in DoH would be headed by the CAO who would be a senior Karnataka State Accounts Department (KSAD) officer. The CAO would be supported by 2 accounts staff from KSAD. Apart from them, the project is expected to appoint one commerce graduates (with experience in computerized accounting) after effectiveness at Head Office (HO) level. The detailed staffing structure would be outlined in the FM Manual. In case of POH office, one accounts staff from KSAD and one commerce graduate (with experience in computerized accounting) for each office would be appointed within three months of effectiveness.

37. **Accounting System:** WDD and DoH: The project funds would be accounted for separately by WDD and DoH. Separate cashbook and ledger accounts would be maintained by the WDD and DOH for the IDA funds activity to record utilization of funds. The overall accounting for expenditure would be carried out by treasury while the details of the expenditure would be maintained by the HO and DWDO (in case of WDD) and POH (in case of DoH). All the accounting locations would be having separate cashbook to record the project expenditure. The accounting would be carried out using a common chart of accounts. The project accounts would initially start with maintaining a manual cashbook and the need for computerized accounting will be assessed at the end of six months. If necessitated, TALLY software for project accounting will be rolled out as a pilot in HO and thereafter at other reporting/accounting centers.

38. **FM Manual:** For WDD and the DoH, the revised draft FM manual has been submitted to the Bank and has been reviewed and comments provided. The final manual would be formally agreed during negotiations.

39. **Report based disbursement:** Interim unaudited financial reports (IUFRR) based disbursement would be followed for the project which would also be used for reporting and financial monitoring. IUFRR shall be submitted to the Bank on a quarterly basis within 45 days from the end of the quarter. The IUFRRs would disclose receipt and utilization of project funds (both Bank share and counterpart contribution) and would be based on project accounts and would be reconciled with the project accounts prior to submission. In addition, the IUFRRs would provide contract wise payments. The IUFRR format has been developed and would be formally agreed during negotiations. In terms of disbursement, WDD and DoH would first spend from the budget and then claim reimbursement from the Bank. All expenditures reported in the IUFRRs would be subject to annual project audit. For the DoH component, the IUFRR formats needs to be agreed and finalized with the office of DoH by negotiations. In terms of procedure, DoH would submit its IUFRR to WDD which would further consolidate and submit the final IUFRR to Bank. All expenditures reported in the IUFRRs would be subject to annual project audit.

40. **External Audit:** The annual audit of the Project Financial Statements (PFS) would be carried out by state office of the Comptroller and Auditor General of India (CAG). The PFS in an

agreed format would be subject to audit by the CAG under Terms of Reference (TOR) already agreed between the Bank and CAG. All supporting records and documents under the project would be subject to this audit. The PFS would summarize all receipts and expenditures reported in the IUFs. The annual audit report would consist of i) annual audited project financial statements ii) audit opinion and iii) management letter highlighting weaknesses, if any, and identifying areas for improvement. The annual project audit report and accounts would be submitted to the Bank by September 30 each year. Any difference between the expenditure reported in the IUFs and those reported in the annual project audit reports would be analyzed and those expenditures which are confirmed by the Bank as being not eligible for funding would be adjusted in the subsequent disbursements.

41. The following audit reports would be monitored in the Audit Reports Compliance System (ARCS):

Implementing Agency	Audit	Auditors	Due Date for Audit Submission
WDD	Project Financial Statement	CAG	30th September (6 months after the end of each fiscal year)
DoH	Project Financial Statement	CAG	30th September (6 months after the end of each fiscal year)
DEA/ GOI	Designated account	CAG	30th September (6 months after the end of each fiscal year)

42. **Internal Audit:** Internal audit would be an integral part of the project design and would cover all activities under project to be carried out by WDD and DoH. The internal audit would be carried out by a Chartered Accountancy (CA) firm. The Terms of Reference (ToR) for the internal audit would cover review of aspects covering internal controls and contract management. The auditors would be appointed based on selection criteria agreed with the Bank, which would be finalized by negotiations. The auditor would be appointed within twelve months from effectiveness. The half yearly audit reports along with the compliance would be shared with the Bank. Also the project would constitute an audit committee at the HO level which would review all the audit reports and follow up on the action taken.

43. **Internal Control:** All financial controls applicable to routine GOK expenditures would also apply to the expenditures under the project. All payments would be approved/ vetted in accordance with the schedule of powers in place for WDD and DoH. All project related receipts and payments/ withdrawals would be reconciled with periodic Treasury Statements.

44. **Producer companies Component:** DoH proposes to establish approximately 75 Producer Companies (PC) under this project. DoH would support creation of PC under the project through facility improvement, civil works, and establishment of the companies by assisting them in registrations and providing training to staff of these companies. All the funds under this component would be spent by DoH and designated project officers. It has been confirmed with the project that this component will not on-lend any money to these PC for further grants to the producers.

45. **Disclosure of information:** WDD and DoH would be hosting their project audit report on their respective website.

46. **Action plan for FM:** The following action plan has been agreed with the client:

Actions	By Whom	By When	Status
DDO wise heads to be created in budget GO to be issued for assigning DWDO and POH as DDO	WDD and DoH	Within 3 months of effectiveness	WDD: The G.O. has been issued. In the case of DoH, it is in progress.
FM Staffing	WDD and DoH	To be appointed after effectiveness	
Final FM Manual	WDD and DoH	By negotiation	Final FMM submitted and approved by Bank
IUFR Formats	WDD and DoH	By negotiation	Final format developed and agreed with Bank
Appointment of internal auditor	One CA firm for WDD and DoH	Within 12 months of effectiveness	

47. **Adequacy of FM Arrangements:** For this project, there are two implementing entities with simplified implementation arrangements, and funds are not transferred to communities or other departments. From an FM perspective, the project is simplified and totally based on the State government existing systems. The FM risk rating for the loan is currently rated as “Moderate”. Overall, the financial management arrangements at WDD and DoH after taking the above-indicated steps may be considered adequate to support the use of funds under the loan.

48. **Supervision:** The supervision would be limited to half-yearly supervision as the risk level is Moderate. In the initial year, frequent visits would be made to ensure that the accounting system is setup and the required output is being derived from the system. Once the system is established, then more desk reviews with half-yearly missions should be sufficient. Further, if any future requirements arise in the field to strengthen the FM/reporting arrangements, then field visits would be carried out based on the facts and issues. In the first year, two to three weeks of FM involvement is expected.

B. Disbursements Arrangements:

49. Applicable disbursement methods include: Advance, Reimbursement and Direct payment. A Designated Account (DA) would be maintained in the RBI for the project and would be operated in accordance with the Bank’s operational policies. The ceiling of advance into the Designated Account would be \$ 3 million. The project would submit withdrawal applications supported by IUFRs to the Controller Aid, Accounts and Audit (CAA&A) in DEA for onward submission to Bank for replenishment of the DA or reimbursement. The Bank would replenish DA equivalent to the amount claimed on eligible expenditure by the project and as reported in the IUFRs.

50. Disbursements would be made based on quarterly Interim IUF⁴⁰ submitted by the project. These IUFs would reflect the actual expenditure for the project components. Any advances given by the project would be separately shown in the IUFs.

51. All expenditures reported in the IUFs would be subject to confirmation/certification by the annual audit reports. Any difference between the expenditure reported in the IUFs and those reported in the annual audit reports would be analyzed and those expenditures which are confirmed by the Bank as being not eligible for funding (refundable to IDA), would be adjusted in the subsequent disbursements. The IUF formats would be agreed by negotiations.

52. Retroactive financing: The project is planning to execute certain contracts under retroactive financing. Following are the Bank rules for retroactive financing:

- the activities financed are included in the project description;
- the payments are for items procured in accordance with applicable Bank procurement procedures;
- such payments do not exceed 20 percent of the loan amount; and
- Payments were made by the borrower not more than 12 months before the expected date of Loan Agreement signing.
- Date after which payments may be made is agreed at appraisal, confirmed during negotiations, and recorded in the Loan Agreement.

C. Procurement

53. Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Procurement Guidelines); and "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Consultant Guidelines) and the provisions stipulated in the Financing Agreement. For each contract to be financed by the Bank, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frame are agreed between the Borrower and the Bank project team in the Procurement Plan. The Procurement Plan would be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

54. **Procurement of Works:** Works procured under this project may include small construction works, though not envisaged at appraisal. These works would be mostly procured following NCB and may involve shopping in some cases. The procurement of civil works is not likely to involve any ICB. The NCB Standard Bidding documents of the Bank as agreed with GOI task force (and as amended from time to time) would be used for procurement of all NCB civil works.

⁴⁰ To be submitted within 45 days from end of quarter.

55. **Procurement of Goods:** Goods procured under this project would include IT Equipment (computers, printers, PDA, network infrastructure and servers), office equipment and furniture, vehicles, etc. Some sophisticated R&D equipment and some software being proprietary in nature would be procured by direct contracting, other goods and software would be procured by ICB, NCB, shopping and or using Directorate General of Supply and Disposal (DGS&D) rate contract within shopping threshold. The NCB standard bidding documents of the Bank as agreed with GOI task force (and as amended from time to time) would be used for procurement of all NCB Goods. For ICB/Limited International Bidding (LIB) contracts, the Bank's latest SBDs would be used.

56. **Selection of Consultants:** Some of the major consultancies are towards project support, for example for specialized technical training, development of internet based information systems, and external M&E agency. Short lists of consultants for services estimated to cost less than \$800,000 or equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. The Bank's Standard Request for Proposal Document would be used as a base for all procurement of consultancy services to be procured under the Project.

57. **Training:** Training would cover study tours, workshops, training for staff, etc. Appropriate training shall be carried out in accordance with the Project Implementation Plan prepared by the WDD, or by specialize training agencies, and agreed with the Bank.

Assessment of the agencies' capacity to implement procurement

58. The implementation responsibility of the proposed project lies with WDD who would handle all procurement under all components except component 4. Procurement under component 4 is envisaged to be done by the Horticultural Department. The procurement capacity assessment of WDD has not been carried out by the Bank as WDD had successfully implemented the previous project which closed in 2009. A procurement cell is being created at WDD, supported by a retired procurement specialist of the Bank and inducting staff who had migrated after completing the previous project. However, the position may be evaluated after formation of the cell. Procurement capacity of DOH has been assessed and it was confirmed they may be able to take up procurement of small and simple goods and works under component 4. The existing e-Procurement platform of GOK will be used, which was found to be acceptable and is being used in other Bank funded projects in Karnataka

Procurement Risks and Mitigation Measures

59. **Procurement Risk Mitigation:** The main procurement risks that can be perceived at this stage, based on the general public financial management in the country, in Karnataka and project areas are: i) procurement of goods and works at WDD and DoH level has normal fiduciary risks of transparency, fairness and capacity but to be realigned to Bank's procedure, ii) inadequate complaint monitoring system, and iii) a lack of established system of public disclosure of information on procurement actions. The above and the other applicable deficiencies have been addressed in the Operational Risk Assessment Framework (ORAF) risk mitigation measures. The overall project risk for procurement is 'Substantial'. After mitigation measures implemented, the residual risk would be 'Moderate'.

60. **Disclosure:** The following documents shall be disclosed on the WDD and DoH website i) procurement plan and updates, ii) invitation for bids for goods and works for all ICB and NCB contracts, iii) request for expression of interest for selection/hiring of consulting services, iv) contract awards of goods and works procured following ICB/NCB procedures, v) list of contracts/purchase orders placed following shopping procedure on quarterly basis, vi) short list of consultants, vii) contract award of all consultancy services, viii) list of contracts following DC or Consultant Qualification Selection (CQS) or Single Source Selection (SSS) on a quarterly basis, and xi) action taken report on the complaints received on a quarterly basis.

61. The following details shall be sent to the Bank for publishing in the Bank's external website and United Nations Development Program (UNDP): i) invitation for bids for procurement of goods and works using ICB procedures, ii) request for expression of interest for consulting services with estimated cost more than \$300,000, iii) contract award details of all procurement of goods and works using ICB procedure, iv) contract award details of all consultancy services with estimated cost more than \$300,000, and v) list of contracts/purchase orders placed following SSS or CQS or DC procedures on a quarterly basis.

62. Further, WDD and DoH would also publish in their websites, any information required under the provisions of suo moto disclosure as specified by the Right to Information Act.

63. **Complaint Handling Mechanism:** To deal with the procurement complaints received by the WDD and DoH, a complaint handling mechanism for the project developed in the earlier project would be modified and improved. On receipt of complaints, immediate action would be initiated to acknowledge the complaint and redress in reasonable time frame. All complaints would be dealt at levels higher than that of the level at which the procurement process was undertaken. Any complaint received would be forwarded to the Bank for information and the Bank would be kept informed after the complaint is redressed.

Procurement Arrangements

64. **Procurement Plan (PP):** WDD and DoH have prepared draft procurement plans for project implementation which provide the basis for the procurement methods and review by the Bank. These plans have been agreed between the Borrower and the Bank's project team by negotiations, and are available in the project file. It would also be published on the WDD and DoH website and on the Bank's external website.

65. **Procurement Manual:** Project has prepared a procurement manual for project implementation covering WDD and DoH. The Bank has reviewed and agreed with the manual. No amendment to the procurement manual shall be carried out without review and clearance from the Bank.

66. **Procurement Staff:** The Procurement Cell at PPMU would have a procurement officer to handle and /or coordinate all purchases under the project. This cell would be supported by a Consultant who had handled Bank funded procurement. DoH will induct staff to handle procurement from the department itself both for PMC and at the districts and supported by a consultant conversant with procedure in Bank funded project. The pre-requisite for staff to handle project procurement would be attending procurement training following Bank

Procurement Guidelines. A training plan is being worked out for staff at DoH who will undergo training.

67. **NCB Conditions:** The following conditions must be met in order for the bidding process under NCB to be acceptable to the Bank

- Only the model bidding documents for NCB agreed with the GOI Task Force (and as amended from time to time) shall be used for bidding;
- Invitations to bid shall be advertised in at least one widely circulated national daily newspaper or on a widely used web site or electronic portal with free national international access, at least 30 days prior to the deadline for the submission of bids;
- No special preference would be accorded to any bidder either for price or for other terms and conditions when competing with foreign bidders, state-owned enterprises, small-scale enterprises or enterprises from any given state;
- Except with the prior concurrence of the Bank, there shall be no negotiation of price with the bidders, even with the lowest evaluated bidder;
- Extension of bid validity shall not be allowed without the prior concurrence of the Bank for the first request for extension if it is longer than four weeks; and for all subsequent requests for extension irrespective of the period;
- Re-bidding shall not be carried out without the prior concurrence of the Bank for procurement identified as “prior review” in the Procurement Plan. The system of rejecting bids outside a pre-determined margin or “bracket” of prices shall not be used in the project;
- Rate contracts entered into by DGS&D would not be acceptable as a substitute for NCB procedures. Such contracts would be acceptable however for any procurement under Shopping procedures; and
- Two or three envelop system shall not be used.

68. **Methods of procurement:** The following methods of procurement shall be used for procurement under the project. It has been agreed that if a particular invitation for bid comprises of several packages, lots or slices, and invited in the same invitation for bid, then the aggregate value of the whole package determines the applicable threshold amount for procurement and also for the review by the Bank.

- Prior review by the Bank for works and goods and Consultancy Services: Prior review thresholds would be defined in the Procurement Plan.
- Post Review by the Bank: All contracts not covered under prior review would be subject to post review during supervision missions, and/or review by consultants to be appointed by the by Bank.

D. Governance and Anti-Corruption

69. A GAC process was undertaken with the client. Refer to Annex 9 for a Governance and Anti-Corruption (GAC) plan.

Summary Procurement Table

Category	Method of Procurement	Threshold (USD Equivalent)
Goods and Non-consultant services	ICB	>1,000,000
	LIB	Wherever agreed and with prior agreement with the Bank
	NCB	1,000,000 or less
	Shopping	Up to 50,000
	DC	As per Para 3.7 of the Bank Guidelines, wherever agreed and with prior agreement with the Bank
	Framework Agreements	1,000,000 or less as per Para 3.6 of the Bank Guidelines, wherever agreed and with prior agreement with the Bank
Works and Supply and Installation	ICB	> 10,000,000
	NCB	10,000,000 or less
	Shopping	Up to 50,000 carried out through a qualified local contractor selected through shopping .
	DC	As per Para 3.7 of the Bank Guidelines, wherever agreed and with prior agreement with the Bank
Consultants' Services	CQS	Up to 300,000 per contract
	SSS	with prior agreement of the Bank
	Individuals	No limit
	Use of NGO	As per Para 3.16 of Guidelines
	QCBS/QBS/FBS/LCS	No limit
	(i) International shortlist (ii) Shortlist may comprise national consultants only	>800,000 Up to 800,000

E. Environmental and Social (including safeguards)

Environmental Assessment

70. The project would finance some on-the-ground horticultural activities that may include, among others, establishing modern nurseries, availability of quality planting materials, laboratory services for soil testing and some post harvest management and processing. Major physical works, such as, water and soil conservation works, constructing multiple check dams, erosion prevention structures etc are not planned under the project. Instead, the project intends to support institutional capacities, use of new and innovative technology for watershed planning and training and capacity building of stakeholders. This minimizes the risks, if any, emanating from Bank's investments.

71. The Project's objective is to improve integration of programs, strengthened institutions related to rainfed agriculture, and a stronger science-based approach supported by new innovations, knowledge and technologies that result in increased productivity of natural resources and incomes for communities in selected watersheds. Consequently, no potential large scale, significant and/or irreversible impacts are anticipated. The key environmental challenges that the project addresses are: (i) optimal utilization of hydrological resources through improved planning and collection of hydrological data; and (ii) arrest decline of groundwater and reduce soil erosion.

72. The project triggers the Environmental Assessment (EA) safeguard (OP 4.01) and Pest Management (OP 4.09). As part of project preparation, an experienced and independent consulting agency was contracted by the WDD to undertake an environmental assessment for the project investment. This builds on work completed under the earlier Bank supported Sujala – I, where an elaborated Environmental Management Framework (EMF) was prepared, which the executing agencies continue to follow for mitigation of adverse impacts in on GOI programs such as IWMP. The assessment undertaken for the current project also has identified a range of mitigation measures but more importantly measures to enhance the potential positive environmental impacts that the project investments would result in. An EMF is ready to guide implementation for addressing any adverse environmental issues and impacts. A supplementary EMF was also prepared to ensure that horticultural investments are also adequately screened for any potential impacts and suitable mitigation measures suggested, including a Pest Management Plan with instructions to manage, handle, use, store and dispose pesticides. As part of the project design, new decision-support tools would be developed and piloted to improve selection of priority watershed sites that combine biophysical, hydrological, socio-economic, and environmental criteria. Deployment of such tools is likely to facilitate sustainable extraction of natural resources, accurate investment plans to improve the natural resource base.

73. The project stakeholders include farmers in the rainfed area, including small and marginal farmers, women self help groups, water user associations, watershed committees, PRIs, NGOs and government line departments and agencies. As part of environmental assessment, wide ranging stakeholders' consultations were undertaken. These consultations were held at individual, household and village/community levels in the field and also with local bodies

(PRIs). The environmental assessment report highlights the key feedback that emerged from these consultations.

74. As part of disclosure plan, the WDD has disclosed the final environmental assessment report, including the EMF on its website and at the district headquarters where the project is to be implemented. The supplementary EA and EMF specifically covering the potential impacts of the horticultural investments has also been disclosed. An executive summary of the environmental assessment would be prepared and translated in the local language and disclosed.

Social Assessment

75. The project's assistance strategy is a significant departure from the conventional approaches of supporting directly grassroots investments in a watershed. It enables the 'enablers' to provide facilitation support to the local farming communities in managing their watersheds for improved livelihoods. To this end, key elements underpinning the project assistance are: development and dissemination of appropriate technologies, capacity building of government agencies in undertaking higher level analytical activities such as sub-watershed assessments, forward and backward linkages to enable establishing value chains, for example with horticulture, and consultations and collaborations. Success of these hence depends on several factors, such as the project's ability to: i) design an Information, Education and Communication (IEC) campaign to spread awareness on the project's purposes, create interest and attract several individuals and organizations to be associated with the project; ii) building the capacity of individuals/ agencies to deliver the required tasks; iii) support the prospective partners to prepare and implement result oriented proposals; iv) establish institutional platforms to provide for 'participation'; and v) ensure systematic documentation and dissemination of learning materials. Therefore the social assessment enquiry has identified the following as key social development issues/ principles which should underpin the project's strategy and implementation: participation, inclusion, capacity building, and IEC campaign.

76. Participation and inclusion. Like in IWMP, mobilizing individuals and institutions for group action underpins the entire project intervention. It occurs at different levels - i) at the grassroots (micro watershed) level, involving the local communities; ii) at the intermediate (sub-watershed) level involving appropriate stakeholders including grassroots representatives; and iii) at the apex (state) level involving all associated project management functionaries as well as individual experts and representatives of the farming as well as civil society. Several institutions would be established at different levels with an explicit composition and a definite mandate, which would include oversight responsibilities as well.

77. The IEC campaign is very much part of IWMP. Similarly under the bank project it would be implemented in three categories: i) publicizing the project including the detailed rules of engagement to attract prospective partners. As this is probably the first ever attempt at such a large scale outreach program in watershed management, the project would have to equip itself appropriately for this, it needs to dispel apprehensions on the part of potential project partners (private sector, NGOs) and it needs to create an enabling environment for participation; ii) undertaking an electronic as well as print media based campaign and establishing a platform for

discussion, information exchange and dissemination; and iii) establishing an information warehouse including digital library with easy accesses to off-the shelf as well as prospective technologies, knowledge, skills and management practices.

78. Stakeholder Analysis - The project stakeholders include farmers in the rainfed area, including small and marginal farmers, women self help groups, water user associations, watershed committees, PRIs, NGOs and government line departments and agencies. As part of environmental and social assessments, wide ranging stakeholders' consultations were undertaken. These consultations were held at individual, household and village/community levels in the field and also with PRIs. The assessment reports highlights the key feedback that emerged from these consultations.

79. The social assessment enquiry identified the following as key social development issues/principles which should underpin the project's strategy and implementation:

- Participation- mobilizing relevant stakeholders at different levels (both horizontally and vertically across a sub- watershed) for a group action with well defined arrangements for coordination is critical to ensure enmeshing technical and social considerations; and
- Inclusion and equity- given the highly diverse socio-economic characteristics of the watershed communities, special and human and institutional development efforts are essential to ensure that none of the sub-groups get 'excluded' and that everyone has an equal access and opportunity to participate in the project.

80. Towards ensuring the above, following arrangements will be adopted:

- Sector related institutions would be strengthened or, if necessary, established, at different levels with an explicit capacity, composition and a definite mandate, with strong emphasis on accountability and service delivery performance. Due considerations will be given to provide adequate representation for women, poor and other vulnerable sections of the society;
- Nutrition garden intervention will be chiefly aimed at women and, in particular, those belonging to landless households; and
- An Information, Education and Communication (IEC) campaign would be developed and implemented for not only publicizing the rules of engagement for project partners but also for establishing a communication platform thus enabling exchange of ideas and shared learning.

81. Convergence: The project preparation also conducted an independent Poverty and Social Impact Analysis (PSIA)⁴¹ of the National Rural Employment Guarantee Act (NREGA), India's major rural employment program so as to enable draw policy guidelines for its convergence and integration with a science based and investment oriented watershed management development program, for improving livelihoods of the poor and vulnerable by developing social and economic infrastructure in rural areas. This analytical enquiry has enabled exploring the potential for enabling convergence between NREGA and IWMP (sponsored by Government of India) and

⁴¹ The convergence study is financed by Bank's PSIA Trust Fund.

formulates alternative models of convergence. A couple of them will be piloted during the implementation.

82. No Social Safeguard Policies are triggered. No lands are to be acquired for any of the proposed activities. Nor any impacts on the tribals expected. However, some risks emanating as 'derivatives', especially in the context of efforts for convergence between IWMP and NREGS cannot be ruled out. Towards addressing this, following actions are planned: i) providing for participation by PRIs through sub-watershed and micro-watershed level institutional platforms; ii) capacity building of PRI institutions and securing participation in planning and implementation; and iii) establishment of Right of Grievance (ROG)⁴² to address not only issues arising at the micro-watershed but also disputes (if any) across the different levels. With respect to IWMP, it follows successful approaches developed under the earlier Sujala project for addressing equity, inclusiveness, social audit, transparency, etc. Specific activities include participatory planning with communities supported NGOs for social mobilization, group formation, capacity building; alternative rural livelihood programs targeting women and landless through SHGs, business enterprise development, and revolving funds to provide seed capital; 3rd party M&E, community-led social audits, etc.

F. Monitoring & Evaluation

Monitoring, Evaluation

83. The project M&E system would i) provide a clear picture of the project, showing the logical link between inputs, activities, outputs, and the sequence of outcomes; ii) outline an institutional/ governance structure for M&E and the roles and responsibilities of stakeholders involved; iii) describe a strategy to track progress, measure outcomes, support the evaluation work, and enable continuous learning and improvement; and iv) provide information regarding what the project aims to achieve, identifies the critical processes and indicators, and how it would measure and report on results.

84. The M&E system would consist of the following broad components: i) concurrent progress monitoring; ii) process monitoring and pathway analysis; iii) results monitoring; iv) participatory monitoring and evaluation; v) thematic studies and case-studies; and vi) impact evaluation. These would be supported by a simple project focused management information system (MIS). These project level activities would complement the project activities which specifically aim to strengthen WDD's internal M&E systems under component 3, and participatory M&E under component 1. Provided below is a brief description of the M&E system components and institutional arrangements for review and coordination.

85. **Concurrent progress monitoring.** The purpose of this component is to assess progress in implementation against timescales, and resource use against budgets. It would report on progress of implementation and expenditure on a quarterly and annual basis. Concurrent monitoring would consist of two parts:

- Input-output monitoring (updated monthly, reported quarterly and annually) to be undertaken by project implementation and management units supported by an MIS; and

⁴² These actions are elaborated in the Governance and Accountability Framework (Annex 9).

- Sample survey (quarterly basis), to be undertaken by external M&E agency for validation of internal reports.

86. **Process monitoring and pathway analysis.** Process monitoring would deal with critical processes which are directly related to the project's objectives, viz., formulation of integrated plans, and convergence of resources and so on. It would be combined with 'pathway analyses' to more systematically study and analyze the factors leading to achievement or non-achievement of project intermediate outcomes and impacts. Process monitoring responsibilities would be divided between internal and external, and specific formats and checklists developed to facilitate process monitoring by internal staff members. To deal with the constraints of lack of capacity for undertaking such assignment, an external agency would be hired for capacity building of project team. The process monitoring activities would be critical for generating lessons learning, and refining processes for scaling up.

87. **Results monitoring.** To track efficiency and effectiveness of the project interventions in translating into desired results, achievement of results would be continuously monitored. While the MIS would be able to track immediate results, tracking of intermediate outcomes would be done by an external M&E agency, which would also validate findings of input-output monitoring on a quarterly basis. This would enable assessment of deviations, if any, and identification of causal factors, so that appropriate measures may be devised to minimize observed variances. Performance of the implementing agencies at different levels, to assess activities according to agreed standards, would be also measured through a series of regular surveys and participatory methods including scorecards.

88. **Project Management Information Systems (MIS).** Input-output and results monitoring would be supported by a web-enabled computerized MIS which would be an integral part of the M&E system, wherever necessary integrated into the overall WDD MIS systems. Support in this area would cover: i) initial assessment of management information requirements and potential for ICT automation; ii) software development; iii) customization; iv) field testing and system rolling out; and v) sustained technical support for maintenance, including further adaptation and refinement.

89. **Participatory monitoring and evaluation.** Participatory M&E (PME) tools would be developed and used extensively at Executive Committee, Panchayat, User group levels for, depending on stage of institutional maturity, sensitization, capacity building, planning and self-assessment of institutional capabilities. Gopal Mitras/ Jala Mitras would be brought on board to facilitate use of the tools, to be developed by the PPMU with assistance from a specialized external agency. Suggested methods include self-scoring by Community Based Organizations (CBOs), and District team facilitated institutional assessment. Results of self-scoring exercises would be integrated within the project MIS and indices developed for assessment of institutional maturity. These, would be used to develop capacity building strategies.

90. **Thematic studies and case-studies.** Thematic studies would supplement and complement other monitoring components through validation of information on indicators of the results framework, as well as provide analytical inputs which go beyond routine monitoring functions. The need for thematic studies would emerge as the project progresses and from the

findings of the process monitoring and external quality monitoring. Specialized agencies with expertise in areas to be studied would be invited for planning and conduct of these studies, to be supervised by the PIU. The studies would generally be evaluative in nature, but may also capture good practices of the project. In addition, the project would proactively undertake documentation of processes, case-studies, best practices and lessons learnt from project experience. Documentation would be for internal learning as well as for disseminating project experiences to other stakeholders; it would be a continuous process throughout the project duration and across all the project personnel.

91. **Impact Evaluation.** The objective of the Impact Evaluation would be to establish the net contribution of the project to the sustainable livelihoods of the targeted families “before” and “after” the project and/or “with” and “without” the project. This would involve examining incremental effects to those already happening under IWMP and NREGs. It is proposed that a quasi-experimental time-series design would be used for the project impact evaluation. As necessitated by the nature of the project outcomes and impacts, an appropriate mix of quantitative and qualitative methods would be adopted for the evaluations. This would be especially important to identify attribution compared to existing programs. The indicators in the results framework would be central to the assessments and therefore guide development of methods, tools and analysis protocols.

92. The baseline would be the first assessment for ascertaining the benchmarks against which project progress in respect of key results, outcomes and impacts would be measured. It would be used for determining the pre-project conditions in project and non-project (or ‘control’) areas, and findings from the baseline study would be used to inform and/or fine tune project strategy and interventions. An external agency is already contracted and the study is in progress.

93. The mid-term and end-of-project evaluations would measure changes with respect to the baseline at mid-term and end-of-project respectively. Mid-term evaluation would involve a comprehensive assessment of the outcomes of project interventions, and the final evaluation would focus on the project’s overarching objectives/PDO. In addition, it would assess sustainability of institutions supported by the project, and resultant changes in social, economic and political empowerment of targeted households. The project would also have smaller set of panel survey households followed in greater detail during the project to understand in more detail project intervention effects.

94. Action learning, documentation and reflection. Internal learning is crucial for the project to be responsive to the changing context of the project as it progresses. The effectiveness of internal learning would depend upon the degree of institutionalization of learning among the various levels of project organization and the community. A considerable part of learning would take place through a structured set of participatory workshops associated with quarterly and annual review and planning, at local, district and State level.

95. The M&E responsibilities would be distributed across all the project units and staff. However, primary responsibilities at each level would rest with M&E specialists:

- M&E Coordinator and MIS Coordinator at the state level;
- M&E Specialist and MIS Specialist at district level; and

96. Besides full-time staff, the PPMU would hire the services of specialized agencies to undertake the following activities:

- Design, development, operation and maintenance of project MIS;
- Capacity building in M&E in general, and process monitoring in particular;
- Results monitoring and sample-based validation of findings of concurrent monitoring;
- Design and piloting of participatory M&E tools for institutions, and PME training
- Thematic studies; and
- Baseline, mid-term and end-of-project evaluation studies

G. Role of Partners (if applicable)

97. While the proposed project is not expected to be co-financed by international agencies – the project would be partnering with other State agencies, aside from the GOK Department of Agriculture. Most significant of these are the Department of Mines and Geology, and the RDPRD. For Mines and Geology the relationship would be mainly a technical one with regards to agreements on sharing of data and in discussions with regards to groundwater related policies in the context of watershed management. With RDPRD, the proposed project would be strengthening local governments and officers from District, Taluk and Gram Panchayat levels in terms of integrated local planning (with a focus on watersheds), with a view to increasing the efficient and effective use of public resources, especially NREGS. This is with a view to effectively complement the resources under the IWMP, to provide a better and more streamlined coverage of interventions and their operations and maintenance in the medium term. In pilot areas, the RDPRP has indicated that it can channel NREGS funds through the WDD, which is possible under the Mahatma Gandhi Rural Employment Guarantee Act (MNREGS). To this effect already a Government Order GRA.APA 167 UKY 2010 Dtd 14-9-2011 designating DWDOs of project Districts as Project Implementing Agency (PIA) for MNREGS funds for watershed development is already issued.

98. The project would also partner closely with a range of research institutions and their programs, local or international, which have high relevance to project objectives and components. Already identified at preparation stage has been the possible involvement of the World Bank funded Wealth Accounting and Valuation of Ecosystem Services project (WAVES) on valuation of environmental services, and similar partnership may be sought, for example on advanced but technically appropriate hydrological monitoring systems for the State.

Attachment 1. Proposed Competitive Research Process

99. Management of the Research Program. The REC would convene a workshop at State level prior to the DOA's and UAS Zonal Research and Extension Advisory Council meetings for research identification and priority setting. The REC would be supported in this by an advisory group which would consist of senior specialists and officers for rainfed agriculture and watershed research and extension, private sector, NGO and farmer representatives. They would decide on research area priorities (within key thematic areas), review and rank research proposals, and select the actual activities to be funded. Broad thematic areas for research were identified through a priority setting workshop July 2011, chaired by the Principal Secretary, Agriculture. While a number of research areas were identified, the REC would fund participatory stakeholder surveys and meetings to validate and further refine these research areas.

100. Findings on the prioritization and research process would be presented to the DOA/UAS Advisory Council workshop for advice on the priority setting and further coordination needs for the competitive research process. The REC would convene additional annual workshops for review of the needs and priorities, as necessary based on emerging issues.

101. Processing of research proposals. For inviting and reviewing research proposals, there would be a two-stage competitive application process. First, in response to a widely advertised "Call for Proposals", Concept Notes (CNs) would be submitted by potential research organizations. Second, after a CN has been approved by the REC's advisory group, following a peer review process as qualifying for the second stage of evaluation, the Full Proposal, including detailed cost estimates, would be submitted. The proposals in each thematic area would be ranked, based on objective and transparent selection criteria. Only those proposals, which meet the prescribed criteria, would be approved for funding. The implementation progress of the approved research sub-projects would be regularly monitored against agreed milestones. The duration of the research projects would normally be 1-2 years, extendable by a maximum of 1 year.

102. Selection criteria. The criteria for evaluation of research proposals would include: relevance and scientific quality of the proposal; expected impact on watershed management, rainfed agricultural productivity, farm income, sustainability and equity; likelihood of achieving the expected outputs and impacts; comparative advantage of research institute; and evidence of a multi-disciplinary and inter-institutional approach. Additional preference may be given to joint proposals, which promote public-private partnerships, involve NGOs or research organizations outside the UASs, and focus on research-extension-farmer linkages, and practical end-user solutions.

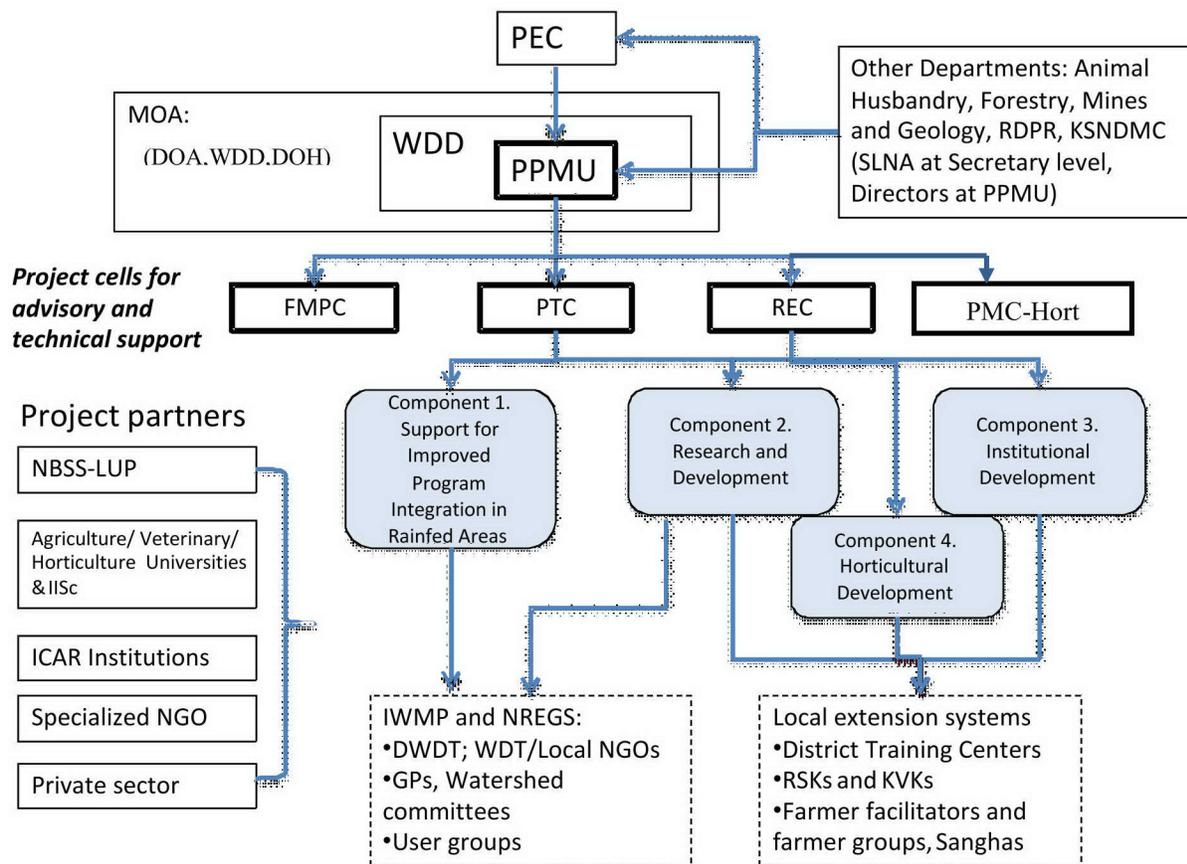
103. Funding of research. The PPMU would finance investment and operational costs, including incremental operating costs; contractual staff (e.g. research associates); goods specifically for proposed research activity, including need-based small equipment; honoraria for researchers and institutional charges; training; and travel.

104. Monitoring. Primary responsibility for monitoring the research process would be by the REC. In addition, the DOA's and Universities bi-monthly Research Workshops at District level would be used for monitoring progress and overseeing demonstration activities.

105. Operational guidelines. Detailed guidelines for the operation and management of the research activities, including pro-formas for the submission and review of concept notes and full proposal, activity milestones, evaluation criteria, sanctioning of approved proposals, project memorandum of understanding (MOU), monitoring, evaluation and reporting would be developed.

Attachment 2. Implementation Flow Charts

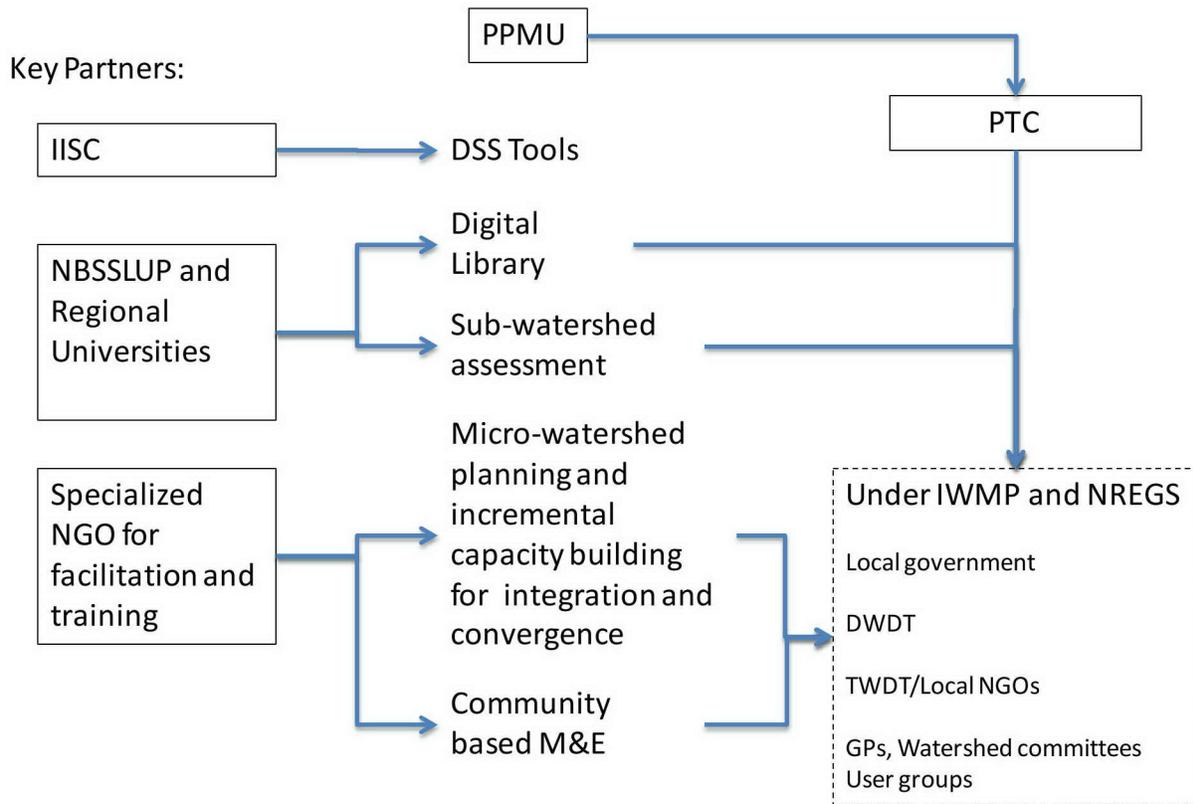
Figure A3-1. Overall Project Management



Acronyms:

DOA	Department of Agriculture
DoH	Department of Horticulture
DWDT	District Watershed Development Team
FMPC	Financial Management and Procurement Cell
GPs	Gram Panchayats
ICAR	Indian Centers for Agricultural Research
IWMP	Integrated Watershed Management Programme
KSNDMC	Karnataka State Natural Disaster Management Center
KVKs	Krichi Vigyan Kendra (University extension centers)
NBSS-LUP	National Bureau of Soil Survey and Land Use Planning
NREGS	National Rural Employment Guarantee Scheme
PMC	Project Monitoring Cell
PPMU	Project Planning and Management Unit
PTC	Project Technical Cell
RDPRD	Rural Development and Panchayat Raj Department
REC	Research and Extension Cell
RSKs	Raith Samparka Kendra (Farmer Contact Centers)
SLNA	State Level Nodal Agency
TWDT	Taluka Watershed Development Team
WDD	Watershed development Department

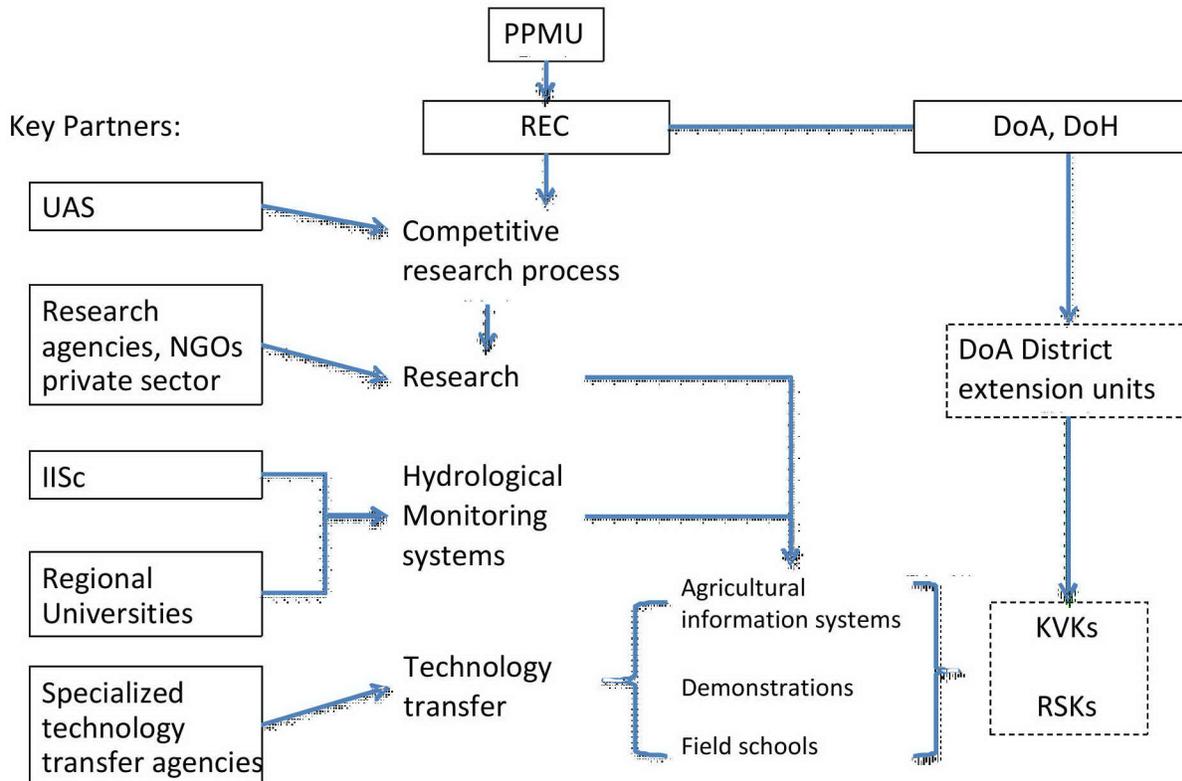
Figure A3-2. Project implementation arrangements for Component 1



Acronyms:

DSS	Decision support system
DWDT	District Watershed Development Team
GPs	Gram Panchayats
IISc	India Institute of Science
IWMP	Integrated Watershed Management Programme
NBSS-LUP	National Bureau of Soil Survey and Land Use Planning
NREGS	National Rural Employment Guarantee Scheme
PPMU	Project Planning and Management Unit
PTC	Project Technical Cell
TWDT	Taluka Watershed Development Team

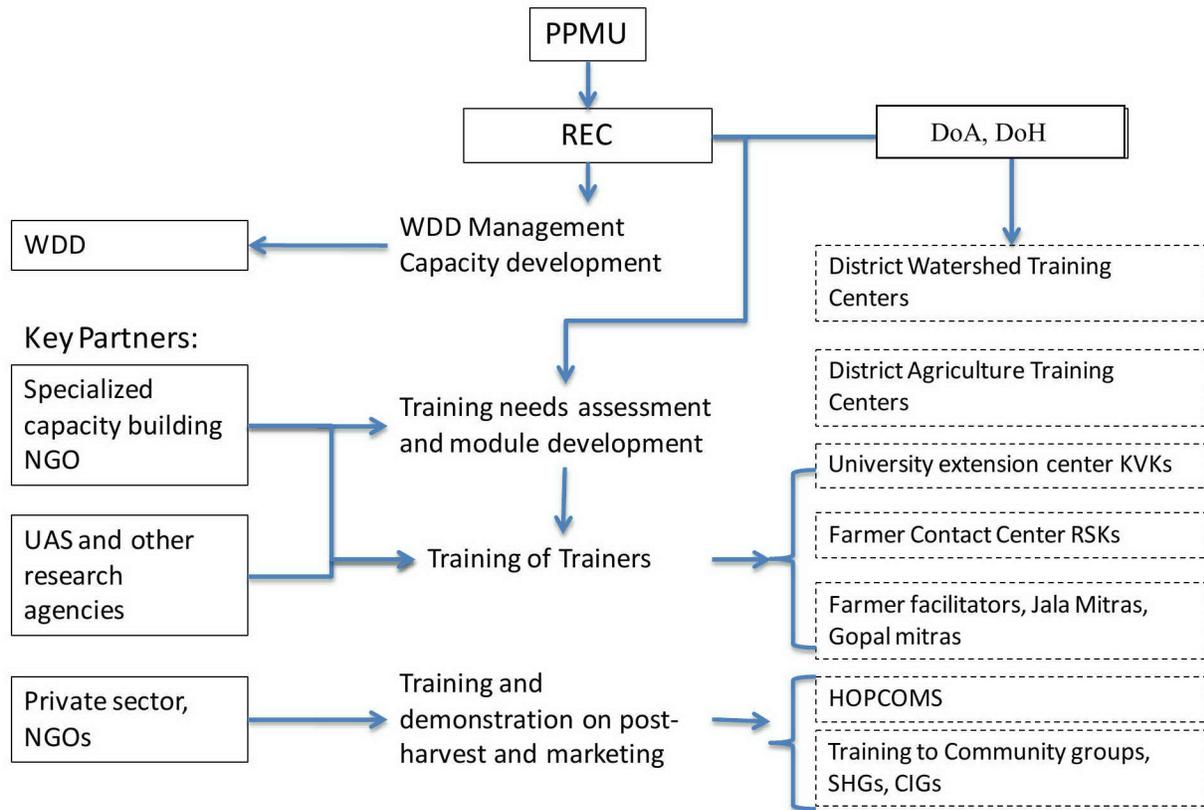
Figure A3-3. Project implementation arrangements for Component 2



Acronyms:

DOA	Department of Agriculture
DoH	Department of Horticulture
PPMU	Project Planning and Management Unit
REC	Research and Extension Cell
IISc	Indian Institute of Science
UAS	Universities of Agricultural Sciences
RSKs	Raith Samparka Kendra (Farmer Contact Centers)
KVKs	Krichi Vigyan Kendra (University extension centers)

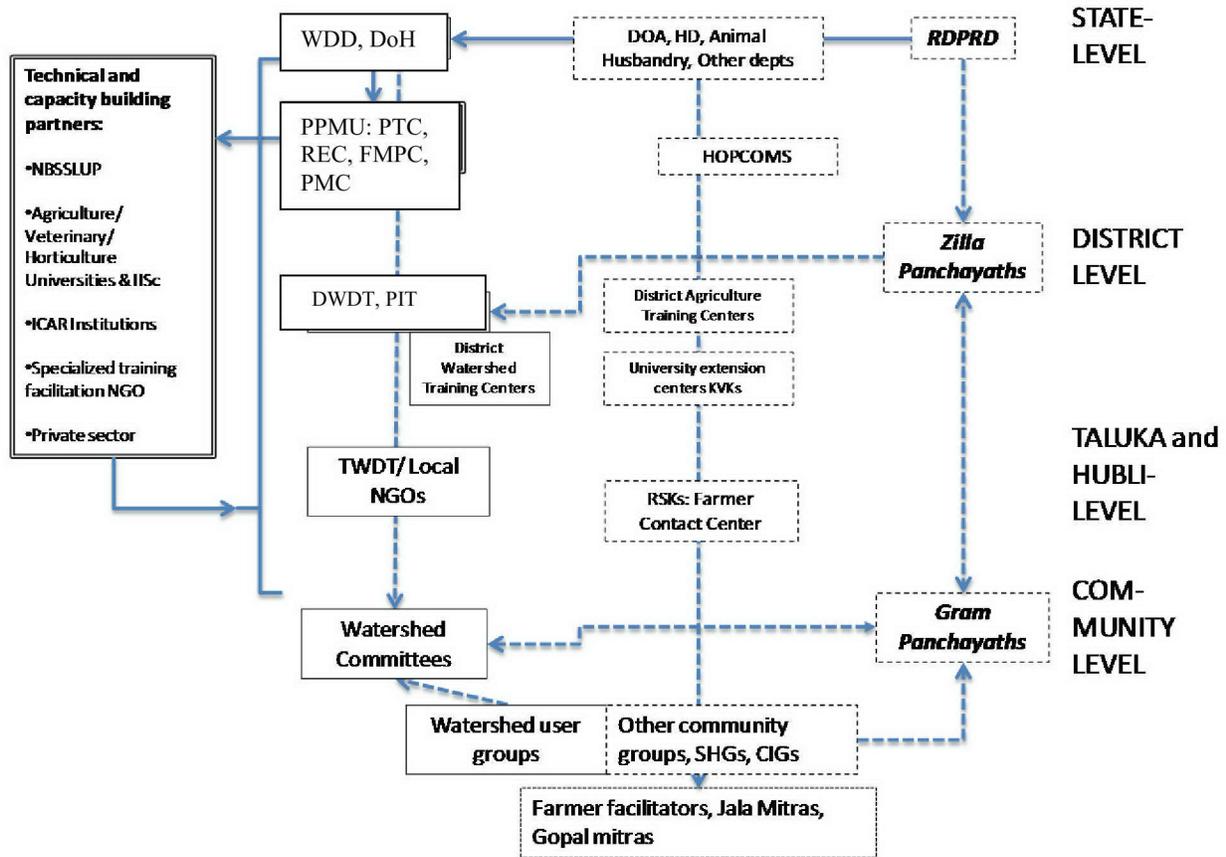
Figure A3-4. Implementation arrangements for Components 3 and 4



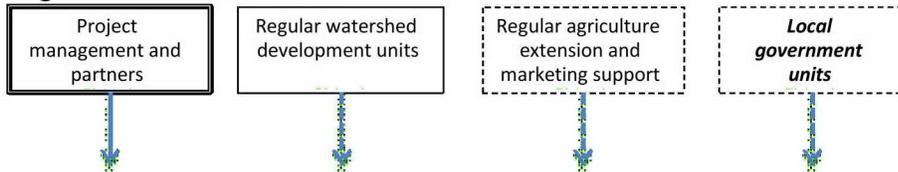
Acronyms:

CIGs	Common Interest Groups
DOA	Department of Agriculture
DoH	Department of Horticulture
HOPCOMS	Horticulture Producers Cooperative Marketing Society
IISc	Indian Institute of Science
KVKs	Krichi Vigyan Kendra (University extension centers)
PPMU	Project Planning and Management Unit
REC	Research and Extension Cell
RSKs	Raith Samparka Kendra (Farmer Contact Centers)
SHGs	Self Help Groups
UAS	Universities of Agricultural Sciences
WDD	Watershed Development Department

Figure A3-5. Institutional structure from state to community level



Legend and abbreviations



- DOA Department of Agriculture
- DoH Department of Horticulture
- WDD Watershed development Department

- PPMU Project Planning and Management Unit
- FMPC Financial Management and Procurement Cell
- PTC Project Technical Cell
- REC Research and Extension Cell

- NBSSLUP National Bureau of Soil Survey and Land Use Planning
- ICAR Indian Centers for Agricultural Research
- IISc India Institute of Science
- UAS Universities of Agricultural Sciences
- RDPRD Rural Development and Panchayath Raj Department
- HOPCOMS (State) Horticulture Producers Cooperative Marketing Society

- DWDT District Watershed Development Team
- TWDT Taluka Watershed Development Team
- GPs Gram Panchayaths

- RSKs Raith Samparka Kendra (Farmer Contact Centers)
- KVKs Krichi Vigyan Kendra (University extension centers)
- SHGs Self Help Groups
- CIGs Common Interestse Groups

Technical Annex 4
Operational Risk Assessment Framework (ORAF)

Negotiations

1. Project Stakeholder Risks		Rating	Low		
Description : Coordination with some of the other line departments may pose some challenge which may lead to some delays.		Risk Management: Multiple round of stakeholder consultations have been held prior to conceptualizing and during preparation of the project. These consultations would be continued during implementation. A state level committee (PEC) would be set up under the leadership of Development Commissioner. The experience of the earlier Sujala project and strong corporate memory among the WDD, line departments, NGOs and local universities would be helpful in getting the new project off to a good start.			
		Resp: Client	Stage: Preparation	Due Date : 01//06/12	Status: In progress
2. Operating Environment Risks (Not applicable)					
3. Implementing Agency Risks (including fiduciary)					
3.1. Capacity		Rating	Moderate		
Description: Multiplicity of implementation partners may lead to coordination problems and delays in implementation. Potential delayed fund flow and FM staffing.		Risk Management: WDD is the lead implementing and coordinating agency for the majority of the project activities. DoH will implement component 4 (Horticulture). WDD has successful record of management and coordination of large programs (including the award winning Sujala Project), and considerable experience working with other line agencies. A Project Management Unit (PMU) staffed with a dedicated multi-disciplinary team is being established in WDD to coordinate and manage day-to-day activities of the watershed activities. A Project Management Cell will be established in DoH for component 4. A needs assessment would be carried out for WDD and DoH to get a better understanding of the capacity needs and to develop training programs to address those needs. In addition broad areas for capacity building have been identified targeting key participating agencies. To complement these implementation arrangements, a phased approach consisting of incremental training and technical support is planned to effectively mobilize individuals and institutions at different levels from community to state in a phased and coordinated manner. The institutional governance structure together with the roles and responsibilities of participating agencies, institutions, committees and special groups and partners would be clearly spelled out and incorporated in the project's Operational manual. FM system strengthening would be established by Effectiveness. Simplified FM arrangements following core state government systems for all key functions of FM has been agreed. From FM perspective, there are two implementing agencies; however WDD would be responsible for overall project reporting. The budget heads for the project have already been created and funds allocated from Finance. This project would follow the state treasury system for funds release and usage. The overall accounting for expenditure would be carried out by treasury while the details of the expenditure would be maintained by the Head Office and District Watershed Development Officer. These offices would maintain a separate cash book to record project expenditure. The statutory audit would be carried out by Accountant General's office as per the standard ToR. Internal audit for the project would be carried out by a CA firm as per the agreed ToR with the Bank. Additional staffing requirements have been identified and they would be hired in the first year of implementation.			
		Resp: Client	Stage: Implementation	Due Date : N/A	Status: In progress

3.2. Governance	Rating:	Low		
Description: Complaints may not be addressed adequately or in a timely manner resulting in added costs. Concerns regarding the institutional arrangements and capacities being capable, effective and efficient.	Risk Management: A complaint handling mechanism exists from earlier project which would be modified as soon as possible and included in the Project Implementation Plan and Procurement Manual. Action taken report on the complaints received would be published in the Sujala website on a quarterly basis. An analysis on institutional/governance arrangements and capacities, as part of the social assessment, has been carried out. State's own Procurement Act had been developed with assistance from the Bank and built on established procurement procedure. The procurement would be centralized at WDD and DoH, supported by a consultant (retired World Bank Staff) and supporting other Bank funded projects in Karnataka. The project involves procurement of remote sensing images, hydrological monitoring equipments, other goods / works and consultancies. To improve competition, measures such as broad technical specifications, realistic post qualification criteria, would be adopted supported by competent technical staff at PMU. A Procurement Manual has been developed to guide all procurement envisaged under the project.			
Resp: Client		Stage: Preparation	Due Date : 01/06/12	Status: In progress
4. Project Risks				
4.1. Design	Rating:	Moderate		
Description: District and Taluk level staff of the various agencies may not be comfortable with the new project design as it involves working with PRIs and Executive Committees of IWMP. This may require more time. Line departments may not see enough benefits in using new tools developed under the project.	Risk Management: The District and Taluka level staff have implemented watershed projects of varied approaches over a period of watershed development process both pre and post Hariyali guidelines and also the Bank assisted Sujala I. The staff are quite adoptive to new approaches and quickly learn with required capacity building. Further, working with PRIs is a regular phenomenon and already PRI interphase exists. The project is being implemented in a phased manner. There is a smaller batch of watersheds in the first phase; lessons learnt would be used to make any necessary modifications in the design. A detailed needs assessment with all the stakeholders would be carried out prior to development of these tools. The tools would be practical and simple to use. Once the tools are ready, WDD and DoH would conduct trainings for the relevant stakeholders.			
Resp: Client		Stage: Implementation	Due Date : N/A	Status: Not yet due
4.2. Social & Environmental	Rating:	Low		
Description : Guidance to improve environmental sustainability is often overlooked while identifying and implementing investment decisions, especially when the line agencies are not used to work in close collaboration of each other resulting in maximizing positive gains through leveraging and convergence of various programs at the watershed level. Research & Development and other major investments may not fully take into cognizance social and environmental considerations. Sub Watershed assessments are rather exclusively technical, while micro watershed assessments are more 'social' oriented. Ensuring technical and social matching in planning and implementation is essential. Research Themes/ activities could be decided by a few individuals who may not encompass the field level requirements in its	Risk Management: A detailed environmental assessment has been undertaken which has developed an Environmental Management and Monitoring Plan in the form of a good practice manual/guideline. This would be translated in local language and disseminated in simplified form at different stakeholder level. A social and environmental management matrix would be prepared by the respective proponent and shall form an integral part of the appraisal system. This matrix would address the issues likely to arise and the measures to address thereof. WDD Institutions at sub-watershed level would hold continuous consultations with grassroots level WDD. Consultations with CBOs would ensure proper match between technical and social aspects through mutual considerations. Project would establish a state level R&D Body with participation from the participating districts as well including the representatives of the farming community, CBOs (such as Common Interest Groups, Self-Help Groups, milk federations, seed agencies) and women. This body would steer all the R&D activities under the project. Project would make all efforts through a full scale IEC campaign so as to ensure wider reach and adequate competition. One third of the funds may be earmarked for agencies other than ICAR and SAUs. Appropriate capacity building programs would be designed and conducted to ensure that WDD functionaries are fully on board. Arrangements would also be made for establishing an institute locally for Redressal of Grievances (ROG).			

<p>totality. Enmeshing IWMP and NREGS would also mean WDD and DoH imbibing NREGS systems and procedures as well. Nature and extent of adoption could vary substantially across the WDD, DoH and other functionaries resulting in substantial delays and discomfort among the local communities.</p>	<p>Resp: Client</p>	<p>Stage: Implementation</p>	<p>Due Date : N/A</p>	<p>Status: In progress</p>
<p>4.3. Program & Donor (Not applicable)</p>				
<p>4.4. Delivery Monitoring & Sustainability</p>	<p>Rating:</p>	<p>Low</p>		
<p>Description: Monitoring may not be carried out in a systematic manner. Best practices developed in the new project are not scaled up after closure.</p>	<p>Risk Management: Monitoring will follow the successful model used in the earlier Sujala project, which won an IEG Best Practice Award in 2011. A third party agency will be contracted by the implementing agency to provide objective monitoring support for project activities, while the project also builds the capacity of the implementing agency itself. M&E will drive learning and knowledge sharing of best practices, which can be replicated in the broader IWMP operation throughout the state as well as DoH programs. As was the case with the Sujala project, it is expected that best practices will be sustained following project closure by being integrated into these other programs.</p>			
	<p>Resp: Client</p>	<p>Stage: Implementation</p>	<p>Due Date : N/A</p>	<p>Status: In progress</p>
<p>5. Project Team Proposed Rating <u>Before</u> Review (Not applicable)</p>				
<p>6. Risk Team (Not applicable)</p>				
<p>7. Overall Risk Following Review</p>				
<p>7.1. Preparation Risk Rating: (Not applicable)</p>		<p>7.2 Implementation Risk Rating: Moderate</p>		

Technical Annex 5: Implementation Support Plan

1. The project focus is largely on research and development, and capacity building, supporting the Government of Karnataka to improve the integration of the IWMP with other sectoral programs (agriculture, horticulture, etc) largely through improved planning. The project would also support better informed convergence with NREGS-financed soil and water conservation activities in the same watersheds. Safeguard risks for Bank-financed investments are low. The lead implementing agency (WDD) has a successful track record delivering the earlier Bank-supported watershed project (Sujala I) with good performance in both financial management and procurement, backed up by third party monitoring. The implementing agency for component 4 (Horticulture) is DoH, which has less experience with managing Bank-supported projects. Overall, the implementation risks, including financial management and procurement, are judged to be moderate in the new project, and would require moderate oversight during missions. Procurement would be important since a high portion of project funds would be used for contracting consultants and technical agencies for professional services to deal with complex and technical studies.
2. Implementation support would need to focus significant oversight on the quality of research and development (studies, tools, etc), how these results are demonstrated and adopted into regular GoK watershed operations. Supervision would also need to review capacity building activities, especially those designed to strengthen agricultural extension service delivery. Another key area of focus for implementation support would be on how well sector programs in selected watersheds are becoming more integrated (watershed, agriculture, horticulture, etc) as well as broader program convergence between IWMP and NREGS with soil and water conservation operations. The mid-term review in Year 3 would provide a good opportunity to consolidate lessons learned (and emerging lessons) to guide the second phase of operations.
3. As with the earlier Bank-supported watershed project, the emphasis on implementation support would be flexibility to minor adjustments in project component direction based on the GOI M&E results from internal as well as a third-party agency. The WDD demonstrated in the earlier project that M&E results are reviewed seriously in guiding continual improvement in project implementation.
4. A key focus on implementation would also be on disbursements relative to emerging savings and/or deficits in the overall budget allocation, based on exchange rate fluctuations. Decisions can then be made to propose additional work (in the case of projected savings), or alternatively to augment the allocation (in the case of projected deficits).
5. The following Implementation Support Plan (ISP) reflects preliminary estimates of skill requirements, timing, and resource requirements over the life of the project. Keeping in mind the need to maintain flexibility over project activities from year to year, the ISP would be reviewed annually to ensure that it continues to meet the implementation support needs of the project.

Implementation Support Plan (ISP)

Time	Focus	Primary Skills Needed	Number of Trips	Resource Estimate (USD)	Partner Role	Comments
<i>Year 1</i> 08/12 To 03/13	<ul style="list-style-type: none"> Project launch Initiating key R&D activities and quality control processes FM systems functioning effectively Procurement practices following Bank norms 	<ul style="list-style-type: none"> Team lead FM, Procurement Hydrologist Horticulture specialist R&D specialists covering quality assurance, data base design, decision-support models, agriculture, and climate change 	<i>FY12</i> - nil <i>FY13</i> September/2012 <u>March/2013</u> Total	\$35,000 <u>\$35,000</u> \$70,000	Staff up M&E cell in WDD and contract 3 rd party M&E agency	<ul style="list-style-type: none"> Project would likely become effective April 1, 2012 Want to support smooth start-up following effectiveness, with special emphasis on quality of key R&D activities that would be started in year 1
<i>Year 2</i> 04/13 To 03/14	<ul style="list-style-type: none"> Monitor R&D progress Support launch of new integrated planning processes and field convergence of programs FM Procurement Environment and social safeguards 	<ul style="list-style-type: none"> Team lead FM, Procurement Hydrologist Horticulture specialist R&D specialist in quality assurance and technology transfer Post-harvest and value addition specialist Safeguards, Social specialist 	<i>FY14</i> September 2013 <u>March 2014</u> Total	\$36,000 <u>\$36,000</u> \$72,000	Prepare comprehensive project progress report in advance of each mission	<ul style="list-style-type: none"> New sub-watershed and expanded micro-watershed planning processes are launched Continue to support main R&D component Ensure safeguards are built into new integrated watershed planning process
<i>Year 3</i> 04/14 To 03/15	<ul style="list-style-type: none"> Monitor R&D progress Support integrated planning processes FM Procurement Safeguards 	<ul style="list-style-type: none"> Team lead FM, Procurement Hydrologist Horticulture specialist General R&D expert plus technical subject specialists as needed Economist and Cost-tab specialist Safeguards, Social specialist 	<i>FY15</i> September 2014 <u>March 2015</u> Total	\$37,000 <u>\$50,000</u> \$87,000	Prepare comprehensive project progress report in advance of each mission	Mid-term review
<i>Years 4 to 5</i> 04/15 To 03/17	<ul style="list-style-type: none"> Monitor R&D progress Support integrated planning processes FM Procurement 	<ul style="list-style-type: none"> Team lead FM, Procurement Hydrologist General R&D expert plus technical subject specialists as needed Safeguards, Social specialist 	<i>FY16</i> September 2015 <u>March 2016</u> Total <i>FY17</i> September 2016 <u>March 2017</u> Total	\$38,000 <u>\$38,000</u> \$76,000 \$39,000 <u>\$39,000</u> \$78,000	Prepare comprehensive project progress report in advance of each mission	General support to monitor progress, provide technical oversight, ideas for improvement, etc.
<i>Year 6</i> 04/17 To 08/18	<ul style="list-style-type: none"> Complete project supervision monitor Bank withdrawal Complete project closure 	<ul style="list-style-type: none"> Team lead FM, Procurement Hydrologist Horticulture specialist General R&D expert plus technical subject specialists as needed Safeguards, Social specialist 	<i>FY18-19</i> September 2017 <u>August 2018</u> Total	\$40,000 <u>\$52,000</u> \$92,000	Prepare comprehensive project progress report in advance of each mission	Final supervision mission and undertake ICR mission

Technical Annex 6: Team Composition
World Bank Staff and Consultants who worked on the project

Name	Title	Unit
Grant Milne	Task Manager	SASDA
Reena Gupta	Co-Task Manager	SASDA
Yuka Makino	Sr. Natural Resources Mgmt. Spec.	SASDI
Anupam Joshi	Environmental Specialist	SASDI
Nicole Maywah	ET Environmental Consultant	SASDI
Anju Gaur	Water Resources Specialist	SASDA
S. Krishnamurthy	Financial Management Specialist	SARFM
Debabrata Chakraborti	Procurement Specialist	SARPS
Suryanarayan Satish	Senior Social Development Specialist	SASDS
R.R. Mohan	Senior Social Development Specialist	SASDS
Manvinder Mamak	Sr. Financial Management Specialist	SARFM
Pai-Yei Whung	Advisor – Research and Development	ARD
Glenn-Marie Lange	Senior Environmental Economist	ENV
Urvashi Narain	Senior Environmental Economist	ENV
Caroline Mascarell	Senior Operations Officer	SARDE
Juan Carlos Alvarez	Senior Counsel	LEGES
Jacqueline Julian	Operations Analyst	SASDA
Rohan G. Selvaratnam	Operations Analyst	SASDA
Jai Mansukhani	Program Assistant	SASDO
Vibhuti Narang Khanna	Program Assistant	SASDO
John Prakash	Program Assistant	SASDO
Jim Hancock	Senior Natural Resources Specialist	FAO-TCIN
S. Selvarajan	Economist and M&E Specialist	FAO-TCIN
Ben O'Brien	Agriculture Specialist	FAO-TCIN
Jan Hendrickx	Hydrology Specialist	Consultant
Crispino Lobo	Watershed Institutional Specialist	Consultant

Technical Annex 7. Economic and Financial Analysis

A) Introduction

1. The KWDP-II targets to increase the productivity of natural resources through improved scientific management and better program integration in 935 micro-watersheds in two phases covering 465,000 ha. All physical structures for these watersheds will be taken up with IWMP funds. The KWDP-II proposes to complement IWMP activities in these 935 micro-watersheds. The project interventions will incrementally benefit 319,550 ha of cropped land area operated by 160,000 farmer households. Small farm holders account for 66 percent of the project farmers. The project area has 39,400 landless families in the project villages. Annual normal rainfall varies from 600 to 800 mm with 43 rainy days in a year. Rainfed agriculture in 278,000 ha in the project area, experiences at least two water deficit years in a five year cycle due to prolonged dry spells during crop season and/or delayed onset of monsoon rains. The project specifically targets convergence of resources to achieve better integration between agriculture (including horticulture) and watershed management by supporting R&D innovations and institutional strengthening along with capacity development to enhance the overall productivity of natural resources.

B) Project's Incremental Strategy

2. Effective watershed management should reduce the runoff and soil loss and improve the productivity of natural resources while being cost-efficient. Balancing effectiveness and efficiency will need (i) detailed bio-physical, hydro-geological and socioeconomic database; validated models to evaluate alternate technical options for watershed investment decisions; and technical capacity development for prioritizing and guiding watershed interventions, institutional strengthening to sustain the database development and modeling applications for future watershed planning and implementation; and (ii) need based adequate investments to take up the prioritized watershed development interventions. The project focuses on both these aspects; namely science-led watershed management planning and convergence of resources together with the integration of programs to improve the productivity of rainfed agriculture in selected micro-watersheds.

3. *Science-led Watershed Management Planning:* Component A: Improved program integration in rainfed areas involves development of digitized database and decision support systems while strengthening participatory Sub-watershed and micro-watershed planning for effective watershed management. Component B: Research, development and innovation involves integrated assessment and monitoring of soil and water harvesting, ground water recharging and soil moisture status while transferring best conservation practices for effective rainfed agriculture management under diverse soil moisture conditions. Component C: Institutional strengthening targets watershed management training and capacity building for extension agents and community institutions for integrated and efficient service delivery. Component D: Horticulture targets area expansion and productivity enhancement and strengthen market linkages for diversification.

4. *Resource Convergence*: Under the without project (WOP) scenario, available IWMP funds for the physical works are often considered inadequate to take up the prioritized needs of watershed development. The project targets to leverage other public funds (like NREGA) to augment this incrementally by about 35 percent to take up all the priority works in the micro-watershed as identified during the project planning stage. Currently, NREGA funds are used in varying magnitudes across the state for soil and water conservation related works, but its effectiveness is very limited due to lack of a science-based watershed approach. The augmented funds in the project along with the IWMP funds will be utilized based on the integrated watershed development plan following science-based resource conservation principles.

C) Project Costs

5. Total project costs, including contingencies at 2012 prices is INR 4713 million. Improved program integration in rainfed areas account for 26 percent of the project costs to develop and share digitized comprehensive database and tested decision support models for effective watershed management planning and to train and strengthen participatory micro and sub-watershed planning starting from community level. Research development and innovation component account for 23 percent of the project costs to develop integrated assessment and monitoring of surface water harvesting, ground water recharging and soil moisture status for effective rainfed agriculture management and to promote the transfer of best conservation technologies for diverse soil moisture situations. Institutional strengthening accounts for 11 percent of the project costs and horticulture component accounts for 32 percent of the project costs.

D) Project Benefits

6. Component A will support other components while reducing the cost of future R&D, planning and development of watershed management. The project, by promoting science-led planning with convergence of resources and integration of programs, will increase the size as well as the sustainability of incremental project benefits for a longer duration as compared to the WOP situation. Expansion of incremental benefits will come from multiple sources namely; incremental crop productivity and cropping intensity due to more efficient soil moisture conservation-based crop management, incremental irrigated area due to more integrated watershed management planning, improved adoption rate of conservation based production technologies and minimizing productivity fluctuations due to longer dry spells in the cropping seasons. All benefits are quantified incrementally over the WOP, which represent IWMP investments. Strengthened institutions and capacity development will increase the duration of project benefits under a “with project” (WP) situation with better sustainability as compared to WOP situation.

7. The project analysis and with/without assumptions is based on data compiled from multiple sources like; available evidences from the earlier Bank-supported Sujala-I project experiences and other watershed management impact/research studies and documents. Farm level data for the project area is taken from farm management study reports of Karnataka State covering major crops, 2540 farmers per year, spread across diverse agro-climatic zonesⁱ. Major cereal crops (jowar, maize and paddy), pulse crops (redgram, greengram and bengal gram),

horticulture crops (mango and onion) covering over 2/3rd of the gross cropped area in the project area are considered for formulating crop budgets for with and without project situation. Technology adoption assessment is based on the study of 172 demonstrations and 234 non-participating farmers from Sujala-1 project documents. Sustainability assessment of soil and moisture conservation activities is based on a study of 20 micro-watersheds in five districts covering 600 households in Sujala-1 project.

Specific benefits

Increased crop productivity

8. Rainfed agriculture is practiced in 87 percent of the crop lands in the project area. Pulses (red gram, bengal gram and green gram) and Cereals (jowar and maize) are the major rainfed crops and paddy, maize and Bengal gram are the major irrigated crops in the project area. All these crops occupy 64 percent of the gross cropped area. Based on the Sujala-1ⁱⁱ and other watershed development impact assessment databaseⁱⁱⁱ, it has been estimated that under WOP, rainfed agriculture productivity will increase by 7.5 to 10 percent across cereals, pulses and vegetables. The project will improve scientific planning of watershed investments to efficiently conserve the surface runoff in the soil profile and conservation structures within the watershed. Available literature reveals that up to 30 percent runoff can be conserved through in situ moisture conservation practices to increase rainfed crop yield by about 20 to 25 percent across crops in the agro climatic dry zones of Karnataka. But to realize this, effective watershed investment activities need to be planned, prioritized and implemented in the project micro-watersheds. The project will leverage additional public funds to enhance the IWMP allocation for the physical watershed development works by about 35 percent, to take up an increased number of prioritized resource conservation activities in the project micro-watersheds and increase the coverage of treatments. Under the WP situation, rainfed agriculture productivity across cereals, pulses, fruits and vegetables will increase by 9 to 17 percent incrementally over the WOP situation (T-1).

Adoption of resource conservation technologies

9. Agriculture crops: Under WOP situation, Sujala-1 documented adoption of improved crop production technologies varying from 27 to 46 percent, mainly limited to the beneficiaries who have participated in the demonstration activities, mostly covering new varieties and cropping patterns^{iv}. Based on this, it is projected that under the WOP situation, adoption rate for the improved crop production technologies will be 35 percent, which will be realized in phases over a three-year period. Strengthening information based extension knowledge transfer and putting micro-watershed specific contingency plans in place for mobilizing seed and other input supplies will enhance the adoption rate and spread of agricultural technologies in the project watersheds. To improve the adoption rate, the project will specifically train all the existing 935 farmer facilitators in science-based innovative resource conservation and production technologies. One trained farmer facilitator will be used for each micro-watershed to effectively disseminate the technology to the project farmers through two farmer field schools for each micro-watershed. Under the WP situation, it is projected that over three year phase, about 60 percent for rainfed crops and 66 percent for horticulture crops will come under the demonstrated technology package with emphasis on resource conserving technologies to maximize the

productivity during normal seasons and minimize the productivity loss during the moisture stress seasons.

10. Horticulture crops: Besides enhancing the productivity, the focus for horticulture is to increase the area under horticulture crops from the current level of 7.5 percent to 20 percent of the crop lands in the project area. Based on the current trends, the area will be equally shared between perennial and seasonal crops. In the project area, mango is the major fruit crop (occupying 25 percent of the area under fruit crops). Onion is the major vegetable crop (occupying 48 percent of the area under vegetables). Most preferred major fruits and vegetable crops are used to quantify the project benefits. Improved horticulture crop production technologies will be demonstrated through 65,450 demonstrations covering perennial and annual crops covering about 40 percent of the project farmers in all project micro-watersheds. The project will also spread the demonstrated technologies to more farmers through field days, trainings and soil and crop monitoring to ensure that at least 20 percent of the crop land area gets allocated for the horticulture crops at full development.

Reduced productivity fluctuations

11. The project area experiences dry spells during crop growing seasons affecting productivity by 30 to 50 percent, twice in a five-year production cycle. The project area covers 28 taluks in seven districts. Percent of project taluks experiencing dry spells for 7 to 12 weeks vary from 45 percent in kharif to 65 percent in rabi^{iv}. The project promotes scientific soil moisture based crop production management and transfer of resource conservation technologies through trained farmer facilitators. Efficient conservation and utilization of critical soil moisture during moderate rainfall deficit years will minimize the productivity fluctuations by about 57 percent as evidenced in the farmer adaptive trials. For quantifying the soil moisture stress mitigation benefits, we considered 35 percent loss in productivity under the WOP scenario and 15 percent loss in productivity under the WP scenario, which will occur twice in every five years (T-1).

Sustainability impacts

12. Watershed impact studies in India recorded higher returns to watershed development investments with stronger participation of all stakeholders in the planning and implementation of watershed programs, mainly due to improved efficiency and sustainability as compared to other watersheds. The Sujala-1 impact study based on a sample

T-1 KWDP-II Agriculture Impact summary

Impact Variables	Unit	WOP	WP	Change
Cropped area	Ha	319550	319550	0%
Cropping Intensity	%	127%	134%	5%
Irrigated area	Ha	43620	45700	5%
Horticulture crops	Ha	23970	63910	167%
<i>Crop Productivity</i>	t/ha			
Cereals (RF)		1.9	2.1	12.4%
Pulses (RF)		0.6	0.7	12.1%
Cereals (I)		5.0	5.4	9.3%
Pulses (I)		1.1	1.2	9.3%
Fruits		13.0	15.2	17.0%
Vegetables		16.5	18.2	10.0%
<i>Gross Margin</i>	Rs/ha			
Cereals (RF)		8940	10490	17.4%
Pulses (RF)		13340	15460	15.9%
Cereals (I)		28540	32640	14.4%
Pulses (I)		27000	30590	13.3%
Fruits		69350	87470	26.1%
Vegetables		35580	40220	13.0%
Adoption	%	35%	61%	74.3%
Yield fluctuations	%	35%	15%	-57.1%
SWCS Sustainability	%	25%	65%	160.0%

of 20 micro-watersheds in five districts and covering 600 households, documented that about 61 percent of the watershed conservation structures/activities are sustained in good condition and another 23 percent in moderate condition after the project withdrawal phase as against 20 percent sustainability in case of other watershed programs^{vi}. Meta-analysis of 636 watershed impact case studies in India documented 30 to 70 percent increase in IRR with varying levels of community participation in the watershed development both during and beyond implementation^{vii}. Similarly, integrating agriculture with livestock along with watershed programs always yielded better returns to watershed development investments. Optimal investment for need based and prioritized soil and water conservation works enhanced the financial returns to such investments by over 40 percent as compared to public sector funded watershed programs compared across agro-climatic zones. Both the size of the benefits as well as the duration of project benefits will be impacted by institutional strengthening, resource convergence, program integration and capacity development at all levels. While size of the benefits are already captured under production benefits, sustainability impacts are quantified as follows: Duration of project benefits will be extended by five more years with reduction in the projected benefits in phases from 10th year to reach 35 percent in yr-16 for the WP and for the WOP, reduction in benefits will start in phases from 10th year to reach 75 percent in yr-16.

Efficiency in use of public funds

13. The project will augment IWMP resources by leveraging public funds (like NREGA) in rainfed agriculture areas to support the prioritized watershed investment activities. It is projected that incrementally INR 1917 million will be accessed to support the micro-watershed development in the project areas. Currently, about 30 percent of the NREGA funds are utilized for resource conservation activities but without an integrated watershed development based approach. The project, by leveraging available public funds from NREGA, will not only augment overall funds for micro-watershed development but enhance their effectiveness by utilizing them based on science led prioritized watershed investment activities. With the annual NREGA budget of INR 20 billion, mainstreaming such resource convergence experiences for future watershed development activities will have system wide impact on the efficient use of public funds in the state.

14. The project will support scientific planning based on larger scale soil maps (1:12,500) and hydro geology of the watershed through interactive models at various levels up to community level in the micro-watershed for optimizing resource conservation investments. Studies in Karnataka state indicate excessive investments with more than required conservation structures due to watershed planning that are not based on biophysical characteristics of the watershed and spatial and temporal pattern of demand for water^{viii}. Utilizing larger scale soil maps helped in site specific soil test based nutrient management and conservation treatments to save nutrients and soil loss across five watersheds in Karnataka/Andhra Pradesh states. The project-led development, maintenance and sharing of comprehensive database in digital format and tested decision support systems for guiding integrated planning and investment decisions will have system wide impact on the efficient use of public funds in watershed development.

E) Project Analysis

15. Project cost, including contingencies, is INR 4713 million. The project will additionally leverage public funds to supplement the IWMP funds by about 35 percent which is included in the cost-benefit analysis. Financial analysis is done at market prices. Economic analysis is conducted after making appropriate adjustments to financial benefits and costs. The adjustments include; (a) netting out price contingencies, taxes and subsidies (20 percent), (b) using appropriate parity prices for traded items, and (c) using SCF varying from 0.80 (labor cost) to 0.90 for other non-traded items. Project costs and benefits are estimated at 2012 prices over 15 to 20 years with 12 percent opportunity cost of capital.

16. Due to the interdependence of project components, a component level analysis is not attempted. Instead, the analysis was done by evaluating the project benefits at three levels and comparing them with overall project costs for a 15-year project life. **First**, production benefits from (i) increased crop productivity for agriculture and horticulture crops by 9 to 17 percent; (ii) increased adoption rate for technologies by 74 percent; (iii) increased area expansion for horticulture crops by 167 percent; (iv) increased irrigated area by 5 percent; and (v) increased cropping intensity by 5 percent; all arising from efficient soil moisture conservation based agriculture management are quantified. **Next**, drought mitigation impacts from reduced productivity fluctuations by 57 percent occurring twice in five year cycle are quantified. **Finally**, improved sustainability impacts due to strengthened institutions are quantified by assuming an extended duration of project benefits by five more years along with 35 percent fall in benefits for WP, and 75 percent fall in benefits for WOP occurring in phases from yr-10 onwards.

17. *Financial analysis:*

Annual average undiscounted net incremental financial benefits from project investments are INR 1.5 billion, out of which crop production contributes 14 percent, horticulture production 38 percent, drought mitigation 26 percent and sustainability impacts 22 percent. With only production benefits, FRR is estimated at 2.2 percent, which improved to 9.7 percent when drought mitigation benefits are included. With the inclusion of sustainability impacts, project FRR went up to 18 percent. When evaluated against all project costs including the project management costs, the FRR for the project is estimated at 17.2 percent. The financial NPV is INR 2.3 billion. The projected FRR is for the project investments including incremental NREGS funds over the IWMP investments. In the absence of NREGS funds, the projected FRR came down to 14.3 percent with substantial fall in NPV by 69 percent.

18. *Economic analysis:* Annual average undiscounted incremental

T-2 KWDP-II Financial Analysis Summary

	PVC	PVB	NPV	FRR
Production Impacts	4,552	2,614	(1,937)	2.2%
Plus Drought Mitigation Impacts	4,552	3,989	(563)	9.7%
Plus Sustainability Impacts	4,592	7,180	2,588	18.0%
Over all Project	4,861	7,180	2,319	17.2%
Over all Project (Without NREGS)	3,595	4,308	713	14.3%

T-3 KWDP-II Economic Analysis Summary

	PVC	PVB	NPV	ERR
Production Impacts	3,775	2,759	(1,016)	6.1%
Plus Drought Mitigation Impacts	3,775	4,017	242	13.2%
Plus Sustainability Impacts	3,807	6,957	3,150	20.6%
Over all Project	4,023	6,957	2,934	19.7%
Over all Project (Without NREGS)	2,884	4,174	1,291	17.0%

net economic benefits from project investments are INR 1.4 billion, of which crop production contributes 20 percent, horticulture production 34 percent, drought mitigation 25 percent and sustainability impacts 21 percent. With only production benefits, ERR is estimated at 6.1 percent, which improved to 13.2 percent when drought mitigation benefits are included. With the inclusion of sustainability impacts, project ERR went up to 20.6 percent. When evaluated against all project costs, the ERR for the project is estimated at 19.7 percent. The economic Net NPV is INR 2.9 billion. The projected ERR is for the project investments including incremental NREGS funds over the IWMP investments. In the absence of NREGS funds (Fig.1), the projected ERR came down to 17 percent with substantial fall in NPV by 56 percent.

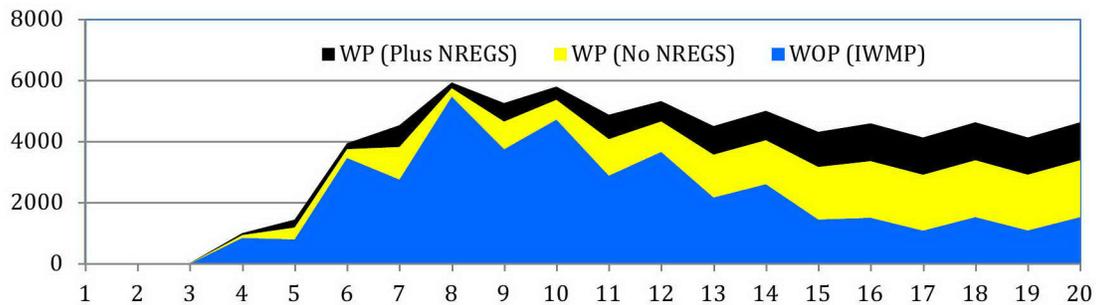


Fig 1 KWDP-II Annual financial benefits (Rs Million)

19. *Sensitivity Analysis.* The project can sustain: significant decreases in benefits or increases in costs. A 73 percent increase in costs, or a 42 percent decrease in benefits, or a combined 27 percent increase in costs and fall in benefits, reduces the project ERR to about 12 percent. Implementation delays would delay benefits. If all benefits are delayed by two years the project ERR falls to 14.6 percent with a substantial reduction in NPV by 65 percent. If sustainability impacts are limited to 50 percent, project ERR comes down to 16.2 percent. In general, projected ERR is more sensitive to changes in benefits than for costs. Sensitivity tests indicate that the project is able to absorb substantial negative impacts yet still generate robust ERRs.

T-4 KWDP-II Sensitivity Analysis Summary

Sensitivity Analysis	NPV	ERR
Base	2,934	19.7%
<i>Change in costs and Benefits</i>		
Costs up by 20%	2,130	17.0%
Benefits fall by 20%	1,543	16.4%
Costs & Benefits by 27%	(30)	11.9%
Sustainability Impacts limited to 50%	1,202	16.2%
Project Implementation Delayed by 2 yrs	1,023	14.6%
<i>Switching Value for</i>		
Costs to increase by 73%	1	12.0%
Benefits to fall by 42%	(7)	12.0%

20. *Risk Analysis.* Risk analysis was done to assess the effects of uncertainty on the projected outcomes of the proposed project investments and evaluate the confidence limit for realizing the projected

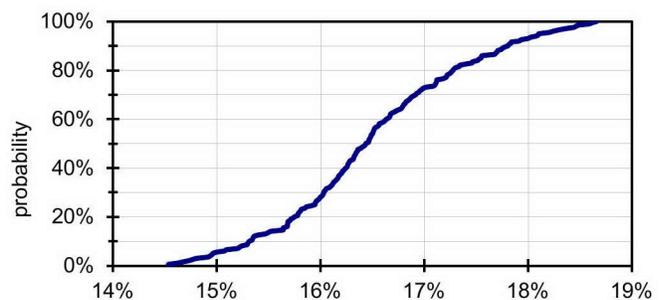


Fig.2 KWDP-II Cumulative Distribution of ERR

economic returns. Besides, database for the analyses is compiled from multiple sources. Very often, critical variables and assumptions used in the analysis can have a range of values and distribution of these values will impact the projected costs and benefits. To capture this, based on the available data and in tune with the sensitivity analysis, a joint 50 percent increase in project costs and 50 percent fall in estimated project benefits arising from production, drought mitigation and sustainability impacts are separately considered for the risk analysis. Simulated ERRs ranged from 14.5 percent to 18.7 percent with an expected ERR of 16.5 percent and coefficient of variation of 6 percent. The expected ERR of 16.5 percent can therefore be considered reasonably stable.

End Notes

- i Report on Region wise cost of cultivation of crops, Karnataka State Department of Agriculture, Bangalore (Various years)
- ii ICRR for the Karnataka Watershed Development Project, Sep 28, 2009, Report No. ICR00001205, The World Bank, Sustainable Development Department, Agriculture and Rural Development Unit, South Asia Region
- iii Concurrent Monitoring and Evaluation of CSS-NWDPR and RVP Projects in Southern Karnataka, Director of Research, University of Agricultural Sciences, GKVK, Bangalore and Assessment of socio-economic impact of watersheds under NWDPR in Northern Karnataka, University of Agricultural Sciences, GKVK, Bangalore (various reports)
- iv A feedback on ICRISAT demonstrations, Sujala Watershed Development Project, Monitoring, Evaluation and Learning, Antrix Corp., ISRO, Bangalore, May 2007.
- v Annual Seasonal Rainfall and Area Coverage during in Karnataka, Directorate of Economics and Statistics, Bangalore (for various years)
- vi Soil and moisture conservation activities- A report on Impacts and sustainability, Sujala watershed project, Monitoring, evaluation and learning, Antrix Corp., ISRO, Bangalore and Report on Assessment of Socioeconomic impact of watersheds under NWDPR in northern Karnataka, University of Agricultural Sciences, Dharwad.
- vii Impact of Watershed Program and Conditions for Success, A Meta-Analysis Approach by PK Joshi, AK Jha, Suhas P Wani, TK Sreedevi and FA Shaheen Global Theme on Agro ecosystems Report no. 46, ICRISAT/NCAP, Ministry of Agriculture and Ministry of Rural Development Government of India, New Delhi, India, 2008
- viii Watershed development in India. 1. Biophysical and societal impacts, Ian Calder et al., Sustainable Environment Development, Springer Science Business Media B.V. 2007

Technical Annex 8 – Key Documents

World Bank and Sujala related:

World Bank, September 2009. India - Karnataka Watershed Development Project - Implementation Completion and Results Report.
[<http://go.worldbank.org/HZU6HFX610>]

The World Bank's Country Strategy (CAS) for India for 2009-2012.
[<http://go.worldbank.org/5IWA37WFB0>]

Government of Karnataka request for Repeater project - 2009. Request from DEA to the World Bank.

Aide Memoires and Mission Notes for preparation mission of KWDP II (2010-2011)

Guidelines:

Common Guidelines for Watershed Development Projects, 2008. Department of Land Resources, Ministry of Rural Development, Government of India
[http://dolr.nic.in/iwmp_main.htm]

Operationalization of Common Guidelines Watershed Development 2008
[[http://dolr.nic.in/common_guideline/Rollout percent20plan percent20for percent20SLNA.doc](http://dolr.nic.in/common_guideline/Rollout%20plan%20for%20SLNA.doc)]

Guidelines for convergence between NREGS and Integrated Watershed Management Programme (IWMP) of Department of Land Resources (DOLR) - No.J-11019/2/208-NREGS of DOLR Dated 29 May 2009
[http://www.NREGS.net/csd/convergence-guidelines/Convergence_Guidelines.pdf]

Other background studies (see also Lessons learned):

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Technical Annex 9. Proposed Governance and Accountability Framework

1. Karnataka is one of the most progressive states in India in promoting initiatives to make its governance citizen friendly, transparent and responsive. The GOK has undertaken a number of initiatives including: e-procurement, Khajane (computerized transactions for the Treasury), Karnataka State Wide Area Network (KSWAN), Attendance Monitoring System/Flexi-time, Bhoomi (digitization of land records), Nemmadi, Stamps and Registration. The GOK has also introduced many other reforms such as citizen's charter, public hearing and online complaints system to promote administrative accountability in the state.
2. Karnataka has a well-established system for investigation of alleged cases of irregularities in respect of duties discharged by public servants. Investigation of implementing agencies and high-level government officials is conducted by an independent agency, the Lokayukta, which is a similar institution of the state as the Central Vigilance Commission (CVC) at the Central level. The Lokayukta, headed by retired judges, has jurisdictions over all implementing agencies and government officials except for the Chief Minister and his Cabinet Ministers. It has offices in all the districts of the state and has a website (<http://lokyukta.kar.nic.in>). Any member of the public can contact the Lokayukta to complain about any aspect of the administration.
3. The Governance and Anti-Corruption (GAC) framework for the project would build upon existing good governance policies and constitutional provisions for tackling corruption in the state. The framework emphasizes on supporting the implementation of the Right to Information Legislation within the project and strengthening risk management and accountability mechanisms in the project.
4. The objective of the GAC is to strengthen overall of governance of the project to minimize risks related to deviation in processes and mis-utilization of project funds. The GAC would therefore comprise of i) project specific actions that support transparent systems and processes for procurement, financial management and reporting; ii) systems and processes for free and wider access to information and oversight by all stakeholders, project beneficiaries and civil society; and a monitoring system that would ensure that the agreed project principles and rules of engagement governing implementation of the project activities are followed. The key GAC related risks and mitigation measures associated with this project are illustrated in the following table (next page).
5. The GAC acknowledges that at the national level, convergence (in the case of the project, between IWMP and NREGS) is a major governance objective as outlined in the Approach Paper to the 12th Five Year Plan. The GAC also acknowledges that the GoK is addressing corruption and governance through a new state monitoring initiative and relevant indicators.

Key GAC risks and proposed mitigation measures:

Key GAC Risks	Mitigation Measure
The need to enhance Transparency	Community institutions and stakeholders at different levels are involved in the project process. A public information officer (PIO) is in place as provided under the Right to Information. Project details would be posted on the web.
Exclusion and Equity Issues	Participatory watershed planning with community groups by IWMP already ensures that the poor and socially excluded are represented at all levels of the decision making process. The Bank project is providing incremental planning and capacity building tools.
Weak Institutional Capacity, Lack of Team Work and Accountability	At each level the responsibilities would be mutually and collectively owned. Training would be imparted to project staff for various tasks associated with the project. Each stakeholder is responsible for decisions and actions taken. Monitoring and periodic review and auditing would be given priority to ensure transparency and accountability.
Inadequate grievance redress mechanism	Project would develop an efficient and responsive grievance redress mechanism based on a responsive administration, with provisions of online tracking/monitoring in a time bound manner.
Governance implications related to the indirect linkage with NREGS	A social assessment has been carried out covering institutional/governance arrangements and capacities, as well as stakeholders and social trends and forces. The GOI is now tracking NREGS financial resources through the CAG offices.

6. The GAC recognizes that two of the constitutional provisions or legal acts that would be applicable to project are i) The Right to Information Act; and ii) The Prevention of Corruption Act, 1988. In addition other constitutional provisions related to fraud and corruption as appropriate would be injected by the project.

7. The policy and legal enforcement provisions above for mitigating and tackling fraud and corruption would cover all the stakeholders including project implementation agencies and community institutions (individually or institutionally).

8. Transparency and Disclosure. The Right to Information Act 2005 (RTI)⁴³ would be one of the main tools through which transparency and disclosure would be ensured in the project. For the implementation of RTI, the project would follow the provisions as outlined in the Right to Information Act, 2005. The system and guidelines that would ensure implementation of RTI would be detailed out in the project operational manuals. The PIP would articulate in detail on how RTI Act would be implemented for the project.

⁴³ The State of Karnataka has a State Information Commission. Right to Information (RTI) legislation is operational across all government departments with the objective of enhancing transparency and accountability for reducing corruption arising out of asymmetric information flow. Each public office has a designated Public Information Officer and Assistant Public Information Officer Structure.

9. The RTI mandates the disclosure of and universal access to information wherever in the public interest. Compliance to the Act is required for all public entities including the PPMU. The implementation of the RTI Act requires substantial resources to put in place systems and procedures for both “on demand” and “suo moto” disclosures of information. The proposed project would provide the required funding and technical assistance for the PPMU to improve its system and procedures so that information about the project is widely available to the public.

10. To enable the project staff to respond to public requests for better information, training programs would be arranged for all officers for in-depth understanding of the RTI Act, in suitable institutions such as ATI-Mysore etc.

11. The GoK is implementing a Results Framework Document (RDF) as an additional accountability mechanism. It is expected that the RDF being implemented by Department of Agriculture will link with the project M&E system where common indicators exist.

12. The project is preparing various operational manuals which would outline the rules of business for project implementation and monitoring of outcomes. The rules and processes related to procurement, financial management, and implementation would be available in the public sphere.

Social approval of participatory plans to be implemented under IWMP

13. With the intention of allowing greater access to information and suo motto disclosure, all the information would be displayed in the Project Website including disclosure of various operational manuals, mid-term review reports, safeguards information as well as information on the procurement process.

14. As a part of the project’s communication and transparency strategy, the project would publish quarterly newsletters and compile other publications containing case-studies, best practices, and news reports, for reaching out to various stake holders. These publications would be shared with the concerned departments, district and sub-district level offices and CBO’s. These publications would also be hosted in the project web-site.

15. Independent Monitoring. Various key activities and processes of the project would be reviewed by a specially contracted independent agency who would conduct research and thematic studies on specific issues. The studies would not only be evaluative in nature but would also capture the good practices of the project. These studies would be published and hosted in the public domain.

16. Audited financial reports of the project would be posted on the Project/Department website.

17. Grievance and Complaints Handling System. The project would establish a Grievance and Complaints Handling System that would include:

- A *complaint registration and coding system* would be developed at all the levels of project management (State and district level). Online complaints handling system would be introduced at the Projects website;
- According to the nature and seriousness of the complaints the complaints would be prioritized and enquired. The decision would be taken based on the findings of the enquiry team and the same would be communicated to the complainant.

18. Monitoring of GAC implementation. The project would form a review committee comprising of WDD Commissioner/Project Director, Executive Project Director, Public Information Officer, Coordinator M&E and finance controller at the state PPMU that would meet at least bi-annually or as and when required to review the progress and status of pending enquiries. This committee would review cases and agree on ways to dispose them efficiently. This would be of tremendous value in reducing backlog and also send a strong message about the efficiency of the implementation mechanisms that enforce integrity within project.

19. The GAC mechanism that is inbuilt into the project design is presented below and this matrix would be monitored during project implementation and supervision and would serve as the Governance and Accountability Action Plan for the project:

GAC mechanisms in the proposed project

GAC Mechanisms	Tools proposed in project design	Level	Actor
<i>Disclosure and Transparency</i>	Project Website with full disclosure of key information (i.e., project rules for open engagement of partners)	State	Project
	Display Board, Posters etc	District/Community	Project/Community
	Disclosure Policy or System	State	Project
	Project Newsletter/publications	State	Project
	Records of key meetings, decisions, accounts, procurement etc	All	Project & Community
	Radio programs	State	Project
	Application of RTI Act	District/ Community	Community
	Stakeholder workshops	All	Project
	Shareholder perceptions made publicly available	State	Project
	Easily accessible digital library	State	Project
<i>Business Processes and Service Standards</i>	Project Implementation Plan and various manuals	State	Project
	Community Operational Manual	State	Project
	Watershed Management Plans.	District/ Community	Community
<i>Complaints Handling/ Grievance Redress</i>	Complaint Registration and Coding System	Project	Public
<i>Financial Controls</i>	External Audit	State/District	Project
	Internal Audit	State/District	Project
	Standard Accounting System	State/District	Project

Technical Annex 10. Watershed Management and Global Best Practices

Defining Watershed Management

1. For purposes of this discussion, watershed management (WSM) is defined as the integrated use/management of land, vegetation and water in a geographically discrete drainage area for the benefit of its residents, with the objective of protecting or conserving the hydrologic services which the watershed provides and of reducing or avoiding negative downstream or groundwater impacts.

2. Watershed management⁴⁴ means putting in place systems that ensure land resources are preserved, conserved and exploited sustainably now and for future generations. The watershed management approach integrates various aspects of forestry, agriculture, hydrology, ecology, soils, physical climatology and other sciences. But it is more than natural science methods and tools. Rather, watershed management is a continuous and participatory process that involves people and aims to improve their livelihoods. A watershed approach can be a coordinating framework for management that attempts to focus public and private, community and individual efforts toward addressing high priority land and water-related issues within the hydrologically-defined geographic area (for example, see Box 1). Watersheds are being considered as a unit of management for many natural resource-related issues including land degradation, water conservation, non-point source pollution, etc. Watershed management is simultaneously a technical and social undertaking (see Box 2). From a technical perspective, it involves reducing soil erosion, promoting vegetative cover, and harnessing rainwater resources. From a socioeconomic perspective, it involves coordinating the actions of numerous land users in a watershed who may have multiple, conflicting objectives. Prior to the 1990s, watershed management was treated largely as a technical problem with top-down engineering solutions, but lack of attention to socioeconomic complications undermined numerous projects because people refused to go along with technical plans that conflicted with their diverse interests. From the 1990s, more successful programs tended to adopt various participatory approaches.

Box 1. Watersheds & Groundwater Basins

A **watershed** is an area that supplies water by surface or sub-surface flow to a given drainage system or body of water. Size is not a factor in the definition. Watersheds vary from a few hectares (or less) to millions of square kilometers (e.g., Amazon River basin). Unless a watershed discharges directly into the ocean it is part of a larger watershed that does, and may be referred to as sub-watershed.

Whereas a watershed is defined by surface drainage, a **groundwater basin** or catchment is defined by the below ground area from which groundwater drains. Therefore a groundwater divide may not follow the watershed divide. The boundary between two adjacent groundwater basins, which is represented by a high point in the water table, is constituted by a geologic or hydrologic boundary.

3. The largest watershed management unit is the basin, which drains to a major receiving water such as a large river, estuary or lake. Basin drainage areas typically exceed 10-20 thousand square kilometers and often include major portions of a single state or even a group of states.

⁴⁴ Paragraph 2 was drawn from (FAO 2004). Factsheet – Participatory watershed management. FAO, Rome.

Within each basin are a group of sub-basins that extend over a few thousand square kilometers. Sub-basins are a mosaic of many diverse land uses, including forest, agriculture, range, and urban areas. Sub-basins are composed of a group of watersheds, which, in turn, are composed of a group of sub-watersheds. Within sub-watersheds are micro-watersheds (also called catchments), which are the smallest units in a watershed. A micro-watershed is often defined as the area that drains an individual development site to its first intersection with a stream.⁴⁵

4. Watershed management is complex owing to the complexity of ecosystem dynamics and interactions (Figure 1). This includes hydrological, energy, nutrient cycles, complicated even further when human habitation, interventions and impacts are thrown into the mix.

Box 2. Are watersheds “a natural unit” for natural resource management and/or rural development?

The common wisdom says “yes” but experience says “not necessarily”. While watersheds are one of the most basic units of natural organization in landscapes, they are not natural units of social organization. People and institutions have generally organized around other types of political, administrative, geographic and/or territorial/natural units (e.g., forest, grazing lands, agro-ecoregions). Organizing around watersheds, on the other hand, is most relevant when there are land/water or water-related externalities of sufficient concern that they are driving forces in the setting of objectives, decision-making and investment. Rather than trying to force a watershed framework, other alternatives and organizational schemes may be more sensible and cost effective.

General Approaches to Watershed Management

5. In practice, there are two basic approaches to WSM — targeted and mainstreamed. The former has very specific objectives and indicators related to water resources and hydrologic outcomes and the management interventions and the instruments applied are designed to address these. In the latter there are broader goals and objectives, such as sustainable land/natural resources management, poverty alleviation, and/or rural development. Here, WSM practice and concerns are integrated (mainstreamed) into planning and investment as a contribution to overall WSM and to conserving or restoring the integrity of the watershed system. Most development-oriented WSM programs and projects are of this latter type.

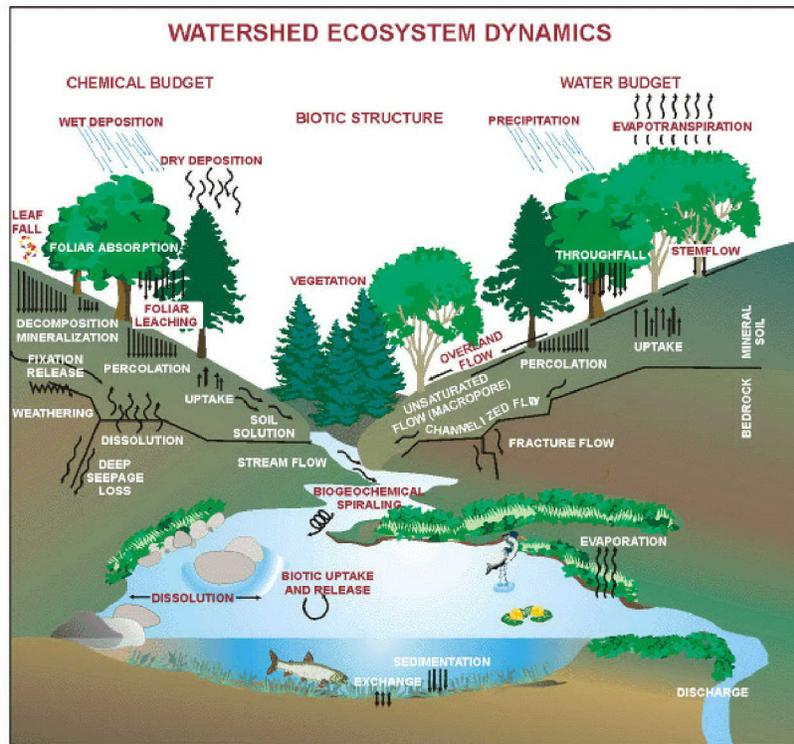
6. Irrespective of the approach, a number of factors are (or should be) common to the two approaches. These include:

- Clarity of objectives as regards WSM issues and desired outcomes, viz. water resources and the interactions with land and vegetation;
- Appropriate matching of management interventions and instruments to the defined hydrologic objectives. See Box 3.
- Adaptation of approach and interventions to local conditions and needs; to the dynamics of natural resources use, climate and environment; and to the social, economic, and institutional imperative that are both context and drivers for the proposed interventions. Note that “local conditions” also include those that are relevant to the watershed’s hydrology.

⁴⁵ Source: Center for Environmental Protection 2006. Basic concepts in watershed planning. CEP, Ellicott City, Maryland.

- Stakeholder management. The management of water resources generally affects the personal and institutional interests of a multiplicity of stakeholders. Successful WSM requires strong attention to stakeholder management and communications in all phases (e.g., problem identification; planning, prioritization and goal setting; decision-making; implementation; and follow-up).

Figure 1. Watershed ecosystem dynamics⁴⁶



Scales of Intervention

7. Physical scales. WSM programs have tended to adopt the micro-watershed as the basic unit and focus for implementation. This has proven to be a flexible, practical, and economical unit for project intervention. Within a micro-watershed all stakeholders can be readily identified and included in participatory processes to establish a consensus vision on problems, needs and priorities. Management at this level is not overly complex such that local capacity can be built to plan and manage the interventions and to administer funds for the execution of the plans. Also, linkages between the stakeholders' income, livelihood and welfare and the water and land resources are more readily apparent, facilitating the identification of potential win-win management scenarios that can provide positive incentives and align local stakeholder's interests with the broader watershed protection and conservation goals. Finally, collective actions at the micro-watershed level can result in lower costs and better use of financial and human resources, especially for the management of common resources.

⁴⁶ Source: Source: Environment Protection Agency 2010. Watershed management field notes. Washington DC.

8. At the same time however, a micro-watershed approach done in isolation – i.e., carried out as a patchwork of individual micro-watershed interventions and lacking prioritization or

Box 3. Matching approach to objectives.

Many WSM projects state a series of hydrologic objectives but subsequently fail to pursue these in any substantive fashion. A common example is projects with objectives of soil conservation and reduction of downstream sedimentation from agricultural watersheds. If sedimentation is an issue, it cannot simply be assumed that on-farm interventions will resolve the problem. Rather, it is first necessary to evaluate and identify the principal sources of sediments, and only then specify the interventions required to address these. Commonly the principal sources of sediments in a rural watershed will be the road systems, sediments stored in flood plains and riparian zones, and/or stream bank erosion. It is not common, however, to find these sources actually targeted by WSM projects with stated goals of downstream sediment reduction. Concern for sustainable land management and soil productivity are ample justifications for supporting on-farm soil and moisture conservation; a “watershed management project” is not required to address these. However, if off-farm and downstream impacts are real issues, the approach and instruments must be relevant to and support the stated WSM objectives.

planning within the context of the larger watershed – would be uncertain of achieving broader goals of protecting and conserving the hydrologic services of interest and/or of managing negative downstream or groundwater impacts. Working at the micro-watershed scale alone does not necessarily aggregate up to watershed management or capture upstream/ downstream interactions.

9. Therefore, it is important to undertake a higher-level, larger scale assessment to understand basic hydrological services, land cover and use, upstream and downstream linkages, etc. This larger-scale assessment can then guide more effective lower level micro-watershed planning, and implementation of soil and water conservation interventions.

10. Table 1 provides an illustration of how aggregation from the micro-watershed level to larger scales introduces changes in

focus, management approach, instruments, and the key stakeholders who must be involved. Note that objectives may also, and oftentimes do, change with scale.

11. For example, at the micro-watershed scale the objective may be to improve livelihoods through intensifying and diversifying agricultural production in an environmentally sustainable manner whereas objectives at the watershed scale might be flood prevention, protecting water quality for human consumption, and maintaining environmental flows. In this example, interventions at the micro-watershed scale may require orientation to ensure compatibility with broader watershed objectives. Note also that the relative ability to influence and manage some hydrologic factors would also vary scale. Best practices would thus include mechanisms for (i) planning in which stakeholders have a voice and are able to agree on measures that can achieve both local and larger scale objectives and (ii) inter-agency collaboration and local-regional-state level coordination.

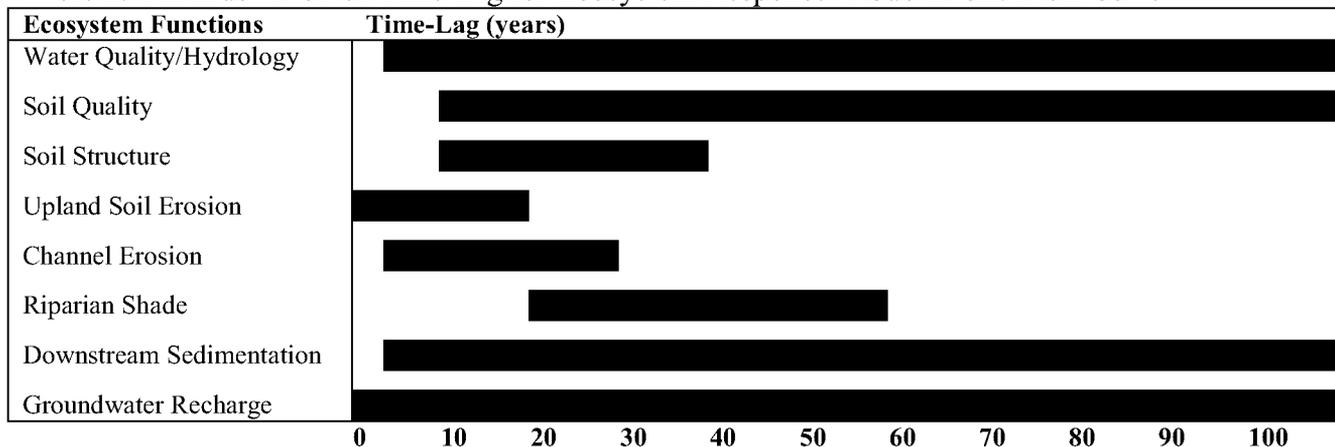
12. Temporal Scales. In watershed management, there can be significant time lags between cause-and-effect for parameters of interest, with scale being one of the determining factors in the length of the time lag. The smaller the scale, the more immediate the impact. A common example of this is sediments derived from inappropriate practices or activities in the upper watershed. These may take decades or centuries to work their way through the watershed system. Since most WSM projects assume they can have short-to-medium term impact on

overall watershed health, it is important to understand that a problem encountered today may be the result of a causal factor that no longer exists or that a solution implemented tomorrow may take years or decades to achieve its desired downstream objective. See Table 2.

Table 1. An Idealized Scheme of Changes in WSM Approach and Focus with Scale

Watershed Management Unit	Indicative Size (km ²)	Influence of Rural Land Use on Watershed Hydrology	Primary Stakeholders	Typical Management Focus/Instruments
Micro-watershed	0.01 – 2.5	Very Strong	Property owners (local)	Participatory planning; BMPs; site design
Sub-watershed	2.5 – 25	Very Strong to Strong	Local government w/ principal local stakeholders	Stream classification; land use planning/zoning; land, water resources & stakeholder mgmt.
Watershed	25 – 250	Strong to Moderate	Local or multiple local governments w/principal local and regional stakeholders	Watershed-based zoning; land use & water resources planning; stakeholder mgmt; policy, norms, regulations & incentives
Sub-basin	250 - 2,500	Moderate to Weak	Local, regional or state w/principal regional stakeholders	Basin planning; stakeholder mgmt; policy, legal framework & incentives
Basin	2,500 - 25,000 +	Weak to Very Weak	State, multi-state, or federal w/principal regional & state stakeholders	Basin planning; stakeholder mgmt; policy, legal framework & incentives

Table 2. An Illustration of Time Lag for Ecosystem Response at Sub-Basin/Basin Scale



Watershed Management Best Practices

Introduction

13. The 2008 World Bank report *Watershed Management Approaches, Policies and Operations: Lessons for Scaling-up* offers a body of learning on best-practices in watershed management approaches. The review of some 15 years of practices identified factors of success for achieving goals of upland soil and water conservation and of intensification of natural resource use to increase the incomes of upland populations in a sustainable way. Even though there were significant variations in practice and performance, and although adaptation and flexibility are hallmarks of all good projects, some principal factors of success were common. These are detailed below, and would serve as the framework for benchmarking of the three Bank-financed projects being considered in this report.

Technical Benchmarks

14. Watershed management versus other approaches. Watershed management approaches are often more complex and costly both for natural resources management (dealing with the myriad interactions of land, water, and people within a complex system), and in implementation (requiring elaborate decentralized and participatory approaches, complex financial and subsidy arrangements, and organizational setups involving many different agencies). Therefore there should be a clear rationale for pursuing this approach. The WSM approach is not a panacea that can or should be applied to every situation where natural resource management and/or rural poverty objectives or problems exist. Sometimes it would make more sense to follow approaches based on more socially, politically, administratively or ecologically meaningful land units or affiliations.

15. Begin watershed planning with a larger scale assessment. Water-related and downstream externalities are the central justification for applying a WSM approach, yet linking and orienting upstream activities to management objectives at the broader watershed level is a major challenge. Too commonly WSM projects fail to pay attention this factor, resulting in micro-watershed activities and institutions not contributing to improved conditions at the watershed-scale or even accounting for their impacts on water resources. If micro-watershed approaches are to be scaled up such that they affect significant areas of watersheds, then their planning and implementation would have to proceed within the broader context of watershed-level (or sub-basin/basin) assessment/planning processes. The larger-scale processes, among others, should:

- Identify water resources issues and the linkages between upstream water and land uses and practices and downstream conditions;
- Use readily available models for basin or sub-basin level planning and analyses – then connect to micro-watershed delivery
- Involve key stakeholders and deal with institutional challenges of interagency collaboration and local-regional level coordination;
- Identify relevant socioeconomic and environmental characteristics, issues and parameters; and
- Define broad criteria to target critical watersheds/sub-watersheds and the menu of potential interventions within these.

16. Implement projects from the building block of the micro-watershed. Watershed management programs undertaken at the micro-watershed level clearly allow the needs and concerns of all stakeholders to be taken into account and an integrated package of land, water, and infrastructure to be developed that is responsive to those needs.

17. Target actions to both livelihoods and WSM/natural resource objectives. Although difficult, it is feasible to target both improved livelihoods and conservation objectives. Best results are obtained where conservation techniques that are profitable for stakeholders can be developed, and a menu of interventions can be offered that combines income and conservation objectives. Since conservation would not always be in the interests of some or all stakeholders and local interests may conflict with downstream interests, approaches are required that include such elements as:

- Stakeholder analysis to identify potential winners and losers, and assess losses to be incurred by different community groups because of conservation practices.
- Addressing equity concerns so that the distribution of costs and benefits do not disproportionately accrue to some groups of stakeholders;
- A focus on generating positive income streams for affected, key stakeholders groups through intensification, diversification, downstream processing and marketing, and the creation of new income-generating activities;
- Technical analysis of the potential for improving resource conservation within livelihood systems;
- Financial and economic analysis to establish the basis for project incentives, identify interventions, and to provide clarity on if and how subsidies and other incentives would create sustainable watershed management outcomes;
- Participatory approaches to developing and adopting new technologies and, as required, local research and development to construct least-cost and maximum-benefit technical packages;
- Where common pool resources exist, providing relevant stakeholders a secure stake in the benefits from improved management and, where restrictions to access or use are involved, provision of viable income alternatives; and
- Promoting interventions that reduced risk, such as improving water sources.

18. Monitoring and evaluation is critical. Monitor the project to ensure that it is on track to achieve desired livelihood and environmental objectives, and adapt plans as needed. Watershed management programs require effective monitoring and evaluation systems to track performance against objectives and provide information to help managers at all levels with implementation. Although measurement of externalities is difficult, they are fundamental to the justification of many watershed management programs, and projects should be careful to measure baseline data, define expected outcomes, and monitor results. Useful and affordable tools, such as remote sensing, are increasingly being made available for measurement of externalities. Modeling is also being used successfully, in particular to study dynamic phenomena at the basin, watershed, and even micro-watershed scales.

19. Hydrological monitoring is critical. Establishment of M&E systems for on-site achievement of economic, environmental, and institutional objectives is relatively

straightforward and well-documented. There is less experience with M&E systems to track downstream outcomes and the challenge of measurement is much harder. Yet M&E of off-site outcomes is essential to both the justification and the management of watersheds. Advances in dynamic modeling at the basin level coupled with more affordable monitoring tools, such as remote sensing, provide the capability to define upstream-downstream relations, set and monitor targets, and value benefits. Where possible, the impacts of watershed management on basin hydrology need to be integrated into planning and monitoring. Again, modern tools, such as modeling and remote sensing, can help understand and study these critical phenomena. In large or complex hydrological systems, an integrated approach all along the watershed may be needed, with institutions for basin-wide management.

20. M&E systems should be as simple and as low cost as possible. They should provide information needed to track performance against targets. Stakeholders who have a “need to know” are people living in the project area who are affected by the project, managers who need information for implementation, and promoters (government and external financiers) interested in results. Systems should call on a mix of quantitative and qualitative techniques, and participatory M&E is an effective way to collect and analyze information and to get stakeholders more involved. Given the complexities and externalities, the process should ideally be long term within a permanent public agency.

21. Other best practices to be considered in M&E include:

- Timely collection of baseline data, i.e., before or at project/program startup;
- Careful design of baseline data to capture outcomes and impacts relevant to stated WSM objectives;
- Physical monitoring to capture outcomes and impacts, not just inputs and outputs;
- Design of M&E system, indicators and institutional and implementation arrangements that ensure sustainability (e.g., is relevant to institutional needs, recurrent costs of operation and maintenance are affordable) and use as a management tool to support day-to-day management. This latter is especially important in the multi-level matrix management structures that characterize most watershed management projects.

22. To the extent possible monitoring systems should rely on low-cost, easy-to-use, and effective techniques for collection of both: (i) quantitative data involving measurement of physical indicators and household surveys and (ii) qualitative data involving interviews and observations of stakeholders about perceived progress and challenges in project implementation. Hard science data assessments should be matched with feedback from stakeholders.

23. Remote sensing offers good opportunities for generating data at low cost. The use of maps is a good way to have an overview of project progress and to communicate with stakeholders. Participatory M&E is a very useful way to collect information about projects, analyze information, and get stakeholders more involved.

Institutional Benchmarks

24. At the national and state-levels. Government commitment is an important ingredient for success as are supportive policies and legal frameworks. This is particularly true for (i)

decentralized and participatory development; (ii) ensuring institutional and implementation arrangements that allow and encourage public agencies at all levels to work together; and (iii) securing access to natural resources – in a manner that reflects local legislation and tenure practices and problems – to allow for planning and management. Projects may need to contribute to the development of more supportive policy frameworks.

25. Effective interagency collaboration is critical to success. Successful approaches allow for decentralized implementation and set up institutional arrangements for multidisciplinary and multiagency collaboration across ministries. Decentralization and multiagency collaboration do not work well when dominated by a single institution.

26. Mainstream watershed management concerns and practices within relevant institutions. The complexity and burden of achieving WSM objectives across the broad range of institutional actors who are concerned by or who affect watershed hydrology – e.g., power and transport sectors, agriculture, forestry, agribusiness, and local governments – can be reduced when these agencies internalize and develop their own sectoral approaches for avoiding and/or mitigating their impacts on water and land resources (e.g., within their EIA processes, development and specification of BMPs, monitoring indicators, etc.).

27. Institutional and implementation arrangements. These should be focused upon and supportive of local level implementation. It is preferable that responsibilities be placed upon permanent agencies, with clear arrangements for integration between local and higher level agencies, and for interagency collaboration. Simplicity and clarity on responsibilities are key factors in success. Integration within permanent agencies and structures increases the potential for sustainability and for scaling up of program actions. Watershed management programs should contribute, as needed, to frameworks for overall watershed planning and management.

Box 4. Integrated Water Resources Management

IWRM has been defined by the Technical Committee of the Global Water Partnership (GWP) as "*a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.*" IWRM is a comprehensive, participatory planning and implementation tool for managing and developing water resources in a way that balances social and economic needs, and ensures the protection of ecosystems for future generations. Water's many different uses – for agriculture, for healthy ecosystems, for people and livelihoods – are the subject of an open, flexible process that brings together decision-makers across the various sectors that impact water resources and all the relevant stakeholders to set policy and seek to make sound, balanced decisions in response to the specific water challenges faced.

The four principles on which IWRM is based are the 1992 Dublin Principles for Water:

1. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
2. Water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels.
3. Women play a central part in the provision, management and safe-guarding of water.
4. Water has an economic value in all its competing uses and should be recognized as an economic good as well as social good.

Source: Adapted from GWP Tool Box for IWRM (undated) and Integrated Water Resources Management, Wikipedia (undated).

28. Institutional mechanisms are necessary to integrate micro-watershed programs into higher-level objectives at the watershed, sub-basin and/or basin-levels, as well as to measure and monitor outcomes and impacts. WSM programs need to work toward an integrated institutional process with three complementary components:

- A process of watershed planning to engage on issues of water and land resource dynamics within the broader watershed of interest, identify critical hydrologic externalities to be addressed and/or services to be conserved and protected, and to establish higher-level objectives. The level and complexity of this planning process would vary, but new institutional arrangements and a broader range of planning tools may be required that would be adapted to the particular context. These tools may range from basic water balance and water accounting through environmental and social analysis to evaluate broader considerations and responses to basin-level hydrological and groundwater modeling to a comprehensive basin-wide Integrated Water Resources Management planning framework incorporating land and water resources together with other aspects of spatial planning. See Box 4. Irrespective of the level and complexity, appropriate stakeholder management approaches involving consultations and mechanisms for multi-sectoral, participatory diagnosis need to be integrated into the process.
- A bottom-up institutional and investment process to set objectives and priorities, negotiate between stakeholders, and to develop and measure the impact of a set of interventions that can fulfill both upstream objectives (at the local community level and also between upstream communities) and broader downstream objectives.
- Improved M&E methodologies, incorporating research, measurement, and monitoring to provide the scientific, economic and social knowledge for managing and evaluating watershed management programs and for, among others, assessing sustainability and pricing costs and benefits. New modeling and satellite imagery tools can be of great value in this.

29. Participatory/decentralized approaches. Although effective participation imposes demanding requirements, participatory approaches and the use of community watershed management plans have often been effective in empowering communities and in gaining ownership of watershed management programs. At the watershed level, develop and implement watershed management plans in partnership with government agencies and local stakeholders. However, since decentralization is an ongoing process in many countries, local-level participatory approaches for governance of resources, planning, management and technical functions should reinforce – rather than conflict with – the broader processes to decentralize responsibilities for local development.

30. Implementing participatory approaches. This requires appropriate sequencing, inclusion of all stakeholders in the process, political commitment, public agencies that understand the rationale and process of participation, and sustained capacity building at all levels for both stakeholders and public agencies.

31. Decentralized service delivery. Approaches and structures that effectively partner local communities are generally more successful. The interface between the decentralized delivery structure for watershed management, local government, technical agencies and community organizations needs to be carefully defined and managed, and capacity building may be needed

for all stakeholders. Further, since partnership approaches require time to evolve. The gestation period can be lengthy, particularly for joint management of common resources.

32. Demand-driven research and dissemination. Successful programs are characterized by relative simplicity and being demand-driven, by participatory research and learning, and by careful up-front organization and incentives to ensure institutional cooperation.

33. Common pool resource issues. Frameworks are required for assessing and dealing with the policy, institutional, and programmatic aspects of land tenure and common pool resources. Although land tenure and common pool resources have long been identified as critical in developing a sustainable incentive and institutional framework for watershed management, generally too little systematic attention has been paid to handling these issues at the policy, institutional, and program levels.

Social Benchmarks

34. Poverty reduction. Poverty reduction is not the objective of watershed management per se. However, where poverty is an issue, it must be recognized that WSM projects are by nature asset-based interventions that would tend to direct their efforts to enhancing the value and productivity of land and water to which the better-off segments have more access or ownership. Further, the poor may actually be losers under WSM approaches that, for conservation purposes, restrict access to common resources upon which the poor disproportionately depend for their livelihoods. It cannot be simply assumed that employing participatory approaches would solve this issue; there is little evidence that communal decision-making mechanisms are inherently pro-poor and, indeed, the opposite may be true. The challenge is to develop mechanisms that can reach three potentially conflicting objectives: i) to target the needs of the poor; ii) to adopt a participatory approach inclusive of all stakeholders; and iii) to reach watershed management objectives. Among others, it is important to know who the poor are, how are they affected by proposed WSM interventions, incorporate actions and mechanisms to include the poor in project benefits and governance; and include the means to encourage communities to adopt pro-poor approaches. Finally, stakeholder management approaches should ensure that the concerns of the poor as regards water resources are brought out in the planning processes. In the implementation these should receive the same attention as the concerns of other stakeholders. Commonly the non-land resource concerns of the poor would be more focused on issues of access to potable water and water for domestic use and livestock as well as issues of health (water-borne diseases) and sanitation. Avoiding a too narrow focus on land and land management in WSM would be another means of enhancing pro-poor aspects.

35. Stakeholder management. Targeting only the poor is generally neither possible nor desirable as effective WSM has to be inclusive of all stakeholders in the watershed. In best-practice examples, the role of stakeholders is analyzed within a watershed and institutional mechanisms and the stakeholder communication process are designed to include all relevant actors. When management issues arise in the larger watershed, approaches may be required to strengthen the voice of more vulnerable or marginalized stakeholders or communities so that they – and the poor within them – do not bear inequitably bear costs of providing environmental services to downstream stakeholders and communities. As strictly necessary, watershed or

higher-level committees (e.g., basin-level) that both empower stakeholders through participatory processes and provide spaces for negotiation, consensus-building and transparency in decision-making are one possible approach.

36. **Participation.** Project management has to foster participation, and benefits must be apparent to the local people. This is not straightforward. Participation is not a neutral concept as it involves shifts in decision-making power between the state and local communities, and also between different segments of the local community. Participatory processes need equitable rules and the rules have to be designed for the specific development and distributional outcomes desired.

37. **Participatory processes.** These tend to be more successful where: i) common purposes can interest all or most of the population; ii) the processes and organization are flexible and enough time and resources are provided for capacity building and genuine empowerment, and iii) where there were income and livelihoods incentives. Conversely, processes that do not take account of local social dynamics or do not genuinely empower local communities are unsuccessful.

38. **Flexibility.** Although projects would have targets for inputs, outputs, and outcomes; these targets have to be flexibly interpreted, since the community has the ultimate decision over the choice of investment. Often the lag between planning and implementation and the learning that comes with experience would result in the need to adjust targets. Appropriate mechanisms to allow for such flexibility in the implementation are necessary.

Economic Benchmarks

39. **Financial and economic analysis.** Profitability is fundamental to engaging stakeholders in conservation however, many watershed management interventions may not in themselves be profitable. Financial and economic analysis is thus an important tool for designing watershed management investment programs. While it is true that establishing accurate estimates of financial costs and benefits at the farm level may be difficult, simple step-by-step methodologies are available for farm-level analysis. For other impacts beyond the farm-level, quantification and valuation should be pursued to allow for the types of economic analysis that is valuable for choosing between different policy options and to test assumption and validate if technical choices are profitable and/or of economic value to society.

40. **Externalities.** Accounting for externalities is needed to demonstrate the potential costs and benefits of watershed management interventions, which is important to their economic justification. As one of the main attributes of watershed management is the potential to improve the management of externalities resulting from land and water interactions, the relationships between upstream investments (costs) and expected downstream impacts (benefits) should be clarified and analyzed. Valuation of externalities is also important for defining incentive structures for watershed management and providing a clear rationale any proposed incentive structures. Over time, monitoring would be critical to i) ensure that upstream intervention are not resulting in unintended downstream costs; ii) provide insight into the downstream benefits and/or costs, such that economic analysis may value environmental benefits; and iii) to test if the

incentives used to internalize externalities – most commonly investment subsidies – are effective and if they should or can be sustained after the investment period ends. Alternative compensation approaches such as “payment for environmental services” (PES) may become incrementally possible for sustaining incentive structures to the extent that monitoring and valuation demonstrate the linkages, desirability and feasibility.

41. Incentives for sustainability. Sustainable watershed management requires an incentive structure that continues beyond the project period and that is supported by economic instruments that assign costs and benefits according to public and private goods. The design of the incentive structure requires analysis of both local level incentives (what technologies, for example, could both achieve resource conservation objectives and justify stakeholder investment and effort) and the public good characteristic of conservation activities. Incentive structures must incorporate concerns for both equity and sustainability and be built upon a quantified assessment of externalities. Experimentation with innovative instruments, such as payment for environmental services (PES) is desirable. Research would generally be required to understand the relationship between land use and the generation of environmental services, to develop simple technical and economic tools for measuring costs and benefits and their distribution, and to define options for low-cost and practical institutional frameworks for PES

42. i) How water moves through a watershed is the product of the interactions between a number of factors, which include the watershed's underlying geology, climate and precipitation patterns, slope, soils, vegetative cover and land use. "Watershed hydrology", as a term, encompasses these interactions.

Technical Annex 11. Watershed Management and National Rural Employment Guarantee Programs: Catalyzing Synergies & Unlocking Potential

Introduction

1. This paper is aimed at portraying in brief two of the India's major development programs - Integrated Watershed Management Program (IWMP) and the National Rural Employment Guarantee Scheme (NREGS). While doing so, it brings out the key strengths and limitations of both these programs and the benefits that can likely result if the two can be enmeshed through a synergistic convergence and effective joint implementation arrangements. A strong case, subsequently, is made for facilitating, and options for, convergence between NREGS and the IWMP.

Integrated Watershed Management Program (IWMP)

2. Approximately 60 percent of India's population depends on agriculture for primary livelihood, largely from rainfed agriculture. Out of a net sown area of 141 million hectares in India, approximately 68 percent are under rainfed cultivation, mostly in arid and semi-arid areas. The rainfed productivity problem is exacerbated by the fact that currently 32 percent of the total area of the country is undergoing land degradation. Thirteen states, including Karnataka account for about three-quarters of the total rainfed area. Karnataka's dry regions are among the state's poorest, have low agricultural productivity, and are susceptible to recurring droughts leading to chronic poverty and migration.

3. Watershed management (WSM) provides credible answers to a range of tough challenges facing rural India helping to: increase productivity under difficult rainfed conditions; arrest and reverse land degradation; reduce water stress by recharging local aquifers and improving downstream water flows. Good WSM is rooted in participatory planning and requires institutional capacity in State-line departments, local authorities and within communities to manage watershed resources that cross administrative boundaries. Participatory WSM has established itself in rainfed areas as a sound basis and framework for stabilizing and improving the productivity of rainfed agriculture, increasing environmental flows and services, building resilience to and mitigating the impacts of droughts and floods and generally creating the conditions that promote sustainable nature based livelihoods and local employment. WSM however is a long gestation endeavor that also requires substantial and sustained flow of resources in order to be successfully implemented. Securing sustained and adequate funding to treat degraded watersheds across the vast rainfed regions of our country in which majority of people dependent on agriculture live as also the bulk of the poorest, has always been a challenge.

4. GOI is providing significant financial support to the states through two major schemes in the aggregate amount of approximately US\$4.9 billion (INR 23,000 crores) in 2010/11. The key program is MORD's Integrated Watershed Management Program (IWMP),⁴⁷ which is

⁴⁷ In early 2008, three central watershed schemes--Integrated Wastelands Development Program, Drought Prone Areas Program, and Desert Development Program--were combined into the IWMP under the Common Guidelines on Watershed Development.

implemented by state governments. For 2010/11, IWMP-supported projects covered 8.5 million ha across 23 states with a total cost of US\$2.4 billion (or INR 11,000 crores). The IWMP has adopted many lessons learned from both Bank and government supported watershed management programs. As currently structured, the IWMP can still be significantly improved through further innovation and learning through the proposed Bank-supported Karnataka Watershed Development II project.

National Rural Employment Guarantee Scheme (NREGS)

5. The landmark legislation, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), was notified on September 7, 2005. The objective of the Act is “to enhance livelihood security in rural areas by providing at least 100 days of guaranteed wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work”. Thus, MGNREGA, through the operational program of NREGS aims to provide a strong social safety net for the vulnerable groups by providing a fall-back employment source, when other employment alternatives are scarce or inadequate. Through the process of providing employment on works that address causes of chronic poverty such as drought, deforestation and soil erosion, the Act seeks to strengthen the natural resource base of rural livelihoods and create durable assets in rural areas. It aims at empowering the rural poor through the processes of a rights-based law and fostering conditions for inclusive growth.

6. The Act was notified in 200 districts in the first phase in February 2006 and then extended to additional 130 districts in the financial year 2007-2008. The remaining districts were included under the NREGS in April, 2008. Thus the NREGS covers the entire country with the exception of districts that have a hundred percent urban population. Based on the last three years performance, it is reported that the Scheme has assisted nationwide annually about 52 million households generating 2,200 million person days of employment, with women accounting for about 50 percent. Likewise, data for Karnataka state stands at 2.2 million households and 160 million person days with women 45 percent. Number of households gaining full employment (of 100 days) in Karnataka during 2010-11 aggregates to 1.31 million or 59 percent of the participating households.

7. For 2010-11, Government of India’s budget for NREGS was approximately US\$6.7 billion of which about 39 percent went to identifiable watershed management activities. According to the NREGS website, states spent about \$2.5 billion (INR 12,000 crores) on 7.5 million works of soil and water conservation activities through NREGS. Karnataka’s expenditure for NREGS for 2010-11 stands at INR 2510 crores (US\$ 480 million) of which 47 percent accounts for watershed management type of activities. The level of these expenditures for watershed-related expenditure probably makes it the largest soil and water conservation program in the developing world. However, reportedly, the field level impacts are behind expectations as the activities were not designed with quality WSM in mind. Thus, enmeshing NREGS with IWMP will ensure quality improvements substantially. This lays the foundation for exploring the space for convergence between IWMP WSM practices and NREGS resources in soil and water conservation.

8. The earlier Bank-supported Sujala watershed project successfully implemented community-led watershed development interventions at scale. The lessons learned from Sujala have largely shaped the IWMP which would be the primary partner with KWDP-II. A major goal of the project is to facilitate better convergence between IWMP and NREGS. Towards this, the paper analyzes the two programs from a convergence perspective following a Strength-Weakness-Opportunity-Threats (SWOT) framework.

A Comparative Analysis from a Convergence Perspective

Similarity of Development Objectives

9. The main goal of the IWMP is to improve and ensure sustainable livelihoods by enhancing productivity and incomes by restoring the local ecological balance by harvesting rain water in-situ, conserving soil and developing vegetation in degraded ecological habitats using a watershed development approach. The objectives are to reduce and prevent soil erosion, regenerate natural vegetation, increase rain water impounding and recharge the ground water table. This improves the quality of life of local communities, as it enables multi-cropping and the introduction of diverse agro-based activities, increased availability of natural resources for livelihoods intensification and diversification as well as improvement in livestock holdings, all of which contribute to providing sustainable livelihoods opportunities.

10. The MGNREGS has the twin objectives of employment and rural development. NREGS, operational arm of the Act, aims to provide for the enhancement of livelihood security of rural households by providing at least one hundred days of guaranteed wage employment every financial year to every household whose adult members seek work. Its auxiliary objective is to create durable assets and strengthen the livelihood resource base of the rural poor through undertaking works that address causes of chronic poverty such as drought, deforestation, soil erosion and poor connectivity. The Act stipulates that works must be targeted towards a set of specific rural development activities such as: water conservation and harvesting, afforestation, rural connectivity, flood control and protection such as construction and repair of embankments, etc. Digging of new tanks/ponds, percolation tanks and construction of small check dams are also given importance. The employers are given work such as land leveling, tree plantation, etc. The process outcomes include strengthening grassroots process of democracy and infusing transparency and accountability in governance.

11. It is well recognized that leveraging the huge funds available under NREGS requires inter-sectoral convergence. Since NREGS is decentralized and that the funds are untied, developmental works can be planned to suit the local needs. Thus, the effective convergence of two similar programs like IWMP and NREGS that share the same overall goal and objectives will not only help realize them more easily, but also generate significant value and benefits such as: i) optimal use of public investments; ii) enhancing economic opportunities; iii) strengthening democratic processes; iv) mitigating climate change effects; and v) sustainable improvements in livelihoods.

Approach and Works/ Activities

12. NREGS is an entitlement based, demand driven program restricted to being undertaken within Gram Panchayat boundaries. The IWMP adopts a sub watershed approach consisting of geo-hydrological units (clusters of micro-watersheds generally of about 500 ha each) normally averaging 5,000 hectares, cutting across several GP jurisdictions. There may be more than one micro-watershed within the revenue boundaries of a GP. Generally, only areas within the watershed boundaries are treated in the IWMP. In hilly/difficult terrain areas, smaller sized sub-watershed projects (1,000 ha and above) are also sanctioned.

13. The IWMP funds the following activities/ measures: All soil and water conservation measures – mechanical, hydraulic and vegetative - on all lands within the WS irrespective of land ownership and socio-economic restrictions. It includes afforestation, staggered trenching, contour and graded bunding, bench terracing, earthen check dams, brushwood checks, gully plugs, loose boulder check dams, gabion structures, low-cost farm ponds, nalla bunds, masonry weirs, percolation tanks, ground water recharge measures as well as raising of nurseries. It also supports productivity enhancing investments such as crop demonstrations, water saving technologies such as drip irrigation, etc. Livelihoods are also supported such as sericulture, bee keeping, back yard poultry, aquaculture, small ruminants, other livestock, agro-processing and off-farm micro-enterprises together with the necessary support services (such as veterinary services, market access and marketing support).

14. With the objective to create durable assets and strengthen the livelihood resource base of the rural poor, NREGS funds the following works in their order of priority: i) water conservation and water harvesting; ii) drought proofing (including afforestation and tree plantation); iii) irrigation canals including micro and minor irrigation works; iv) provision of irrigation facility, horticulture plantations and land development facilities to land owned by households belonging to the SCs/ STs/ BPL families, beneficiaries of land reforms, beneficiaries under the Indira Awas Yojana and Small and Marginal Farmers as defined in the Agriculture Debt Waiver and Debt Relief Scheme, 2008; v) renovation of traditional water bodies including desilting of tanks; vi) land development; vii) flood control and protection works including drainage in water logged areas; viii) rural connectivity to provide all-weather access; and (ix) any other work which may be notified by the Central Government in consultation with the State Government such as the Bharat Nirman Rajeev Gandhi Sewa Kendras scheme.

15. It can thus be seen that NREGS covers all the natural resources based interventions included in IWMP as well as provides farm based productivity enhancing infrastructure to defined social and economic groups (such as wells, pump sets and water delivery mechanisms), the latter which is generally not afforded by the IWMP, as well as rural roads and community infrastructure such as meeting halls, office space for public agencies and Resource Centers under the Bharat Nirman Rajeev Gandhi Sewa Kendras scheme. On the other hand, IWMP provides funding for off farm based livelihoods through SHGs thus specifically prioritizing women. Provided there is community consensus on what is to be done, dovetailing the two programs could make substantial resources available for overall village development, and enable greater benefit realizations to villagers through better price realizations and improved market access. Furthermore, given common will and purpose, it could enable the IWMP to accomplish

“saturation treatment” of micro-watersheds, optimize the productive potential of created assets as well as treat those areas falling within the revenue limits of the GPs but outside the micro-watershed boundaries thus allowing for inclusive and comprehensive development at the project level⁴⁸.

Augmentation of Human, Technical, Financial and Organizational Resources

16. Effective convergence between IWMP and NREGS will provide additional supplementary and complementary resources to both programs respectively.

17. Life Cycle Approach: The IWMP is a well structured sequenced program focused on developing and sustaining nature based productivity enhancing measures, building the requisite capacities of local communities and groups to implement and manage these resources and creating assets and opportunities that generate local livelihoods and employment. It has clearly defined phases (preparatory -1-2 yrs; works -2-3 yrs and consolidation phase-1-2 yrs) which correspond with the life cycle requirements of an integrated watershed based developmental project to which are matched the requisite resources and measures necessary to realize the overall goal of the project. Such a systemic approach applied consistently over a period of 7 years has a reasonable chance of facilitating the acquisition and consolidation of at least basic social, technical, organizational and institutional competencies (various essential capitals) at the individual, household and community level, so necessary to catalyze and sustain a broad based developmental momentum for poverty reduction.

18. NREGS which, on the other hand, seeks to develop a portfolio of assets that can generate value streams and livelihood opportunities which can provide an acceptable quality of life to poor rural households, only has an annual perspective. This is too short a period to develop the set of underlying resources and competencies necessary to achieve this objective. Dovetailing NREGS into the IWMP project cycle with its accompanying provisioning (particularly in regard to capacity building and institutional development) provides a sound framework to realize the long term objectives of NREGS in a sustainable manner.

19. Personnel and Competencies: Of the nine work items currently eligible for funding under NREGS, seven are related to nature based assets on which communities, especially the poor, depend for their sustenance and livelihoods. The successful implementation of these activities requires reasonably competent and technically sound personnel, a resource that is in acute short supply in NREGS, more so given the scale and magnitude of operation. This has resulted in a large number of works that are of poor quality, incomplete or both, thus rendering many expenditures technically ineffective.

⁴⁸ States like Madhya Pradesh and Andhra Pradesh have issued guidelines which actively seek convergence between various schemes. In MP, for instance, repairs of minor tanks, bunds and minor irrigation canals, flood control and river management works are taken up. In AP, a Drought Adaptation Initiative involving 10 initiatives for up-scaling in 100 villages has been taken up; a Common Property Resource (CPR) Management Project in 2 districts with NGOs is being implemented; a Community Managed Sustainable Agriculture initiative involving non-pesticide management, silt application & vermi-composting components is underway; as well as a Plantation program with Rubber Board, Coffee Board and Tribal Welfare Department is under implementation.

20. The IWMP on the other hand, even though not adequately staffed, nevertheless has access to a large pool (in-house and external) of qualified and competent individuals and agencies experienced in providing technical support and social facilitation. Moreover, since the relevant agencies have been undertaking watershed development activities since the last 35 years with a growing community focus in the last 15 years, they have acquired know-how, established systems and processes and secured the necessary infrastructure, equipment and policy enablement needed to implement or facilitate technically sound and socially accepted measures.

21. Planning and Proposal Formulation at project level: IWMP allows for the deployment of sophisticated social and technology-assisted planning tools (such as GIS, remote sensing, Net Planning, etc) to ensure that works undertaken yield desired and optimal results over the long term. This requires comprehensive and detailed resource mapping, planning, selection of interventions, their sequencing and phasing right down to the farm level. In NREGS, works are selected by popular consensus to address current felt needs of the participants and largely reflect a “wish list”. The approach of comprehensive, systematic, sequenced and sustained implementation over a period of time, which is necessary to achieve its objectives, namely, that of creating durable livelihood assets in the long term, is missing in the NREGS.

22. Dovetailing NREGS funds into the IWMP at the GP level would necessarily require application of the tools and planning processes deployed under the IWMP as well as adopting a multi-year perspective to planning and implementation. This would result in assets of better quality and longer shelf life than at present resulting in long term benefits to a larger number of people.

23. Capacity Building: The WDD has over the years developed and tested comprehensive modules and pedagogies for training and capacity building of persons and groups at all levels from the village/ watershed upwards across related natural resources and production areas as well as has access to facilities for mass communication. Capacity building is a major objective of NREGS but the concerned agencies are not equipped to handle this core requirement. By way of reciprocal arrangement, the WDD could also commit to train and qualify capable and willing people (“barefoot” para-technicians – social as well as technical- as well as those technically qualified) in the numbers required to support Gram Panchayats implementing NREGS funded works. This would greatly improve the performance of NREGS and strongly contribute to realizing its objectives. It would also advance a sub-objective of NREGS, which is to create the conditions for a “transformative empowerment process for democracy” (NREGS Guidelines/point 1.2)

Assurance of Long Term Supplemental Funding - NREGS’s proffer to IWMP

24. NREGS adopts a rights-based approach which is demand driven; whereas the IWMP exists by administrative fiat and is allocation led. In the case of NREGS, the central government contributes 100 percent of unskilled labor costs, 75 percent of material costs and administrative costs equivalent to 6 percent of overall costs. The state contributes 25 percent towards material costs. In the case of IWMP, the central share is 90 percent whereas the state’s, 10 percent. Thus, if the state does not allocate its share of resources for the IWMP in a timely fashion, smooth implementation can suffer, as has happened on occasion in the past in some states (not

Karnataka). In the case of NREGS, laborers are assured of continuous work as per the Act, or unemployment allowance in lieu thereof.

25. The quantum of Central Government funds allocation to states under the IWMP is determined by specific criteria, which put a ceiling on the total funds available to the state and which extend downwards to district level funds allocations (Common Guidelines/Sec. 9.1 and 9.2). In NREGS, fund allocation is notionally determined by the number of valid job cards in existence multiplied by the maximum allowable days of employment per household (100 days per year) into the notified minimum wage rate.

26. With the scale, quality and speed of implementation of watershed development interventions critically dependent on funds quantum and timely flow, NREGS, besides providing needed funds, can also serve as a stabilizing and bridging resource thus allowing works to continue in times when availability of funds from the IWMP are delayed or inadequate.

27. There is a widespread belief that huge funds are available at the GP level for watershed works; this is not supportable if one examines the issue closely. As indicated above, NREGS funds are subject to a ceiling (number of job cards) and as government, in recent times, has launched a drive to weed out bogus cards, the amount of funds available on an annual basis may proportionately go down. Moreover, it must be remembered that the priorities of elected GP members may have nothing to do with watershed development (rather roads, building, etc) and even where so, the sequencing and location of structures may be determined by considerations other than need and outcome efficiency. And such a situation can well repeat itself year-on-year as planning is done on an annual basis.

28. This has a direct bearing on the pace of implementation and length of project period. The Works Action Plan under NREGS has an annual cycle which, in turn affects the choice of works implemented. The IWMP, on the other hand, has a 7 year perspective and can choose and sequence measures that, while meeting some immediate eligible needs of the people, are primarily focused on realizing the overall objectives of the project. Even within this period, a maximum period of 3-4 years is available for implementation of physical measures. The need to harmonize different temporal perspectives as well as manage expectations will be a challenge that will need to be addressed on a continuing basis throughout the project period.

Unit Cost Allocations and Cost Norms

29. The IWMP prescribes a unit cost of INR. 12000/per ha for undertaking integrated watershed development activities and INR. 15,000/- for hilly areas inclusive of management, mobilization, capacity building, livelihood promotion and production system development in accordance with prescribed proportionate allocations. An amount of 63 percent of these unit costs is allocated for watershed and production enhancement interventions, which effectively works out to INR. 7,560/ INR. 9450 cost per hectare. Given the increase in the minimum wage rate and material costs, these amounts are roughly less than half that required to undertake comprehensive and sound conservation and production enhancing measures. With likely increases in the minimum wages in the near future occurring (given the overall inflationary pressures in the economy) and the likelihood of these cost norms being correspondingly revised

upwards in the short term being small, effectively, much less work (or of inferior quality) will get done within these norms, thus undermining the overall goals of the program. While a problem for IWMP, it also provides an opportunity for leveraging funds from NREGS for soil and water conservation activities that can be carried out with manual labor. Under NREGS, there is neither a cost norm for the area nor a unit cost for work/ activity. In fact, as the minimum wage rates increase, the effective costs per activities undertaken also correspondingly increase. Thus, converging NREGS into the IWMP will address the issue of under-financing of eligible activities and enable the IWMP to undertake measures in the required quantity and quality, subject to the caveats mentioned above.

30. In Karnataka, the current wage rate for works under NREGS is INR. 125/ day. Wage computation and payment, however, is done on a volumetric basis and it is gender neutral. Men and women are paid same wages for equal work done. The wages paid under NREGS are substantially higher than those paid under the IWMP because while the same Minimum Wages Act is followed in both programs, the output norms per activity are lower under NREGS. Currently, soft soil work is paid at INR. 94 per cum whereas the same under the IWMP is paid at INR. 50 per cum.

31. While this works in favor of laborers, this has the potential to cause problems for IWMP funded works being undertaken in areas where NREGS funds are also deployed. One way out is to harmonize the former's output norms with those under NREGS. The fear of being able to undertake less works if nominal wages go up, given the existing ceiling of INR. 12,000/ 15,000 per hectare, is largely obviated as NREGS, which is computed on the basis of activities and not per hectare costs can also be drawn upon to augment resources.

32. NREGS has a 60:40 labor to material ratio which limits its uses in activities that have a high proportion of material inputs (includes semi-skilled/ skilled labor), such as check dams, gabion structures, engagement of machinery for digging and transportation of earth in hard earth or rocky areas, etc. IWMP, on the other hand, has no such restrictions.

33. In such circumstances, in a watershed project, it is preferable that labor intensive works be financed through NREGS and works where material inputs are high be included under IWMP, or a combination of the two, in the case of specific activities having both labor and material inputs.

Sustainability, Contribution and Post Project Maintenance:

34. Under NREGS, no contribution is expected from the people as it is a rights- based program and until recently, works on private lands could not be taken up. In the IWMP, works on all categories of lands, be they privately or publicly owned can be taken up. Being a development program, people are expected to contribute 10 percent of works done on private lands (5 percent in the case of SC/STs) and varied amounts for farming system intensification activities on private lands (no contribution is expected from works undertaken on common lands). The proceeds collected (together with fines, fees, donations, etc) go into building up of the Watershed Development Fund (WDF). The WDF however is often inadequate to the task and

in the majority of cases beset with problems of capture, leakage and dormancy. Furthermore, the WDF cannot be used to repair works taken up on private lands.

35. Since NREGS now offers assured funds on an annual continued basis for maintenance of common and certain classes of private assets, even if created by other programs (Section 6.1.3 of the NREGS Guidelines) and with there being a fair likelihood that treatments on private lands may be included under NREGS in the near future, the need for the WDF is, to that extent, reduced. However, the developmental benefits of securing buy-in from beneficiaries expressed through own contributions, still argue a case for mandating some amount of physical or monetary contribution. In any case, since the same is not possible from NREGS, if contributions have to be secured, these can be required of IWMP funded private land holders.

Inclusion, Equity, Transparency and Accountability: IWMP's Proffer to NREGS.

36. NREGS has evolved a detailed and impressive suite of mechanisms and processes to foster transparency and accountability at all levels. These however, in practice, are less than effective for a number of reasons listed below:

- Inadequate community participation and consultations. Poorly attended Gram Sabhas result in an incomplete / in appropriate list of activities which subsequently are firmed up by the members of the GP.
- Participation by women, SC and STs in Gram Sabha meetings is substantially low.
- Over reporting on the issuance of the job cards to secure higher financial allocations.
- Job Cards without photos (a mandatory requirement) and most of them resting in the hands of the GP members are quite common.
- Arrangements to ensure that all needy households do get job cards and all the card holders are able to demand employment and are ensured of the same sufficiently in advance are all yet to be developed fully.
- Exclusion of a good number of households. Issuance of Job Cards, necessary for seeking employment, rests with the GPs. Primary information reveals that, the Job Card holding households completing 100 days of work in an year range from 10 percent to 60 percent across the GPs; average number of days per household ranges 10-40; and wage rates paid/ received averages to INR 60.
- Considerable time lag between work completion and wage payments. Public works schemes' completed product (e.g. water conservation, land development, afforestation, provision of irrigation systems, construction of roads, or flood control) is vulnerable to being taken by over wealthier sections of society. In both the NREGS and IWMP, wages are now being paid directly to the accounts of the laborers or service providers through the GP accounts so as to reduce fraud. This however does cause problems where the nearest bank branch/ post office is far from the project area, and has led to abuses and collusive arrangements creeping in (such as "collection contractors" who collect wages for a commission in collusion with bank/PO authorities).
- Quality control/ assurance arrangements including adequate checks and balances are not in place and hence investments may not yield expected returns.

37. There is no external agency deployed (NGOs) for instance, to mobilize and organize people on a sustained basis to hold functionaries accountable, as in the case of the IWMP. Moreover, even though it is mandated to maintain the written records in an accessible public place, there is no requirement to put up for public display the activities that have been sanctioned. The methods adopted by the IWMP to raise awareness, increase participation and engagement and enhance transparency and accountability such as engaging of NGOs, organizing a variety of need based training programs for capacity building, wall paintings, use of OK cards, exposure visits to successful projects, folk media and interaction amongst participating villages together with the additional complement of technical personnel from the WDD, would go a long way in realizing the accountability objectives of NREGS.

38. Apart from the normal methods of evaluation and monitoring which are prescribed and also variedly followed in the NREGS, it might help to have the added oversight of satellite based remote sensing monitoring and planning which the WDD successfully used in Sujala and which can readily be deployed in projects which draw upon funds from both programs (“converged projects”). Remote sensing would help verify targeting against planned locations for many soil and water conservation works, for both IWMP and NREGS.

39. Management Information System (MIS) and Reporting. Under NREGS, reporting is done on a regular basis (at least on a fortnightly basis) by directly uploading on the web enabled MIS platform (www.NREGS.nic.in) directly from the GP level. Such a system is not followed under the IWMP at present. While this is desirable and the IWMP should move in this direction, nevertheless, due to connectivity, software and hardware problems and power outages frequently experienced at the GP level, uploading data on time without which payments are not released, can be a significant challenge. The WDD will have to strengthen its communication infrastructure. Apart from enhancing transparency and making real time data available, such facilities would open up a world of possibilities for the villagers in terms of access to market information, employment opportunities, crop advisories, access to government schemes and the e-governance programs of the government. Developing more community based monitoring under IWMP would be a positive step, which could extend to soil and water conservation work financed through NREGS in project areas.

Institutional Triggers for Convergence.

40. Both programs have clearly defined and separate institutional structures and mechanisms stretching from the village upwards to the Taluka, District, and State level and thereon to the related department in the Ministry of Rural Development (MORD), Government of India. In the case of the IWMP, the Department of Land Resources (DoLR) is the nodal agency with the WDD as the implementing agency at the state level. In the case of NREGS, Department of Rural Development and Panchayat Raj (RDPR) is the nodal agency at the state level with GPs as implementing institutions. A detailed profile of the organizational structure as well as the project and fund flow process (formulation, scrutiny, sanction, funds release, works implementation and reporting) established in both the NREGS and the IWMP is described in Attachment 1.

41. A notable feature in both programs is the central role played by the GP at the project level and the fact that administrative and technical sanction of the Action Plans/ DPRs, as applicable, are done at a level no higher than that of the district.

42. Despite seemingly different institutional mechanisms, there are common administrative and operational arrangements that facilitate convergence of the two programs.

43. At the project level, in both cases, the Gram Panchayat is the final Project Implementing Agency (PIA). In the case of the IWMP, an Executive Committee (EC) chaired by the President of the GP is set up as a subcommittee of the GP established under Sec 61A of the GP Act. Funds, in both cases, are routed through the GP.

44. Common to both programs at the district level is the anchoring, sanctioning and coordinating role played by the Zilla Parishad, headed by a Chief Executive Officer. The consolidated overall and annual plans of both Programs⁴⁹, as well as of several other government programs, are accorded administrative approval at the district level by the CEO. This focusing of administrative powers in the office of the CEO makes possible coordination, leveraging and dovetailing of resources from various agencies and programs (such as National Horticulture Mission, BRGFs, NRLM, NRHM, etc.) so that synergies and sustainable livelihoods opportunities are created, a common goal of both, as also other programs.

45. Since space exists for NGOs in both Programs (and the IWMP has used them to great effect), they can also be engaged to play an important intermediation, relationship building and facilitating role between different related agencies.

46. By effectively combining the two different institutional mechanisms deployed for project implementation, namely, the GP in the case of NREGS and an empowered sub-committee of the GP (the Executive Committee) in the case of IWMP, a wider space could create allowing for greater representation and leadership opportunities. It also creates a platform that simultaneously affords both political (electoral and contestive) and developmental (consensus driven and accommodative) engagement, both of which are necessary for inclusive and sustainable growth.

IWMP CONVERGENCE with NREGS – the way ahead

47. There are similarities in goals and objectives as well as, to an extent, institutional arrangements. The dissimilarities, however, in respect to approach adopted, cost norms, nature of funding, planning and project formulation, implementation horizons, beneficiary contributions, approaches to transparency and accountability, throw up challenges that must be addressed if convergence in a synergistic manner is to be achieved. The following considerations might help in ameliorating the differences, smoothing joint implementation and setting the ground for the evolving of a workable model for large scale adoption.

48. Need for Piloting: Given the challenges inherent in any joint venture, while joint implementation may begin in all the projects to various degrees, it is advisable that a limited

⁴⁹ The “Shelf of Projects” in the case of NREGS and the Watershed Plan or DPR in the case of the IWMP.

number of watersheds/GPs be selected on a pilot basis for focused attention. The project proposes to demonstrate convergence in seven project districts.

49. Selection Criteria: Those GPs should be selected that have the highest potential for success. Pointers in this regard would be:

- The extent of poverty and the number of job cards (this would indicate the net availability of funds for watershed works – the more, the better!);
- the expressed need for project activities uncovered by willingness of the communities to accept the social disciplines required for successful implementation of watershed rehabilitation measures;
- willingness to make voluntary contributions mandated for activities funded by the IWMP;
- the extent of active representation and engagement of the various constituencies (elected members and sub-committees) in the functioning of the GP and the nature and quality of relationship with local government functionaries;
- The distance of the village/ watershed from the nearest town or area where alternative better paying job opportunities exist.
- The vibrancy of SHGs, if existing, would be an important indicator of the quality of interpersonal and familial relationships existing in the village.
- Since NREGS works will already have been undertaken in these villages, a survey of works done and more importantly, the satisfaction levels of the villagers would reveal whether malpractices have taken place and whether these are amenable to correction⁵⁰.

50. These indicators, taken as a whole, would help the project assess the quality of social relationships and institutional capital, both of which are predictive of the likely “success quotient” of a project. A matrix to assess villages for inclusion in a pilot program of intensive convergence could be developed in consultation with village leaders where good works have been done, either under NREGS or the earlier Sujala project, experienced and effective NGOs and proactive government functionaries with experience in handling both these programs. The project will develop a decision-support model to aid IWMP in site selection that incorporates these kinds of factors.

51. Multi-dimensional Mobilization and Planning Effort: Once villages are selected, an intensive mobilization effort on lines of IWMP should be undertaken and competent NGOs engaged for this purpose. Comprehensive resource and social mapping using physical and technology assisted means (such as Participatory Net Planning-PNP, remote sensing, GIS applications, Socio-economic surveys, etc), situation and problem analysis using PRA methods, village envisioning using the LFA methodology⁵¹ (or similar such methods), Stakeholder Analysis⁵² etc may be employed for purposes of project formulation.

⁵⁰ Villages where entrenched interests and collusive arrangements with the official machinery are very strong are best avoided during the pilot phase.

⁵¹ WOTR (www.wotr.org) has developed, tested and widely used such methods successfully.

⁵² There is considerable material on the web. The following Source Book titled, “Institutional and Organizational Analysis for Pro-Poor Change: Meeting IFAD’s Millennium Challenge” written by Crispino Lobo may also be consulted for methodologies to undertake stakeholder analysis with a view to assessing situations and devising focused strategies- <http://www.ifad.org/english/institutions/sourcebook.pdf>

52. Effective and Harmonious Integration of GP and the EC: The GPs and the EC play a crucial role in both projects. It is important that these two institutions get their relationships right from the very beginning. Harmonization efforts should be such as to result in a comprehensive multi-year Village Development Plan consisting of all measures that would be needed to meet the developmental needs of the village, in general, and in particular, as well as of its poor households.

53. Activities selection and Prioritization: These proposed activities and works must then be prioritized, sequenced and phased out over the time line of the project and the schemes/ programs under which they can be accessed, determined. The concerns and needs of poor women and poor households must be included and prioritized in these discussions which must take place at the habitation level aggregating upwards to the village level and finally, the GP level. Activities that are best funded by NREGS and IWMP respectively (as also other schemes) should be identified. Once the village level DPRs are finalized and ratified by their respective Gram Sabhas, they would then have to be consolidated, prioritized and ratified by the GP and its General Body (the General Gram Sabha) and forwarded to the concerned authorities for sanction and resourcing.

54. Multi-year Perspective and Commitment: Villagers must be educated on the need to commit to a multi-year program wherein activities are phased out in such a way that immediate requirements are addressed on a priority basis. While project authorities may have to balance the need for technical efficiency with social and political compulsions and may have to accept less – than- optimal decisions in regard to choice and sequencing of activities in the overall interest of the project, the same can be offset to the extent that alternative funding for preferred activities from other on-going programs is accessed. This would ensure that the required and planned-for funds would be available as envisaged, result in harmonization of different temporal perspectives and effective management of expectations of all concerned stakeholders.

55. Harmonization of Norms: The WDD would need to harmonize its output norms with those under NREGS, as the former is lower. This would bring about wage parity across works resulting in all works being seen by the people/ labors as equally desirable. This would ensure that prioritization and desirability of works would be wage neutral and determined more by considerations of efficiency and effectiveness.

56. Works Financing: Since NREGS has a 60:40 labor to material ratio whereas IWMP, on the other hand, has no such restrictions, it is preferable that labor intensive works be financed through NREGS and works where material inputs are high be included under IWMP, or a combination of the two, in the case of specific activities having both labor and material inputs.

57. Adequate Personnel Provisioning: Since adopting a joint, convergent and effective approach is human resource intensive, the WDD would have to equip itself with the necessary professional staff, be they departmental or from the market. Planning in this regard and necessary action would have to be undertaken well in advance of project roll out.

58. Capacity Building and Capacity Support: Capacity Building, especially of “barefoot” para-technicians (social as well as technical) and those technically qualified formally, is the key to success of a jointly implemented program. Modules would have to be specifically designed for the purpose by the WDD (in addition to existing ones), drawing upon its considerable experience and resource and communications networks built up during the Sujala years.

59. Local Ownership: Stakeholder participation and “buy-in” is the key to long term sustainability of created assets. Efforts should be made to secure beneficiary contributions on private lands, at least from works funded under the IWMP. Besides this, works which can be undertaken through community contributions should be encouraged and periodically taken up so as to foster a sense of solidarity, fellowship and co-responsibility.

60. Transparency: Methods adopted by Sujala to enhance transparency and accountability (wall paintings, use of OK cards, exposure visits to successful projects, satellite based remote sensing planning and monitoring as well as third party monitoring) should be deployed in such “converged projects”.

61. Monitoring and Evaluation (M&E). NREGS which has a web based MIS operationalized at the GP level, thus making real time data available at all levels. IWMP has yet to establish and operationalize such a system effective at the GP level. It has been informed that though the documentary and procedural requirements for work measurements and payments are different from those adopted under the NREGS, harmonizing operational systems at the field level would not present a significant challenge. This would become especially important when the WDD is approved by the government as an Implementing Agency (IA) under NREGS, a role the WDD seeks to play, as in the case of the Forest and Horticulture Departments.

62. IEC campaign: Given the keen attention NREGS attracts, successes achieved should be documented and widely disseminated especially amongst the developmental community and the general public in order to secure and attract political and administrative support.

Alternative Models of Convergence

63. Based on extensive enquiry and investigations, the following four models emanate as possible options:

64. **Collaborative or Synergistic in terms of the works/ activities.** Once a watershed (sub/micro) is prepared with due cognizance of the aspects raised above, an Activity Breakdown Matrix can be drawn detailing works to be accomplished and assigning role and responsibility to different institutions/ agencies such as GP, GP Committee, WDD, NGO etc. Roles are to be defined depending on the relative strengths. This way, NREGS and IWMP would retain the institutional (including financial management) identity, but would require an over-arching coordination as well as oversight bodies.

65. **WDD as a Facilitator rather than Provider.** WDD transforms itself completely to a ‘Facilitator’ from the existing ‘provider cum facilitator’ role. In this model, WDD will assume full technical assistance responsibility right from selection of watersheds/ villages, through

planning and implementation as well as capacity building and M&E. All decision making including managing funds and procurement of goods and services will rest with the GP.

66. **WDD as a Service Provider.** GP entrust full responsibility to WDD and the payments are made as per a mutually agreed terms and conditions with detailed schedule and work accomplishments and collaboration.

67. **WDD to act as a Depository.** WDD will perform all activities including procurement and financial management and shares the reporting from time to time with GP but be accountable to the higher echelons.

68. The models will be deliberated in depth and could be tested during the implementation.

Attachment 1. NREGS and IWMP- Institutional Arrangements, Project Scrutiny, Sanction and Funds Flow - Karnataka

69. Both programs have clearly defined and separate institutional structures and mechanisms stretching from the village upwards to the Taluka, District, and State level and thereon to the related department in the MoRD. In the case of the IWMP, the DoLR is the nodal agency. In the MoRD, the Department of Rural Development is the nodal agency for NREGS.

Organisational Structure of NREGS

70. In the case of NREGS, the key stakeholders in the state are: (i) Wage seekers ii) the Gram Sabha, (iii) the Gram Panchayat, (iv) the Programme Officer at the Taluka level, (v) District Programme Coordinator, (vi) the Principal Secretary, Rural Development and Panchayat Raj and (vi) the Karnataka State Employment Guarantee Council which is a policy making, advisory, oversight and coordinating body between the state government, the Central Govt. and the DPC/CEO.

71. Organizationally, at the state level, the Rural Development and Panchayati Raj Department is responsible for implementation of NREGS, headed by a Principal Secretary. A specially appointed Director is responsible for NREGS, reporting to the Principal Secretary. This Director is assisted by 4 officials, 3 of whom are Jt. Directors (JDs) responsible for General Coordination, IEC and Social Audit and Governance respectively; the fourth official is designated as Chief Finance and Administration. Assisting these officials are several Assistant Directors

72. At the District level, the CEO of the ZP, also designated as District Program Coordinator, (DPC) is responsible for the Program. He is accountable to the Director (NREGS) at the state level. Assisting him for the specific purpose of the Program are 3 officials - the District Nodal Officer (overall coordination), District MIS Coordinator and the District Social Coordinator. Assisting this team with technical inputs are district level implementing officers from various line departments posted at the ZP (Agriculture, Watershed Development, Horticulture, Forestry, Animal Husbandry, etc).

73. At the Taluka Level, the Executive Officer of the Taluka Panchayat, also called the Program Officer (PO) is responsible for the program and reports to the CEO/DPC. Assisting him for the specific purpose of the Program are 3 officials - the Taluka MIS Coordinator, the Taluka Social Coordinator and the Assistant Project Officer (APO). Assisting this team with technical and social inputs are Taluka level implementing officers from various line departments posted at the Taluka Panchayat level (Agriculture, Watershed Development, Horticulture, Forestry, Animal Husbandry, etc) and Hobli level (cluster of GPs at the sub-Taluka level) government personnel such as Forest Guards, Agriculture Assistants, Horticultural Assistants, etc., as well as NGOs whose services may have been retained.

74. The President (Sarpanch) of the Gram Panchayat, together with other members of the GP, is responsible for implementation of the project. Assisting him/her at the GP level is the

Panchayat Development Officer (a government servant) and implementing officers from the Hobli and Taluka levels. A Data Entry Operator is also provided at the GP level.

NREGS: Project Scrutiny, Sanction, Works Implementation and Funds Flow

75. Each GP is expected to prepare on an annual basis an Action Plan which consists of a “shelf of projects”, which may also serve as a rolling plan, some items being carried over to the following year. This is done at the village level wherein the Gram Sabha determines works to be implemented and approves the work plan. Work Plans from each of the constituent villages of a GP are then consolidated, prioritized and approved by the General Body (Overall Gram Sabha) of the Gram Panchayat. The total quantum of the budget is determined on the basis of existing number of job cards at the GP level. This Action Plan is then sent to the PO at the Taluka Panchayat level for scrutiny and recommendation. The Action Plan is then sent to the CEO/ DPC at the ZP level where after due scrutiny, based on previous performance and the labor budget, administrative approval is given by the CEO/DPC. After this, the same is forwarded to the related state and national level bodies for information and necessary action. Approved plans are then communicated to the Taluka and GP functionaries.

76. In order to execute approved works, the GP must then prepare a Works Estimate. It can take the help of Taluka/ Hobli level government personnel to do so. Once prepared, technical sanction is given by the notified government officers in accordance with the delegation of powers⁵³ and the same is then given administrative sanction by the President of the GP, or the EO/PO or the CEO/DPC, as the case may be, in accordance with the delegation of powers⁵⁴. It should be noted that administrative and technical sanction of the Action Plans, as applicable, are done at a level no higher than that of the district. Once overall sanction is accorded, a unique work code is generated at which point, Numbered Muster Rolls are issued (NMR) and the MIS system at the GP level becomes operational. Data is generally entered at the GP level (except in areas or times where connectivity is a problem) and directly uploaded onto the NREGS site maintained by the GOI.

77. Once the Action Plan has been approved by the CEO/DPC, funds are released by way of advance to the GP accounts (usually an amount of INR. 10 lakhs per GP). Once works begin, payments are made (after due verification and authorization by the EO/ PO or empowered staff at the Hobli/ Taluka level) directly into the bank / post office accounts of the workers.

78. The NREGS Act also permits agencies other than the GPs to become implementing agencies provided less than 50 percent of works is done through them. Recently, the Forest and Horticulture Departments have been designated as Implementing Agencies. The WDD is in the process of getting itself notified as an Implementing Agency for the purposes of NREGS.

⁵³ Delegation of Powers to accord Technical Sanction: (i) The Jr. Eng/ Asst Eng at the Hobli level is empowered to sanction works up to Rs. 1 lakh; (ii) The Asst. Executive Eng. at the Taluka level is empowered to sanction works above Rs. 1 lakh and up to Rs. 10 lakhs; (iii) The Executive Eng. at the District level is empowered to sanction works beyond Rs. 10 lakhs.

⁵⁴ Delegation of Powers to accord Administrative Sanction: (i) The Sarpanch/ President of the GP is empowered to sanction works up to Rs. 10 lakhs; (ii) The Executive Officer/ Project Officer at the Taluka level is empowered to sanction works above Rs. 10 lakhs and up to Rs. 30 lakhs; (iii) The CEO/ DPC at the District level is empowered to sanction works beyond Rs. 10 lakhs.

79. Given these possibilities, there are 3 modalities of funds transfers: (i) From the State (Dept of Rural Development and Panchayati Raj) to the CEO/ DPC of the ZP who then transfers it to district level Implementing Agencies (IAs); (ii) From the State or the CEO/ DPC to the EO/PO of the Taluka Panchayat who then transfers it to the Taluka level IAs; (iii) From the EO/PO or CEO/ DPC or State to the GP at the project level who then transfers it to the workers, suppliers or service providers, as the case may be (GP level IAs).

Organisational Structure of IWMP at the State level

80. The **Nodal Agency** at the State level is the State Level Nodal Agency (SLNA) which is a policy making, advisory, oversight and coordinating body between the state government, the Central Govt. and the WDD. At the state level, IWMP is managed by the WDD which is led by a Commissioner who is designated as Project Director. S/he is assisted by 6 Additional Project Directors (APDs) each handling a specific brief – coordination of Sujala, Documentation, Forestry, Horticulture, Agriculture and Animal Husbandry.

81. At the **District level**, there are Watershed Cell and Documentation Centers (WCDCs)⁵⁵ headed by District Watershed Development Officers (DWDOs). Supporting the DWDO is a District Resource Group (DRG) also called the District Watershed Development Team (DWDT) which consists of line department technical personnel as well as appointees from the open market, as required. At the Taluka level (wherever works are on-going), multidisciplinary Watershed Development Teams (WDTs) are established headed by an Agricultural Officer assisted by sectoral officers from line departments as available, or consisting of professionals from the open market. The WDTs draw upon the assistance and services of technical personnel at the Hobli (sub-Taluka) level such as Forest Guards, Agriculture Assistants, Horticultural Assistants, etc., as well as facilitating NGOs who have been appointed at the project level to mobilize communities, build up their capacities, help prepare DPRs, conduct surveys and undertake publicity and promotional measures.

82. **Micro-watershed level.** Under the IWMP, the Gram Sabha constitutes the Watershed Committee (WC) to implement the Watershed project with the technical support of the WDT in the village. The Watershed Committee (WC) would be a sub Committee of the Gram Panchayat. In IWMP, there is one watershed committee for each GP. The watershed committee comprises of the Adhyksha (President), four to five SHG representatives, five to six User Group (UG) representatives, and two or three GP representatives of that area. Of the above members, the committee would have not less than 50 percent members from women and weaker section representatives of Scheduled Caste and Scheduled Tribe representatives. The Secretary of the Watershed Committee (WC) is the Agriculture officer/Range Forest Officer/Assistant Horticulture officer of the jurisdiction (decided in a meeting of the Gram Sabha) and works under the direct supervision of the President of Watershed Committee (WC). And he/she represents the WDT in the Watershed Committee (WC). The committees are associated closely with participatory watershed planning, work implementation, extension, and participatory M&E.

⁵⁵During Sujala 1, these were called District Watershed Development Units (DWDUs)

83. **NGO Partner.** The participatory planning process in IWMP is currently outsourced to NGOs at the sub-watershed level, who are assigned with the responsibility of awareness creation, social mobilization and group formation at GP level as well as community training in various aspects of watershed, livelihood etc. They establish an office at the sub-watershed level, preferably in a centrally located village, and closely work with the community. The composition of the NGO partner is a Team Leader, one Income Generating Activity (IGA) Specialist, and one Data Entry Operator. The NGO partner would help to constitute the watershed executive committee at GP level, with one committee for each GP, after the community organization/formation process is complete. The NGO partners assist the WDTs in participatory planning process at micro-watershed level. The NGOs deliver the planning outputs in MIS based Net plan Module (Net Plans Deal with land treatment on individual parcel of land) which goes to form the Detail Project Report (DPR), which is a comprehensive plan inclusive of land treatment, institution building, training and Livelihood) for each of the IWMP micro-watersheds. The NGO partner would facilitate the Taluka WDT to place the Net Plan and DPR in IWMP before the watershed committee and Gram-Sabha for social approval.

IWMP: Project Scrutiny, Sanction, Works Implementation and Funds Flow

84. The implementing agency (IA) at the GP level is the Executive Committee (EC), also called the Watershed Committee (WC). The EC is a representative body approved by the Gram Sabha. It is a sub-committee of the GP established under Sec 61A of the Panchayat Act. Once an Action Plan for Watershed Development (also referred to as a DPR) is generated at the GP level with support from facilitating NGOs and the WDT and the same is approved by the Gram Sabha, it is sent to the Taluka WDT (TWDT) for scrutiny and recommendation. The TWDT then forwards it to the Watershed Cell and Documentation Centre (WCDCs) at the ZP level for technical sanction. The DWDO/ WCDC then places the DPR which includes Annual Action Plans, for administrative sanction to the District Level Review Committee (DLRC) chaired by the CEO and consisting of representatives of all related line departments. As in the case of the NREGS, administrative and technical sanctions do not go beyond the district level. Once administrative and technical sanction is given, Work Estimates are prepared by the WC supported by the TWDTs and technical personnel at the Hobli (sub-Taluka) level. These estimates are then given technical and administrative sanction by officials of the WDD at the Taluka and ZP levels as per the delegation of powers⁵⁶.

85. Flow of Funds is as follows: (i) Institutional Funds flow from the DoLR to the SLNA and then onwards to the WCDC (District level); (ii) Project Funds have 2 sub components corresponding to “soft” and “hard” measures respectively. The “soft” sub-component includes administration, capacity building, DPR preparation and monitoring. Fund flow is from the DoLR to the SLNA to the WCDC and thereafter to the PIA which could be an NGO, a govt. dept. or any approved agency. Funds for the “hard” component which include entry point activities

⁵⁶ Delegation of Powers to accord Administrative Sanction: (i) Taluka Level Officers – up to Ts. 1 lakh; (ii) Sub-divisional Officers – up to Rs. 5 lakhs; (iii) District Level Officers – up to Rs. 25 lakhs; (iv) Divisional Level Officers – up to Rs. 50 lakhs; (v) Heads of Departments – up to 100 lakhs.

(EPAs), watershed works, livelihood, production systems and microenterprises, flow from the DoLR to the SLNA to the WCDC and finally to the Watershed Committee (WC).

86. Unlike the NREGS which has a web based MIS operationalized at the GP level, thus making real time data available at all levels, the IWMP has yet to establish and operationalize such a system effective at the GP level. It has been informed that though the documentary and procedural requirements for work measurements and payments are different from those adopted under the NREGS, harmonizing operational systems at the field level would not present a significant challenge. This would become especially important when the WDD is approved by the government as an Implementing Agency (IA) under NREGS, a role the WDD seeks to play, as in the case of the Forest and Horticulture Departments.

ⁱ Report on Region wise cost of cultivation of crops, Karnataka State Department of Agriculture, Bangalore (Various years)

ⁱⁱ ICRR for the Karnataka Watershed Development Project, Sep 28, 2009, Report No. ICR00001205, The World Bank, Sustainable Development Department, Agriculture and Rural Development Unit, South Asia Region

ⁱⁱⁱ Concurrent Monitoring and Evaluation of CSS-NWDPPRA and RVP Projects in Southern Karnataka, Director of Research, University of Agricultural Sciences, GKVK, Bangalore and Assessment of socio-economic impact of watersheds under NWDPPRA in Northern Karnataka, University of Agricultural Sciences, GKVK, Bangalore (various reports)

^{iv} A feedback on ICRISAT demonstrations, Sujala Watershed Development Project, Monitoring, Evaluation and Learning, Antrix Corporation, ISRO, Bangalore, May 2007.

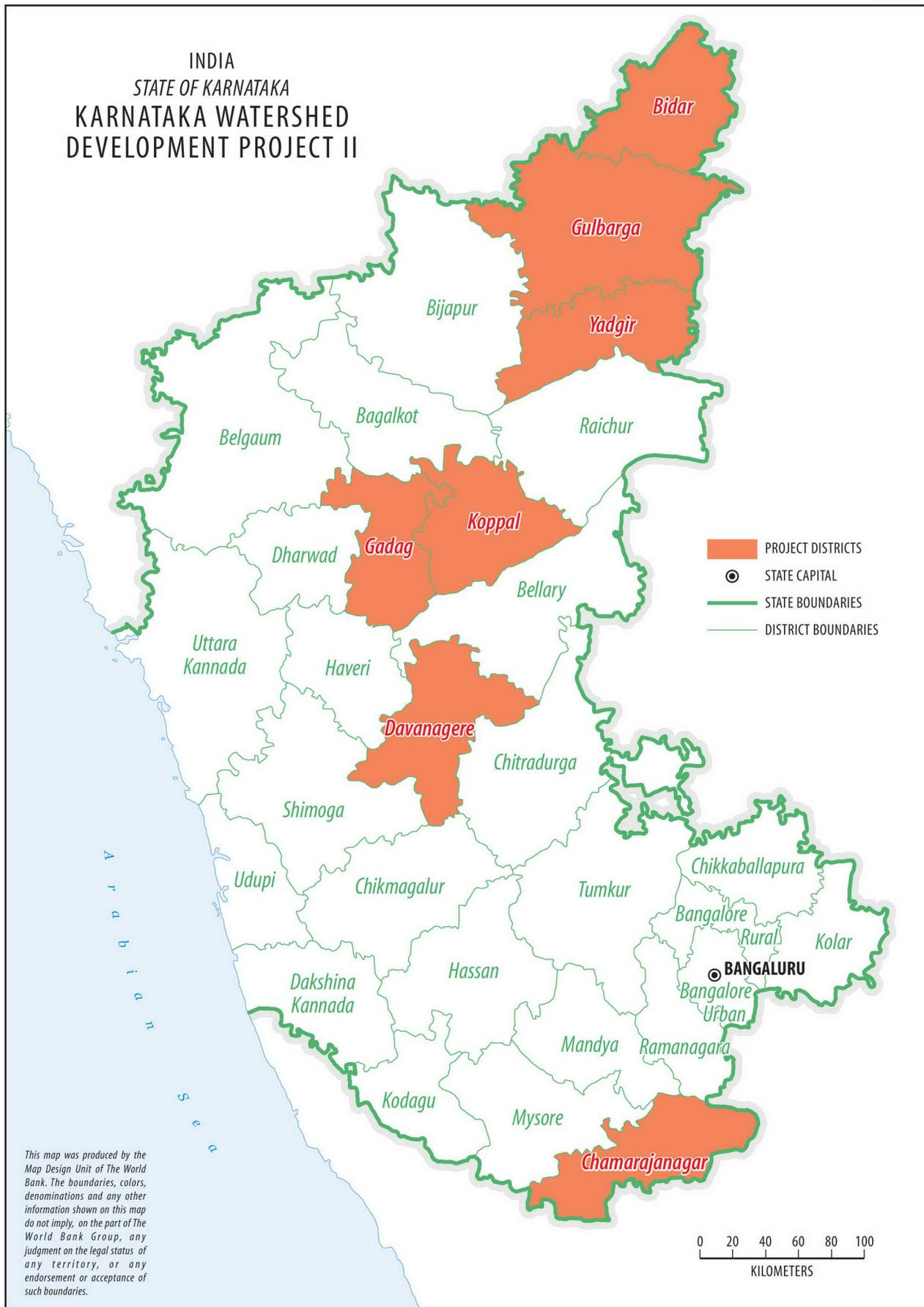
^v Annual Seasonal Rainfall and Area Coverage during in Karnataka, Directorate of Economics and Statistics, Bangalore (for various years)

^{vi} Soil and moisture conservation activities- A report on Impacts and sustainability, Sujala watershed project, Monitoring, evaluation and learning, Antrix Corporation, ISRO, Bangalore and Report on Assessment of Socioeconomic impact of watersheds under NWDPPRA in northern Karnataka, University of Agricultural Sciences, Dharwad.

^{vii} Impact of Watershed Program and Conditions for Success, A Meta-Analysis Approach by PK Joshi, AK Jha, Suhas P Wani, TK Sreedevi and FA Shaheen Global Theme on Agro ecosystems Report no. 46, ICRISAT/NCAP, Ministry of Agriculture and Ministry of Rural Development Government of India, New Delhi, India, 2008

^{viii} Watershed development in India. 1. Biophysical and societal impacts, Ian Calder et al., Sustainable Environment Development, Springer Science Business Media B.V. 2007

INDIA STATE OF KARNATAKA KARNATAKA WATERSHED DEVELOPMENT PROJECT II



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