

**Jharkhand State Livelihood Promotion Society,
Rural Development Department, Jharkhand State,
Republic of India**

**Republic of India
Preparatory Survey on
Initiative for Horticulture Intensification
by Micro Drip Irrigation in Jharkhand**

Final Report

**Volume I
Main Report**

December 2014

Japan International Cooperation Agency (JICA)

Nippon Koei Co., Ltd.

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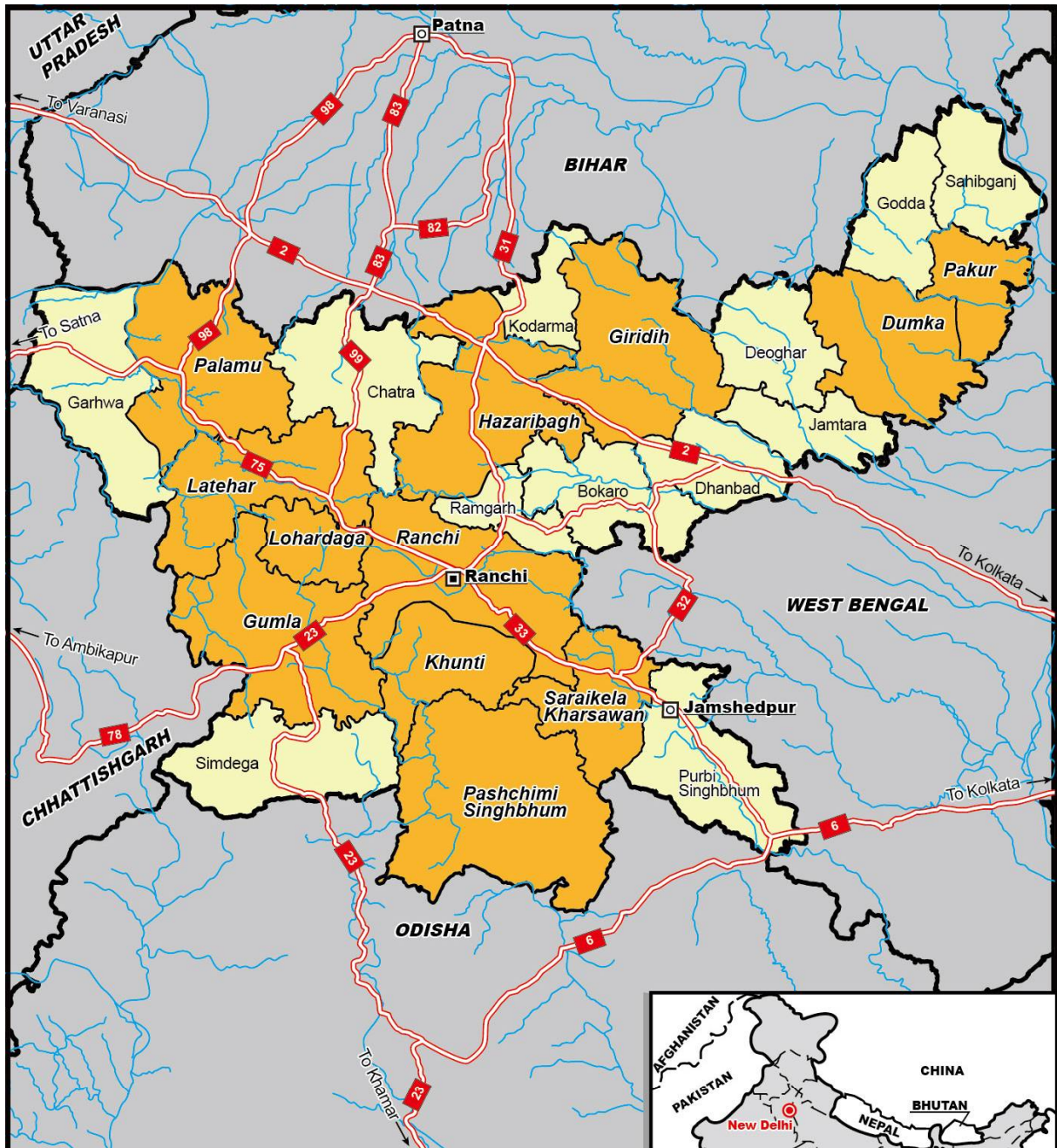
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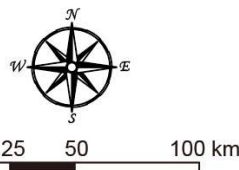
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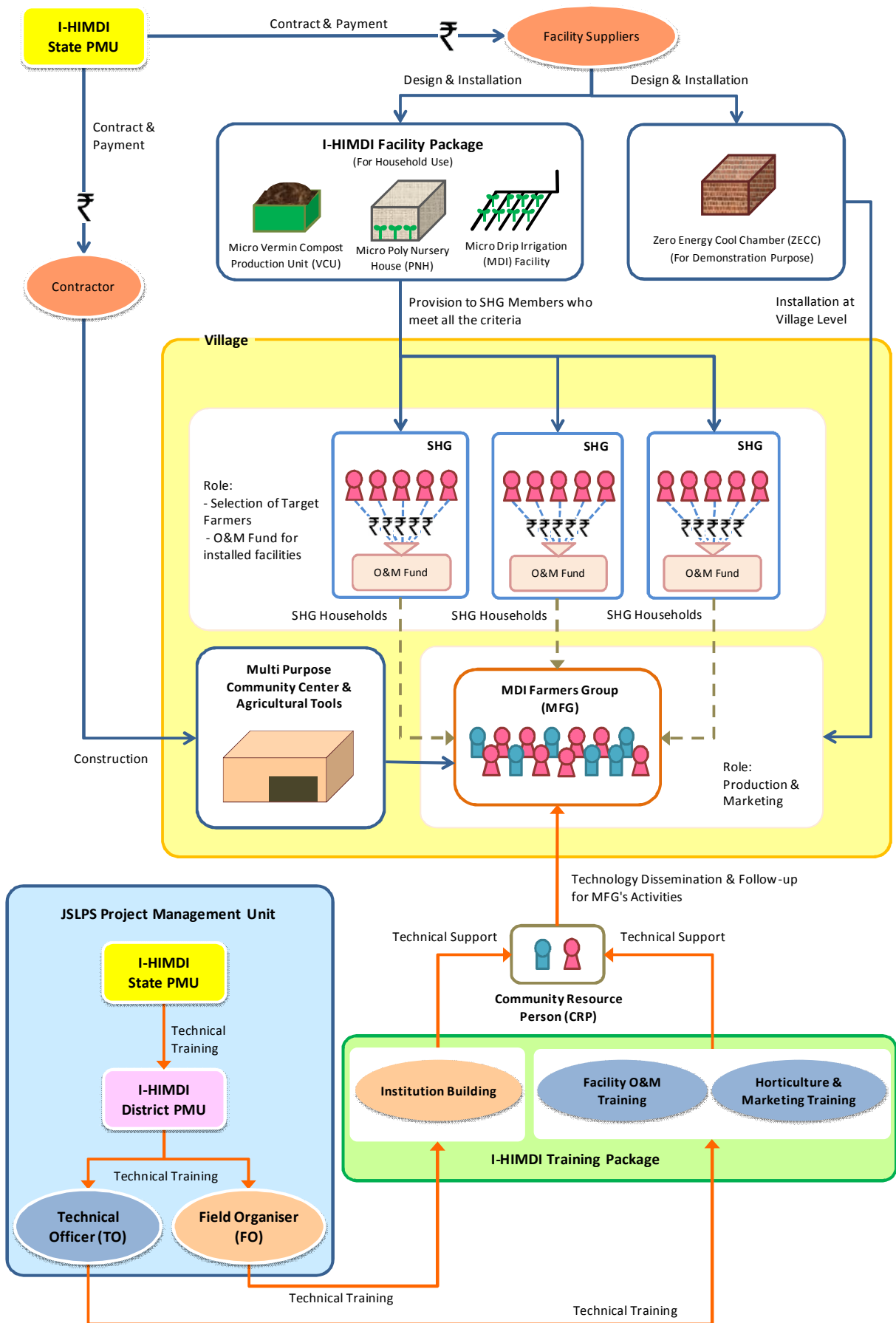
LEGEND

- Target District
- National Highway
- River
- State Boundary (ORISSA) (State Name)
- District Boundary (Chatra) (District Name)
- State Capital
- Major City



Preparatory Survey for Initiative for Horticulture Intensification by Micro Drip Irrigation (I-HIMDI)
Location Map of Target District in Jharkhand State

Source: JICA Survey Team



Source: JICA Survey Team

I-HIMDI Project Contents proposed by JICA Survey Team

Preparatory Survey on Initiative for Horticulture Intensification by Micro Drip Irrigation in Jharkhand
Photographs of the Survey (1)



Dug well used for Irrigation
(Ranchi District)



Tube well used for Irrigation
(Pakur District)



MDI Facility of Direct Pumping Type
(Hazaribagh District)



Drip Lines laid by National Horticulture Mission
(Lohardaga District)



Muskmelon irrigated by MDI
(Ranchi District)



Well-maintained MDI Field installed by UNDP Project
(Ranchi District)

Source: JICA Survey Team

Preparatory Survey on Initiative for Horticulture Intensification by Micro Drip Irrigation in Jharkhand
Photographs of the Survey (2)



Capsicums typically irrigated by MDI
(Ranchi District)



MDI Field surrounded by Fences to protect from Animal Feedings (Ranchi District)



Micro Poly Nursery House to be installed by I-HIMDI
(Ranchi District)



Earthworms raised in Vermin Compost Production Unit
(Ranchi District)



Cocopeat to be introduced as Material for Soil Improvement of Nursery in I-HIMDI
(Ranchi District)



Plastic Trays to be installed in I-HIMDI for Better Seedling Raising of Vegetables
(Ranchi District)

Source: JICA Survey Team

Preparatory Survey on Initiative for Horticulture Intensification by Micro Drip Irrigation in Jharkhand
Photographs of the Survey (3)



Tomatoes transacted at Assembly Market
(Ranchi District)



Whole Seller at Ranchi Wholesale Market
(Ranchi District)



Interview to SHG Members regarding to their Activities
(Ranchi District)



Interview to SHG Members regarding to their Activities
(Ranchi District)



Interview to SHG Members regarding to their Activities
(Ranchi District)



MDI Household and their Family Members
(Lohardaga District)

Source: JICA Survey Team

Preparatory Survey on Initiative for Horticulture Intensification by Micro Drip Irrigation in Jharkhand
Photographs of the Survey (4)



Interview to Scheduled Tribe Villagers
(Ranchi District)



Female Farmers of SHG Member
(Ranchi District)



Weeding by Female Farmers
(Ranchi District)



Hand-made Nursery beside Farmer's House and Female Farmer taking care of Seedlings
(Palamu District)



Internal Meeting with JSLPS regarding to the Selection of Target Areas of I-HIMDI at JSLPS



Presentation Meeting on findings of 2nd Field Survey at JSLPS

Source: JICA Survey Team

Preparatory Survey on Initiative for Horticulture Intensification
by Micro Drip Irrigation in Jharkhand

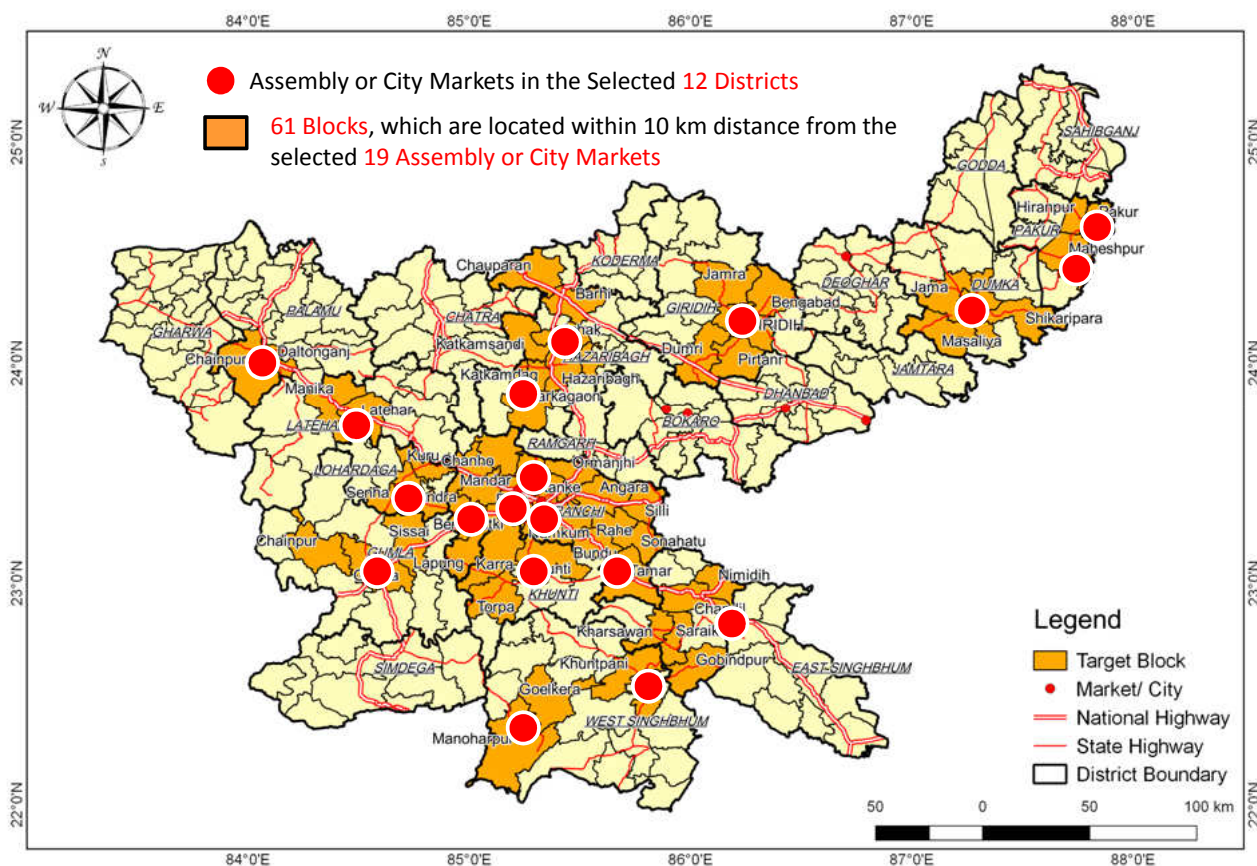
Executive Summary



Objectives of the Project

1. The objective of the Project is to improve livelihoods of **small and marginal farmers** in the target **12 districts** in Jharkhand by providing **micro drip irrigation systems (MDIs)** with **intensive technical support** for enhancement of productivity and marketability of horticulture crops.
2. Consequently, the Project could contribute toward **activation of agriculture sector, poverty alleviation and also empowerment of female farmers** in Jharkhand.

Project Locations



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Necessity and Priority of the Project (1/3)

SN.	Subject	Necessity and Priority
1	Consistent with National Twelfth Five Year Plan	The National Twelfth Five Year Plan emphasises that the growth must not only be rapid but also more inclusive and environmentally sustainable, as follows. (i) to reduce poverty, (ii) to improve regional equality across states and within states, (iii) to improve conditions of the Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBCs) and minorities, (iv) to close the gender gap, and (v) to generate attractive employment opportunities for the youth, (vi) resource use efficiency and technology to ensure sustainability of natural resources, and (vii) adaptation to climate change, and improvements in total factor productivity. Thus, it is noteworthy to implement this project.
2	Consistent with State Twelfth Five Year Plan	The Jharkhand State Twelfth Five Year Plan emphasises: (i) increase in agriculture production through diversification of vegetables, (ii) shift from traditional mono-cropping to horticulture and area expansion under commercial horticultural crops, (iii) increase in irrigation coverage through a mix of major, medium, minor, and groundwater schemes, (iv) increase irrigated area further by 10% to 15% through proper water management and so on. Thus, it is consistent with Jharkhand State Twelfth Five Year Plan.

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Necessity and Priority of the Project (2/3)

SN.	Subject	Necessity and Priority
3	Necessity of poverty alleviation in Jharkhand in comparison with other states	Jharkhand state is far behind in rural development in comparison with national average and/or other states as stated below: (i) Rural Poverty Line = Rs. 749 per month/capita (3rd lowest in all India), (ii) Rural BPL population = 10.4 million (7th highest in all India), (iii) Rural BPL rate = 40.8% (3rd highest in all India), (iv) SGDP per capita = Rs. 27,132 (3rd lowest in all India), (v) Rate of ST = 26.2% (17.6% higher than national average of 8.6%). Accordingly, this project could contribute toward poverty alleviation in Jharkhand.
4	Necessity of gender empowerment in Jharkhand in comparison with other states.	Jharkhand State is behind in gender empowerment in comparison with national average and/or other states as follows: (i) Gender-related Development Index (GDI) = 0.558 (7th lowest in all India) and (ii) Gender Employment Measure (GEM) = 0.435 (10th lowest in all India). Moreover, literacy rate of Jharkhand State is 67.6% (lowest third portion in all India) which is 6.4 points lower than the national average of 74.0%. The difference in literacy rate by gender is 22.2% (highest in all India); 78.5% of male (6th lowest in all India) and 56.2% of female (3rd lowest in all India). Accordingly, this project could contribute toward gender empowerment in Jharkhand as well.

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Necessity and Priority of the Project (3/3)

SN.	Subject	Necessity and Priority
5	Consistent with JICA's policy and development assistance plan to India.	It also coincides with JICA's country analysis paper for India, stating that poverty alleviation and food security are the main issues of the agriculture sector in India, which are to be overcome by means of (i) countermeasures for water shortage, (ii) development of rural infrastructure, and (iii) investment on research and development of agriculture technology. Besides, JICA's development assistance plan to India puts emphasis on eradication of poverty and improvement of the environment. Income and employment generation of the local poor is top priority. Thus, the project is justifiable to apply for the Japanese ODA.

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Project Scope (1/2)

SN.	Component	Scope of Work
1.	Institution Building Programme	a) Orientation workshop to PMU staff; b) Training to PMU staff and exposure visits to similar projects; c) Screening and appraisal of target MDI farmers; d) Planning of action plan of the Project; e) Establishment of project management information system (MIS), etc.
2.	Farmers Support Programme	<u>Preparation of Trainings</u> a) Preparation of materials for Public Dissemination and Awareness; b) Preparation of Training Program and Modules (materials); c) Preparation of Audio-Visual Training materials; d) Development of Evaluation Method for Trainings; e) TOT training to TOs, FOs and CRPs; f) Preparation of Training Program for training to MDI farmers by trainers, etc. <u>Execution of Trainings</u> a) Public Dissemination and Public Consultation Meeting; b) Training to SHGs/MFG and Exposure Visits to similar projects; c) Training on O&M of MDIs and Exposure Visits to similar projects; d) Training on Horticulture Farming Technology and Exposure Visits to similar projects; e) Training on Processing and Marketing of Horticulture Products and Exposure Visits to similar projects; f) Follow-up Workshop for Trainings, etc.

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Project Scope (2/2)

SN.	Component	Scope of Work
3.	Agriculture Infrastructure Development Programme*1	Procurement and installation of the following facilities and goods: a) Micro Drip Irrigation System (0.1 ha model) : 60,000 units b) Poly Nursery House : 60,000 units c) Vermin Compost Unit : 60,000 units d) Agriculture Tools : 1,200 lots (1 per village) e) Multi-Purpose Community Center : 38 units (2 per market cluster) f) Godown cum Cold Storage : 1 unit g) Zero Energy Cool Chamber : 2,400 units (2 per village)
4.	Consulting Services	The project consultant will assist the PMU in the following activities: a) Overall Project Management; b) Installation and Management for MDIs and Agri. Support Facilities; c) Institutional Development; d) Preparation of Training Program and Modules; e) Capacity Development of MDI farmers in O&M, Farm Management.
5.	Others to be provided by the Government of Jharkhand	a) Project Administration; b) Water Resource Development for MDIs (construction of wells); c) Taxes and Duties; d) Front end Fees, etc.

Note: *1= Materials, Products and designs shall be compliant with the Indian Standards (IS).

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Project Cost

No.	Item	F/C (JPY million)	L/C (Rs. million)	Total Cost (JPY million)	Total Cost (Rs. million)
(1)	Institution Building Programme	0.0	218.5	369.2	218.5
(2)	Farmers Support Programme	0.0	291.7	493.0	291.7
(3)	Agriculture Infrastructure Development Program	0.0	2,266.3	3,830.1	2,266.3
Subtotal of Items (1) - (3)		0.0	2,776.5	4,692.3	2,276.5
(4)	Price Escalation	0.0	618.1	1,044.5	618.1
(5)	Physical Contingencies	0.0	169.7	286.8	169.7
Subtotal of Items (1) - (5)		0.0	3,564.3	6,023.7	3,564.3
(6)	Consulting Service	726.3	237.1	1,127.0	666.9
Subtotal of Items (1) - (6) (Eligible Cost)		726.3	3,801.5	7,150.7	4,231.2
(7)	Administration	0.0	211.6	357.5	211.6
(8)	Taxes and Duties	0.0	260.6	440.5	260.6
(9)	Interest during Construction Period	514.3	0.0	514.3	304.3
(10)	Front-end Fee	14.3	0.0	14.3	8.5
Total		1,254.9	4,273.7	8,477.4	5,016.2

<Basic Condition for Cost Estimate>

1. Base prices: July 2014.
2. Exchange rate: US\$1.0 = Rs.60.1 = JPY 101.72
3. Price escalation: 2.0%/annum for F/C and 4.2%/annum for L/C
4. Physical contingency: 5.0%
5. Project administration: 5.0% of the direct cost
6. Interest during construction: 1.4% for works and similarly 0.01% for the consulting services
7. Front-end fee: 0.2% of the accumulated loan portion

Implementation Schedule

A. Overall Implementation Schedule of the Project

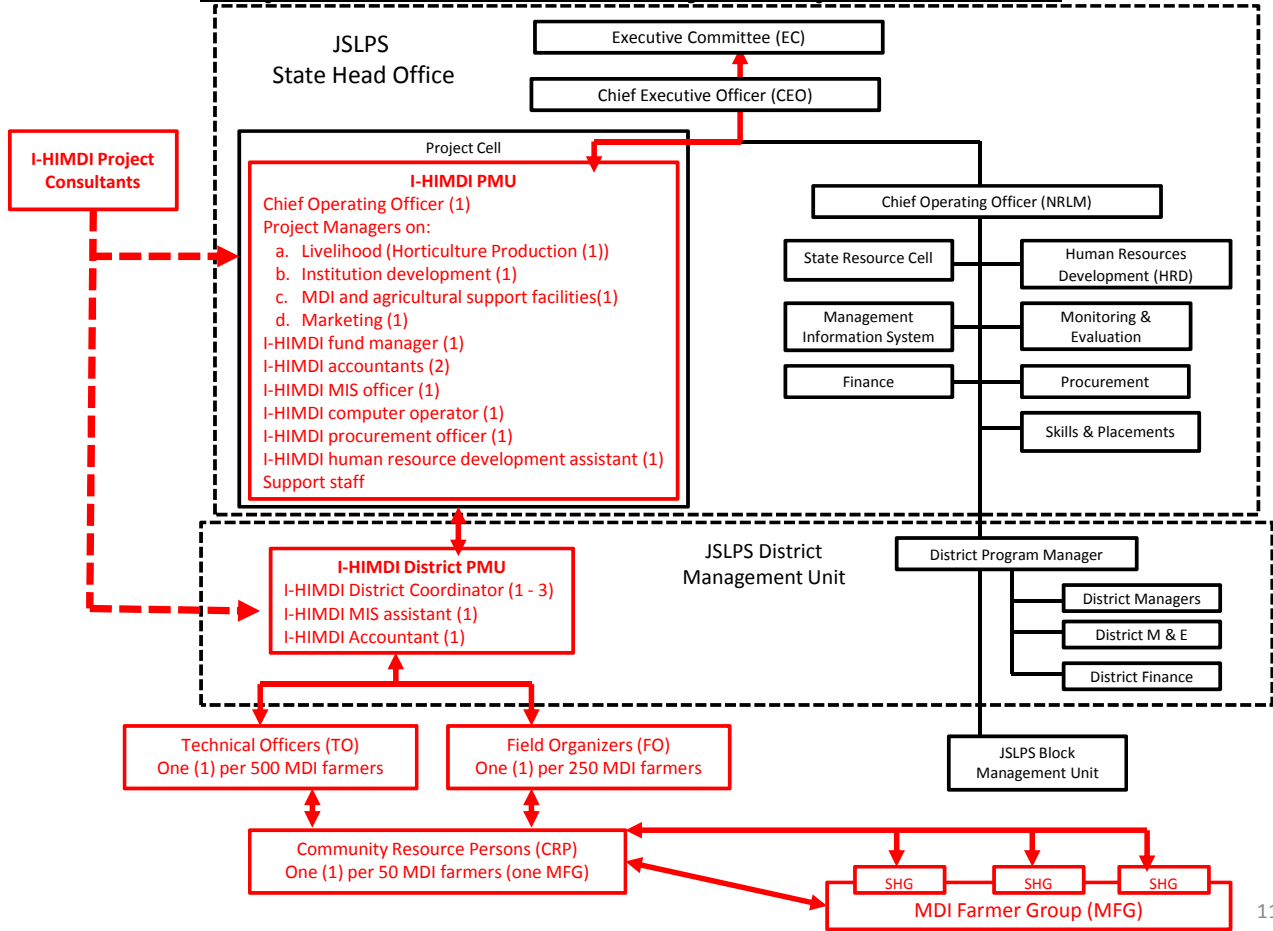
Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year
1. Establishment of PMU	12 months							
2. Selection of Consultants	10 months							
3. Consulting Services		72 months						
4. Institution Building Programme		72 months						
5. Farmers Support Programme		72 months						
6. Agriculture Infrastructure Development Programme		52 months						

B. Overall Work Schedule of the Consulting Services

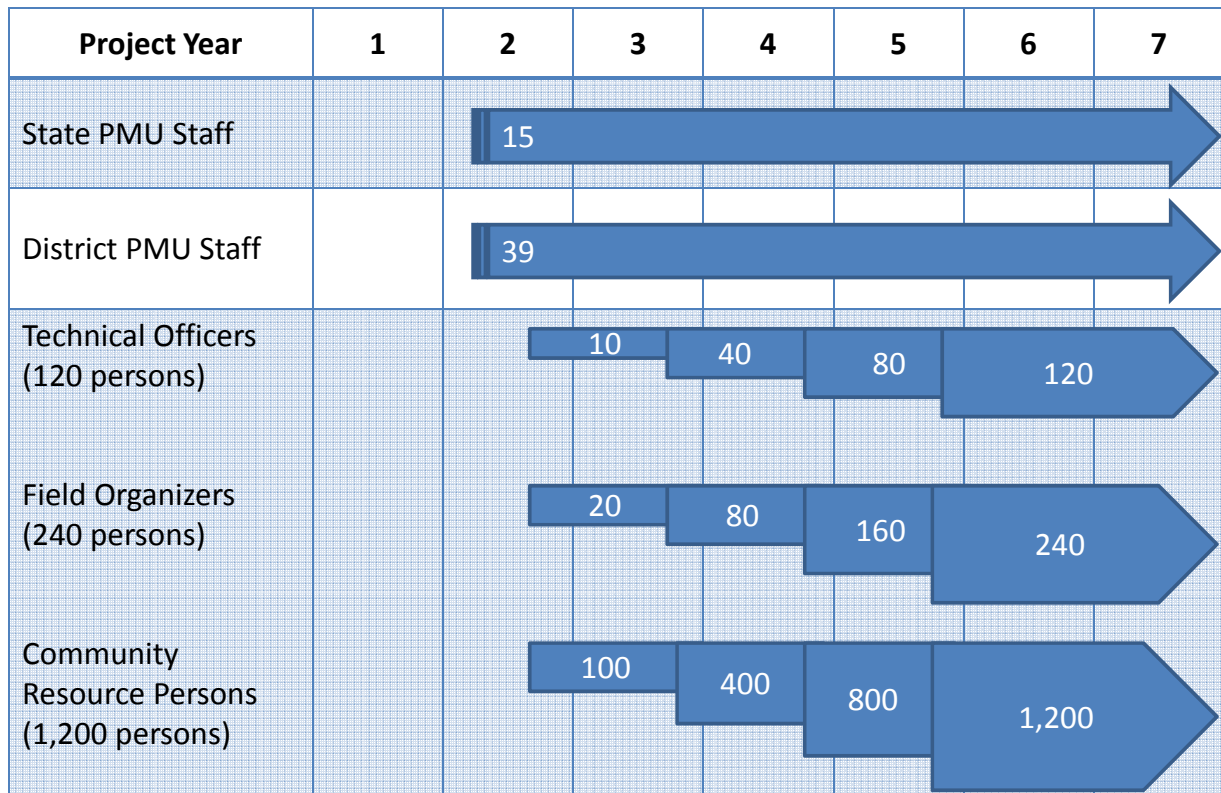
Major Work Component	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year
1. Consulting Services		72 months						
2. Selection of Target MDI Farmers		5,000	15,000	20,000	20,000			
3. Agriculture Infrastructure Development Programme								
• MDI Package (60,000 units)			5,000	15,000	20,000	20,000		
• Multi Purposes Community Center (38 units)				12	26			
• Market Center (Godown and Cold Storage) (1 unit)					1			
4. Baseline/Follow-up Survey and Impact Assessment		BS	BS	BS	BS	BS	IA	
5. Institution Building Programme		PMU	12 DPMUs					
6. Development of Training Program and Modules		Preparation						
7. Farmers Support Programme			5,000	15,000	20,000	20,000		

Note: JICA Loan period will be 10 years.

Proposed Structure for Project Implementation



PMU Staffing Plan



Operation and Management of Revolving Fund

MDI Farmer shall repay a part of MDI cost to respective SHG in the following terms and conditions:

- Amount: 60% of MDI cost (approximately Rs. 15,000)
- Monthly interest rate: 1.5%
- Repayment period: max. 36 months (3 months of grace period)

Note: Advanced Repayment is acceptable.

Purpose:

- Operation and Maintenance of MDI system.
- Repair of fencing, replacement of plastic mulch, erection of vertical trellis, repair or replacement of pumps, agriculture tools used in MDI.
- Purchase of seeds, soluble fertilizers, plant growth hormones, plant protection chemicals etc.
- Similarly, operational cost required in post-harvest activities, such as sorting, grading, packaging and other farm level value addition may also be taken up from this revolving fund.
- Others as needs arisen.

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Environmental and Social Considerations (ESC)

- **JICA Guidelines April 2010** - Impacts on the environment and society must be assessed and means and cost to avoid, minimize or compensate for those impacts must be integrated into the project itself.
- **Environment and Social Management System (ESMS)** – alike Environmental Management Framework (EMS) of NRLM, shall be prepared, implemented and monitored during the project period.
- **The Forest Dwellers Development Framework (FDDF)** is a part of ESMF –guide to prepare the Forest Dwellers Development Plan (FDDP), wherever the Project interventions are going to significantly affect the forest dwellers. Most of the target blocks have sizable population of forest dwellers.

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Major Policies on Gender Consideration

- Trainings of I-HIMDI are provided for both genders equally.
- Project frequently utilizes IEC materials for trainings to consider illiterate female farmers.
- Project concerns gender social norms in selecting CRPs.
- Project sets up the amount of loan portion, considering SHG members' affordability.
- Poly nursery facilities are built near houses for female farmers who take care of seedlings.
- Project should enhance female participation in the periodical meeting for better management including planning and decision making at MDI Farmer Group.
- Project mitigate female farmer's burden through MDI.

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Summary of Crop-wise Net Return (With - Without)

Crop	Net Return (Rs./0.1ha)		Increment
	Without MDI	With MDI	
Vegetables			
Peas	2,745	4,845	2,100
Tomato	7,979	19,615	11,636
Chilli	36,564	46,736	10,172
Cucumber	23,574	29,817	6,243
Bitter Gourd	14,452	19,140	4,688
Muskmelon	12,335	21,701	9,366
Cauliflower	10,646	16,026	5,380
French Bean	8,900	14,997	6,097
Potato	14,459	22,355	7,896
Brinjal	28,517	34,274	5,757
Fruits			
Guava	0	4,406	4,406
Papaya	0	9,144	9,144
Banana	0	5,345	5,345
Lemon	0	1,852	1,852

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Project Evaluation

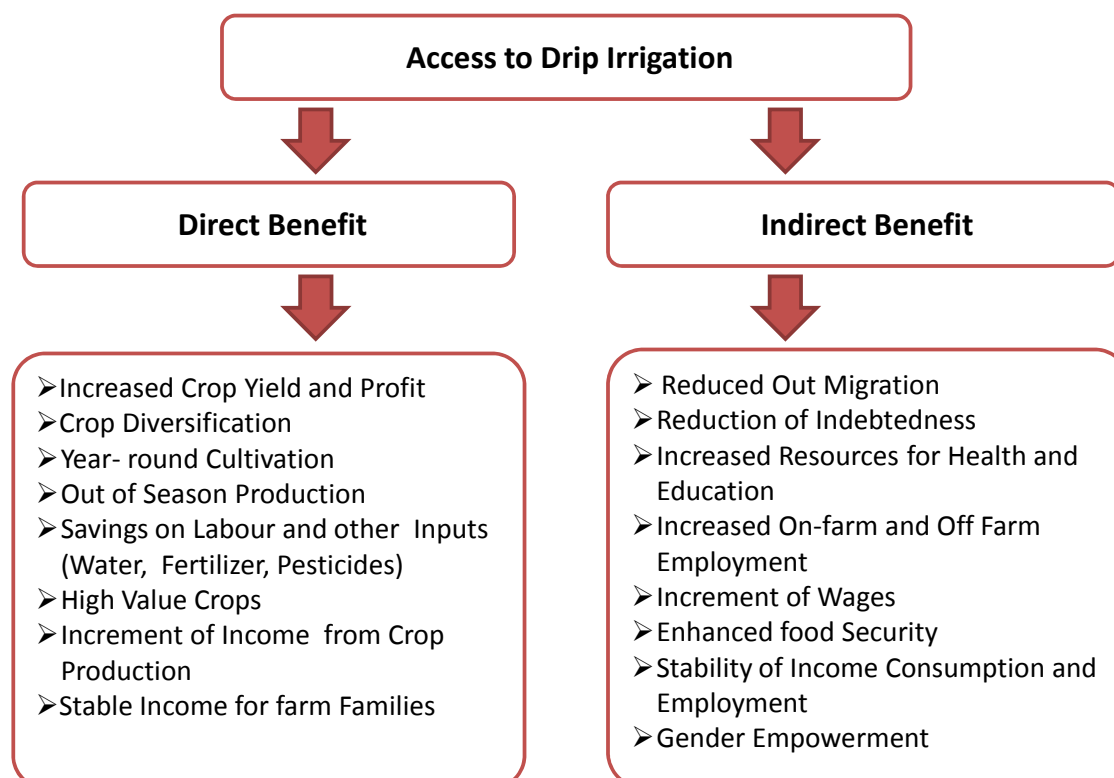
EIRR	26.5%	Net Present Value (Rs. million)			B/C Ratio
		(at 10% Discount Rate)			
		Benefit (B)	Cost (C)	B - C	
		6,304	4,557	1,747	1.38

		Cost		
		Base	5% UP	10% UP
Benefit	Base	26.5%	23.8%	21.5%
	5% DOWN	23.7%	21.3%	19.1%
	10% DOWN	21.1%	18.7%	16.6%

<Basic Assumption for Economic Evaluation>

1. Economic life period: 20 years
2. Discount rate: 10%
3. Economic benefit: Vegetable production
4. Economic cost: Transfer payments (taxes and subsidies), price escalation and interest are excluded.
5. Standard conversion factor: 0.967
6. Shadow wage rate for agricultural labour: 0.584

Some Major Direct & Indirect Benefits of MDI



Operation and Effect Indicators

A. Operation Indicators

No.	Indicators	Present Condition(YR2014)	Target(YR2022)
1	Nos. of MDI beneficiary farmers	-	60,000
2	Vegetable cultivation area	-	6,000 ha
3	Cropping intensity	-	300%
4	Nos. of trainings	-	937 times
5	Rate of MFG formation	-	95%
6	Rate of instalment of O&M funds	-	95%

B. Effect Indicators

No.	Indicators	Present Condition (YR2014)	Target (YR2022)
1	Total Vegetable Production (MT/year)		
	- Tomato (Kharif)	150,000	360,000
	- French Beans (Rabi)	97,440	150,000
	- Cauliflower (Summer)	237,420	330,000
2	Average Unit Yield (kg/ 0.1 ha)		
	- Tomato (Kharif)	2,500	6,000
	- French Beans (Rabi)	1,624	2,500
	- Cauliflower (Summer)	3,957	5,500
3	Average Net Return (Rs/ 0.1 ha/year) *1	22,183	43,807

Note: *1) Calculated based on three main crops (Tomato, French Beans and Cauliflower)

Conclusion

The project is consistent with development policies of GOI&GOJ.

- Poverty alleviation, food security, crop diversification, etc.

The project impact is great.

- MDI coverage: 2.2% of all farmers in Jharkhand
- Incremental vegetable production: 5.1% of the state share by 2022.

The project is technically viable.

- Basic skills have been accumulated in JSLPS through UNDP and SGSY.
(Intensive technical support will be provided by the project.)

The project is economically feasible.

- Total annual economic benefit: Rs. 4,000 million/project or Rs. 50,000/farmer
- EIRR : 26.5%

The project is environmentally friendly.

- No land acquisition and resettlement, adaptation measures for climate change, water saving, reduction in fertilizer and agro-chemical application, soil improvement, etc.



I-HIMDI should come into operation with priority !!!

**PREPARATORY SURVEY
ON
INITIATIVE FOR HORTICULTURE INTENSIFICATION BY MICRO DRIP IRRIGATION
IN JHARKHAND**

FINAL REPORT

Volume I Main Report

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Abbreviations

AAP	Annual Action Plan
AGY	Adarsha Gram Yojna (Model Village Programme)
AIBP	Accelerated Irrigation Benefits Programme
APHC	Additional Primary Health Centres
APL	Above Poverty Line
APMC	Agricultural Producers Market Committee
ATMA	Agriculture Technology Management Agency
ATS	Agricultural Technology System
AWP	Annual Work Plan
B/C	Benefit Cost Ratio
BAU	Birsa Agricultural University
BDO	Block Development Officer
BLF	Block Level Federation
BMMU	Block Mission Management Unit
BPL	Below Poverty Line
BPMU	Block Project Management Unit
BRLPS	Bihar Rural Livelihood Promotion Society
CAD	Command Area Development
CAG	Comptroller and Auditor General
CBO	Community Based Organization
CCA	Culturable Command Area
CEO	Chief Executive Officer
CF	Cluster Federations
CGWB	Central Groundwater Board
CIF	Community Investment Fund
CLF	Cluster Level Federation
COO	Chief Operation Officer
CRP	Community Resource Person
CSO	Civil Society Organization
CSS	Centrally Sponsored Scheme
DC	District Coordinator
DEA	Department of Economic Affairs
DFO	Divisional Forest Officer
DMI	Drip Method of Irrigation
DMMU	District Mission Management Unit
DoA	Department of Agriculture and Cane Development
DoFE	Department of Forest and Environment
DPMU	District Project Management Unit
DPR	Detailed Project Report
DRDA	District Rural Development Agency
DTPA	Diethylene Triamine Pentaacetic Acid
EAC	Environmental Appraisal Committee
EAP	Emergency Action Plan
EC	Electrical Conductivity
EIA	Environment Impact Assessment
EIRR	Economic Internal Rate of Return
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EPA	Environment Protection Act
ESMF	Environment and Social Management Framework
ESMS	Environmental and Social Management System
F/C	Foreign Currency
F/S	Feasibility Study
FAO	Food and Agriculture Organization
FC	Farmers' Club
FDDE	Forest Dwellers Development Framework
FDDP	Forest Dwellers Development Plan
FMI	Flood Method of Irrigation
FO	Field Officer

FTTF	Farmers' Technology Transfer Fund
GCA	Gross Cropped Area
GDI	Gender-related Development Index
GDP	Gross Domestic Production
GHG	Green House Gas
GoI	Government of India
GoJ	Government of Jharkhand
GSDP	Gross State Domestic Product
HDI	Human Development Index
HDPE	High Density Poly Ethylene
IAA	Impact Assessment Authority
IAY	Indira Awas Yojana (Social Welfare Programme)
ICAR	Indian Council of Agricultural Research
IFAD	International Fund for Agricultural Development
I-HIMDI	Initiative for Horticulture Intensification by Micro Drip Irrigation
IPM	Integrated Pest Management
IRDP	Integrated Rural Development Program
ISF	Irrigation Service Fee
IWMP	Integrated Watershed Management Programme
JFM	Joint Forest Management
JICA	Japan International Cooperation Agency
JNHM	Jharkhand National Horticulture Mission
JSAC	Jharkhand Space Application Centre
JSAMB	Jharkhand State Agricultural Marketing Board
JSHM	Jharkhand State Horticulture Mission Society
JSLPS	Jharkhand State Livelihood Promotion Society
JSPC	Jharkhand State Pollution Control Board
JSWM	Jharkhand State Watershed Mission
JTDP	Jharkhand Tribal Development Programme
JTDS	Jharkhand Tribal Development Society
KVK	Krishi Vigyan Kendras (Agriculture Science Centres)
KVS	Krishak Vikaas Sangh (Water Users' Association / Farmers' Group)
L/C	Local Currency
LEP	Lady Extension Officers
M&E	Monitoring & Evaluation
M/M	Minutes of Meeting
M/P	Master Plan
MC	Market Centre
MCC	Multipurpose Community Center
MCM	Million Cubic Meter
MDI	Micro Drip Irrigation
MFG	Micro Drip Irrigation Farmers' Group
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MIP	Micro Investment Plan
MIS	Management Information System
MKSP	Mahila Kissan Shasaktikaran Pariyojna (Women in Agriculture)
MNRE	Ministry of New and Renewable Energy
MoA	Ministry of Agriculture
MoEF	Ministry of Environment and Forests
MoRD	Ministry of Rural Development
MSME	Micro, Small and Medium Enterprise
MT	Metric Ton
MWCD	Ministry of Women and Child Development
MWS	Micro Watershed
NABARD	National Bank for Agriculture and Rural Development
NCDC	National Cooperative Development Corporation
NELP	New Exploration Licensing. Policy
NER	North Eastern Region
NGO	Non Government Organization
NHM	National Horticulture Mission
NIFM	National Irrigation Management Fund
NMMI	National Mission on Micro Irrigation

NMSA	National Mission for Sustainable Agriculture
NPC	Non-pressure Compensating
NPV	Net Present Value
NRDWP	National Rural Drinking Water Programme
NRLM	National Rural Livelihood Mission
NRM	Natural Resource Management
NSSO	National Sample Survey Organization
NTFP	Non -Timber Forest Products
NWM	National Water Mission
O&M	Operation and Maintenance
OBC	Other Backward Caste
ODA	Official Development Assistance
PC	Pressure Compensated
PDCA	Plan-Do-Check-Action (Cycle)
PDD	Planning and Development Department
PDM	Project Design Matrix
PIA	Project Implementation Agency
PIU	Project Implementation Unit
PMGSY	Pradhan Mantri Gram Sadak Yojana (All-weather Road Connectivity to Unconnected Villages Programme)
PMU	Project Management Unit
PNH	Poly Nursery House
PPCP	Public Private Community Partnership
PPP	Public Private Partnership
PRI	Panchayati Raj Institution
PSR	Project Status Report
PTG	Primitive Tribal Group
RAD	Rainfed Area Development
RBI	Reserve Bank of India
RCD	Road Construction Department
RDD	Rural Development Department
RF	Revolving Fund
RGGVY	Rajiv Gandhi Grameen Vidyurikaran Yojana (Rural Electrification Programme)
RKVY	Rashtriya Krishi Vikas Yojna (National Agricultural Development Plan)
RRB	Regional Rural Bank
RRR	Repair, Renovation and Restoration
RUDSETI	Rural Development and self Employment Training Institute
SAMETI	State Agricultural Management Training Institute
SAU	State Agriculture University
SC / ST	Scheduled Caste / Scheduled Tribe
SCB	State Cooperative Bank
SCF	Standard Conversion Factor
SCSP	Special Component Sub Plan
SEAC	State Level Expert Appraisal Committee
SEIAA	State Level Environment Impact Assessment Authority
SERP	Society for Elimination of Rural Poverty
SGDP	State Gross Domestic Product
SGSY	Swarnajayanti Gram Swarajgar Yojna (Golden Jubilee Rural Self-employment Programme)
SHG	Self-Help Group
SHPI	Self Help Promoting Institutions
SIRD	State Institute of Rural Development
SLNA	State Level Nodal Agency
SMIC	State Micro Irrigation Committee
SMP	Social Mobilization Project
SPM	State Programme Manager
SPMU	State Project Management Unit
SRI	System of Rice Intensification
SRLM	State Rural Livelihood Mission
SWOT	Strength, Weakness, Opportunity, Threat
TDS	Total Dissolved Solid
TGA	Total Geographical Area

TO	Technical Officer
TOR	Terms of Reference
TOT	Training of Trainers
TSP	Tribal Sub Plan
ULB	Urban Local Body
UNDP	United Nations of Development Programme
UTs	Union Territories
VAT	Value Added Tax
VCU	Vermin Compost Unit
VDC	Village Development Committee
VEGFED	Vegetable Co-operative Marketing Federation
VO	Village Organization
VRF	Vulnerability Reduction Fund
VVV	Vikas Volunteer Vahini
WALMI	Water and Land Management Institute
WCDC	Watershed Cell cum Data Centre
WMO	World Meteorological Organization
WRD	Water Resource Development
ZECC	Zero Energy Cool Chamber
ZRC	Zonal Research Station

Local Words

Crore	10 Million
Haat	Local Retail Market
Kharif	Southwest monsoon cropping season (June to September)
Lakh, Lac	100 Thousand
Panchayat	Local public administration assembly at the village (or group of villages) level
Rabi	Winter cropping season (November to May)

Units and Currency

kg	kilogram
t, MT	Metric tonnes = 1,000 kg
qt	quintal (100 kilogram)
bigha	12.5 bigha = 1 ha / 1 bigha = 0.08 ha
h	hour
mm	millimetre
cm	centimetre
m	meter
km	kilometre
ha	hectare
HP	Horsepower
INR, Rs.	Indian Rupee
km ² , sq.km	square kilometre
m ³	cubic meter
MCM	million cubic meter
MSL	Mean Sea Level
MW	mega Watt
LPS, l/s	litters per second
mg/L	milligram per litter
mm/mon	millimetre per month
mm/d	millimetre per day
m/s	meter per second
mS/cm	millisiemens/centimetre
m ³ /s	cubic meter per second
° C	degrees centigrade
%	percent
US\$	United States of America Dollar

USD 1.0 = JPY 101.72 = Rs. 60.1 (Rs 1.0 = JPY 1.69)

(as of July 2014)

JPY = Japanese Yen, Rs. = Indian Rupee

CHAPTER 1 INTRODUCTION

1.1 Authority

The draft final report is prepared in accordance with the Minutes of Meetings of the Mission for the Preparatory Survey on Initiative for Horticulture Intensification by Micro Drip Irrigation (hereinafter referred to as “I-HIMDI”) in Jharkhand agreed upon by the Rural Development Department (RDD) of the Government of Jharkhand (GoJ) and the Japan International Cooperation Agency (JICA) on 21 October 2013.

1.2 Background of the Project

The state of Jharkhand, which has an area of 79,000 km² and is inhabited by 33 million people, is located in the eastern part of India, and surrounded by Bihar on the north, West Bengal on the east, Odisha on the south, and Uttar Pradesh and Chhattisgarh on the west. In Jharkhand, around 76% of the population lives in rural areas. The scheduled castes (SCs) and scheduled tribes (STs) account for 12% and 26% of the total population, respectively. The agriculture sector occupies only 15% of the state gross domestic product (SGDP) in Jharkhand. However, the agriculture sector absorbs 63% of the workforce, of which 84% is categorised into marginal and small farmers who have farmlands less than 2.0 ha in terms of number or 43% by area. Thus, majority of the farmers could not get sufficient income from agriculture because of subsistence farming on a small scale. Consequently, the poverty rate is relatively higher in Jharkhand; 37% against the national average of 22%. The climatic condition is generally good for agriculture, particularly for horticulture in hilly undulating topography. The average annual rainfall is around 1,360 mm, but unevenly distributed in space and time. The irrigation coverage remains at around 10%. Therefore, water saving agriculture with development of rechargeable water bodies such as dams, ponds, and wells are indispensable in order to realise a stable agriculture sector. It is a great advantage for Jharkhand that groundwater resources are comparatively rich. However, the groundwater aquifer present under the state is constrained by inhomogeneity and anisotropy.

The Ministry of Rural Development (MoRD), with support of the United Nations Development Programme (UNDP), had implemented the Social Mobilization Around Natural Resources Management for Poverty Alleviation (2003-2008) in three states of India including Jharkhand. The UNDP project brought about the improvement of access to food through livelihood promotion for 47,000 farm households in five blocks of Jharkhand wherein food had been insufficient in quantity and quality. In keeping with this experience, the RDD established the Jharkhand State Livelihood Promotion Society (JSLPS), with the support of the UNDP in September 2009. JSLPS acts as the project implementation agency (PIA) for implementing pilot projects such as the State Level Livelihood Strategy (2009-2012), which cover 477 villages in ten blocks of Jharkhand.

To scale up the UNDP project, the RDD submitted an outline of the project abstract (a brief project proposal) to JICA in March 2013. The project proposal aimed to promote horticulture with micro drip irrigation (MDI) systems using groundwater as the most effective mean for marginal and small farmers so as to improve the livelihood of the local poor.

1.3 Proposed Project

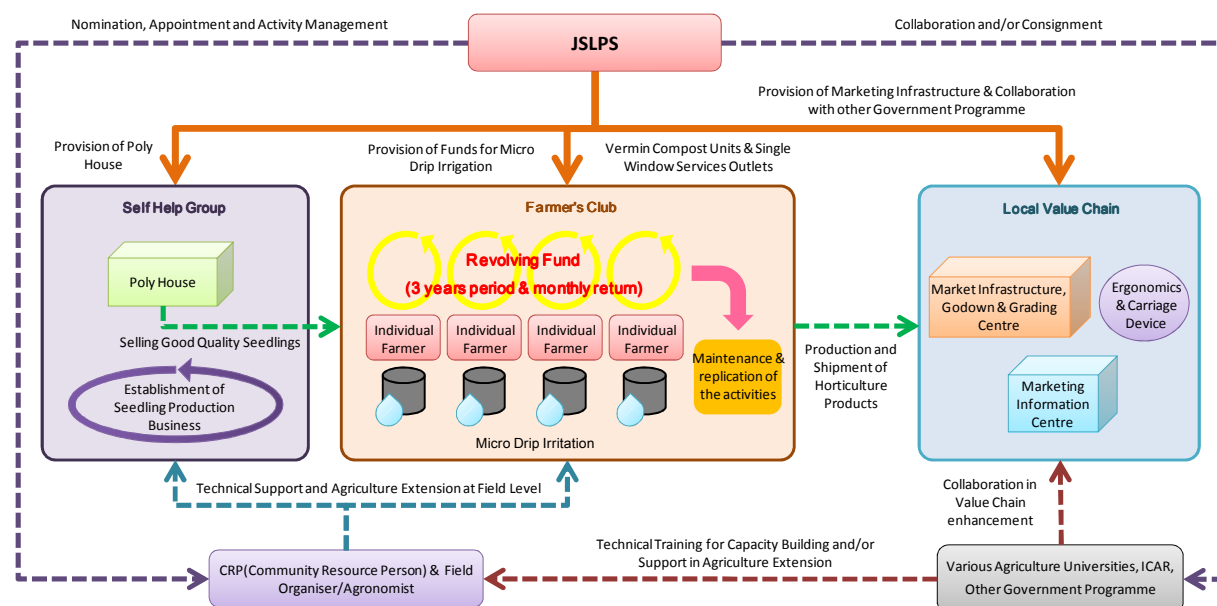
The outline of the project proposal of the RDD is shown below in Table 1.3.1.

Table 1.3.1 Outline of the Project Proposed by JSLPS

Item	Description
Name	Initiative for Horticulture Intensification by Micro Drip Irrigation [I-HIMDI]
Overall Goal	To enhance profitability and well-being of small and marginal farmers through sustainable and eco-friendly irrigation and agricultural technologies
Component	A. Livelihood enhancement of self-help groups (SHGs) thru seedling business using poly houses (60,000 households) B. Livelihood enhancement of farmers' groups thru horticulture production improvement using micro drip irrigation (60,000 households) C. Capacity building of farmers, community based organisation, and government staff (60,000 households) D. Improvement of horticulture value chain thru installation of marketing infrastructure (16,000 households) E. Technical support and administration <i>Note: Consulting services are not included.</i>
Cost	Rs.3,417.7 million
Area	10 Districts (Ranchi, Hazaribagh, Palamu, Pakur, Pashchimi Singhbhum, Lohardaga, Gumla, Godda, Khunti, and Dumka)
Period	7 years (2014-2020)
Implementation Agency	JSLPS, RDD, and GoJ

Source: An Outline of the Project Abstract, JSLPS

The proposed project summary is illustrated as shown below in Figure 1.3.1.



Source: An Outline of the Project Abstract, JSLPS

Figure 1.3.1 Summary of the Project proposed by JSLPS

1.4 Purpose of the Survey

The purpose of the survey is to (i) prepare a project plan suitable for a yen loan project, (ii) prepare a detailed project report (DPR), and (iii) procure additional information and data required by JICA for appraisal of the project proposal, by assisting the State Government of Jharkhand.

1.5 Scope of the Survey

The scope of the survey is summarised below in Table 1.5.1.

Table 1.5.1 Scope of the Survey

Work Stage (Period)	Major Activities
Preparatory work in Japan (March 2014)	<ul style="list-style-type: none"> - Collection, review, and analysis of available data and information; - Preparation of the inception report; and - Preparation of presentation materials to counterpart agencies.
1 st field work (March to mid-May 2014)	<ul style="list-style-type: none"> - Kickoff meeting; - Presentation of and discussion on the inception report; - Collection of supplemental data and information; - Summarising background and chronology of the project; - Review of national development policy and plan in India and Jharkhand; - Review of livelihood promotion, horticulture and extension services, and irrigation in India and Jharkhand; - Analysis of socioeconomic and natural conditions of Jharkhand; - Review of the pilot project by JSLPS; - Selection of target districts/blocks and groups; - Field surveys; - Sorting out problems and constraints in the survey area; - Preparation of the project scope; - Study on organisational structure for project implementation, operation, and maintenance; and - Study on environmental and social considerations.
1 st home office work (late May to early June 2014)	<ul style="list-style-type: none"> - Preparation, explanation, and discussion on the interim report.
2 nd field work (mid-June to mid-July 2014)	<ul style="list-style-type: none"> - Estimation of project cost, implementation schedule, procurement, and implementation method; - Review of technical cooperation; - Preparation of forest dwellers development frameworks; - Project evaluation as well as setting operational and effect indicators; and - Review of the involvement of private firms and non-governmental organizations (NGOs) in the project.
2 nd home office work (late July to August 2014)	<ul style="list-style-type: none"> - Preparation of the draft final report; and - Explanation and discussion on the draft final report, and getting consent of JICA.
3 rd field work (mid-September 2014)	<ul style="list-style-type: none"> - Explanation and discussion on the draft final report, and getting consent from the Government of Jharkhand; - Collection of additional information and data, if any; and - Assistance to the JICA mission for fact-finding and/or project appraisal.
3 rd home office work (October 2014)	<ul style="list-style-type: none"> - Preparation of the final report; and - Preparation of survey form and survey manual for additional interview survey.
4 th field work (mid-November 2014)	<ul style="list-style-type: none"> - Check and analysis of outputs of additional interview survey conducted by JSLPS.
4 th home office work (late November to mid-December 2014)	<ul style="list-style-type: none"> - Preparation and submission of the final report.

Source: JICA Survey Team

1.6 Work Schedule and Progress of the Survey

The members of the JICA Survey Team are shown in Table 1.6.1.

Table 1.6.1 List of JICA Survey Team Members

No.	Position	Name of Expert
A	JICA Experts	
1	Team Leader/Irrigation Engineer	Mr. Kenichi Shibuta
2	Agriculture Infrastructure Engineer	Mr. Nobuo Nagawara

No.	Position	Name of Expert
3	Agriculture and Extension Specialist	Mr. Tomoki Nakamura
4	Agricultural Processing and Marketing Specialist	Ms. Akiko Akiyama
5	Rural Credit/Community Based Organisation Specialist	Ms. Nobuko Miyake
6	Water Resources/Groundwater Engineer	Mr. Shinichi Iseki
7	Project Operation and Management Specialist	Ms. Keiko Itagaki
8	Agro-economist	Mr. Badri Nath Adhikary
9	Environmental and Social Consideration Specialist-1	Ms. Mitsue Umiguchi
10	Environmental and Social Consideration Specialist-2	Mr. Manoj Kumar Pattanaik
11	Cost Estimator/Geographic Information System (GIS)/Team Coordinator	Mr. Shingo Matsuoka
B	Local Experts	
1	Water Resources/Groundwater Engineer	Mr. Sinha Lakshman Sharan Jageshwar
2	Agriculture and Extension Specialist	Dr. Shivendra Kumar
3	Rural Credit/Community-Based Organisation Specialist	Ms. Anamika Prasad
4	Agricultural Processing and Marketing Specialist	Mr. Jitesh Kumar Panda
5	Environmental Specialist	Dr. Abdul Wadood

Source: JICA Survey Team

The counterpart personnel attached to the JICA Survey Team, who are responsible for preparation of the DPR, are listed in Table 1.6.2 below.

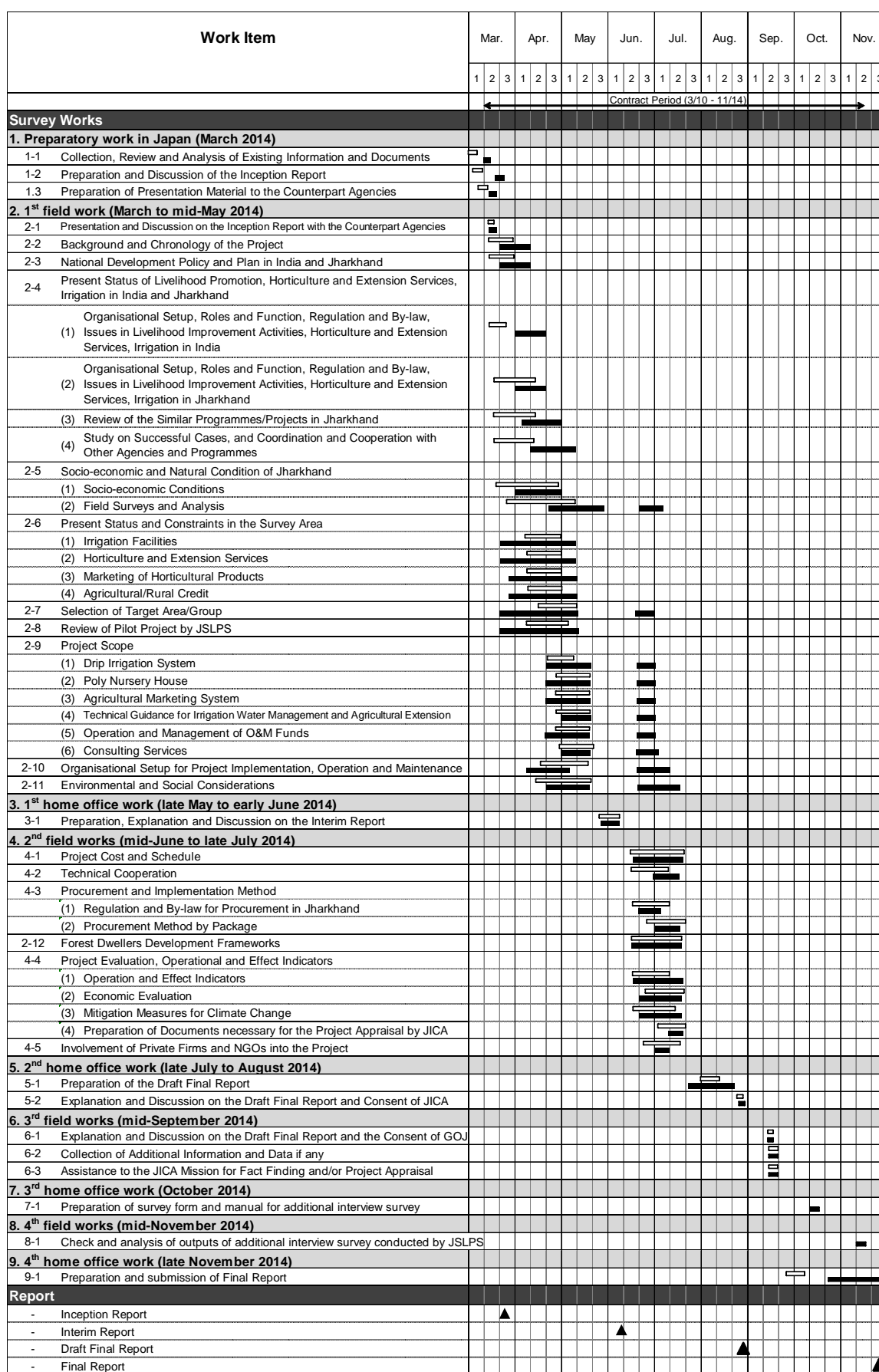
Table 1.6.2 List of Counterpart Personnel

No.	Name of Counterpart	Position
1	Dr. Praveen Kumar Singh	State Programme Manager-Farm
2	Khalid Hussain	Project Executive-Farm
3	Vinay Pandey	SPM-NF
4	Sanjay Bhagat	SRC-Technical Support Officer- Livelihood and Capacity Building
5	Kumar DD Singh	PM Livelihood-Ranchi
6	Pankaj Singh	PM Livelihood-Giridih
7	Sanjay Das	SPM Livelihood Sanjeevani-Project

Source: JSLPS

The work schedule and progress of the survey are shown in Figure 1.6.1. The major work activities and events during the survey period are as follows:

- 1st field survey (10 March to 20 May 2014);
- Kickoff meeting on 13 March 2014 at the JSLPS office (refer to Attachment 1.6.1);
- Submission of the inception report to JICA on 24 March 2014;
- Presentation meeting on outputs of the 1st field survey at the JSLPS office on 15 May 2014 (refer to Attachment 1.6.2);
- Submission of the interim report to JICA on 9 June 2014;
- 2nd field survey (17 June to 18 July 2014);
- Presentation meeting on outputs of the 2nd field survey at the JSLPS office on 14 July 2014 (refer to Attachment 1.6.3).
- Submission of the draft final report to JICA on 29 August 2014;
- 3rd field survey (14 to 21 September 2014);
- Presentation meeting on the JICA draft final report at the JSLPS office on 16 September 2014 (refer to Attachment 1.6.4).
- 4th field survey (13 to 19 November 2014); and
- Submission of the final report to JICA on 15 December 2014.



Source: JICA Survey Team

Figure 1.6.1 Work Schedule and Progress of the Survey

CHAPTER 2 NATIONAL AND STATE DEVELOPMENT BACKGROUND

2.1 Planning Process of National Development Policy and Plan

The Planning Commission of the Government of India (GoI) builds a long-term strategic vision of the future and decides on the priorities of the nation. It works out sectoral targets and provides promotional stimulus to the economy for it to grow in the desired direction. At the state level, the Planning and Development Department (PDD) plays an integrative role in the development of a holistic approach to policy formulation in critical areas of human and economic development of the state under the guidance of the Planning Commission of India.

The mandate of the Planning Commission is summarised in Attachment 2.1.1, and the planning process of policy papers including the Five Year Plan and Annual Plan is illustrated in Attachment 2.1.2. For the preparation of the Twelfth Five Year Plan, 26 working groups were set up on various subsectors and subjects to formulate the plan. Each group output was integrated into the approach paper, which laid out the major targets, the key challenges in meeting them, and the broad approach that must be followed to achieve the stated objectives. The paper provided background information and recommendations to the Twelfth Five Year Plan (2012-2017).

2.2 Twelfth Five Year Plan of India

The Twelfth Five Year Plan has projected to achieve a real gross domestic product (GDP) growth rate of 8.0% during 2012-2017 with other 24 monitorable targets shown in Attachment 2.2.1. Some selected targets are presented below in Table 2.2.1.

Table 2.2.1 Major Monitorable Targets in the Twelfth Plan vs. Eleventh Plan

Indicator	Eleventh Plan* (2007 to 2012)	Twelfth Plan** (2012 to 2017)
GDP Growth	8.0%	8.0%
Agricultural Growth (Agriculture, Forestry, and Fisheries)	3.7%	4.0%
Manufacturing Sector Growth Rate	7.7%	7.1%
Below Poverty Line (BPL) Decline Rate	1.5%	10.0%
Generating Work Opportunities	45 million	50 million
Infant Mortality Rate (per thousand)	45	25
Total Fertility Rate	2.5	2.1
Increase in Green Cover	-	1 million ha per year

Notes: *= realisation, **= projection

Sources: *Twelfth Five Year Plan (2012–2017), Faster, More Inclusive and Sustainable Growth, Volumes I, II & III, Planning Commission, GoI (2013)*

Budget allocation for achieving the proposed growth has been estimated with due emphasis by the GoI during the Twelfth Five Year Plan period, as shown in Table 2.2.2.

Table 2.2.2 Sectoral Plan Outlay for the Twelfth Plan vs. Eleventh Plan

Major Sector	Eleventh Plan		Twelfth Plan	
	Realisation (Rs. million)	% share	Projection (Rs. million)	% share
Agriculture and Water Resources Sector	1,165,540	7.33	2,840,300	7.96
Rural Development and Panchayati Raj	3,975,240	25.01	6,730,340	18.86

Major Sector	Eleventh Plan		Twelfth Plan	
	Realisation (Rs. million)	% share	Projection (Rs. million)	% share
Scientific Departments	586,900	3.69	1,421,670	3.98
Transport and Energy	2,040,760	12.84	4,487,360	12.57
Education	1,775,380	11.17	4,537,280	12.71
Health and Child Development	1,126,460	7.09	4,085,210	11.45
Urban Development	634,650	3.99	1,640,780	4.60
Others	4,588,490	28.87	9,943,330	27.86
Total Plan Allocation	15,893,420	100.00	35,686,260	100.00

Source: *Twelfth Five Year Plan (2012–2017), Faster, More Inclusive and Sustainable Growth, Volume I, II & III, Planning Commission, GoI (2013).*

2.2.1 Background

India has achieved significant economic growth in the most recent decade with a recorded national average real GDP growth rate of 8.0%. Since 2011, the world economy has gone through what looks like a prolonged slowdown, and the domestic economy has also run up against several internal constraints.

2.2.2 Policy Challenges

The policy challenge in the Twelfth Five Year Plan (2012-2017) is therefore two-fold: (i) the immediate challenge to reverse the observed deceleration in growth by reviewing investment as quickly as possible, and (ii) the longer term challenge to leverage the many strengths of the economy to bring it back to 9% growth by the end of the Twelfth Five Year Plan period. Based on SWOT analysis, four key elements have been developed for the preparation of the Twelfth Five Year Plan.

- First, the strategy must be firmly grounded in an understanding of the complexities of the development challenges that India faces, and recognising the transformation that is taking place in the economy and in the world. This understanding of ground reality must be used to identify the critical leverage points where government action could have the maximum impact. The focus must be on identifying the strategic leverage points where successful action could trigger many supportive reactions rather than fixing everything everywhere.
- Second, progress will be achieved through a combination of government action in both policies and public programmes, and the efforts of many private actors that are important in the economy. Much of the inclusive growth to be achieved depends on the investment of the private sector, which accounts for over 70% of the total investment. This includes not only the organised corporate sector, but also micro, small, and medium enterprises (MSMEs), individual farmers and myriads of small businessmen who add to the GDP and create jobs. The dynamism of this segment, and its ability to seize economic opportunities are critical for inclusive growth. Moreover, the plan must address the constraints faced by all these private actors in achieving better results.
- Third, the outlay on government programmes has to increase in many areas, but this must be accompanied by improved implementation. For this, it is necessary to focus on capacity building and governance reforms, including system change that will increase accountability in the public sector. The Twelfth Five Year Plan must backup this focus by making specific allocations to improve the ability of the government to work better.
- Finally, the planning process must serve as a way of getting different stakeholders to work together in order to achieve broad consensus on key issues. These stakeholders include (i) different levels of the government sector: centre, states, and Panchayati Raj Institutions (PRIs)/urban local bodies

(ULBs); (ii) the private sector, both big companies and small businesses, whose investments will drive growth, and (iii) citizens' groups and the voluntary sector, which bring the key element of people's participation and can greatly help improve the quality of government action.

2.2.3 Policy and Plan

The broad vision and aspirations that the Twelfth Five Year Plan (2012-2017) seeks to fulfill are reflected in the subtitle: "Faster, Sustainable, and More Inclusive Growth". The Twelfth Five Year Plan emphasises that the growth must not only be rapid but also more inclusive and environmentally sustainable. The inclusiveness is a multidimensional concept, i.e., (i) to reduce poverty, (ii) to improve regional equality across states and within states, (iii) to improve conditions of the Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBCs) and minorities, (iv) to close the gender gap, and (v) to generate attractive employment opportunities for the youth.

To achieve the broad objectives, the Twelfth Five Year Plan has taken up four priority policies and plans as stated below in Table 2.2.3.

Table 2.2.3 Four Priority Policies and Plans in the Twelfth Five Year Plan

SN.	Policy	Plan
1	Developing Capabilities	<ul style="list-style-type: none"> - Development of human capabilities - Development of institutional capabilities - Implementation capabilities - Delivery of public services - Regulatory institutions - Development of infrastructure - The reach of banking and insurance - Science and technology
2	Managing Natural Resources and Environment	<ul style="list-style-type: none"> - Soil health and productivity - Rational use of land - Water as a scarce natural resource
3	Key Policy Initiatives Needed	<ul style="list-style-type: none"> - Immediate priorities: reviving investor sentiments (fuel supply to power stations, financial problems of the distribution companies, clarity in terms of NELP contracts) - The size of the public sector plan - Longer term increase in investment and saving rates - The need for fiscal correction - Managing the current account deficit - Economic reforms and efficiency of resource use - Transparency in allocating scarce natural resources - Agricultural growth - Manufacturing - Energy policies for long-term growth (coal production, petroleum price distortions, natural gas pricing) - Urbanisation
4	Monitorable Targets for the Plan	<ul style="list-style-type: none"> - Twenty-five core indicators that are listed, which reflect the vision of rapid, sustainable and more inclusive growth

Sources: *Twelfth Five Year Plan (2012–2017), Faster, More Inclusive and Sustainable Growth, Volume I, Planning Commission, GoI (2013).*

2.2.4 Rural Development Sector

Rural development programmes cover employment through the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the National Rural Livelihoods Mission (NRLM), housing via the *Indira Awas Yojana* (IAY) and other state schemes and bank support, sanitation through

the Total Sanitation Campaign, provision for drinking water via the National Rural Drinking Water Programme (NRDWP), social security through the National Social Assistance Program, watershed development via the Integrated Watershed Management Programme (IWMP), road connectivity through the *Pradhan Mantri Gram Sadak Yojana* (PMGSY) and electrification via the *Rajiv Gandhi Grameen Vidyutikaran Yojana* (RGVY). Among others, MGNREGA, IWMP and NRLM have the most significant impacts of rural livelihood improvement.

To achieve the broad objectives, the Twelfth Five Year Plan has taken up eight priority policies and plans for the rural development sector as shown below in Table 2.2.4.

Table 2.2.4 Priority Policies and Plans for the Rural Development Sector

SN.	Policy	Plan
1	MGNREGA	<ul style="list-style-type: none"> - Strengthening the demand-driven character of MGNREGA - Planning for an adequate shelf of projects - Reducing delays in wage payments - Better social audits, vigilance, and grievance redressal
2	National Rural Livelihood Mission (NRLM-AAJEEVIKA)	<ul style="list-style-type: none"> - New directions - Block level professional support - Skills development and job placements - Livelihood upscaling
3	Rural Drinking Water and Sanitation	<ul style="list-style-type: none"> - NRDWP
4	Total Sanitation Campaign	<ul style="list-style-type: none"> - Review and change of Total Sanitation Campaign (TSC)
5	Rural Housing	<ul style="list-style-type: none"> - Abolition of the above poverty line (APL)-BPL distinction - Enhancing access to the poor to land - Improving quality of IAY houses - Rural building centres (RBCs) at the district level - Emphasis on disaster risk reduction - Training of masons, artisans, and others - Partnerships with civil society and PRIs
6	Provision of Urban Amenities in Rural Area (PURA)	<ul style="list-style-type: none"> - Providing urban amenities and livelihood opportunities in rural areas to bridge the rural-urban divide in Indian society
7	National Social Assistance Program (NSAP)	<ul style="list-style-type: none"> - Providing succor to senior citizens, differently able people and others who have suffered due to mishaps in life through unconditional cash transfers
8	Flexi-Fund for Rural Development	<ul style="list-style-type: none"> - Giving states much greater flexibility in spending decisions with respect to Government schemes

Sources: *Twelfth Five Year Plan (2012–2017), Faster, More Inclusive and Sustainable Growth, Volume II, Planning Commission, GoI (2013).*

2.2.5 Agriculture Sector

Although the agriculture and allied sector now account for only 14% of the GDP, it is still the main source of livelihood for majority of the rural population. As such, the rapid growth of agriculture is critical for inclusiveness. The Twelfth Five Year Plan has set out a target growth of 4% for agriculture. Important structural changes are taking place within the sector and there are definite signs of improved performance. According to data from the National Sample Survey Organisation (NSSO), rural labour is shifting to non-agricultural work, tightening the labour market in agriculture and putting pressure on farm wages. However, dependence on agriculture remains unchanged among the rural self-employed whose average farm size continues to decline with population growth. The viability of the farm enterprise, which is composed mostly of small farms, must therefore be under a special area of the plan focus in the Twelfth Five Year Plan. The plan must also focus on other priorities such as resource use efficiency and technology to ensure sustainability of natural resources, adaptation to climate change, and improvements in total factor productivity.

The main lesson from the performance in the Eleventh Five Year Plan (2007-2012) is that while there has been a welcome turnaround from the deceleration that was evident in the past years until 2005, and while several indicators have shown marked improvement and potential to build upon, several policy imbalances exist that can prove to be major handicaps. There are also other formidable challenges, for example, a shrinking land base, dwindling water resources, adverse impacts of climate change, shortage of farm labour, and increasing costs and uncertainties associated with volatility in international markets. The Twelfth Five Year Plan will need to face these challenges boldly.

The key drivers of growth will be as follows:

- Viability of the farm enterprise and its returns to investment that depend on scale, market access, prices, and risks;
- Availability and dissemination of appropriate technologies that depend on quality of research and extent of skills development;
- Plan expenditures on agriculture and in infrastructure, which together with policy, must aim to improve the functioning of markets and achieve more efficient use of natural resources; and
- Governance in terms of institutions that make possible better delivery of services such as credit, animal health, and of quality inputs such as seeds, fertilisers, pesticides, and farm machinery.

In addition, certain regional imbalances must be clearly addressed. A national priority in terms of both food security and sustainability is to fully extend the green revolution to areas of low productivity in the eastern region where there is ample groundwater, and thereby help reduce water stress elsewhere. Rainfed areas continue to be at a disadvantage, and their development still requires some mindset changes.

To achieve the broad objectives, the Twelfth Five Year Plan has taken up six priority policies and plans for the agriculture sector as stated below in Table 2.2.5.

Table 2.2.5 Priority Policies and Plans for the Agriculture Sector

SN.	Policy	Plan
1	Farm Viability: Securing Economies of Scale and Better Market Access and Return	<ul style="list-style-type: none"> - Centrality of smallholdings - Issues in expanding agricultural marketing and process - Credit and cooperatives - Farm income variability: managing world price volatility and climate risk
2	Agriculture Research and Education	<ul style="list-style-type: none"> - Shift from a commodity based approach to a farming systems approach within each agro-climatic region
3	National Mission on Extension and Technology Management	<ul style="list-style-type: none"> - Seeds and planting material - Farm machinery - Strengthening extension
4	Specific Plans and Objectives for the Major Subsectors	<ul style="list-style-type: none"> - Livestock - Fishery - Horticulture - Food grains and oil seeds
5	Natural Resources	<ul style="list-style-type: none"> - Water - Watershed development - Land and soil health management - Use of fertilisers and pesticides
6	National Mission for Sustainable Agriculture (NMSA)	<ul style="list-style-type: none"> - Design of national mission for sustainable agriculture

Sources: *Twelfth Five Year Plan (2012–2017), Faster, More Inclusive and Sustainable Growth, Volume II, Planning Commission, GoI (2013).*

2.2.6 Water Sector

The Indian economy and society face daunting challenges in the water sector. The demands of a rapidly industrialising economy and urbanising society come at a time when the potential for augmenting supply is limited. Water tables are falling and water quality issues have increasingly come to the fore. As drilling deeper for water, groundwater contaminated with fluoride and arsenic is encountered. Both rivers and groundwater are continuously polluted by untreated effluents and sewage. Climate change poses fresh challenges, with its impact on the hydrologic cycle. More extreme rates of precipitation and evapotranspiration will exacerbate the impact of floods and droughts. It is no wonder that conflicts across competing uses and users of water are growing by the day. Meanwhile, water use efficiency in agriculture, which consumes around 80% of the water resources, is only around 38%, which compares poorly with 45% in Malaysia and Morocco as well as 50–60% in Israel, Japan, China, and Taiwan.

These challenges can only be met through a paradigm shift in the management of water resources in India. This shift comprises the following elements:

- A move away from a narrowly engineering, construction-centric approach to a more multidisciplinary, participatory management approach to major and medium irrigation projects, with central emphasis on command area development and a sustained effort at improving water use efficiency.
- Since groundwater accounts for nearly two-thirds of India's irrigation and 80% of domestic water needs, it needs a participatory approach for sustainable management of groundwater based on a new programme of aquifer mapping.
- A massive programme for watershed restoration and groundwater recharge must be launched by transforming MGNREGA into the largest watershed programme, giving renewed energy to the reformed IWMP launched in the Eleventh Five Year Plan, which is a completely revamped programme, i.e., Repair, Renovation and Restoration (RRR) of Water Bodies.
- A new approach to rural drinking water and sanitation.
- All urban water supply projects to necessarily integrate sewage systems with them.
- Definite targets for recycling and reuse of water by the Indian industry to move in conformity with international standards.
- Renewed focus on non-structural mechanisms for flood management; vastly improved systems for water-related data collection and management as well as transparency in availability of data.
- Adaptation strategies to mitigate the likely impact of climate change to be pursued under the National Water Mission (NWM).
- Perennial rivers with sufficient draft through the year could be the focal point of a renewed thrust to inland waterways transport as an environment-friendly economical mode of transport compared to road and rail.
- A new legal and institutional framework for water based on broader consensus among the states.

To achieve the broad objectives, the Twelfth Five Year Plan has taken up seven priority policies and plans for the water sector as stated below in Table 2.2.6.

Table 2.2.6 Priority Policies and Plans for the Water Sector

SN.	Policy	Plan
1	Need for Paradigm Shift	<ul style="list-style-type: none"> - Limit to large irrigation projects; - Review of major and medium irrigation (MMI) projects in India

SN.	Policy	Plan
		- The Accelerated Irrigation Benefits Program (AIBP) experience - Macro Management of Agriculture (MMA) reform
2	National Irrigation Management Fund (NIMF)	- Establishing a non-lapsable NIMF, for contribution to irrigation service fee (ISF) collection from irrigator
3	Modified AIBP	- To modify AIBP - To emphasise the centrality of Command Area Development (CAD) to all irrigations projects
4	Groundwater: An Emerging Crisis	- Mapping India's aquifers - National Groundwater Management Program - Central Groundwater Board (CGWB) reforms - Breaking the groundwater-energy nexus - Promoting groundwater development in Eastern India
5	IWMP	- Integration of watershed management programmes - Capacity building and institutional building - Convergence of IWMP with allied programmes such as MGNREGA, NRLM, and Rastriya Krishi Vikas Yojna (RKVY) - Focus on physical outcomes and monitorable indicators
6	RRR of Water Bodies	- Restoring the health of the catchment areas to reduce the rate of siltation of the water bodies and to prolong their life - Developing the command areas to be served by these water bodies
7	Urban Water and Waste Management	- Management and equitable support of water - Groundwater: missing link in city water accounts - Water-waste connection - Investment in water and sanitation

Sources: *Twelfth Five Year Plan (2012–2017), Faster, More Inclusive and Sustainable Growth, Volume I, Planning Commission, GoI (2013)*.

2.3 Twelfth Five Year Plan of Jharkhand

The State Twelfth Five Year Plan has projected to achieve a real GDP growth rate of 7.5% during 2012-2017 with other 13 monitorable targets which is shown in Attachment 2.3.1. Some selected targets are shown below in Table 2.3.1.

Table 2.3.1 Major Monitorable Targets for the Twelfth Plan vs. Eleventh Plan

Indicator	Eleventh Plan* (2007 to 2011)	Twelfth Plan** (2012 to 2017)
GDP Growth	8.0%	7.5%
Agriculture Growth (Agriculture, Forestry, and Fisheries)	7.8%	6.5%
Manufacturing Sector Growth Rate	1.86%	12.5%
BPL Decline Rate	2.18%	6%
Infant Mortality Rate (per thousand)	42	23
Total Fertility Rate	3	2.1
Increase in Green Cover	172 km ² (SFR-2009)	360 km ²

Notes: *= realisation, **= projection

Sources: *Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, Government of Jharkhand (GoJ)*.

The budget allocation to achieve the proposed growth has been estimated with due emphasis by the state government of Jharkhand during the State Twelfth Five Year Plan period.

Table 2.3.2 Sectoral Plan Outlay for the State Twelfth Plan vs. State Eleventh Plan

Major Sector	Eleventh Plan		Twelfth Plan	
	Approved (Rs. million)	% share	Proposed (Rs. million)	% share
Agriculture and Allied Activities	25,177.5	6.3	40,177.7	3.8
Rural Development	55,005.7	13.7	102,998.6	9.7
Special Areas Programme	18,557.8	4.6	53,228.0	5.0
Irrigation, Flood Control, and Disaster Management	33,793.7	8.4	131,626.4	12.4
Energy	56,346.2	14.0	80,908.6	7.6

Major Sector	Eleventh Plan		Twelfth Plan	
	Approved (Rs. million)	% share	Proposed (Rs. million)	% share
Industry and Minerals	8,713.4	2.2	13,015.2	1.2
Transport	47,127.4	11.7	167,013.4	15.7
Science, Technology, and Environment	9,115.5	2.3	12,424.7	1.2
General Economic Services	6,476.5	1.6	92,874.8	8.7
Social Services	132,613.4	33.0	350,738.7	32.9
General Services	9,472.9	2.4	20,361.1	1.9
Total Plan Allocation	402,400.0	100.0	1,065,367.1	100.0

Sources: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.

2.3.1 State Policy and Plan

The PDD of GoJ has prepared the State Twelfth Five Year Plan based on the approach paper and guidance by the Planning Commission of GoI.

Table 2.3.3 Thrust Area and Strategies of the State

SN.	Sector	Strategy
1	Agriculture and Allied Sector	
	1) Agriculture	<ul style="list-style-type: none"> - Increase in agriculture production through crop diversification to pulses, oilseeds, and vegetables; - Increase in seed exchange; - Set up of seed villages in each district; - Promote agricultural extensions; - Shift from traditional monocropping to horticulture and area expansion under commercial horticultural crops; - Strengthen plant resource centre and agribusiness centres; - Promote agriculture research and education; - Extensive soil and water conservation measures; - Increase in minor irrigation; and - Strengthen rain water harvesting structures.
	2) Animal Husbandry	<ul style="list-style-type: none"> - Enhance milk production and productivity; - Breed improvement of local nondescript breeds of cattle; - Extend modern technology of mixed carp culture and seed production to ponds and reservoirs, etc.
2	Irrigation	<ul style="list-style-type: none"> - Increase in irrigation coverage by taking minor irrigation schemes; - Complete major irrigation project in time; - Make existing irrigation network more efficient; - Move toward effective participatory irrigation management; - Increase in irrigation coverage through a mix of major, medium, minor, and groundwater schemes; and - Increase irrigated area further by 10% to 15% through proper water management.
3	Infrastructure Development	
	1) Energy	<ul style="list-style-type: none"> - Access and availability of power to all households by 2014 and overcome shortage of power by 2013; - Increase in availability of per capita electricity to 1,000 units by 2013 and provide minimum lifeline consumption of one unit per household per day; - Strengthen transmission and distribution systems, etc.
	2) Industry	<ul style="list-style-type: none"> - Simplify rules, regulations and procedures to remove bottlenecks; - Encourage setting up of fruit processing, vegetable processing, spice processing, horticulture, and other food processing industries; - Develop industrial parks for specialised activities in the field of information technology, tasar and mulberry, electronics, plastic, chemicals, biotech and herb, export and food processing with adequate power, water, communications, transport and other facilities, etc.
	3) Roads and Bridges	<ul style="list-style-type: none"> - Four laning of strategic roads and high density corridors; - Strengthening and two laning of interstate roads; - Widening and strengthening of roads of economic importance, etc.

SN.	Sector	Strategy
4	Human Resources Development	<ul style="list-style-type: none"> - Universal and complete elementary education; - Special efforts to cater the needs of SCs/STs and girls for secondary education; - Strengthen teacher education institutes: focus on vocational education, skills development, coordination with different industries, industrial educations for practical training, and employment of youth, etc.
5	Health	<ul style="list-style-type: none"> - Improve the status of institutional delivery and safe delivery in the state; - Encourage child immunisation; - Update the skill among medical and paramedical personnel, etc.
6	Programmes for tribal sub-plan (TSP)/ special component sub-plan (SCSP) and District Plan	<ul style="list-style-type: none"> - The nodal department for TSP and SCSP scheme is the Welfare Department; and - Formulate and implement significant important development programmes in view of high poverty and unemployment among ST and SC.

Sources: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.

Major challenges of Jharkhand under the State Twelfth Five Year Plan are set in the following subjects:

- Enhancing capacity for growth;
- Managing the environment;
- Markets for efficiency and inclusion;
- Enhancing skills and faster generation of employment;
- Decentralisation, employment, and information;
- Technology and innovation;
- Securing energy in the future;
- Accelerated development of transport infrastructure;
- Rural transformation and sustained growth of agriculture;
- Managing urbanisation;
- Improved access to quality education; and
- Better prevention and curative health care.

2.3.2 Rural Development Sector

Considering the present scenario of large-scale unemployment, underemployment, and distinguished underemployment, as well as the number of persons in the category of marginal worker and non-worker in the state, the major emphasis of the Rural Development Department (RDD) under the Twelfth Five Year Plan is on generating productive assets, protecting the environment, empowering rural women, reducing rural-urban migration, and fostering social equality.

The development strategies are stated as follows:

- Labour-intensive growth;
- Micro and small enterprise development in rural areas;
- Participation of youth and women in the labour market;
- Capacity building;
- Empowerment of women self-help groups (SHGs);
- Empowerment of model villages;
- By generating wage-based employment opportunities and economically assisting people of permissible category to start their own small enterprises and generate sustainable income;
- Creation of village forest and road side forestation;

- Connecting road for every village with community development blocks;
- Earthen check dams and ponds for harvesting rain water;
- New construction work of block building under the model plan of the infrastructure development programme;
- Increasing economic and job security by helping low income people attain jobs and self-sufficiency, while increasing community based economic development in rural areas;
- Creating new and enhancing existing local infrastructure to generate long-term avenues for rural employment and growth;
- Stress on water conservation, land development, micro/minor irrigation, plantation, drought proofing, etc.;
- Construction of a large number of medium- and large-size bridges for facilitating better rural connectivity; and
- Construction of 80 blocks of office buildings/ residences/ premises development.

The earmarked schemes for rural development are summarised in Table 2.3.4 below.

Table 2.3.4 State Share to Centrally Sponsored Schemes (CSS) for Rural Development

SN.	Name of Programme
A. Emerged Programme	
1	No programme
B. State Share to CSS Programme	
1	MGNREGA (90:10)
2	Swarnajayanti Gram Swarojgar Yojana (SGSY) (75:25)
	NRLM
	Mahila Kisan Shasaktikaran Pariyojna (MKSP) Part of NRLM
3	IAY (75:25)
4	IWMP
5	District Rural Development Agency (DRDA) Administration (75:25)

Source: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.

Table 2.3.5 State Plan Schemes

SN.	Name of Programme
C1. Continuing Schemes	
1	SGSY/NRLM Administration
2	MGNREGA Establishment
3	IAY Administration
4	SLNA-Jharkhand State Watershed Mission (JSWM)
5	Seed Money for Women SHG
6	SIRD Establishment
7	Block Building (Minor Construction and Renovation)
8	Strengthening of DRDA
9	Mukhya Mantri Gram Setu Yojana (MMGSY)
10	Consultancy Fee
11	Gram Awas Marammati Anudan
12	Adarsh Gram Yojna
13	MGNREGA (Ex-gratia Assistance)
14	Legislature Scheme (Lok Jal Samridhi Yojana)
15	Legislature Scheme (Recommendations)
16	Mukhyamantri Vikas Yojana (MMVY)
C2. New Schemes	
17	Adarsh Gramin Awas Yojna
18	Project Sanjivni
19	Block Building Construction

Sources: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.

The financial proposal for rural development is summarised below in Table 2.3.6. TSP accounts for 44% and SCSP makes up 12% of the total amount of proposed outlay respectively.

Table 2.3.6 Summary of Budget Outlay for Rural Development in the Twelfth Five Year Plan

(unit: Rs. million)				
SN.	Name of Scheme	Proposed Outlay	Flow to TSP	Flow to SCSP
A	Earmarked Schemes	-	-	-
B	State Shared Schemes	24,048.0	8,744.6	3,461.6
C	State Plan Schemes			
	C1: Continuing Schemes	34,925.5	17,255.2	3,883.7
	C2: New Scheme	4,395.7	1,582.4	659.4
D	Emergency Action Plan (EAP)			
E	Others (13 Finance Commission)	2,025.0	1,113.5	0.0
	Grand Total	65,394.2	28,696.7	8,004.7

Note: This table shows the budget outlay for Rural Development only, exclusive of Rural Works, Panchayati Raj, Land Reforms.

Sources: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012–2013), PPDD, GoJ.

2.3.3 Agriculture Sector

About 76% of the state population resides in rural areas and 67% of the total labour force is dependent on agriculture. The agriculture sector suffers from low capital formation and low productivity. The institutional credit flow to the agriculture sector is negligible, and agricultural extension activities need to be strengthened. Keeping the above in mind, the target indicators for the Twelfth Five Year Plan are set in Table 2.3.7 below.

Table 2.3.7 Target Indicators for the Twelfth Five Year Plan

SN.	Indicators	India 2008-09	Jharkhand 2008-09	Jharkhand 2017-18
1	Per capita availability of food grains (g)	583.0	250.0	500.0
2	Cropping intensity (%)	140.0	116.0	150.0
3	Area irrigated (%)	35.4	13.0	25.0
4	Fertiliser consumption (kg/ha)	140.0	65.0	80.0
5	Productivity of agricultural crops (t/ha)			
	- Rice	2.2	2.0	2.5
	- Fruits	15.0	12.3	14.0
	- Vegetables	17.0	15.0	16.0
6	Soil fertility status (% deficiency)			
	- N	63.0	80.0	50.0
	- P	42.0	80.0	50.0
	- K	13.0	50.0	30.0
7	Agricultural workers (%)			
	- Cultivators	31.7	38.5	35.0
8	Average size of operational holdings (% households having less than 2 ha)	78.3	72.9	72.0
9	Percent population below poverty (%)	26.1	46.0	35.0
10	Percent population with food security (%)	97.7	87.5	92.5
11	Capacity utilisation of soil testing labs (%)	587.3	21.5	50.0
12	Seed replacement ratio (%)	33.0	5.0	33.0

Sources: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012–2013), PDD, GoJ.

The earmarked schemes for agriculture are summarised in Tables 2.3.8 and 2.3.9 below.

Table 2.3.8 State Share to CSS for Agriculture

SN.	Name of Programme
A.	Emerged Programme
1	RKVY; Stream-I and II

SN.	Name of Programme
B. State Share to CSS Programme	
1	RKVY; Stream-I and II
2	MMA/ RADO (90:10)
3	National Horticulture Mission (NHM) (85:15)
4	Support to State Extension Program for Extension Reform (90:10)
5	Pilot Weather Based Crop Insurance (50:50)
6	National Mission on Micro Irrigation (NMMI) (50:50)

Sources: *Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.*

Table 2.3.9 State Plan Schemes

SN.	Name of Programme
C1. Continuing Schemes	
	Agriculture
1	Exchange and Distribution of Crop Seed on Subsidy
2	Seed Production at State Seed Farm
	Training, Demonstration, Extension, etc.
3	Agriculture Fair, Workshop, and Demonstration
4	Prizes for Progressive Farmers
5	Jharkhand Agriculture Card Scheme
	Grants and Aid Scheme
6	Grants in Aid to Agricultural Technology Management Agency (ATMA) / State Agricultural Management and Extension Training Institute (SAMETI)
7	Grants in Aid to Seed Certification Agency
8	Grants in Aid to State Seed Corporation
9	Grants in Aid to Fertiliser Preposition
10	Sugar Cane Development
11	Strengthening of Infrastructure and Other Support Facilities of Agriculture Department for Effective Implementation and Monitoring of Agriculture Schemes
12	Projects Under RIDF
13	Mukhyamantri Kissan Khushali Yojna
14	Incentive for New Technologies for Horticultural Development
15	Establishment and Development of Nursery
16	Development of Nutritional Fruit Plants and Vegetables
	Soil and Water Conservation
17	Soil Conservation, Research, and Training Programme
18	Integrated Crop Development Programme for Agriculturally Suitable Waste Land and Rice Fallow Land
	Agriculture Research and Education
19	Grants in Aid to Birsa Agriculture University (BAU)
20	Establishment of Agriculture College
21	Establishment of Dairy Technology
	Other Agriculture Programmes
22	Strengthening of State Quality Control Laboratory
23	Establishment of Agriculture Development Council
24	Agriculture Consultancy and Evaluation Service Scheme
	Other General Economic Services
25	Strengthening and Standardisation of Weight and Measure
26	Development and Expansion of Agrotechnology
C2. New Schemes	
	Agriculture
27	Training, Exposure, Encouragement, Award, Publicity, and Extension
	Grants and Aid Scheme
28	State Mission on Organic Farming
29	State Mission on Spices
30	State Mission on Medicinal Plants
31	Grants in Aid to Agriculture
32	Grants in Aid to Jharkhand Agriculture and Soil Management Institute
33	Agriculture Mechanisation Promotional Scheme
34	Rice Fallow and Land Development Scheme
35	Soil Reclamation and Soil Management Scheme

SN.	Name of Programme
36	Land Acquisition Scheme
37	Development of Agriculture Technology
38	Consultancy and Capacity Building

Sources: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.

The financial proposal for agriculture is summarised below in Table 2.3.10. The TSP accounts for 63% and the SCSP makes up 2% of the total amount of proposed outlay respectively.

Table 2.3.10 Summary of Budget Outlay for Agriculture in the Twelfth Five Year Plan

(unit: Rs. million)

SN.	Name of Scheme	Proposed Outlay	Flow to TSP	Flow to SCSP
A	Earmarked Schemes	10,000.0	5,400.0	150.0
B	State Shared Schemes	1,820.0	970.0	120.0
C	State Plan Schemes			
	C1: Continuing Schemes	10,685.0	7,744.5	180.0
	C2: New Scheme	4,495.0	2,901.0	80.0
D	EAP	-	-	-
E	Others, if any	-	-	-
	Grand Total	27,000.0	17,015.5	530.0

Note: This table shows the budget outlay for Agriculture only, exclusive of Allied Activities such as Animal Husbandry, Daily Development, Fisheries and Cooperation.

Sources: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.

2.3.4 Water Sector

The geographical area of Jharkhand is 7.972 million ha, of which the total agriculture area is about 2.974 million ha. Ultimate irrigation potential which could be created is estimated at 2.425 million ha. Water is a critical factor for increasing agricultural production and productivity.

The development strategies for the Twelfth Five Year Plan are stated as follows:

- Putting a priority on completion of ongoing major and medium irrigation projects
- Optimum utilisation of available surface water and groundwater for increasing agricultural production and productivity
- Formulation of Water and Land Management Institute (WALMI) that will impart training to irrigation engineers and farmers
- Mapping of all aquifers in Jharkhand
- Setting up of water regulatory authority
- Groundwater law to be legislated
- Restructuring of river basin management organisation as per new water framework law, etc.

Keeping the above in mind, the irrigation development targets for the Twelfth Five Year Plan are set as shown in Table 2.3.11.

Table 2.3.11 Anticipated Creation of Irrigation Potential by the End of the Twelfth Five Year Plan

SN.	Name of Scheme	At the end of the Eleventh Plan	During the Twelfth Plan	At the end of the Twelfth Plan
1	Major and Medium Irrigation Schemes (ha)	347,900	457,570	805,470
2	Minor Irrigation Schemes (ha)	575,900	240,000	825,900
	Total (ha)	923,800	707,570	1,631,270
3	% creation of irrigation potential against ultimate irrigation potential of 2,425,500 ha	38.1%	-	67.3%

Sources: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.

The earmarked schemes for agriculture are summarised in Tables 2.3.12 and 2.3.13 below.

Table 2.3.12 State Share to CSS for Minor Irrigation

SN.	Name of Programme
A. Emerged Programme	
1	AIBP (Construction of check dams, medium, and minor irrigation schemes)
B. State Share to CSS Programme	
1	RRR of Water Bodies (90:10)

Note: This table shows the budget outlay for Minor Irrigation only, exclusive of Major and Medium Irrigation, CAD, Flood Control, and Disaster Management.

Sources: *Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.*

Table 2.3.13 State Plan Schemes (Minor Irrigation)

SN.	Name of Programme
C1. Continuing Schemes	
1	Execution of Ongoing Minor Irrigation Projects
	- Construction of micro-lift projects
	- Construction of check dam/series check dams
	- Construction and rehabilitation of water harvest structures under Gram Bhagirathi Yojana
	- Construction of medium irrigation projects
	- Construction of lift irrigation projects
	- Construction of different diameter dug wells
2	Groundwater Survey and Recharging Projects
3	Restoration of Old Minor Irrigation Projects and Its Maintenance
	- Renovation of micro-lift irrigation projects
	- Renovation of minor irrigation projects and check dams
	- Renovation of Ahar ponds and augmentation of traditional water resources
	- Renovation of lift irrigation projects
C2. New Schemes	
4	Execution of Ongoing Minor Irrigation Projects
	- Construction of micro-lift projects
	- Construction of check dam/series check dams
	- Construction and rehabilitation of water harvest structures under Gram Bhagirathi Yojana
	- Construction of medium irrigation projects
	- Construction of lift irrigation projects
	- Construction of different diameter dug wells
5	Groundwater Survey and Recharging Projects
6	Restoration of Old Minor Irrigation Projects and Its Maintenance
	- Renovation of micro-lift irrigation projects
	- Renovation of lift irrigation projects
	- Renovation of minor irrigation projects and check dams
	- Renovation of Ahar ponds and augmentation of traditional water resources
7	Capacity Building, Strengthening, and Upgrading
	- Survey and investigation, consultancy and evaluation
	- E. Governance
	- Renovation of old vehicles and purchase of new vehicles
	- Renovation of buildings and construction of new buildings
	- Training, workshop, seminar of departmental offices, water user association, and beneficiaries committee
	- Salary grant to JHALCO employees
	- Provision to Jharkhand state water resources development society

Note: This table shows the budget outlay for Minor Irrigation only, exclusive of Major and Medium Irrigation, CAD, Flood Control, and Disaster Management.

Sources: *Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.*

The financial proposal for minor irrigation is summarised below in Table 2.3.14. TSP accounts for 58% and SCSP makes up 3% of the total amount of proposed outlay, respectively.

Table 2.3.14 Summary of Budget Outlay for Rural Development in the Twelfth Five Year Plan (Minor Irrigation)

(unit: Rs million)

SN.	Name of Scheme	Proposed Outlay	Flow to TSP	Flow to SCSP
A	Earmarked Schemes	23,000.0	14,950.0	0.0
B	State Shared Schemes	1,500.0	750.0	0.0
C	State Plan Schemes			
	C1: Continuing Schemes	150.0	58.0	16.0
	C2: New Scheme	11,350.0	5,170.0	1,150.0
D	EAP, if any	-	-	-
E	Others	-	-	-
	Grand Total	36,000.0	20,928.0	1,166.0

Note: This table shows the budget outlay for Minor Irrigation only, exclusive of Major and Medium Irrigation, CAD, Flood Control and Disaster Management.

Sources: Draft Twelfth Five Year Plan (2012–2017) and Annual Plan (2012-2013), PDD, GoJ.

2.4 State Programmes Related to Rural Livelihood Promotion

The Government of India (GoI) puts emphasis on an inclusive development approach in the Twelfth Five Year Plan, in which reducing poverty, narrowing regional disparity, assisting vulnerable groups and gender empowerment are taken up as major strategic development fields. In response to this, the Jharkhand State is implementing many programmes for rural livelihood promotion to date with support from the central government as well as external aid agencies. The key flagship programmes for rural livelihood promotion are summarised in Table 2.4.1 below.

Table 2.4.1 Key Flagship Programmes for Rural Livelihood Promotion in Jharkhand

Name of the Programme	Programme Domain	Nodal Dept./ PIA	Duration	Covered Districts	Financing Share (GoI:GoJ)
State Level Support to Livelihood Promotion Strategies, Jharkhand*	Rural livelihood	RDD/ JSLPS	2009- 2012 (completed)	5 districts	UNDP 100%
SGSY	Rural livelihood	RDD/ JSLPS	1999- 2012 (completed)	All districts	75% : 25%
NRLM*	Rural livelihood	RDD/ JSLPS	2012- (ongoing)	All districts	75% : 25%
MGNREGA	Rural employment	RDD/ DRDA	2006 - (ongoing)	All districts	90% : 10%
IAY	Rural housing	RDD/ DRDA	2010- (ongoing)	All districts	75% : 25%
IWMP*	Natural conservation	RDD/ JSWM-SLNA	2009- (ongoing)	All districts	90% : 10%
PMGSY	Rural road	RDD/ SRRDA	2001- (ongoing)	All districts	GOI 100%
Rashtriya Gram Swaraj Yojna (RGSY)	Capacity building	RDD/ SIRD	2010- (ongoing)	All districts	75% : 25%
RKVY	Agriculture	DoA/ SAMETI	2007- (ongoing)	All districts	75% : 25%
NHM	Horticulture	DoA/ JNHM	2010- (ongoing)	All districts	85% : 15%
NMMI under NHM	Horticulture	DoA/ SMIC	2010- (ongoing)	17 districts	40% : 50%

Note: *) Externally funded programme, **) Project Implementation Agency

Sources: Draft Annual Plan 2013-2014, PDD, GOJ, and Annual Plan 2013-2014 of respective departments of Jharkhand.

Out of the key flagship programmes mentioned above, the United Nations Development Programme (UNDP) supported the state level support to livelihood promotion strategies in Jharkhand, and the World Bank is supporting NRLM and IWMP.

Under the Twelfth Five Year Plan, MGNREGA, IWMP, RKVY, NHM and other schemes/missions should be coordinated, leveraged, and converged with NMSA announced in 2014, which has four major components: (i) rainfed area development (RAD), (ii) on-farm water management (OFWM), (iii) soil health management (SHM), and (iv) climate change and sustainable agriculture: monitoring, modeling, and networking (CCSAMMN). Promotion of drip irrigation will be under component (ii).

NRLM is a succeeding programme of SGSY, bringing about reform and structural changes in institution, process, and programme. Differences in key features between SGSY and NRLM are given in Table 2.4.2.

Table 2.4.2 Differences in Key Features between SGSY and NRLM

SN.	Key Feature	SGSY	NRLM
1	Fund allocation	District wise allocation based on BPL list/rural poverty estimate	Overall state allocation based on estimated poverty population- sub state poverty level based on State Perspective Plan
2	Fund flow	To the districts	To the state
3	Delivery mechanism and programme management	Through DRDAs	Through state Mission structure, a special purpose organisation established for NRLM
4	Programme priority	Capital subsidy	Mobilisation of poor into groups
5	Capital subsidy flow	Through banks as subsidy for economic activities	Direct to groups as demand based seed capital
6	Role of banks	As disbursers of capital subsidy	As providers of credit

Source: NRLM, Programme Implementation Plan, MoRD, GoI

NRLM also seeks for convergence of social protection schemes like MGNREGA, food security, public distribution system, social insurance and pensions. Under the State Rural Livelihood Mission (SRLM), the Jharkhand State Livelihood Promotion Society (JSLPS) is conducting related projects: MKSP and Sanjeevani Project.

2.5 Micro Drip Irrigation Programmes in Jharkhand

Proper management of natural resources and environment is one of important development policies of the Government of India (GoI). Under this policy, agriculture and water resources sectors put development priority on efficient uses of lands and water resources, appropriate technologies, research and skills development, adaptation of climate change and improvements in total factor productivity. In line with the development priority, the Jharkhand State has initiated horticulture intensification by micro drip irrigation (MDI) as a part of rural livelihood promotion programme. The major programmes are listed in Table 2.5.1.

Table 2.5.1 Rural Livelihood Promotion Programmes with MDI Component in Jharkhand

Programme	Nodal Dept./ PIA	Scheme Size (ha)	Major Water Source	Major Crops	Recipient	End-user F. Share
State Level Support to Livelihood Promotion Strategies, Jharkhand	RDD/ JSLPS	0.1	Open Well	Vegetables	SHG	0%
SGSY	RDD/ JSLPS	0.1	Open Well	Vegetables	SHG	50%
NRLM	RDD/ JSLPS	0.1	Open Well	Vegetables	SHG/ Farmers Clubs (FCs)	100%
NMMI	DoA/ JNHM	0.2-5.0	Pond and Well	Fruits and Vegetables	Individual/ Group	10%

Source: Annual Plan 2013-14, Jharkhand

NMMI has been converged with NMSA in 2014 in which government subsidy in principle is 35% by central and 10% by state, and the balance 55% is born by beneficiary.

Outlines of the above programmes are given below.

(1) State-Level Support to Livelihood Promotion Strategies, Jharkhand

Table 2.5.2 State Level Support to Livelihood Promotion Strategies in Jharkhand

Item	Description
Nodal Department/ PIA	JSLPS
Project Area	477 villages in ten block in five districts
Implementation Period	2009 – 2012 (completed)
Project Cost	Total Cost: UNDP: US\$2,678,783 GoI: Nil GoJ: Nil
Fund Arrangement	100% grant by UNDP
Objectives	To implement the government strategy for rural livelihood promotion in the state
Key Components:	As stated below
(1) Building of governments' capacities and strengthening their coordination mechanism at state and district level for designing and implementing livelihood strategies for disadvantaged groups and regions	<ul style="list-style-type: none"> - Formation of autonomous society dedicated to livelihood promotions (JSLPS) - Constitution of state livelihood committee - Formation of district livelihood committee - Appointment of partner agencies - Appointment of community resource persons - National livelihood mission
(2) Development of effective livelihood models to reduce the vulnerabilities of disadvantaged groups in the long term	<ul style="list-style-type: none"> - Popularisation of poly nursery and MDI - Improved model of goat rearing - Cultivation of vegetables and marketing - System of rice/wheat intensification - Revival of lac - Promotion of 40 agro-horticultural models (Wadi model in Ranchi) - Non-timber forest produce - Sal leaf plate and cup cluster - Installation of electronic weighing scale
(3) Partnership building among communities, community-based organisations (CBOs), private sector, technical institutions, and government for diversifying livelihoods and skills development	<ul style="list-style-type: none"> - Producer groups and relevant form of institutions to be established in project areas with a strong backward and forward linkage with the market through PPP/PCP - Appropriate technological interventions demonstrated across five project districts in the field of agriculture, micro irrigation, enterprise promotion, etc. - Training the youth from poor and disadvantaged groups equipped with market-driven skills
(4) Project management development of project monitoring and evaluation, development of management information system (MIS)	<ul style="list-style-type: none"> - Preparation of web-enabled SHG database - Preparation of farmer cards, etc.

Source: Terminal evaluation of the GoJ – UNDP Project: State Level Livelihood Strategies, Final Report, December 2012, by Mott MacDonald

(2) Swaranjayanti Gram Swarojgar Yojana (SGSY)

Table 2.5.3 Review of SGSY Programme

Item	Description
Nodal Department/ PIA	JSLPS
Project Area	All areas of Jharkhand (259 blocks in 24 districts)
Implementation Period	1999 – Current (being merged into NRLM)
Project Cost	Total Cost: Annual allocation (2013-14): Rs.1,676.35 million GOI: Rs.1,035.9 million

Item	Description
	WB : Rs.640 million GOJ: Rs.0.45 million
Fund Arrangement	Central government and state government support to this programme is in the ratio of 75:25. Under this programme, subsidy of Rs.10,000 (Rs.7,500) or Rs.1.25 lakh is provided to individual Swarojgaris (poor family) or SHG. 50% assistance is given to SC/ST, 40% to women, 15% to minorities, and 3% to disabled.
Objectives	To bring assisted poor families above the poverty line by ensuring appreciable sustained level of income through empowerment of SHGs.
Key Components:	As stated below.
(1) Formation of SHGs	<ul style="list-style-type: none"> - Group formulation - Group stabilisation - Microcredit - Microenterprise development
(2) Capacity Building of SHGs	<ul style="list-style-type: none"> - Taking up of economic activities - Loan-cum-subsidy to the members of group - Loan-cum-subsidy for group activity
(3) Financing the Investment, Bank Credit, and Subsidy	<ul style="list-style-type: none"> - Norms of lending - Sanction of loans by the banks - Repayment of loan
(4) Skill Upgradation	<ul style="list-style-type: none"> - Skill development training - Training of trainers - Exposure visit to areas with successful SHGs
(5) Marketing Support	<ul style="list-style-type: none"> - Study of local markets - Quality production
(6) Monitoring	<ul style="list-style-type: none"> - Monthly progress report - Annual progress report - Evaluation studies
(7) Special Projects	<ul style="list-style-type: none"> - Providing long term suitable self-employment opportunities even in terms of organisation of the rural poor - Providing support infrastructure, technology, marketing, training, etc. - Combination of the above

Source: Swarnjayanti Gram Swarozgar Yojana, Guidelines, MoRD

(3) National Rural Livelihood Mission (NRLM)

Table 2.5.4 Review of National Rural Livelihood Mission

Item	Description
Nodal Department/ PIA	RDD/ JSLPS
Project Area	All areas of Jharkhand (259 blocks in 24 districts)
Implementation Period	2012/13 – 2019/20
Project Cost	Total Cost: Rs.59,990 million WB : Rs.5,270 million GoI: Rs.41,040 million GoJ: Rs.13,680 million
Fund Arrangement	Central government and state government support to this programme is in the ratio of 75:25 Revolving fund: Rs.15,000/SHG (Grant) Interest subsidy Community investment fund Rs.50,000/SHG (Loan)
Objectives	To bring assisted poor families above the poverty line by ensuring appreciable sustained level of income through empowerment of SHGs and FCs.
Key Components:	As stated below.
(1) Social Inclusion and Institutions of the Poor	<ul style="list-style-type: none"> - Universal social mobilisation - Promotion of institutions of the poor - Training, capacity building, and skill building - Revolving fund and capital subsidy - Universal financial inclusion - Provision of interest subsidy
(2) Livelihoods	<ul style="list-style-type: none"> - Multiple livelihoods for the poor - Infrastructure creation and marketing support - Skills and placement projects - Rural self employment training institutes - Innovations

Item	Description
(3) Convergence and Partnership	<ul style="list-style-type: none"> - Convergence - Partnership with non-governmental organisations (NGOs) and other civil society organisations (CSOs) - Linkages with PRIs
(4) Sensitive Support	<ul style="list-style-type: none"> - External sensitive support structures at the state, district, and block levels - Technical support - Monitoring and learning, etc.

Source: Mission Document of National Rural Livelihood Mission, MoRD.

(4) National Mission on Micro Irrigation (NMMI)

Table 2.5.5 Review of NMMI

Item	Description
Nodal Department/ PIA	DoA/ SMIC
Project Area	All areas of Jharkhand (17 districts)
Implementation Period	2010 – (ongoing)
Project Cost	Total Cost: N.A. GoI: Rs. N.A. GoJ: Rs. N.A.
Fund Arrangement	Central government and state government support to this programme is in the ratio of 50:40. This is directly made available to the state-level implementing agency (IA), on the basis of the approved annual action plan.
Objective	To enhance water use efficiency, productivity by introducing micro irrigation under major government programmes, such as NHM, and the National Food Security Mission (NFSM)
Key Components:	As stated below
(1) Area Coverage under Micro Irrigation	<ul style="list-style-type: none"> - Drip irrigation in the range of 0.2 ha to 5 ha per beneficiary - Sprinkler irrigation in the range of 0.2 ha to 5 ha per beneficiary
(2) Transfer of Technology through Demonstrations	<ul style="list-style-type: none"> - Drip irrigation system demonstration for 0.5 ha/unit - Micro sprinkler irrigation system demonstration for 0.5 ha/unit - Mini sprinkler irrigation system demonstration for 0.5 ha/unit
(3) Human Resource Development	<ul style="list-style-type: none"> - Human resource training for officials, farmers, etc. - Seminars and exhibitions - Awareness programmes and publicity - Exposure visit to international organisations for technical personnel involved in the mission

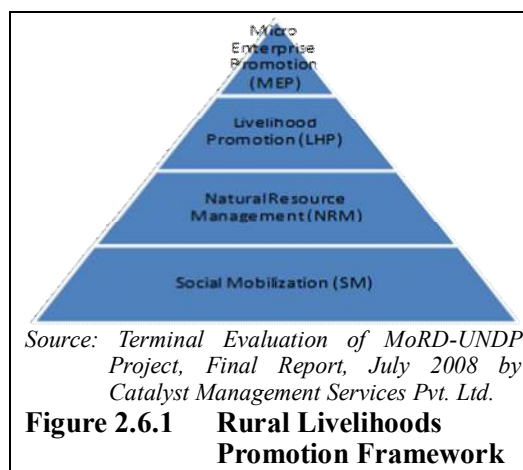
Source: NMMI, Operational Guidelines, November 2010

2.6 Implications from Past Experiences

It is very important in making a better plan to reflect on lessons learnt from recommendations of past programmes and projects. Those, which may be essential for the survey, are taken up as follows:

- (1) Terminal Evaluation of MoRD-UNDP Project, Social Mobilisation around Natural Resources Management for Poverty Alleviation, Final Report, July 2008 by Catalyst Management Services Pvt. Ltd.

- Social mobilisation is an important ingredient. But it is important to make all the partners understand that social mobilisation is only a means to an end, i.e., livelihood promotion and accessing services, which finally lead to poverty reduction. Since, the livelihood of most communities in these areas are natural resource (NR) based, the route for achieving



Source: Terminal Evaluation of MoRD-UNDP Project, Final Report, July 2008 by Catalyst Management Services Pvt. Ltd.

Figure 2.6.1 Rural Livelihoods Promotion Framework

sustainable livelihood could be (based on past experiences) – social mobilisation → NR based livelihoods → NR based enterprises → market based opportunities, all of which are illustrated in Figure 2.6.1.

- The understanding and application of social mobilisation, evidently, has influenced the outcomes. Some of the Social Mobilisation Project (SMP) partners have taken social mobilisation as an end in itself, thereby limiting it to be only the process of promoting people's organisations. In these situations, social organisation, which is mainly through SHGs, which were motivated to take up further efforts on their own, may or may not happen naturally.
- It is learnt from SMP experience that sector-wise integration (livelihoods, forests, water, agriculture, health, and education) can faster achieve aims of poverty alleviation through social mobilisation.
- Inclusive institutional model includes SHGs. The SHG model works for effective livelihood promotion as capital formation and credit linkages happen in SHGs. The SHG federations and other form of apex bodies can also serve their purpose, provided that role clarity and capacities for the same exist.
- Improving the basic conditions and status of women require multiple strategies (SHG, health, education, women leaders, economic opportunities, women's role in natural resource management (NRM), etc.) for increasing women's role and participation in the decision making process at the household, group, village, and area levels.
- The predominant mandate and capabilities of the partner organisations significantly influence the outcomes. However, there may be trends when the livelihood specialist organisation may not do well in livelihood promotion. In such cases, the quality of project management and livelihood planning are weak. It is known from the SMP experience that the "rights based plus" model of development leads to sustainable outcomes (as strong community institutions are the main plank of the rights based approach) on both livelihoods and NRM.
- The planned convergence at the planning stage of a project lends itself a better chance of realising the full potential.

(2) Terminal Evaluation of GoJ-UNDP Project, State Level Livelihood Strategies, Final Report, December 2012 by Mott MacDonald.

As the selected districts are vulnerable to the Naxal Movements (The Ultra Left Outfits), the project was implemented when the three-tier system of governance was completely absent. The state situation was worsened by frequent calls of Bandh, demonstrations, road blockades, strikes, etc., which ended up slowing down the progress. Many reports tell that the political situation in the state was also not stable and competent enough to take care of smooth implementation of government schemes including 14 major developmental programmes. During that period, the JSLPS project teams and partner agencies had faced major threats while intervening for development. Negative forces even put pressure on the teams, and subsequently tried to deter their regular movement in the field. It is evident that the remote villages of Jharkhand still do not have regular connectivity with roads. Further, absence of basic amenities (electricity, telephones, and other infrastructures) and declaration of the state assembly election have further obstructed the implementation of the project.

- Considering the abovementioned facts, the JSLPS project tried to orient the professionals (block and district coordinators) and agencies who were engaged in the project. The impact was positive

which helped in the smooth implementation of the project. At the same time, officials of the department were also exposed to better development strategies, such that they could also be oriented on livelihood issues.

- It was observed by the JSLPS team that overlapping and confusion of roles and responsibilities of staff exists in different departments. As a result, implementation of government programmed smoothed and also loans are sanctioned to SHGs. During implementation, it was observed that bank officials are not sufficiently oriented towards microcredit. Thus, the bankers met once, which was organised by JSLPS, and then attended each year in order to inculcate microcredit focus among them and help them to understand issues better related to finance in SHG and possible ways of handling.
- When *panchayat* elections have been declared, the village development committees (VDCs) were actually formed at the village level. Once the *panchayat* representatives were elected VDCs became defunct. However, it is really encouraging to report that most of the VDC members have been elected as PRIs because they were the most aware and active habitants at the village level. Thus, the whole initiative, which had been into capacity building of villagers, was actually used to achieve well empowered local governance.
- During terminal evaluation, the project team saw that the project had tried to document the learning, starting from revising the project log frame and making it area specific with finalisation of the Annual Work Plan 2009. The project has also documented one major learning, i.e., the chain effect of the capacity building initiative under the officials of line departments were trained for better service delivery.
- Under this, the JSLPS project has extended handholding support to the State Level Nodal Agency, in engaging the consultants in managing watershed projects for implementation of IWMP to watershed projects under the RDD, GoJ.
- Further implementation of the special SGSY project of MoRD was supported at the state level.
- The project tried to capture trends and incorporate them to the main stream of the project, for example the project conducted a large-scale survey of integrated poultry model in Hazaribagh District and integrated the findings of the survey in their respective annual work plans (AWPs). As per midlevel intelligence interventions on the cluster specific development approach also promoted in production of Tasar Yarn (Silk) through SHGs in Hazaribagh District.
- The JSLPS project also hired KGVK Rural Enterprises Limited and commissioned a research study to assess the demand supply skill and job gaps for the youth in Saranda Region. The study, which is the first of its kind in the micro context of the district and the area, explores the gaps in the existing skills set of the rural youth and the industry demand for people residing in the two blocks of Manoharpur and Noamundi districts in Saranda Region. The survey report is being used for planning the project and programme related to skills development.
- Further, training of newly elected members of PRIs were undertaken by JSLPS, with initial funding from the Department of Panchayati Raj, so that the understanding and demand could be generated.
- It was learnt in due course that while targeting the achievement of project goals, it should be kept separate from the convergence plan. It has been experienced that “convergence” has not been taken up as a policy issue for the state government. Thus, it is becoming time consuming along with uncertainties on the results, for which the programme can not completely rely on.

- It was learnt in due course that the size of the project area as well as programme components should have been identified as per the availability of resource.