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 II
Attachments

December 2014

Japan International Cooperation Agency (JICA)

Nippon Koei Co., Ltd.

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

FINAL REPORT

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Minutes Of Kick-Off Meeting Held At JSLPS Office (Ranchi) On 13-03-14 For Preparatory Survey on Initiative for Horticulture Intensification by Micro Drip irrigation (I-HIMDI) in Jharkhand

MEETING ATTENDED BY:

Meeting was attended by following: *(Refer to Attchament-1)*

A- JICA Tokyo representative-

a. Ms. Wada Momoko -(Country Officer- South Asia Division 1(India .Bhutan)

B- JICA India office-

a. Anurag Sinha- Senior Development Specialist

C- Jharkhand State Livelihood Promotion Society (JSLPS)-

a. Paritosh Upadhyay- Chief Executive Officer (CEO)
b. Bishnu C. Parida- Chief Operating Officer (COO)
c. Dr. Praveen Kumar Singh- State Program Manager-Livelihood Farms.
d. Other state & district level program managers.

D- JICA Survey Team (Nippon Koei)

a- Kenichi Shibuta- Team Leader/ Irrigation Engineer.
b- Tomoki Nakamura- Agriculture & Extension Specialist.
c- Abhishek Singh- Sr. Manager Business Development.

REPRESENTATIVE OF ORGANIZATIONS PRESENTED FOLLOWING POINTS:

A- CEO of JSLPS-

CEO presented the back ground and objective of the project.

B- JICA Tokyo- Ms. Wada Monoko explained following points: *(Refer to Attchament-2)*

- She explained a completed process of ODA loan/grant, including interest rate and eligibility of the loan.
- Only 85% of total cost will be covered under the loan.
- She also stressed that this survey report will give outline for loan agreement to JICA; however they can only peruse the case once DPR by JSLPS is submitted to Government of India.

C- JICA India- Mr. Anurag Sinha stressed on following points:

- Mr. Anurag stressed on close working of JSPLS DPR team and JICA survey team for preparation of Survey Report.
- He also informed that any variation in estimated cost of the project should be properly reasoned.
- Further to it, he clarified that any cost which is supposed to go back to the government, and land cost will not be covered under the loan.
- He also stressed that for effective DPR by JSLPS and smooth flow of loan agreement process it is important that JSLPS work closely with JICA survey team.

D- JICA Survey team- *(Refer to Attchament-3)*

- JICA survey team presented approach and methodology.
- Present dignitary broadly agreed on the approach and methodology of the survey team; however on some issues such as inclusion of PTGs and use of solar pump etc., the survey team agreed that a consensus can developed during course of survey, particularly after field visit and discussions.

GENERAL AGREED & DISCUSSED POINTS:

- **a-** Regarding security issue and selections of districts, JSLPS will collect security related data and maps from the state and home departments. On discussion and assessment of ground situation, choice of district and field visit detail will be finalized. Guidelines of Japan embassy will be given due weightage while deciding the locations and timings.
- **b-** DPR for the I-HIMDI will be prepared by JSLPS, and the survey team will support/guide JSLPS in doing so.
- **c-** Availability of water is important for success of the project hence water resource development (various possible means) and conservation should also be considered as component of this project.
- **d-** Cost and availability of power is an important factor in the acceptance of project by farmers hence options such as solar powered water pumps and other similar option should also be considered.
- **e-** JSLPS based on their past experience have suggested that for development of water source, convergence (funding) of other programs such as NREGA etc. is very difficult, and many times such efforts have not paid off.
- **f-** It may not be possible to include PTGs in first year of program only; however as a social initiative and incentive/encouragement to PTGs, 200 to 250 farms can be supported on grant basis.
- **g-** JSLPS will provide GIS data to the survey team.
- **h-** Detail of number of dug wells taken under NREGA and any other similar data will be provided by JSLPS to the survey team.
- **i-** In light of the General Elections in the state, the situation may not be conducive for field visits. Hence it is advised that field visits may be taken up after 10th of Apr 14.

Attachment-1: List of Participants
Attachment-2: Presentation Material by Ms. Wada, JICA Tokyo Representative
Attachment-3: Presentation Material by JICA Survey Team
Attachment-4: Photographs of Kick-Off Meeting

Date: 18 March 2014

Paritosh Upadhayay
Chief Executive Officer (CEO)
JSLPS

渋田健一
Kenichi Shibuta
Team Leader
JICA Survey Team

Preparatory Survey on Initiative for Horticulture Intensification by Micro Drip irrigation (I-HIMDI) in Jharkhand

Minutes of Interim Meeting

Date: 15 May 2014

Veune: JSLPS Office, Ranchi

Attended by:

No.	Name	Ouganization	Position
1	PARITOSH UPADHYAY	JSLPS, RURAL DEV. DEPT.	CEO CUM SPECIAL SEC
2	BISHNU C PARIDA	JSLPS	COO
3	PRAVEEN KUMAR SINGH	JSLPS	SPM-FARM
4	VINAY KUMAR PANDEY	JSLPS	SPM- LIVELIHOOD NF SKILL & PR
5	RAJIB MOHANTY	JSLPS	SC- MICRO-ENTERPRISES OFF FARM
6	KHALID HUSSAIN	JSLPS	PROGRAM EXECUTIVE LIVELIHOOD FARM
7	ARINDAM MISHRA	JSLPS-SRC	STATE CO-ORDINATOR STATE RESOURCE
8	SANJAY BHAGAT	JSLPS-SRC	TECH. SUPPORT OFFICER LIVELIHOOD SRC
9	KUMAR D. D. SINGH	JSLPS-DMMU, RANCHI	DISTRICT MANAGER
10	SHIBUTA KENICHI	JICA SURVEY TEAM	TEAM LEADER
11	AKIKO AKIYAMA	JICA SURVEY TEAM	MARKETING & PROCESSING
12	ANAMIKA PRASAD	JICA SURVEY TEAM	RURAL CREDIT/CBO
13	BADRI NATH ADHIKARY	JICA SURVEY TEAM	AGRI- ECONOMIST
14	ISEKI SHINICHI	JICA SURVEY TEAM	WATER RESOURCE
15	JITESH KUMAR PANDA	JICA SURVEY TEAM	MARKETING & PROCESSING SPECIALIST
16	MITSUE UMIGUCHI	JICA SURVEY TEAM	ENVIRONMENT
17	NAGAWARA NOBUO	JICA SURVEY TEAM	AGRICULTURE INFRASTRUCTURE
18	NAKAMURA TOMOKI	JICA SURVEY TEAM	AGRICULTURE & EXTENSION
19	NOBUKO MIYAKE	JICA SURVEY TEAM	RURAL CREDIT/CBO
20	S.L.S. JAGESHWAR	JICA SURVEY TEAM	G. W/WR EXPERT
21	SHINGO MATSUOKA	JICA SURVEY TEAM	COST ESTIMATE/GIS
22	SHIVENDRA KUMAR	JICA SURVEY TEAM	AGRICULTURE EXPERT

Minutes:

Mr K. Shibuta, Team Leader, JICA Survey Team welcomed the participants and made opening presentation of the Interim Report. The report was presented in six sections viz., Rationality with the Development Plan, Result of Field Observation and Recommendations, Development Concept of I-HIMDI, Selection Result of Target Districts, Recommended Project Components, and the Way Forward.

The Chairman appreciated the efforts of the JICA Survey Team and initiated the discussion. The following suggestions were made.

1. Fencing of farms is a critical need but due to unavailability of low cost options often cultivation particularly in the summer season is not done due to the present practice of free grazing by farm cattle. It was suggested that support for purchase of low cost fencing material such as nylon net and training for bamboo treatment may be included in the project.
2. Provision of a few new dug well in the project was suggested for demonstration but it was largely agreed that this may be obtained through convergence with MGNREGA.

Attachment 1.6.2

3. The provision of grant for project components was discussed and was suggested that grant to individuals may be reconsidered in the light of present practice. The ratio of grant to loan may be fixed in favour of participating farmers and based on their repayment capacity and purpose of the fund. The livelihood impact will come from the integrated use of all components of MDI, namely, drip irrigation system, poly nursery and vermin compost unit hence these may be considered as integrated package.
4. The unique provision of Revolving Fund (RF) and its scope was discussed in detail. It was reemphasised that RF must always be used for maximising and sustaining use of the MDI systems during and beyond the project period. Apart from other listed activities of RF, de-silting of wells was also included on the suggestion of the members.
5. The discussion also centred on the procurement procedure. It was suggested that cash loan to SHG in place of equipment loan may be considered. Choice of farmers/ SHGs and their involvement in decision may also be looked into.
6. Emphasis of the project on outcome monitoring was appreciated. It was suggested to include incentive/ awards at all levels such as zero-energy cool chamber or fencing material at individual level, integrated agriculture tool/implement package at SHG level and multi-purpose community center and other marketing infrastrutures at cluster level as required.

The Chairman deeply appreciated the painstaking efforts of JICA Survey Team in visiting remote districts for collection of primary information and bringing out the excellent report.

The meeting ended with a vote of thanks to the Chair.

16 May 2014

Paritosh Upadhayay
Chief Executive Officer (CEO)
JSLPS

渋田 健一

Kenichi Shibuta
Team Leader
JICA Survey Team

Preparatory Survey on Initiative for Horticulture Intensification by Micro Drip irrigation (I-HIMDI) in Jharkhand

Minutes of Preliminary Meeting for JICA Draft Final Report

Date: 14 July 2014

Veune: JSLPS Office, Ranchi

Attended by:

No.	Name	Organization	Position
1	Mr. Arun	RDD, GoJ	Secretary
2	Mr. Paritosh Upadhyay	JSLPS	CEO
3	Mr. Bishnu C Parida	JSLPS	COO
4	Dr. Praveen Kr. Singh	JSLPS	SPM-Farm
5	Mr. Vinay Pandey	JSLPS	SPM-Non Farm & Skill
6	Md. Arif Akhtar	JSLPS	SPM-MKSP
7	Mr. Rajeev Mohanty	JSLPS	SPM
8	Mr. Dhiraj Horo	JSLPS	SPM-F1
9	Mr. Deepak Upadhyay	JSLPS	SPM-M&E
10	Mr. Srimanta Patra	JSLPS, Ranchi	SPM- SM-IB
11	Mr. Pankaj Kumar Singh	JSLPS, DM- Livelihood- Giridih	DM- Livelihood
12	Mr. Ranjeet Gupta	JSLPS, SPC-HGM (ANCHOR)	ANCHOR-HGM
13	Mr. Sanjay Bhagat	JSLPS, TSO- Livelihood, SRC	TSO- Livelihood
14	Mr. Kumar D.D. Singh	JSLPS	Dist. Manager Livelihood
15	Mr. Kenichi Shibuta	JICA Survey Team	Team Leader
16	Mr. Badri Nath Adhikary	JICA Survey Team	Project Evaluation Expert
17	Ms. Itagaki Keiko	JICA Survey Team	Project Management Expert
18	Mr. Nakamura Tomoki	JICA Survey Team	Horticulture Development Expert
19	Mr. Shingo Matsuoka	JICA Survey Team	Cost Estimate Expert
20	Mr. Shivendra Kumar	JICA Survey Team	Horticulture Expert
21	Mr. S. L. S. Jageshwar	JICA Survey Team	Ground Water & Water Resources Expert
22	Mr. Manoj Pattanaik	JICA Survey Team	Env. & Social Consideration Expert
23	Mr. Jitesh Kumar Panda	JICA Survey Team	Marketing Specialist
24	Ms. Anamika Prasad	JICA Survey Team	Rural Credit & CBO Expert

Minutes:

The Chairman appreciated the efforts of the JICA Survey Team and initiated the discussion. The proceedings of the meeting are as follows.

1. Secretary, Department of Rural Development GoJ, presided over the meeting, CEO, COO, and other officials of JSLPS and members of JICA Survey Team participated (list enclosed).The COO welcomed the participants and the meeting started after a round of self-introduction of participants.
2. Mr. K Shibuta, Team Leader, JICA Survey Team gave a presentation for Draft Final Report (DFR). The presentation included information on Outline of the Project, Selection of Target Blocks, Micro Drip Irrigation (MDI) and Agri support facility Development, Technical Support, Management of Information System, Organisational Structure and Plan, Environment and Social Consideration, Project Evaluation, and, Conclusion and Recommendations.
3. At the outset the Chairman sought clarification whether the Team has visited project areas and whether the working and aspirations of potential SHGs, farmers and markets have been studied prior to the formulation of DFR. It was clarified that team has visited all target districts in four rounds in the month of April and JSLPS has facilitated visit and interaction with the members of SHGs. In addition, a questionnaire based detailed survey with a total of 347 SHGs from the 12 target districts and MDI farmers was also carried out to capture basic information from primary sources. The project has been developed mainly around these findings.

4. The Chairman suggested to rationally prepone the activities so that the benefit of the project can reach to the beneficiaries on an early date. It was clarified that the central point in the implementation is action learning cycle and need capturing to be done on the annual basis. This arrangement will help unfolding the implementation in a rational manner.
5. The points of organisational hierarchy, operation of Revolving Fund, and involving CRPs (Community Resource Persons) in marketing, marketing verticals from production to market, etc., were also discussed and properly clarified by the Survey Team.
6. JSLPS could initiate convergence with schemes IWMP and MGNREGA, so that potential beneficiaries would have access to water resources like dug wells, to be able to install MDI.
7. JSLPS would make a presentation on the proposed project to Planning Department, GoJ, so that the Department is aware of the project.
8. The CEO, JSLPS complemented the team for timely completion of study and for bringing out a very systematic project and plan. He added that proposal has already been moved in the government and the government is taking up the proposal very favourably. It was hoped that once the final DPR is received the government will ensure forwarding the project to the Central Government within 2-3 months including the JICA Technical Cooperation Project. Since the project is already listed in the Department of Economic Affairs, GoI the processing will not get unduly delayed.

The Chairman deeply appreciated the painstaking efforts of JICA Survey Team in preparation of the project plan and bringing out the excellent report. The meeting ended with a vote of thanks to the Chair.

15 July 2014

Paritosh Upadhayay
Chief Executive Officer (CEO)
JSLPS

渋田健一
Kenichi Shibuta
Team Leader
JICA Survey Team

Minutes of the Kick-Off Meeting Held at JSLPS Office (Ranchi) On 16-09-14 for Fact Finding Mission on "Initiative for Horticulture Intensification by Micro Drip Irrigation in Jharkhand"

MEETING ATTENDED BY:

Meeting was attended by following: *(Refer to Attachment-1)*

JICA Fact Finding Mission

- Ms. Chikako Maruyama, Country Officer, JICA HQ
- Mr. Satoru Fujita, Deputy Director, JICA HQ
- Mr. Sinha Anurag, Senior Development Specialist, JICA India
- Mr. Hiroshi Yoshida, Representative, JICA India
- Mr. Akihiro Kimura, Representative, JICA India

Jharkhand State Livelihood Promotional Society (JSLPS)

- Paritosh Upadhyay- Chief Executive Officer (CEO)
- Dr. Praveen Kumar Singh – State Programme Manager Livelihood Farms.
- Other State and District level Managers/

JICA Survey Team (Nippon Koei)

- Kenichi Shibuta- Team Leader/Irrigation Engineer.
- Tomoki Nakamura- Agriculture Extension Specialist
- S.L.S. Jageshwar- Ground Water Expert
- Anamika Prasad- Rural Credit & CBOs Expert

REPRESENTATIVE OF ORGANIZATION PRESENTED FOLLOWING POINTS:

Dr. Praveen Kumar, JSLPS started the meeting with welcome address. All participants gave a self-introduction.

Ms. Chikako Maruyama, JICA Team presented the following points: *(Refer to Attachment-2)*

- Purpose of the meeting was to confirm the contents of the draft final report (DFR) submitted by the JICA survey team, and to discuss the key issues for mutual understanding on the Project details, and to share the information of further time schedule among the participants.
- She also explained 5-day tentative schedule of the Fact Finding Mission.
- Some issues to be discussed during the mission such as financial arrangement, project target, project scope, sustainability, and project cost were raised.
- She also stressed upon that JSLPS should make an official request of ODA loan to the Government of Japan (GoJ) through the Government of India (GoI) after materialising the detailed project report (DPR) and finance approval of the state.

Attachment 1.6.4

Mr. Kenichi Shibuta, JICA Survey Team presented the following points: *(Refer to Attachment-3)*

- Mr. Shibuta presented the summary of draft final report (DFR) on "Initiative for Horticulture Intensification by Micro Drip Irrigation in Jharkhand".
- His presentation covered the outline of the project, technical support, crop wise net return, operational management of MDI, environmental and social consideration, MIS design, total project cost, economic evaluation, operation effect indicators, conclusion, and ended with recommendations to JSLPS and JICA.

GENERAL AGREED AND DISCUSSED POINTS:

a) Japanese ODA has different schemes such as Yen Loan Project and Technical Cooperation Project (TCP). TCP is generally smaller project and restricted to 3-4 villages for which the development model be created, while Yen Loan Project is relatively large project mainly for infrastructure development. This project (I-HIMDI) will take a year or more for commencement of the project implementation counting from the date of official request is made. JICA and GoI will discuss more in detail on this issue to ensure smooth implementation and sustainability of the project.

b) JICA loan could cover only 85% of the project cost, and the state government shall contribute the balance 15%. Physical contingency will be set at 5% for the project.

c) Representative of the JICA mission raised point that whether community resource person (CRP) will be able to provide training to farmers individually or not. It was cleared that training will be provided to the group but guidance will be provided individually by the respective CRP. CRPs are readily available in most of local communities.

d) JICA mission suggested that one official be appointed for the project from government department, who can make decisions. As in JSLPS organisation structure, one government officer CEO is working here. Whenever need of the decision making arises, the I-HIMDI COO will take decision in consultation with JSLPS CEO and NRLM COO. As far as financial matter is concerned, one retired government officer or government financial officer may be deputed for financial matter.

e) Convergence with the IWMP and MGNREGA is very important point for the project, so one person should work specifically for it. JSLPS stated that NRLM is already collaborating with such programmes; COO is responsible for it at state level and District Programme Manager is responsible for it at field level.

Date: 16 September 2014

Paritosh Upadhyay
Chief Executive Officer (CEO)
JSLPS

Kenichi Shibuta
Team Leader
JICA Survey Team

Attachment 2.1.1 Mandate of Planning Commission

Particulars	Organization	Purpose	Frequency
Government of India			
Working Groups of Planning Commission of India	Planning Commission of India	Relates to different ministries and specific theme	Before preparation of 5 year plan
Approach Paper to Five Year Plan	Planning Commission of India	Five Year Plan	Once in 5 year
Five Year Plan	Planning Commission of India	Five Year Plan	Once in 5 year
Annual Action Plan	Planning Commission of India		
Budget Speech	Ministries/ Departments of GoI	Budget Allocation and Introduction schemes	Before Financial Year
Annual Report	Ministries/ Departments of GoI	Annual Reporting	After completion of financial year
Outcome Report	Ministries/ Departments of GoI	Annual Reporting - Recent initiative	After completion of financial year
New Schemes	Ministries/ Departments	Introduce/Revise schemes	As and when required
Formulation of Policy	Relevant Ministry	Clarify policy perspective of GoI	No specific frequency; about 10 years
New Mission and independent Society	Relevant Ministry	Flexibility and independence to pursue efforts in mission mode	Recent initiatives; Does not relate to frequency
Guidelines/Manuals	Relevant Department	Implementation of key schemes	Initially and revised based on need
Specific Studies	Relevant Department/ Organization	Monitoring and Evaluation	As and when need is felt
State Government			
Perspective Plans relating Mission/flagship schemes	Relevant Department/ Organization	Formulate overall plan	Usually in 5 years
Annual Action Plans relating Mission/flagship Schemes	Relevant Department/ Organization	Formulate detail plan	Once in a year
District Development Plans	Planning and Coordination Department/ State Planning Commission	Mainly collation of schemes	Once in a year
State Policy	Relevant Ministry/ Department	Clarify and giving thrust on policy	No specific frequency; usually in about 10 yrs
Outcome Report	Relevant Department	New initiative – just started	After financial year
Introduction of State Schemes	Relevant Department	Initiative of State Govt.	In annual budget speech/As and when required
Specific Studies	Relevant Department/ Organization	Monitoring and Evaluation	As and when need is felt

Source: JICA Survey Team

Attachment 2.1.2 Planning Process of Five Year Plan and Annual Plan

Step-1 (start) Setting up of Working Groups on sub-sectors and/or subjects for the formulation of Five Year Plan and Annual Plan

Step-2 Finalization of their composition and terms of reference

- Task-1 Processing of reports
- Task-2 Preparation of evaluation notes
- Task-3 Preparation of background notes
- Task-4 Identification of the thrust areas that need special attention

Step-3 Taking follow up action based on discussion of the Working Groups

Step-4 Identification of policy directions, major strategies and thrust areas for inclusion in the approach documents

- Task-1 Preparation of background notes
- Task-2 Meeting with the central departments concerned
- Task-3 Finalization of approaches, policies, strategies, targets, investment priorities, etc.

Step-5 Drafting of sub-sectoral sections for inclusion in the draft plan document

Step-6 Preparation of briefs in respect of sub-sectors state-wise for the Deputy Chairman's discussions with Chief Ministers and State Plan Advisers

Step-7 Organizing the Working Group meetings to finalize Annual and Five Year Plans, draft Five Year Plan proposals and proposals of the State Government

- Task-1 Preparation of background papers
- Task-2 Discussions on inter-se plan priorities
- Task-3 Critical examination of plan proposals in relation to plan objectives and approaches
- Task-4 Preparation of Working Group Reports giving interalia, outlays and physical targets

Step-8 (end) Publication of Five Year Plan and Annual Report

Note: Finalization of Annual Plans except for the first year of Five Year Plan

- Task-1 Assessment of progress both in physical and financial terms in relation to the approved targets and outlays.
- Task-2 Scheme-wise examination of the proposals and recommendations regarding targets and outlays for the next Plan.
- Task-3 Finalization by the Central Government and State Governments.

Sources: Prepared vy JICA Survey Team based on website of Planning Commission, the Government of India

Attachment 2.2.1 List of Monitorable Targets for the Twelfth Plan of India

SN	Monitorable Target
1.	Real GDP Growth Rate of 8.0%.
2.	Agriculture Growth Rate of 4.0%.
3.	Manufacturing Growth Rate of 10.0%t.
4.	Every State must have an average growth rate in the Twelfth Plan preferably higher than that achieved in the Eleventh Plan.
	Poverty and Employment
5.	Head-count ratio of consumption poverty to be reduced by 10% points over the preceding estimates by the end of Twelfth Five Year Plan.
6.	Generate 50 million new work opportunities in the non-farm sector and provide skill certification to equivalent numbers during the Twelfth Five Year Plan.
	Education
7.	Mean Years of Schooling to increase to seven years by the end of Twelfth Five Year Plan.
8.	Enhance access to higher education by creating two million additional seats for each age cohort aligned to the skill needs of the economy.
9.	Eliminate gender and social gap in school enrolment (that is, between girls and boys, and between SCs, STs, Muslims and the rest of the population) by the end of Twelfth Five Year Plan.
	Health
10.	Reduce IMR to 25 and MMR to 1 per 1,000 live births, and improve Child Sex Ratio (0-6 years) to 950 by the end of the Twelfth Five Year Plan.
11.	Reduce Total Fertility Rate to 2.1 by the end of Twelfth Five Year Plan.
12	Reduce under-nutrition among children aged 0-3 years to half of the NFHS-3 levels by the end of Twelfth Five Year Plan.
	Infrastructure, Including Rural Infrastructure
13.	Increase investment in infrastructure as a percentage of GDP to 9% by the end of Twelfth Five Year Plan.
14.	Increase the Gross Irrigated Area from 90 million hectare to 103 million hectare by the end of Twelfth Five Year Plan.
15.	Provide electricity to all villages and reduce AT&C losses to 20% by the end of Twelfth Five Year Plan.
16.	Connect all villages with all-weather roads by the end of Twelfth Five Year Plan.
17.	Upgrade national and state highways to the minimum two-lane standard by the end of Twelfth Five Year Plan.
18.	Complete Eastern and Western Dedicated Freight Corridors by the end of Twelfth Five Year Plan.
19.	Increase rural tele-density to 70% by the end of Twelfth Five Year Plan.
20.	Ensure 50% of rural population has access to 40 lpcd piped drinking water supply, and 50% gram panchayats achieve Nirmal Gram Status by the end of Twelfth Five Year Plan.
	Environment and Sustainability
21.	Increase green cover (as measured by satellite imagery) by 1 million hectare every year during the Twelfth Five Year Plan.
22.	Add 30,000 MW of renewable energy capacity in the Twelfth Plan.
23.	Reduce emission intensity of GDP in line with the target of 20%t to 25% reduction over 2005 levels by 2020.
	Service Delivery
24.	Provide access to banking services to 90% Indian households by the end of Twelfth Five Year Plan.
25.	Major subsidies and welfare related beneficiary payments to be shifted to a direct cash transfer by the end of the Twelfth Plan, using the Aadhar platform with linked bank accounts.

Sources:12th Five-Year Plan (2012–2017), Faster, More Inclusive and Sustainable Growth, Volume I, II & III, Planning Commission, Government of India (2013).

Attachment 2.3.1

Attachment 2.3.1 List of Monitorable Targets for the Twelfth Plan of Jharkhand

SN	Monitorable Target
1.	GSDP Growth Rate at 7.53%.
2.	Agriculture Growth Rate at 6.36%.
3.	Industry Growth Rate at 5.00% and Services Growth Rate at 9.79%.
	Poverty and Employment
4.	Create 2.12 million new job opportunities.
	Education
5.	Reduce dropout rate of children in elementary school from 45.55 to 30%.
6.	Increase literacy rate from 67.73% to 88 %%
7.	Lower gender gap from 22% to 2%
8.	People teacher ratio in secondary sector from 53:1 to XX:1.
9.	Gross enrolment rate in secondary sector from 29% to xx%, and combined secondary and higher secondary from 9% to18%.
	Health
10.	Reduction of IMR to 24, and MMR to 109 per 1,000 live births,
11.	Reduce total fertility rate to 2,1 %..
12	Reduce malnutrition among children of age group 0-3 years to half its present level.
13	Reduce anemia among women and girls by 50%.
	Women and Children
14.	Raise sex-ratio for age group 0-6 years from 0.943 to 0.989.

Source: Draft Twelfth Five Year Plan (2012–2017) & Annual Plan (2012-2-13), Planning & Development Department, Government of Jharkhand.

Attachment 3.2.1 Original Data of Ceusus 2011

No.	District	No of Households	Total Population Person	Ave. Member of HH	Total Population Male	Total Population Female	Scheduled Castes population Person	Rate of SC (%)	Scheduled Castes population Male	Scheduled Castes population Female
1	Garhwa	254,697	1,322,784	5.19	683,575	639,209	319,946	24.19	165,313	154,633
2	Chatra	182,271	1,042,886	5.72	533,935	508,951	340,553	32.65	172,668	167,885
3	Kodarma	116,155	716,259	6.17	367,222	349,037	109,003	15.22	55,346	53,657
4	Giridih	396,521	2,445,474	6.17	1,258,098	1,187,376	325,493	13.31	166,447	159,046
5	Deoghar	264,347	1,492,073	5.64	775,022	717,051	190,036	12.74	98,295	91,741
6	Godda	253,648	1,313,551	5.18	677,927	635,624	115,567	8.80	59,835	55,732
7	Sahibganj	227,023	1,150,567	5.07	589,391	561,176	72,341	6.29	37,317	35,024
8	Pakur	182,317	900,422	4.94	452,661	447,761	28,469	3.16	14,352	14,117
9	Dhanbad	507,064	2,684,487	5.29	1,405,956	1,278,531	437,309	16.29	226,362	210,947
10	Bokaro	394,918	2,062,330	5.22	1,072,807	989,523	299,227	14.51	154,297	144,930
11	Lohardaga	88,638	461,790	5.21	232,629	229,161	15,330	3.32	7,862	7,468
12	Purbi Singhbhum	476,931	2,293,919	4.81	1,176,902	1,117,017	111,414	4.86	56,147	55,267
13	Palamu	358,754	1,939,869	5.41	1,006,302	933,567	536,382	27.65	277,119	259,263
14	Latehar	133,381	726,978	5.45	369,666	357,312	154,910	21.31	78,266	76,644
15	Hazaribagh	304,749	1,734,495	5.69	890,881	843,614	303,515	17.50	155,013	148,502
16	Ramgarh	179,375	949,443	5.29	494,230	455,213	106,356	11.20	54,986	51,370
17	Dumka	275,019	1,321,442	4.80	668,514	652,928	79,614	6.02	40,802	38,812
18	Jamtara	155,275	791,042	5.09	404,830	386,212	72,885	9.21	37,212	35,673
19	Ranchi	569,444	2,914,253	5.12	1,494,937	1,419,316	152,943	5.25	78,613	74,330
20	Khunti	103,700	531,885	5.13	266,335	265,550	24,037	4.52	12,223	11,814
21	Gumla	188,988	1,025,213	5.42	514,390	510,823	32,459	3.17	16,446	16,013
22	Simdega	118,288	599,578	5.07	300,309	299,269	44,674	7.45	22,150	22,524
23	Pashchimi Singhbhum	302,046	1,502,338	4.97	749,385	752,953	56,986	3.79	28,144	28,842
24	Saraikela-Kharsawan	221,232	1,065,056	4.81	544,411	520,645	56,195	5.28	28,243	27,952
	JHARKHAND	6,254,781	32,988,134	5.27	16,930,315	16,057,819	3,985,644	12.08	2,043,458	1,942,186

Source: Census 2011

No.	District	Scheduled Tribes population Person	Rate of ST (%)	Rate of Minority	Literates Population Person	Rate of Leterates Population	Literates Population Male	Literates Population Female	Illiterate Persons	Illiterate Male
1	Garhwa	205,874	15.56	39.75	653,476	49.40	405,161	248,315	669,308	278,414
2	Chatra	45,563	4.37	37.02	510,061	48.91	303,902	206,159	532,825	230,033
3	Kodarma	6,903	0.96	16.18	390,249	54.48	238,780	151,469	326,010	128,442
4	Giridih	238,188	9.74	23.05	1,253,475	51.26	783,736	469,739	1,191,999	474,362
5	Deoghar	180,962	12.13	24.87	793,538	53.18	489,837	303,701	698,535	285,185
6	Godda	279,208	21.26	30.06	604,519	46.02	376,212	228,307	709,032	301,715
7	Sahibganj	308,343	26.80	33.09	483,263	42.00	287,303	195,960	667,304	302,088
8	Pakur	379,054	42.10	45.26	352,881	39.19	206,989	145,892	547,541	245,672
9	Dhanbad	233,119	8.68	24.97	1,722,204	64.15	1,014,950	707,254	962,283	391,006
10	Bokaro	255,626	12.40	26.91	1,273,520	61.75	759,088	514,432	788,810	313,719
11	Lohardaga	262,734	56.89	60.21	259,707	56.24	149,568	110,139	202,083	83,061
12	Purbi Singhbhum	653,923	28.51	33.37	1,507,699	65.73	856,526	651,173	786,220	320,376
13	Palamu	181,208	9.34	36.99	1,024,563	52.82	621,706	402,857	915,306	384,596
14	Latehar	331,096	45.54	66.85	350,682	48.24	209,706	140,976	376,296	159,960
15	Hazaribagh	121,768	7.02	24.52	1,013,249	58.42	596,113	417,136	721,246	294,768
16	Ramgarh	201,166	21.19	32.39	596,497	62.83	350,031	246,466	352,946	144,199
17	Dumka	571,077	43.22	49.24	672,409	50.88	406,275	266,134	649,033	262,239
18	Jamtara	240,489	30.40	39.61	426,312	53.89	258,260	168,052	364,730	146,570
19	Ranchi	1,042,016	35.76	41.01	1,911,433	65.59	1,085,244	826,189	1,002,820	409,693
20	Khunti	389,626	73.25	77.77	284,575	53.50	164,741	119,834	247,310	101,594
21	Gumla	706,754	68.94	72.11	559,720	54.60	321,795	237,925	465,493	192,595
22	Simdega	424,407	70.78	78.23	343,483	57.29	191,991	151,492	256,095	108,318
23	Pashchimi Singhbhum	1,011,296	67.31	71.10	727,561	48.43	439,273	288,288	774,777	310,112
24	Saraikela-Kharsawan	374,642	35.18	40.46	612,993	57.56	365,332	247,661	452,063	179,079
	JHARKHAND	8,645,042	26.21	38.29	18,328,069	55.56	10,882,519	7,445,550	14,660,065	6,047,796

Source: Census 2011

Attachment 3.2.1

No.	District	Illiterate Female	Total Worker Population Person	Rate of Total Worker Population (%)	Total Worker Population Male	Total Worker Population Female	Main Cultivator Population Person	Main Cultivator Population Male	Main Cultivator Population Female	Main Agricultural Labourers Population Person
1	Garhwa	390,894	571,431	43.20	335,451	235,980	47,082	35,512	11,570	57,365
2	Chatra	302,792	397,690	38.13	251,213	146,477	75,717	56,865	18,852	63,773
3	Kodarma	197,568	257,418	35.94	173,993	83,425	39,007	30,171	8,836	24,197
4	Giridih	717,637	1,036,277	42.38	623,946	412,331	134,666	97,777	36,889	78,621
5	Deoghar	413,350	551,467	36.96	383,691	167,776	72,898	58,619	14,279	69,187
6	Godda	407,317	552,191	42.04	344,019	208,172	76,990	63,170	13,820	87,229
7	Sahibganj	365,216	490,202	42.61	295,690	194,512	82,755	63,299	19,456	110,168
8	Pakur	301,869	404,584	44.93	234,012	170,572	68,549	54,103	14,446	57,797
9	Dhanbad	571,277	844,504	31.46	658,851	185,653	32,963	25,780	7,183	25,466
10	Bokaro	475,091	685,368	33.23	507,677	177,691	50,940	40,804	10,136	23,861
11	Lohardaga	119,022	221,332	47.93	121,605	99,727	52,916	36,663	16,253	21,281
12	Purbi Singhbhum	465,844	837,167	36.50	616,249	220,918	49,893	41,395	8,498	39,661
13	Palamu	530,710	713,175	36.76	473,042	240,133	68,895	55,028	13,867	95,734
14	Latehar	216,336	313,379	43.11	180,106	133,273	47,375	33,135	14,240	33,198
15	Hazaribagh	426,478	654,636	37.74	423,472	231,164	112,671	83,221	29,450	43,404
16	Ramgarh	208,747	312,125	32.87	234,202	77,923	59,360	44,107	15,253	21,342
17	Dumka	386,794	624,779	47.28	367,108	257,671	83,224	60,983	22,241	72,157
18	Jamtara	218,160	326,631	41.29	214,740	111,891	42,802	33,437	9,365	26,814
19	Ranchi	593,127	1,142,867	39.22	743,967	398,900	208,011	135,622	72,389	103,770
20	Khunti	145,716	259,984	48.88	141,123	118,861	107,222	64,568	42,654	16,422
21	Gumla	272,898	487,508	47.55	264,774	222,734	196,517	122,451	74,066	33,161
22	Simdega	147,777	288,645	48.14	159,867	128,778	96,004	67,365	28,639	29,589
23	Pashchimi Singhbhum	464,665	694,863	46.25	392,690	302,173	137,464	95,888	41,576	72,410
24	Saraikela-Kharsawan	272,984	430,051	40.38	283,281	146,770	57,441	43,996	13,445	32,167
	JHARKHAND	8,612,269	13,098,274	39.71	8,424,769	4,673,505	2,001,362	1,443,959	557,403	1,238,774

Source: Census 2011

No.	District	Marginal Cultivator Population Person	Marginal Cultivator Population Male	Marginal Cultivator Population Female	Marginal Agriculture Labourers Population Person	Marginal Agriculture Labourers Population Male	Marginal Agriculture Labourers Population Female
1	Garhwa	66,479	31,333	35,146	271,308	129,817	141,491
2	Chatra	43,580	22,004	21,576	124,740	63,543	61,197
3	Kodarma	44,119	16,831	27,288	40,078	18,307	21,771
4	Giridih	235,247	94,587	140,660	283,989	133,140	150,849
5	Deoghar	55,758	31,630	24,128	140,506	76,418	64,088
6	Godda	67,613	35,464	32,149	220,538	108,314	112,224
7	Sahibganj	27,220	12,976	14,244	96,734	39,176	57,558
8	Pakur	36,785	17,060	19,725	92,231	36,982	55,249
9	Dhanbad	64,155	27,545	36,610	78,022	36,516	41,506
10	Bokaro	86,581	42,525	44,056	102,545	50,105	52,440
11	Lohardaga	46,864	19,734	27,130	59,559	23,907	35,652
12	Purbi Singhbhum	62,166	39,014	23,152	170,141	81,040	89,101
13	Palamu	64,690	36,012	28,678	285,242	158,696	126,546
14	Latehar	56,318	27,710	28,608	109,531	52,593	56,938
15	Hazaribagh	129,789	53,922	75,867	128,981	57,632	71,349
16	Ramgarh	31,410	12,696	18,714	25,473	12,921	12,552
17	Dumka	110,178	55,521	54,657	230,927	111,850	119,077
18	Jamtara	63,206	34,995	28,211	108,853	60,588	48,265
19	Ranchi	109,476	49,440	60,036	163,590	72,231	91,359
20	Khunti	59,068	26,386	32,682	33,026	12,974	20,052
21	Gumla	124,755	52,105	72,650	64,757	26,515	38,242
22	Simdega	62,015	25,808	36,207	60,643	22,425	38,218
23	Pashchimi Singhbhum	106,708	50,054	56,654	195,065	75,690	119,375
24	Saraikela-Kharsawan	59,290	31,871	27,419	110,799	50,735	60,064
	JHARKHAND	1,813,470	847,223	966,247	3,197,278	1,512,115	1,685,163

Source: Census 2011

Attachment 3.6.1 Prioritisation of Block-wise Groundwater Potential

District	Block	Number of Water Source	GW Availability per Area (m)	GW Utilization Status (%)	Fluoride (mg/L)	Arsenic (mg/L)	pH	TDS (mg/L)	Point							Total Score
									No. of WS	GW Availability	Utilization	Fluoride	Arsenic	pH	TDS	
Giridih	Gawan	6263	0.06197	36.63	0.53				7	5	7	0	0	0	0	19
	Tisri		0.05775	19.44	0.53		6.85	269.6	7	4	10	0	0	0	0	21
	Deori		0.06666	40.65	0.60		6.87	260.9	7	5	6	0	0	0	0	18
	Dhanwar		0.08140	62.68	0.60				7	7	4	0	0	0	0	18
	Jamua		0.06476	46.89	0.60				7	5	6	0	0	0	0	18
	Bengabad		0.07032	37.07	0.60				7	6	7	0	0	0	0	20
	Gande		0.06954	34.02	0.87		6.88		7	5	7	-3	0	0	0	16
	Giridih		0.08169	36.04	0.95		6.88		7	7	7	-3	0	0	0	18
	Birni		0.07069	52.81	0.69		6.83		7	6	5	0	0	0	0	18
	Bagodar		0.07356	24.84	0.62		6.92	186.8	7	6	8	0	0	0	0	21
	Sariya		0.07356	24.84	0.39		6.90	490.0	7	6	8	0	0	0	0	21
	Dumri		0.06087	32.64	0.52		7.00		7	5	7	0	0	0	0	19
	Pirtanr		0.05874	21.92	0.79		6.82	275.8	7	4	8	-3	0	0	0	16
Pakur	Litipara	1848	0.06018	9.65	1.63		6.40		2	5	10	-8	0	-2	0	7
	Amrapara		0.06155	8.52	0.94		6.40		2	5	10	-3	0	-2	0	12
	Hiranpur		0.07346	12.38	0.55	0.010	6.40		2	6	10	0	-5	-2	0	11
	Pakur		0.07207	29.78	0.61		6.40		2	6	8	0	0	-2	0	14
	Maheshpur		0.08655	13.66	0.31		6.40		2	7	10	0	0	-2	0	17
	Pakuria		0.06408	9.48	1.03	0.010	6.40		2	5	10	-8	-5	-2	0	2
Lohardaga	Kisko	4356	0.05380	17.19	2.13		6.40		5	4	10	-8	0	-2	0	9
	Peshrar		0.05675	38.72	1.60		6.40		5	4	7	-8	0	-2	0	6
	Kuru		0.06901	44.79	0.80		6.40		5	5	6	-3	0	-2	0	11
	Kairo		0.06901	44.79	0.80		6.40		5	5	6	-3	0	-2	0	11
	Lohardaga		0.06795	67.00	2.00		6.40		5	5	4	-8	0	-2	0	4
	Senha		0.05675	38.72	1.00		6.40		5	4	7	-8	0	-2	0	6
	Bhandra		0.08336	50.25	1.00		6.40		5	7	5	-8	0	-2	0	7
Palamu	Hussainabad	7943	0.05391	35.91	1.28		7.40		8	4	7	-8	0	0	0	11
	Haidernagar		0.05391	35.91	1.20		7.27		8	4	7	-8	0	0	0	11
	Mohammad Ganj		0.05391	35.91					8	4	7	0	0	0	0	19
	Hariharganj		0.05875	47.87	1.49		7.40		8	4	6	-8	0	0	0	10
	Pipra		0.05875	47.87					8	4	6	0	0	0	0	18
	Chhatarpur		0.07507	23.35	1.14		7.27		8	6	8	-8	0	0	0	14

Attachment 3.6.1

Attachment 3.6.1 Prioritisation of Block-wise Groundwater Potential

District	Block	Number of Water Source	GW Availability per Area (m)	GW Utilization Status (%)	Fluoride (mg/L)	Arsenic (mg/L)	pH	TDS (mg/L)	Point							Total Score
									No. of WS	GW Availability	Utilization	Fluoride	Arsenic	pH	TDS	
	Nawadiha Bazar/Nawadiha		0.07507	23.35					8	6	8	0	0	0	0	22
	Pandu		0.08164	34.15	1.25		7.28		8	7	7	-8	0	0	0	14
	Untari Road		0.08164	34.15	1.28		7.29		8	7	7	-8	0	0	0	14
	Bishrampur		0.11174	34.97	1.04		7.34		8	8	7	-8	0	0	0	15
	Nawa Bazar		0.11174	34.97	2.03				8	8	7	-8	0	0	0	15
	Patan		0.08536	53.82	1.24				8	7	5	-8	0	0	0	12
	Padwa		0.08536	53.82	1.24		7.33		8	7	5	-8	0	0	0	12
	Manatu		0.09972	16.18	1.14				8	7	10	-8	0	0	0	17
	Tarhasi		0.09972	16.18	1.14		7.36		8	7	10	-8	0	0	0	17
	Panki		0.10162	15.24	1.13		7.37		8	8	10	-8	0	0	0	18
	Satbarwa		0.08210	59.52	1.27		7.35		8	7	5	-8	0	0	0	12
	Nilambar-Pitambarpur (Lesliganj)		0.11023	47.42	1.31		7.27		8	8	6	-8	0	0	0	14
	Medininagar (Daltonganj)		0.13612	31.67	2.13		7.23	579.3	8	10	7	-8	0	0	-2	15
	Chainpur		0.05831	37.99	1.47		7.41		8	4	7	-8	0	0	0	11
Latehar	Manika	4239	0.05783	30.84	2.23				5	4	7	-8	0	0	0	8
	Barwadih		0.05895	32.38	0.80				5	4	7	-3	0	0	0	13
	Mahuadanr		0.07608	16.34	0.90				5	6	10	-3	0	0	0	18
	Garu		0.05138	42.42	0.90				5	4	6	-3	0	0	0	12
	Latehar		0.04786	60.09	0.37		7.17		5	3	4	0	0	0	0	12
	Balumath		0.08313	22.19	0.70				5	7	8	-3	0	0	0	17
	Bariyatu		0.08313	22.19	0.90				5	7	8	-3	0	0	0	17
	Herhanj		0.08313	22.19	0.90				5	7	8	-3	0	0	0	17
	Chandwa		0.08021	19.45	0.90				5	7	10	-3	0	0	0	19
Hazaribag	Chauparan	1989	0.06536	20.07	0.54		6.58		2	5	8	0	0	0	0	15
	Barhi		0.06127	39.89	0.85	0.050	7.06	2000	2	5	7	-3	-5	0	-2	4
	Padma		0.07880	45.25	1.09		6.91		2	6	6	-8	0	0	0	6
	Ichak		0.07238	59.52	0.42		6.94		2	6	5	0	0	0	0	13
	Tati Jhariya		0.07042	40.36	2.80				2	6	6	-8	0	0	0	6
	Daru		0.05693	66.41	0.51		6.80		2	4	4	0	0	0	0	10
	Barkatha		0.07137	30.60	2.65				2	6	7	-8	0	0	0	7
	Chalkusa		0.07137	30.60	0.46		6.88		2	6	7	0	0	0	0	15
	Bishungarh		0.07042	40.36	1.18		6.87		2	6	6	-8	0	0	0	6
	Hazaribagh		0.05693	66.41	0.39	0.030	6.90		2	4	4	0	-5	0	0	5
	Katkamsandi		0.07367	39.11	0.63		6.85		2	6	7	0	0	0	0	15

Attachment 3.6.1 Prioritisation of Block-wise Groundwater Potential

District	Block	Number of Water Source	GW Availability per Area (m)	GW Utilization Status (%)	Fluoride (mg/L)	Arsenic (mg/L)	pH	TDS (mg/L)	Point							Total Score
									No. of WS	GW Availability	Utilization	Fluoride	Arsenic	pH	TDS	
	Katamdag		0.07367	39.11	0.46		6.90		2	6	7	0	0	0	0	15
	Keredari		0.05151	52.27	2.98		6.93		2	4	5	-8	0	0	0	3
	Barkagaon		0.05449	29.98	0.82		6.82		2	4	8	-3	0	0	0	11
	Churchu		0.07531	31.75	0.44		6.74		2	6	7	0	0	0	0	15
	Dadi		0.07531	31.75	0.99		6.78		2	6	7	-3	0	0	0	12
Dumka	Saraiyahat	27296	0.04348	54.43	1.88		6.20		10	3	5	-8	0	-2	0	8
	Jarmundi		0.05178	51.65	6.36		6.20		10	4	5	-8	0	-2	0	9
	Ramgarh		0.07359	37.46	1.88		6.20		10	6	7	-8	0	-2	0	13
	Gopikandar		0.07282	7.15	1.85		6.20		10	6	10	-8	0	-2	0	16
	Kathikund		0.06163	24.05	1.85		6.20		10	5	8	-8	0	-2	0	13
	Shikaripara		0.08146	13.48	1.85		6.20		10	7	10	-8	0	-2	0	17
	Ranishwar		0.09684	11.15	1.81		6.20		10	7	10	-8	0	-2	0	17
	Dumka		0.07352	30.50	1.52		6.20		10	6	7	-8	0	-2	0	13
	Jama		0.08647	35.46	8.81		6.20		10	7	7	-8	0	-2	0	14
	Masalia		0.07188	23.69	1.81		6.20		10	6	8	-8	0	-2	0	14
Ranchi	Burmu	14020	0.08495	27.83	0.53		6.40		10	7	8	0	0	-2	0	23
	Khelari		0.08495	27.83	0.31		6.40		10	7	8	0	0	-2	0	23
	Kanke		0.06669	112.4	0.54		5.80	181.0	10	5	0	0	0	-2	0	13
	Ormanjhi		0.08098	68.67	0.54		6.40		10	7	4	0	0	-2	0	19
	Angara		0.05562	8.69	0.54		6.40		10	4	10	0	0	-2	0	22
	Rahe		0.06861	22.62	0.72		6.40		10	5	8	-3	0	-2	0	18
	Silli		0.05526	30.75	0.72		6.40		10	4	7	-3	0	-2	0	16
	Sonahatu		0.06861	22.62	0.72		6.40		10	5	8	-3	0	-2	0	18
	Namkum		0.05560	57.27	0.72		6.44	372.0	10	4	5	-3	0	-2	0	14
	Ratu		0.09351	72.49	0.31		6.40	344.0	10	7	4	0	0	-2	0	19
	Nagri		0.09351	72.49	0.43		6.40		10	7	4	0	0	-2	0	19
	Mandar		0.12258	53.37	0.42		6.40		10	10	5	0	0	-2	0	23
	Chanho		0.06628	49.87	0.56		6.40	262.4	10	5	6	0	0	-2	0	19
	Bero		0.07345	36.91	0.54		6.40		10	6	7	0	0	-2	0	21
	Itki		0.07345	36.91	0.26		6.40		10	6	7	0	0	-2	0	21
	Lapung		0.05954	38.55	0.54		6.40		10	4	7	0	0	-2	0	19
	Bundu		0.06286	28.01	0.72		6.40		10	5	8	-3	0	-2	0	18
	Tamar I		0.07066	14.43	0.72		6.40		10	6	10	-3	0	-2	0	21

Attachment 3.6.1

Attachment 3.6.1 Prioritisation of Block-wise Groundwater Potential

District	Block	Number of Water Source	GW Availability per Area (m)	GW Utilization Status (%)	Fluoride (mg/L)	Arsenic (mg/L)	pH	TDS (mg/L)	Point							Total Score
									No. of WS	GW Availability	Utilization	Fluoride	Arsenic	pH	TDS	
Khunti	Karra	6504	0.05577	43.48	0.72		6.40		7	4	6	-3	0	-2	0	12
	Torpa		0.05247	31.97	0.42	0.050	6.40		7	4	7	0	-5	-2	0	11
	Rania		0.06470	21.98	4.71	0.050	6.40		7	5	8	-8	-5	-2	0	5
	Murhu		0.05391	25.06	4.09	0.050	2.26		7	4	8	-8	-5	-2	0	4
	Khunti		0.07240	26.33	0.38	0.050	6.40		7	6	8	0	-5	-2	0	14
	Erki (Tamar II)		0.03627	13.68	4.09		6.40		7	2	10	-8	0	-2	0	9
Gumla	Bishunpur	10839	0.05860	16.69	1.75		6.40		10	4	10	-8	0	-2	0	14
	Ghaghra		0.07219	17.95	1.30		6.40		10	6	10	-8	0	-2	0	16
	Sisai		0.07185	40.87	1.00		6.40		10	6	6	-8	0	-2	0	12
	Verno		0.08872	24.74	0.30		6.40		10	7	8	0	0	-2	0	23
	Kamdara		0.06734	35.23	0.41		6.40		10	5	7	0	0	-2	0	20
	Basia		0.07591	34.09	0.65		6.40		10	6	7	0	0	-2	0	21
	Gumla		0.06062	42.00	1.10		6.40		10	5	6	-8	0	-2	0	11
	Chainpur		0.06265	23.92	0.40		6.40		10	5	8	0	0	-2	0	21
	Dumri		0.06858	23.64	0.73		6.40		10	5	8	-3	0	-2	0	18
	Albert Ekka (Jari)		0.06858	23.64	1.24		6.40		10	5	8	-8	0	-2	0	13
	Raidih		0.07385	24.30	0.63		6.40		10	6	8	0	0	-2	0	22
	Palkot		0.06672	12.85	0.56		6.40		10	5	10	0	0	-2	0	23
West Singhbhum	Sonua	970	0.06311	8.85	0.44		6.40	578.5	1	5	10	0	0	-2	-2	12
	Gudri		0.06311	8.85	1.50		6.40		1	5	10	-8	0	-2	0	6
	Bandgaon		0.05037	8.17	0.70		6.40	563.8	1	4	10	0	0	-2	-2	11
	Chakradharpur		0.05829	11.66	0.77		6.40	633.6	1	4	10	-3	0	-2	-2	8
	Khuntpani		0.05165	9.86	0.69		6.40	589.8	1	4	10	0	0	-2	-2	11
	Goilkera		0.05834	9.18	0.54		6.40	517.5	1	4	10	0	0	-2	-2	11
	Anandpur		0.06958	7.02	0.49		6.40	510.2	1	5	10	0	0	-2	-2	12
	Manoharpur		0.06958	7.02	0.53		6.40	751.2	1	5	10	0	0	-2	-2	12
	Noamundi		0.04144	10.01	0.64		6.40	639.3	1	3	10	0	0	-2	-2	10
	Tonto		0.06892	3.79	0.62		6.40	580.3	1	5	10	0	0	-2	-2	12
	Hat Gamharia		0.06095	17.92	0.78		6.40	557.7	1	5	10	-3	0	-2	-2	9
	Chaibasa		0.06095	17.92	0.55		6.40	614.2	1	5	10	0	0	-2	-2	12
	Tantnagar		0.06767	6.73	0.67		6.40	626.1	1	5	10	0	0	-2	-2	12
	Manjhari		0.07601	8.82	0.63		6.40	534.0	1	6	10	0	0	-2	-2	13
	Jhinkpani		0.06791	7.86	0.61		6.40	568.1	1	5	10	0	0	-2	-2	12

Attachment 3.6.1 Prioritisation of Block-wise Groundwater Potential

District	Block	Number of Water Source	GW Availability per Area (m)	GW Utilization Status (%)	Fluoride (mg/L)	Arsenic (mg/L)	pH	TDS (mg/L)	Point							Total Score
									No. of WS	GW Availability	Utilization	Fluoride	Arsenic	pH	TDS	
	Jagannathpur		0.06220	10.89	0.46		6.40	495.9	1	5	10	0	0	-2	0	14
	Kumardungi		0.07257	6.60	0.64		6.40	627.8	1	6	10	0	0	-2	-2	13
	Majhgaon		0.07754	10.09	0.65		6.40	606.6	1	6	10	0	0	-2	-2	13
Saraikela	Kuchai	1703	0.06084	6.70	0.64		7.17	7.1	2	5	10	0	0	0	0	17
	Kharsawan		0.06681	10.29	0.57		7.21	801.8	2	5	10	0	0	0	-2	15
	Chandil		0.05567	11.17	0.60		7.43		2	4	10	0	0	0	0	16
	Ichagarh		0.07488	13.62	0.95		7.41	438.0	2	6	10	-3	0	0	0	15
	Kukru		0.07488	13.62	1.16		7.23	351.3	2	6	10	-8	0	0	0	10
	Nimdih		0.06423	17.68	0.49		7.37	384.3	2	5	10	0	0	0	0	17
	Adityapur(Gamharia)		0.06209	19.23	0.66		7.27	203.8	2	5	10	0	0	0	0	17
	Saraikela		0.05554	10.37	0.52		7.17	350.3	2	4	10	0	0	0	0	16
	Gobindpur (Rajnagar)		0.06560	8.60	0.83		7.21	592.7	2	5	10	-3	0	0	-2	12

Source: JICA Survey Team

Attachment 3.6.2

Attachment 3.6.2 Recommended Maximum Concentrations of Trace Elements in Irrigation Water

Element	Recommended Maximum Concentration[2] (mg/l)	Remarks
Al (aluminium)	5.0	Can cause non-productivity in acid soils (pH < 5.5), but more alkaline soils at pH > 7.0 will precipitate the ion and eliminate any toxicity.
As (arsenic)	0.10	Toxicity to plants varies widely, ranging from 12 mg/l for Sudan grass to less than 0.05 mg/l for rice.
Be (beryllium)	0.10	Toxicity to plants varies widely, ranging from 5 mg/l for kale to 0.5 mg/l for bush beans.
Cd (cadmium)	0.01	Toxic to beans, beets and turnips at concentrations as low as 0.1 mg/l in nutrient solutions. Conservative limits recommended due to its potential for accumulation in plants and soils to concentrations that may be harmful to humans.
Co (cobalt)	0.05	Toxic to tomato plants at 0.1 mg/l in nutrient solution. Tends to be inactivated by neutral and alkaline soils.
Cr (chromium)	0.10	Not generally recognized as an essential growth element. Con-servative limits recommended due to lack of knowledge on its toxicity to plants.
Cu (copper)	0.20	Toxic to a number of plants at 0.1 to 1.0 mg/l in nutrient solutions.
F (fluoride)	1.0	Inactivated by neutral and alkaline soils.
Fe (iron)	5.0	Not toxic to plants in aerated soils, but can contribute to soil acidification and loss of availability of essential phosphorus and molybdenum. Overhead sprinkling may result in unsightly deposits on plants, equipment and buildings.
Li (lithium)	2.5	Tolerated by most crops up to 5 mg/l; mobile in soil. Toxic to citrus at low concentrations (<0.075 mg/l). Acts similarly to boron.
Mn (manganese)	0.20	Toxic to a number of crops at a few-tenths to a few mg/l, but usually only in acid soils.
Mo (molybdenum)	0.01	Not toxic to plants at normal concentrations in soil and water. Can be toxic to livestock if forage is grown in soils with high concentrations of available molybdenum.
Ni (nickel)	0.20	Toxic to a number of plants at 0.5 mg/l to 1.0 mg/l; reduced toxicity at neutral or alkaline pH.
Pd (lead)	5.0	Can inhibit plant cell growth at very high concentrations.
Se (selenium)	0.02	Toxic to plants at concentrations as low as 0.025 mg/l and toxic to livestock if forage is grown in soils with relatively high levels of added selenium. An essential element to animals but in very low concentrations.
Zn (zinc)	2.0	Toxic to many plants at widely varying concentrations; reduced toxicity at pH > 6.0 and in fine textured or organic soils.

[1] Adapted from National Academy of Sciences (1972) and Pratt (1972).

[2] The maximum concentration is based on a water application rate which is consistent with good irrigation practices (10,000 m^3 per hectare per year). If the water application rate greatly exceeds this, the maximum concentrations should be adjusted downward accordingly. No adjustment should be made for application rates less than 10,000 m^3 per hectare per year. The values given are for water used on a continuous basis at one site.

Source: Ayres, R.S. and Westcott, D.W. (1976), Water quality for agriculture. FAO. Irrigation and Drainage Paper No. 29 F.A.O. http://www.fao.org/docrep/003/t0234e/T0234E00.htm#TOC

Attachment 3.6.3 Water Quality Testing Result of Open Dug Wells

No	District	Name of Block	Village	pH	TDS	Turbidity	Arsenic	Fluoride	Nitrate	Iron
					mg/L	NTU	mg/L	mg/L	mg/L	mg/L
1	Gumla	Gumla	Dand Toli	7.0	100	0.50	0.00	0.40	5.00	0.20
2	Gumla	Sesai	Bech Khora	7.2	230	1.50	0.00	0.30	10.00	0.20
3	Gumla	Bharno	MalgoLangro Toli	7.5	120	1.00	0.00	0.00	38.00	0.12
4	Gumla	Ghagra	Burhu Bech	7.4	240	1.70	0.00	0.25	25.00	0.15
5	Gumla	Dumri	Manargeya Toli	7.6	170	1.20	0.00	0.00	0.00	0.25
6	Gumla	Vishnpur	Vikash Bharti	7.2	115	1.00	0.00	0.70	20.00	0.00
7	Gumla	Chainpur	Dhan Pur	7.2	140	1.00	0.00	0.35	15.00	0.14
8	Gumla	Raidih	Jham Toli	7.3	210	1.60	0.00	0.22	22.00	0.15
9	Gumla	Palkot	Chor Tand	7.4	190	1.50	0.00	0.00	14.00	0.23
10	Gumla	Basia	SanicharToli Uper	7.5	175	1.40	0.00	0.00	17.00	0.24
11	Gumla	Kamdara	Longa Sadak Toli	7.2	280	1.80	0.00	0.00	23.00	0.22
12	Gumla	Jari	Jari	7.1	220	2.00	0.00	0.21	0.00	0.22
13	Lohardega	Peshrar	Peshrar	7.2	110	0.80	0.00	0.00	0.00	0.00
14	Lohardega	Kisko	pathgecha	7.1	90	0.50	0.00	0.00	5.00	0.20
15	Lohardega	Bhandra	Bhaish mundo	7.3	140	1.50	0.00	0.00	15.00	0.12
16	Lohardega	Kairo	Kairo	7.2	240	1.80	0.00	0.00	12.00	0.15
17	Lohardega	Kuru	Doba	7.3	160	1.10	0.00	0.00	0.00	0.22
18	Lohardega	Senha	Jhargaon	7.0	80	1.00	0.00	0.00	10.00	0.00
19	Lohardega	Lohardega	Raghutoli	7.6	230	2.00	0.00	0.00	12.00	0.14
20	Palamu	Medininagar	Pokraha Khurd	7.2	200	1.50	0.00	0.40	5.00	0.20
21	Palamu	Satbarwa	Rajderwa	7.0	210	2.00	0.00	0.30	10.00	0.20
22	Palamu	Chhatarpur	Sarma	6.9	190	2.00	0.00	0.00	38.00	0.12
23	Palamu	Manatu	Sughmi	7.3	220	1.80	0.00	0.25	25.00	0.15
24	Palamu	Chainpur	ornar	6.8	230	1.90	0.00	0.00	0.00	0.25
25	Palamu	Lesliganj	basoura	7.0	415	1.75	0.00	0.70	20.00	0.00
26	Palamu	Panki	Ganesh Pur	7.2	355	2.00	0.00	0.35	15.00	0.14
27	Palamu	Sarhassi	sarhassi	7.1	220	2.00	0.00	0.22	22.00	0.15
28	Palamu	Pattan	Mahuliya	7.8	460	1.50	0.00	0.00	14.00	0.23
29	Palamu	Parwa	Kajri	7.6	350	1.50	0.00	0.00	17.00	0.24
30	Palamu	Nawa Bazar	Rajhara	7.4	310	1.00	0.00	0.00	23.00	0.22
31	Palamu	Vishrampur	Vishrampur	7.0	220	2.00	0.00	0.21	0.00	0.22
32	Palamu	Pandu	Kajroo khurd	7.3	340	2.50	0.00	0.20	21.00	0.25
33	Palamu	Uttari Road	Uttari road	7.1	320	3.00	0.00	0.00	22.00	0.25
34	Palamu	Nawdiha Bazar	Gulabjhari	6.9	210	2.10	0.00	0.00	25.00	0.00
35	Palamu	Hariharganj	Hariharganj	7.4	345	1.50	0.00	0.45	15.00	0.00
36	Palamu	Pipra	Pipra	7.3	340	1.40	0.00	0.22	10.00	0.22
37	Palamu	Hussainabad	Islam Gunj	7.6	390	1.80	0.00	0.00	15.00	0.25
38	Palamu	Mohmmad Ganj	Bhaganiya	7.0	310	1.60	0.00	0.00	17.00	0.29
39	Palamu	Hyder Nagar	Hydernagar	7.1	320	1.40	0.00	0.00	23.00	0.20
40	Ranchi	Budmu	Burmu	8.5	590	3.20	0.00	0.28	10.13	0.20
41	Ranchi	Chanho	Chanho	7.1	410	2.90	0.00	0.17	9.13	0.13
42	Ranchi	Mandar	Sargaon	6.9	520	5.20	0.00	0.12	9.43	0.03
43	Ranchi	Itki	Kundi	9.1	650	4.10	0.00	0.23	3.03	0.18
44	Ranchi	Lapung	Lapung	7.2	320	5.20	0.00	0.17	11.80	0.20
45	Ranchi	Nagri	Naro	7.1	50	8.70	0.00	0.04	2.70	0.02
46	Ranchi	Bero	Bero	7.3	170	4.10	0.00	0.09	7.14	0.21
47	Ranchi	Ratu	Ratu Chatti	7.3	120	2.90	0.00	0.14	2.44	0.42
48	Ranchi	Kanke	Kanke	6.3	590	1.10	0.00	0.08	12.63	0.07
49	Ranchi	Namkom	Namkom	7.3	340	2.30	0.00	0.18	14.21	0.27
50	Ranchi	Ormanjhi	Ormanjhi	7.2	730	1.30	0.00	0.13	10.67	0.36

Attachment 3.6.3 Water Quality Testing Result of Open Dug Wells

No	District	Name of Block	Village	pH	TDS	Turbidity	Arsenic	Fluoride	Nitrate	Iron
					mg/L	NTU	mg/L	mg/L	mg/L	mg/L
51	Ranchi	Angarha	Angarha	7.8	430	1.90	0.00	0.28	18.21	0.01
52	Ranchi	Bundu	Damari	6.9	690	2.60	0.00	0.15	12.31	0.27
53	Ranchi	Khalari	Khalari	7.3	560	3.60	0.00	0.24	13.25	0.31
54	Ranchi	Silli	Nawadih	7.6	230	4.70	0.00	0.31	12.18	0.21
55	Ranchi	Sonahatu	Sonahatu	7.3	190	5.20	0.00	0.19	11.78	0.09
56	Ranchi	Taimara	Amlesa	6.8	230	4.90	0.00	0.27	12.36	0.23
57	Hazaribag	Choparan	Choparan	7.6	420	3.20	0.00	0.39	14.72	0.22
58	Hazaribag	Barhi	Karso	7	960	0.60	0.00	1.50	9.31	0.51
59	Hazaribag	Padma	Padma	6.9	420	0.90	0.00	0.52	10.72	0.29
60	Hazaribag	Katkamsandi	Katkamsandi	7.6	360	0.40	0.00	0.59	12.36	0.67
61	Hazaribag	Keredari	Keredari	7.2	510	0.60	0.00	0.37	10.54	0.27
62	Hazaribag	Barkagano	Natraz Nagar	7.6	230	0.40	0.00	0.29	9.87	0.41
63	Hazaribag	Mandu	Mandu	7.3	480	0.90	0.00	0.46	12.13	0.36
64	Hazaribag	Ichak	Hadari	6.3	300	0.70	0.00	0.18	2.39	0.18
65	Hazaribag	Hazaribag	Merawal	6.4	100	0.90	0.00	0.74	1.81	0.27
66	Hazaribag	Barkatta	Barkatta	6.9	430	0.50	0.00	0.49	6.47	0.37
67	Hazaribag	Tatijhariya	Jhariya	7	430	0.50	0.00	0.51	1.49	0.42
68	Hazaribag	Daru	Daru Kharika	6.8	580	0.10	0.00	0.39	5.61	0.18
69	Hazaribag	Churchu	Churchu	6.7	330	2.30	0.00	0.42	6.87	0.35
70	Hazaribag	Vishnugarh	Chalanga	6.8	240	3.60	0.00	0.48	9.81	0.11
71	Pakur	Litipara	Jabdih	7.7	270	2.30	0.00	0.11	10.25	0.34
72	Pakur	Hiranpur	Gobindpur	6.9	230	2.30	0.00	0.03	5.43	0.28
73	Pakur	Amarapara	Saharghati	6.9	220	1.90	0.00	0.13	0.68	0.36
74	Pakur	Pakur	Solagariya	7.7	270	5.20	0.00	0.10	3.56	0.27
75	Pakur	Maheshpur	Baliadanga	7.5	250	5.30	0.00	0.45	12.41	0.15
76	Pakur	Pakuria	Dumaarsal	8.1	250	1.20	0.00	0.08	3.20	0.62
77	West Singhbhum	Sonuwa	Beljori	7.4	280	5.50	0.00	0.26	2.26	0.14
78	West Singhbhum	Aanadpur	Bhaludungri	6.9	200	0.80	0.00	0.06	13.14	0.28
79	West Singhbhum	Manoharpur	Undhan	7.1	130	3.60	0.00	0.08	2.86	0.27
80	West Singhbhum	Bandgano	Lumbai	7.7	100	6.10	0.00	0.13	1.46	0.31
81	West Singhbhum	Golyalkera	Goikera	7.9	320	4.10	0.00	0.30	1.77	0.17
82	West Singhbhum	Nawamundi	Nawamundi	7.8	50	5.70	0.00	0.02	3.39	0.26
83	West Singhbhum	Chakradharpur	Asantalia	7.6	400	1.30	0.00	0.24	5.34	0.22
84	West Singhbhum	Khuntpani	Sangajata	8.9	220	9.00	0.00	0.33	2.47	0.36
85	West Singhbhum	Tonto	Dokata	8.6	820	1.90	0.00	0.18	10.13	0.31
86	West Singhbhum	Chaibasa	Tambo	8	270	9.70	0.00	0.19	2.94	0.24
87	West Singhbhum	Jhinkpani	Basahatu	8.4	840	3.00	0.00	0.39	1.68	0.16
88	West Singhbhum	Hatgamhariya	Hatgamharia	7.8	550	0.60	0.00	0.29	1.25	0.28
89	West Singhbhum	Jagarnathpur	Jagarnathpur	8	370	0.70	0.00	0.28	14.73	0.42
90	West Singhbhum	Tantnagar	Paharbhanga	8.1	270	3.40	0.00	0.11	2.32	0.15
91	West Singhbhum	Manjhari	Bharbharia	7.7	570	2.20	0.00	0.11	11.35	0.29
92	West Singhbhum	Kumardugi	Kumardugi	8	270	3.70	0.00	0.42	9.13	0.31
93	West Singhbhum	Majhgano	Majhgaon	7.9	570	2.20	0.00	0.15	8.75	0.28

Attachment 3.6.3 Water Quality Testing Result of Open Dug Wells

No	District	Name of Block	Village	pH	TDS	Turbidity	Arsenic	Fluoride	Nitrate	Iron
					mg/L	NTU	mg/L	mg/L	mg/L	mg/L
94	Dumka	Sariyahat	Birna	7.6	360	3.50	0.00	0.24	11.42	0.36
95	Dumka	Jarmundi	Kendwatikar	7.3	230	2.60	0.00	0.31	11.36	0.26
96	Dumka	Jama	Sugnibad	7.5	310	3.10	0.00	0.27	10.45	0.18
97	Dumka	Masliya	Manipur	7.4	430	2.40	0.00	0.62	13.24	0.15
98	Dumka	Ramgarh	Ramgarh	7.3	260	2.80	0.00	0.15	11.27	0.32
99	Dumka	Dumka	Shastrinagar	7.1	410	3.10	0.00	0.48	11.36	0.41
100	Dumka	Kathikund	Kathikund	7.5	310	3.60	0.00	0.15	9.87	0.26
101	Dumka	Ranishwar	Ranigram	7.2	250	4.20	0.00	0.64	6.24	0.15
102	Dumka	Gopikandar	Babuikhura	7.6	150	9.40	0.00	0.07	5.95	0.42
103	Dumka	Shikaripara	Jamugaria	7.8	230	4.20	0.00	0.15	7.45	0.61
104	Godda	Mehrama	Pahar Khand	7.6	580	2.10	0.00	0.08	48.00	0.21
105	Godda	Mahgama	Lilabari	7.8	250	0.80	0.00	0.49	0.15	0.36
106	Godda	Basantrai	Bela Kita	6.9	200	9.70	0.00	0.08	1.95	0.17
107	Godda	Pathargama	Jagarnathpur	7.6	220	1.20	0.00	1.90	2.38	0.35
108	Godda	Godda	Murlidih kita	7	160	0.40	0.00	0.83	30.54	0.24
109	Godda	Poderyahat	Thekaha	7.6	220	6.00	0.00	1.30	3.42	0.16
110	Godda	Thakurganti	Thakurganti	7.9	490	0.60	0.00	0.39	0.24	0.22
111	Godda	Bobarijora	Baghmunda	7.1	166	0.40	0.00	0.28	6.54	0.74
112	Godda	Sundarpahari	Nipaniya	7.6	350	0.70	0.00	0.52	6.66	0.61
113	Khunti	Karra	Karra	6.8	210	0.60	0.00	0.12	0.75	0.12
114	Khunti	Torppa	Barkuli	7.4	208	1.50	0.00	0.31	3.61	0.17
115	Khunti	Rannia	Raniyan	7.3	80	2.00	0.00	0.65	0.33	0.33
116	Khunti	Khunti	Khunti	7.3	84	1.10	0.00	0.27	2.92	0.15
117	Khunti	Murhu	Binda	8.6	560	3.00	0.00	0.19	5.71	0.51
118	Khunti	Arki (Taimara-2)	Serenghatu	7.6	260	0.80	0.00	0.51	6.86	0.15

Source: Drinking Water and Sanitation Department, GOJ

Attachment 3.8.1 Policy and Schemes of Agricultural Marketing

(1) Policy of Agricultural Marketing

(a) Jharkhand Agriculture Produce Markets Act 2000

The Act provides for the levy of market fee at the rate of 1 % on agriculture produce bought and sold in the notified market area. This Act is governed by Cooperation Department of Government of Jharkhand. Most of the market yards in the State are managed within the purview of this Act. As per provision of this Act, Jharkhand State Agriculture Marketing Board (JSAMB) is involved in strengthening of the market yards that include 27 Primary APMCs and 192 Secondary APMCs.

Meanwhile, the Government of India has come with model APMC Bill, to encourage the State Governments to take up reforms related to agriculture marketing that includes setting up of private markets, institutional support to contract farming, direct purchase from farmers' fields and to promote Public Private Partnership (PPP) in developing agriculture markets. Government of Jharkhand has undertaken some of the reforms proposed in model bill.

(b) The Jharkhand Panchayat Raj Act 2001

According to Sec 75 (21) of The Jharkhand Panchayat Raj Act 2001, management of fairs, markets and *haats* comes under the purview of Panchayats. Section 93, 2 (i) (b) of this Act entitles Panchayats to collect fee from local *haats* and markets. Panchayats are encouraged to develop cooperative marketing for agriculture produce. Most of the small rural *haats* are managed by Panchayats. Besides the above Acts, storage and transportation of essential commodities are governed by Essential Commodities Act.

(c) Twelfth Plan Working Group on Agriculture Marketing

The Working Group has highlighted issues related to marketing of horticulture produces which include presence of more number of intermediaries; inadequate infrastructure for storage, sorting, grading and post harvest management; and inadequate access to market information. Amongst different suggestions, the Working Group has proposed promotion of lead farmers at village level to take up marketing of agriculture produces. As there is more of inter-state movement of agriculture produces, the Working Group has also suggested to consider moving 'Agriculture Marketing' as a subject to concurrent list. It has further recommended that Central Government to enact an Inter State Agriculture Produce Trade and Commerce Regulation Act. More importantly, it has suggested that sale of fruits and vegetables be de-notified from APMC Acts or exempted from market fees. Such initiatives related to 'agriculture market reforms' may further boost marketing of fruits and vegetables, especially flow of vegetables from surplus regions of Jharkhand to all across India.

(2) Government of India Schemes related to Agriculture Marketing

(a) Integrated Scheme for Agriculture Marketing (ISAM)

This scheme is implemented by Department of Agriculture & Cooperation, Ministry of Agriculture; the Government of India. The scheme aims at developing agriculture marketing infrastructure for effectively managing marketable surplus of agriculture including horticulture. While doing so, the focus is on promoting innovative and latest technologies related to infrastructure, promote alternative

infrastructure, scientific storage; and developing infrastructure for grading, standardization and quality certification. It also aims at promoting direct marketing and developing integrated value chain till primary processing stage.

(b) Rural Godown Scheme/ Gramin Bhandaran Yojona

Rural Godown Scheme implemented by NABARD, envisages creation of scientific storage capacity in rural areas for storing farm produce, processed farm produce and agriculture inputs. The thrust is on prevention of distress sale immediately after harvest. This scheme is expected to pave for the introduction of a national system of warehouse receipts in respect of agricultural commodities stored in such godowns.

(c) Scheme for Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization

This scheme of the Government of India, implemented by NABARD intends to develop marketing infrastructure in the country to cater to the post-harvest requirement of production and marketable surplus of various farm products. The scheme is implanted in States which have amended the APMC Act, to encourage initiative related to direct marketing and contract farming and to permit setting up of markets in private and cooperative sectors.

(d) National Bank for Agriculture and Rural Development (NABARD)

Under Non Farm Sector initiatives, it provides financial assistance up to Rs.5 lakh to Panchayti Raj Institutions (PRIs) to develop new *haats* or improve existing rural *haats*. It also provides grant assistance to initial viability gaps for group of entrepreneurs like Self Help Groups (SHGs) to set up rural market outlets. It also envisages setting up of clusters by providing support through Cluster development Agency for 3-5 years. Besides this, assistance under Rural Infrastructure Development Fund (RIDF) includes developing market yards, rural haats and cold storage. Support for agriculture marketing and cold chains is available to the State owned institutions having sustained income streams.

(e) National Horticulture Board (NHB)

This is an autonomous society set up by Ministry of Agriculture, the Government of India in 1984. Besides collection of market related information under market information service scheme, NHB provides credit linked back ended subsidy for developing commercial horticulture and post harvest management. It also provides capital investment subsidy for construction, expansion and modernization of cold storages and storages of horticulture produce.

(f) Small Farmers Agribusiness Consortium (SFAC)

With financial assistance of RKVY – A Scheme of the Government of India, SFAC is implementing National Vegetable initiatives for Urban Cluster. This program aims at enhancing production, productivity and profitability of vegetables through off season production under protected cultivation. This market led initiatives focuses on enhcing production of vegetables nearby major cities. In Jharkhand, IGS and CTRAN are implementing partner of SFAC.

With a view to taking advantage of the new international trade environment, Agricultural and Processed Food Products Export Development Authority (APEDA), has also established 48 Agriculture Export Zones (AEZs). The AEZ follows comprehensive approach including cluster approach of identifying the potential products and geographical regions, end to end approach from production to consumption stage

and integration of activities by different agencies. In context of Jharkhand, vegetables have been identified as potential product covering districts like Ranchi, Hazaraibagh and Lohardaga.

Besides this, within the purview of Ministry of Food Processing, one Mega Food Park is coming up near Ranchi. A study by JINFRA and ILFS Clusters has also suggests up-gradation of supply chains infrastructure through Integrated Value Chain Approach. The study recommends setting up backward linkage with Mega Food Park, and giving thrust on developing District Food Processing Hubs with emphasis on focus crops.

Attachment 3.8.2 Jharkhand Mega Food Park Private Limited

(1) About Mega Food Parks in India

Mega Food Parks in India are envisaged to provide modern infrastructure facilities for food processing along the value chains i.e. from farmer to market. The Mega Food Park Scheme (MFPS) is implemented by Ministry of Food Processing Industries, Government of India. These parks are being set up across different production clusters in India. Such parks are expected to contribute to increase in income of farmers, creation of high quality processing infrastructure, reduction in wastage, creation of employment opportunities and capacity building of producers and processors.

(2) Guideline for establishing Mega Food Parks

The Mega Food Park Scheme follows a demand driven approach. Ministry of Food Processing Industries invites Expression of Interest (EoI) for setting up of Mega Food Park. Interested Anchor Promoting Organization along with other partners is required to form a company as Special Purpose Vehicle (SPV) to establish the Mega Food Park. Under the scheme, Ministry provides subsidy up to 50 % of eligible capital cost, maximum being Rs. 50 Crores. The SPV is required to bring in at least 20 percent of total project cost as equity.

The Anchor Investor holding majority stake, with or without other promoters is required to set up food processing unit in the park with investment not less than Rs. 10 Crores. The anchor investor would have 51 % stake in such processing unit(s). The SPV can only give plots/facilities on lease to other food processing units. It is not permitted to sell plots/facilities in Mega Food Park. The common facilities in the park cannot be sold or leased out; which can only be offered on rent basis. As Government of India considers food processing as a priority sector, 100 % Foreign Direct Investment (FDI) is allowed enabling foreign companies to either participate as promoter in Mega Food Park and/or establish processing unit in the food park.

(a) Supports to Food Processing Industry in Jharkhand

Jharkhand Industrial Policy 2012 further encourages establishment of food processing units in the State. All the facilities and benefits extended to Private Industrial Estates like support for infrastructure facilities including road network, drainage, drinking water and power supply would be available to Food Park. The State Government may offer viability gap funding and other help if required. There is provision of quality power at agriculture rate to cold storage/cold chain facilities for five years. Food processing industries would be declared as seasonal industry wherever necessary, and would be eligible to get relief from minimum electricity charges during the closure (non seasonal) period. Industrial units setting up captive power plant are exempted from payment of 50 % of electricity duty for a period of 5 years for power used for self consumption.

Besides this, the food processing units would not be charged market fee on notified agriculture produce purchased for use as raw material from outside State. Assistance @50 % or up to Rs. 2 lakh is also available for units getting quality certification from recognized body. There is also provision of reimbursement of 75 % of NETVAT paid per annum up to maximum of 75 % of total fixed capital investment for sectors including food processing for different duration depending on location.

Government of Jharkhand considers FDI as important way of transmission of skills, knowledge and technology. In its industrial policy, it has proposed to enter into technological collaboration with overseas corporate bodies and multinational companies in sectors including food processing.

(3) Experience of setting up of Mega Food Park across India

The Ministry of Food Processing has given in- principle approval for establishment of 40 Mega Food Parks across India. The potential future domestic demand for consumption of processed foods, combined with subsidy support from Government of India has been key driver for setting up of Mega Food Parks. However, the process for setting up of Mega Food Park seems to be moving at a slow pace. There is limited demand for use of facilities in proposed Food Parks.

As of now, few Mega Food Parks in India are in operational stage. Although there is increasing trend of consumption of processed food in India, in volume terms it has not been significant, thereby limited demand for setting up of new processing units. There has also not been significant participation of FDI in Mega Food Parks. However, the scenario would steadily change, more so with increase in demand for processed foods and reforms in agriculture marketing. With increase in involvement of big corporate entities in Mega Food Parks, the foreign companies are expected explore opportunities to invest in upcoming food parks.

(4) Jharkhand Mega Food Park Private Limited (JMFPPL)

Jharkhand Mega Food Park Private Limited, a Special Purpose Vehicle (SPV) company is setting up Mega Food Park at Getalsud Industrial Area, about 35 km from Ranchi city. This has been promoted by Mumbai based GenX Veture Capital, other partners being Patanjali Ayurveda Limited, Lunar General Trading and State Government through Ranchi Industrial Area Development Authority (RIADA). The proposed food park would have facilities to set up 33 processing units (including plots and sheds for MSMEs) and other facilities like cold storage facility of 10,000 tons, Individually Quick Frozen (IQF) facility, one ripening chamber, dehydration line and warehouse facility. Besides this it would have electric facility through electric sub-station linked to National grid, back up electric generator facility, water facility, Common Effluent Treatment Plant (CETP), truck parking area, workers dormitory, quality control laboratory; and amenity building having Banks, health centre, shops and commercial space.

Discussion with JMFPPL functionaries reveal that, as of now, four companies have explored possibility of setting up of processing facilities like related to cereal processing, tomato pulp making, milk processing and potato fry making. JMFPPL expect that the demand for setting up of units and using facilities would increase steadily. In future, they are planning to take up promotion efforts to attract potential users of Mega Food Park. They further shared that there has been delay in operation of Food Park mainly due to delay in environment clearance for Common Effluent Treatment Plant (CETP). The study team had an opportunity to visit the Jharkhand Mega Food Park site, where the civil construction work was in progress. JMFPPL is hopeful that Mega Food Park would start becoming operational in next six months. JMFPPL is open to explore interest of foreign companies including Japanese companies to set up processing facilities and/or participate through equity investment.

(5) Way Forward

Review of internet websites indicates that there is growing interest of Japanese companies in food

process sector in India. Ajinomoto Co. and Toyo Suisan have planned to set up instant noodle business company Maruchan Ajinomoto India Private Limited. This company would set up processing unit in Chennai in India. Similarly, Indo Nissin Foods Limited, a subsidiary of Japan based Nissin Foods Holdings, has commissioned 20,000 tons per annum 'Short Noodle Processing Unit' in IDCO Food Processing Park at Khurda Industrial Estate, near Bhubaneswar in Odisha. Considering the interest shown by JMFPPL, and implementation of market oriented I-HIMDI project focusing on vegetables, there would be scope for investment by Japanese Food Processing Companies in Jharkhand.

Reference

1) Revised guidelines for Mega Food Park Scheme effective from 10.02.2014, Ministry of Food Processing Industries, Government of India

2) Consolidated FDI Policy (effective from April 17, 2014); Department of Industrial Policy and Promotion Ministry of Commerce and Industry; Government of India

3) Presentation by Jharkhand Mega Food Park Private Limited dated 17th Aug 2012

4) Jharkhand Industrial Policy 2012

5) http://www.ajinomoto.com/en/presscenter/press/detail/g2014_04_03.html

6) http://www.business-standard.com/article/companies/indo-nissin-foods-opens-new-factory-in-odisha-114011501187_1.html

Attachment 3.8.3 The Jharkhand State Adivasi Cooperative Vegetable Marketing Federation Limited (VEGFED)

(1) About the Institution

VEGFED is a State level federation, currently having 357 primary cooperatives as its members. The primary cooperatives include 110 Primary Agriculture Credit Cooperative Societies Limited (PACS) and Large Area Multi Purpose Cooperative Societies Limited (LAMPS); and 257 Vegetable Growers Cooperative Societies Limited (VGCS). Both primary cooperatives and federation are registered under Jharkhand Cooperative Societies Act 1935. All the primary cooperatives cover cluster of villages, and have about 100 members, most of them being male members. These primary cooperatives are spread across 20 districts in Jharkhand, majority being in Ranchi district. As implementing agency of National Vegetable Initiatives for Urban Clusters (RKVY) under RKVY, VEGFED has also promoted about 100 cluster level primary cooperatives registered under Jharkhand Self Supporting Cooperative Societies Act 1996. However, these cooperatives are not affiliated to VEGFED. Some of these cooperatives function in operational area, where its member primary cooperatives already operate.

(2) Services

(a) Services of Primary Cooperatives

VGCSs buy fertilizers and seeds in bulk and sale to its members. About 50 VGCSs collect vegetables from some of its members as separate lots i.e. estimated to be about 2 % of total production, and carry to next distant market for marketing. They charge 2 to 5 % commission on sale of vegetables. Marketing of vegetables mainly relate to experience and expertise of office bearers like President and Secretary of the primary cooperative. Many a times, the VGCS have experienced loss in weight and fluctuation of price may be due to curtail by buyers. In general, the primary cooperatives are not able to provide credit services to their members. VGCSs have not been able to mobilize working capital from Banks. VGCSs involved in sale of inputs, temporarily mobilize working capital from some of its members to transact their business. Based on audit rating, the primary cooperatives affiliated to VEGFED are able to get management subsidy that take care of overhead and human resource expenses.

(b) Services of Federation

With support of RKVY, VEGFED had provided 5 refrigerated vans to different VGCSs to carry vegetables, which is currently not used by cooperatives, as the cost of transportation to be high. Based on experience, federation is planning to provide small pick up vans for use by VGCSs.

1) Retail Outlets - VEGFRESH

With part assistance under RKVY, the federation has planned to set up 15 retail outlets, of which 5 have been set up in Ranchi. These outlets have been given on long term rent basis to Lohardaga VGCS. Visit to one of the outlets reveal procurement of vegetables like cabbage, tomatoes, bitter gourd, cucumber and carrot from member farmers of VGCS on a daily basis. The outlet also sells fruits and grocery items purchased from wholesale market in Ranchi. At present, the daily sale of the outlet is about Rs.10, 000, of which Rs.4, 000 is vegetables. About 200 customers from nearby locality visit the outlet, of which 50 % visit on regular basis. This outlet has air conditioned facility and is conveniently located with in reach of potential customers.

2) Cold Storage facility

In 1999, VEGFED took over a damaged cold store at **Bero** from District Rural Development Authority (DRDA). VEGFED has done major repair and maintenance, including construction work and installation of refrigeration system. At present, the cold store is managed in Public Private Partnership (PPP) mode by Lohardaga VGCS at a rent of Rs.6.55 lakh per year. This cold store has two chambers of 1000 tons each, one store being used for storing seed potatoes by local farmers; and other is partly used for storing mohua and tamarind by traders. About 2000 potatoes farmers spread across 20 villages start use the facility for storing seed potatoes. They start storing from Feb till June, the cost of storage being Rs.200 per quintal per season, inclusive of storing, loading and unloading. Farmers usually remove potatoes with start of Kharif and Rabi season for seed purpose. Similarly, about Rs.100 per quintal is charged per season to traders for storing seeded tamarind and mohua. Overall, the VGCS managing the cold store is able to generate revenue of Rs. 30 lakh per year, expenses being Rs.26 lakh. Based on experience, VGCS considers that managing higher capacity cold store like 5000 tons would be more profitable.

With 55 % contribution from National Cooperative Development Corporation (NCDC), Government of India and 45 % contribution through RKVY scheme, VEGFED is constructing cold store with 5000 tons capacity at **Boria** near Ranchi. The construction of this cold store started in year 2007, with an estimated cost of Rs.2.6 Crores. It has 3 chambers i.e. 2 chambers with 2400 tons capacity for storing potato (one already constructed) and one chamber of 200 tons for storing vegetables. The cold store is yet to be operational as it does not have access to high voltage electricity. The tendering process for running the cold store in PPP mode is expected to be initiated in near future. Meanwhile, VEGFED has taken over 3 non functional cold stores earlier constructed by Welfare Department based at Chitra, Dumka and Ranchi; which expected to be revived in PPP mode.

(c) Setting up of Market Yards in existing APMC Market Yards

In collaboration with Jharkhand State Agriculture Marketing Board, VEGFED has planned to set up 9 market yards for vegetables in existing APMC market yards. Such market yards would have facilities like sheds, collection area, processing area, weighing machine, storage area and drinking water facilities.

(d) Implementation of RKVY Scheme – National Vegetable Initiative for Urban Clusters

This RKVY scheme is being implemented with support of primary cooperatives in different production clusters. About 5000 farmers have received technical support and training under this scheme.

(3) Way forward

During implementation of I-HIMDI project, there is potential for leveraging institutional strength and on-going programs of VEGFED. This may include effective utilization of marketing infrastructure being created by VEGFED, and strengthening VGCSs. There could be possibility of linking MFGs and its members to VGCSs promoted by VEGFED.

Attachment 3.9.1

Attachment 3.9.1 State-wise Irrigation Area

State	Geographycal Area (km^2)	Net Area Sown (km^2)	Net Irrigated Area (km^2)	Rate (%)
Andhra Pradesh	27,507	9,991	4,214	42.2
Arunachal Pradesh	8,374	212	56	26.4
Assam	7,844	2,810	197	7.0
Bihar	9,416	5,332	3,394	63.7
Chhattisgarh	13,519	4,683	1,323	28.3
Goa	370	132	29	22.0
Gujarat	19,602	10,302	4,336	42.1
Haryana	4,421	3,550	3,069	86.5
Himachal Pradesh	5,567	542	108	19.9
Jammu & Kashmir	22,224	736	318	43.2
Jharkhand	**7,972**	**1,250**	**102**	**8.2**
Karnataka	19,179	10,404	3,390	32.6
Kerala	3,886	2,079	386	18.6
Madhya Pradesh	30,825	14,971	6,892	46.0
Maharashtra	30,771	17,401	3,254	18.7
Manipur	2,233	233	52	22.3
Meghalaya	2,243	283	62	21.9
Mizoram	2,108	123	10	8.1
Nagaland	1,658	361	73	20.2
Odisha	15,571	5,574	2,180	39.1
Punjab	5,036	4,158	4,073	98.0
Rajasthan	34,224	16,975	5,850	34.5
Sikkim	710	77	14	18.2
Tamil Nadu	13,006	4,892	2,864	58.5
Tripura	1,049	280	58	20.7
Uttar Pradesh	5,348	741	338	45.6
Uttarakhand	24,093	16,589	13,455	81.1
West Bengal	8,875	5,256	3,112	59.2
Union Territories	*1,095*	*85*	*47*	55.3
Total India	**328,726**	**140,022**	**63,256**	**45.2**

Source: Directorate of Economics and Statistics, Ministry of Agriculture, GOI, New Delhi

Attachment 3.9.2 State-wise Minor Irrigation Area

	Area	Population	Irrigated Area (ha) 2006-2007			Rate	
	(km^2)	(person)	Groundwater	Surface	Total	Irrigation Covergae (%)	Irrigation Area (m2) per person
	a	b	c	d	e	e/a/100	e/b * 10000
Andhra Pradesh	275,045	84,580,777	2,540,834	1,221,322	3,762,156	13.68%	444.80
Arunachal Pradesh	83,743	1,383,727	577	86,608	87,185	1.04%	630.07
Assam	78,438	31,205,576	179,964	164,322	344,286	4.39%	110.33
Bihar	94,163	104,099,452	594,119	127,903	722,022	7.67%	69.36
Chhattisgarh	135,191	25,545,198	1,137,725	582,492	1,720,217	12.72%	673.40
Goa	3,702	1,458,545	4,898	6,822	11,720	3.17%	80.35
Gujarat	196,024	60,439,692	2,929,644	264,474	3,194,118	16.29%	528.48
Haryana	44,212	25,351,462	1,183,459	1,591	1,185,050	26.80%	467.45
Himachal Pradesh	55,673	6,864,602	25,760	102,665	128,425	2.31%	187.08
Jammu & Kashmir	222,236	12,541,302	6,793	222,648	229,440	1.03%	182.95
Jharkhand	**79,714**	**32,988,134**	**169,907**	**299,340**	**469,248**	**5.89%**	142.25
Karnataka	191,791	61,095,297	1,300,305	570,139	1,870,444	9.75%	306.15
Kerala	38,863	33,406,061	88,550	173,823	262,372	6.75%	78.54
Madhya Pradesh	308,245	72,626,809	6,154,678	1,714,904	7,869,582	25.53%	1,083.56
Maharashtra	307,713	112,374,333	4,017,226	1,251,942	5,269,169	17.12%	468.89
Manipur	22,327	2,570,390	0	23,747	23,747	1.06%	92.39
Meghalaya	22,429	2,966,889	371	91,616	91,987	4.10%	310.05
Mizoram	21,081	1,097,206	0	13,225	13,225	0.63%	120.53
Nagaland	16,579	1,978,502	173	82,335	82,508	4.98%	417.02
Odisha	155,707	41,974,218	257,789	852,680	1,110,469	7.13%	264.56
Punjab	50,362	27,743,338	3,676,297	15,842	3,692,139	73.31%	1,330.82
Rajasthan	342,239	68,548,437	4,959,934	218,949	5,178,882	15.13%	755.51
Sikkim	7,096	610,577	0	17,266	17,266	2.43%	282.78
Tamil Nadu	130,058	72,147,030	2,305,048	921,915	3,226,963	24.81%	447.28
Tripura	10,486	3,673,917	6,860	44,445	51,305	4.89%	139.65
Uttar Pradesh	53,483	199,812,341	13,739,495	85,960	13,825,454	258.50%	691.92
Uttarakhand	240,928	10,086,292	266,349	210,891	477,240	1.98%	473.16
West Bengal	88,752	91,276,115	1,585,305	677,226	2,262,530	25.49%	247.88
Union Territories	*10,960*	*20,123,354*	*31,733*	*13,666*	*45,399*	*4.14%*	22.56
Total India	3,287,240	1,210,569,573	47,163,791	10,060,756	57,224,547	17.41%	472.71
Source	A	A	B	B	B		

Source A: Census of India 2011 (http://www.censusindia.gov.in/pca/default.aspx)
B: 4th Minor Irrigation Census (2006-2007)

Attachment 3.9.3 District-wise Minor Irrigation Schemes in Jharkhand

	Area	Population	Irrigated Area (ha) 2006-2007			Rate	
	(km^2)	(person)	Groundwater	Surface	Total	Irrigation Covergae (%)	Irrigation Area (m2) per person
	a	b	c	d	e	e/a/100	e/b * 10000
Garhwa	4,288	1,322,784	2,369	6,248	8,617	2.01%	65.14
Chatra	3,755	1,042,886	6,275	11,955	18,230	4.85%	174.80
Kodarma	1,302	716,259	3,673	3,382	7,055	5.42%	98.50
Giridih	**4,932**	**2,445,474**	**6,971**	**6,116**	**13,086**	**2.65%**	**53.51**
Deoghar	2,482	1,492,073	10,939	11,814	22,753	9.17%	152.49
Godda	2,318	1,313,551	8,947	104,106	113,053	48.76%	860.67
Sahibganj	2,018	1,150,567	1,689	3,940	5,629	2.79%	48.92
Pakur	**1,817**	**900,422**	**1,698**	**3,388**	**5,086**	**2.80%**	**56.48**
Dhanbad	2,042	2,684,487	5,045	6,690	11,735	5.75%	43.71
Bokaro	2,890	2,062,330	2,254	6,444	8,697	3.01%	42.17
Lohardaga	**1,536**	**461,790**	**2,701**	**1,505**	**4,206**	**2.74%**	**91.08**
Purbi Singhbhum	5,567	2,293,919	1,930	5,370	7,300	1.31%	31.82
Palamu	**5,247**	**1,939,869**	**13,803**	**19,021**	**32,824**	**6.26%**	**169.21**
Latehar	**3,192**	**726,978**	**7,488**	**18,210**	**25,698**	**8.05%**	**353.49**
Hazaribagh	**4,659**	**1,734,495**	**1,434**	**2,015**	**3,450**	**0.74%**	**19.89**
Ramgarh	1,388	949,443	2,127	456	2,583	1.86%	27.21
Dumka	**3,790**	**1,321,442**	**49,133**	**38,925**	**88,058**	**23.23%**	**666.38**
Jamtara	1,792	791,042	4,595	7,599	12,195	6.81%	154.16
Ranchi	**5,116**	**2,914,253**	**11,533**	**3,838**	**15,371**	**3.00%**	**52.74**
Khunti	**2,467**	**531,885**	**4,755**	**882**	**5,637**	**2.29%**	**105.98**
Gumla	**5,389**	**1,025,213**	**15,009**	**12,571**	**27,580**	**5.12%**	**269.02**
Simdega	3,716	599,578	2,589	2,544	5,133	1.38%	85.61
Pashchimi Singhbhum	**5,627**	**1,502,338**	**1,775**	**18,719**	**20,494**	**3.64%**	**136.41**
Saraikela-Kharsawan	**2,372**	**1,065,056**	**1,177**	**3,599**	**4,776**	**2.01%**	**44.84**
Total Jharkhand	79,701	32,988,134	169,907	299,340	469,248	5.89%	142.25
Source	A	A	B	B	B		

Source A: Census of India 2011 (http://www.censusindia.gov.in/pca/default.aspx)
B: 4th Minor Irrigation Census (2006-2007)

Attachment 3.9.4 Road Density by State

State	Area (km^2)	Population (1,000)	Total Road Length (km)	Road Density			
				(km/100 km2)	Ranking	(km/1000 persons)	Ranking
Andhra Pradesh	275,045	84,581	238,001	86.53	16	2.81	20
Arunachal Pradesh	83,743	1,384	21,555	25.74	27	15.58	3
Assam	78,438	31,206	241,790	308.26	4	7.75	6
Bihar	94,163	104,099	130,641	138.74	12	1.25	26
Chhattisgarh	135,191	25,545	93,965	69.51	21	3.68	15
Goa	3,702	1,459	10,627	287.06	5	7.29	9
Gujarat	196,024	60,440	156,188	79.68	19	2.58	23
Haryana	44,212	25,351	41,729	94.38	14	1.65	25
Himachal Pradesh	55,673	6,865	47,963	86.15	17	6.99	10
Jammu & Kashmir	222,236	12,541	26,979	12.14	28	2.15	24
Jharkhand	**79,714**	**32,988**	**23,902**	**29.98**	**26**	**0.72**	**27**
Karnataka	191,791	61,095	281,773	146.92	11	4.61	13
Kerala	38,863	33,406	201,220	517.77	1	6.02	12
Madhya Pradesh	308,245	72,627	197,293	64.01	23	2.72	21
Maharashtra	307,713	112,374	410,520	133.41	13	3.65	16
Manipur	22,327	2,570	19,134	85.70	18	7.44	8
Meghalaya	22,429	2,967	11,985	53.44	24	4.04	14
Mizoram	21,081	1,097	9,810	46.53	25	8.94	5
Nagaland	16,579	1,979	34,146	205.96	6	17.26	2
Odisha	155,707	41,974	258,836	166.23	8	6.17	11
Punjab	50,362	27,743	84,193	167.18	7	3.03	19
Rajasthan	342,239	68,548	241,318	70.51	20	3.52	17
Sikkim	7,096	611	4,630	65.25	22	7.58	7
Tamil Nadu	130,058	72,147	192,339	147.89	10	2.67	22
Tripura	10,486	3,674	33,773	322.08	3	9.19	4
Uttar Pradesh	53,483	199,812	49,276	92.13	15	0.25	28
Uttarakhand	240,928	10,086	390,255	161.98	9	38.69	1
West Bengal	88,752	91,276	299,208	337.13	2	3.28	18
Union Territories	*10,960*	*20,123*	*37,294*	*340.27*		*1.85*	
Total India	**3,287,240**	**1,210,570**	**3,790,343**	**115.30**		**3.13**	
Source	A	A	B	B	B	B	B

Source:
A: Census of India 2011 (http://www.censusindia.gov.in/pca/default.aspx)
B: Source: PMGSY website (http://omms.nic.in/Aspnet/Citizens/NAT/08NSP/NSPlocalized.aspx).

Attachment 3.9.5

Attachment 3.9.5 Households Having Safe Drinking Water Facilities

	1991			2001			2011		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
All-India (*)	**62.3%**	**55.5%**	**81.4%**	**77.9%**	**73.2%**	**90.0%**	**85.5%**	**82.7%**	**91.4%**
Andhra Pradesh	55.1%	49.0%	73.8%	80.1%	76.9%	90.2%	90.5%	88.6%	94.5%
Arunachal Pradesh	70.0%	66.9%	88.2%	77.5%	73.7%	90.7%	78.6%	74.3%	91.3%
Assam	45.9%	43.3%	64.1%	58.8%	56.8%	70.4%	69.9%	68.3%	78.2%
Bihar	58.8%	56.5%	73.4%	86.6%	86.1%	91.2%	94.0%	93.9%	94.7%
Chhattisgarh**	-	-	-	70.5%	66.2%	88.8%	86.3%	84.1%	93.9%
Goa	43.4%	30.5%	61.7%	70.1%	58.3%	82.1%	85.7%	78.4%	90.4%
Gujarat	69.8%	60.0%	87.2%	84.1%	76.9%	95.4%	90.3%	84.9%	97.0%
Haryana	74.3%	67.1%	93.2%	86.1%	81.1%	97.3%	93.8%	92.0%	96.7%
Himachal Pradesh	77.3%	75.5%	91.9%	88.6%	87.5%	97.0%	93.7%	93.2%	97.8%
Jammu and Kashmir	-	-	-	65.2%	54.9%	95.7%	76.8%	70.1%	96.1%
Jharkhand**	**-**	**-**	**-**	**42.6%**	**35.5%**	**68.2%**	**60.1%**	**54.3%**	**78.4%**
Karnataka	71.7%	67.3%	81.4%	84.6%	80.5%	92.1%	87.5%	84.4%	92.3%
Kerala	18.9%	12.2%	38.7%	23.4%	16.9%	42.8%	33.5%	28.3%	39.4%
Madhya Pradesh	53.4%	45.6%	79.4%	68.4%	61.5%	88.6%	78.0%	73.1%	92.1%
Maharashtra	68.5%	54.0%	90.5%	79.8%	68.4%	95.4%	83.4%	73.2%	95.7%
Manipur	38.7%	33.7%	52.1%	37.0%	29.3%	59.4%	45.4%	37.5%	60.8%
Meghalaya	36.2%	26.8%	75.4%	39.0%	29.5%	73.5%	44.7%	35.1%	79.5%
Mizoram	16.2%	12.9%	19.9%	36.0%	23.8%	47.8%	60.4%	43.4%	75.8%
Nagaland	53.4%	55.6%	45.5%	46.5%	47.5%	42.3%	53.4%	54.6%	51.8%
Odisha	39.1%	35.3%	62.8%	64.2%	62.9%	72.3%	75.3%	74.4%	79.8%
Punjab	92.7%	92.1%	94.2%	97.6%	96.9%	98.9%	97.6%	96.7%	98.9%
Rajasthan	59.0%	50.6%	86.5%	68.2%	60.4%	93.5%	78.1%	72.8%	94.3%
Sikkim	73.1%	70.8%	92.9%	70.7%	67.0%	97.1%	85.3%	82.7%	92.2%
Tamil Nadu	67.4%	64.3%	74.2%	85.6%	85.3%	85.9%	92.5%	92.2%	92.9%
Tripura	37.2%	30.6%	71.1%	52.5%	45.0%	85.8%	67.5%	58.1%	91.9%
Uttar Pradesh	62.2%	56.6%	85.8%	87.8%	85.5%	97.2%	95.1%	94.3%	97.9%
Uttarakhand**	-	-	-	86.7%	83.0%	97.8%	92.2%	89.5%	98.7%
West Bengal	82.0%	80.3%	86.2%	88.5%	87.0%	92.3%	92.2%	91.4%	93.9%
Union Territories									
A. & N. Islands	67.9%	59.4%	90.9%	76.7%	66.8%	97.8%	85.5%	78.2%	98.1%
Chandigarh	97.7%	98.1%	97.7%	99.8%	99.9%	99.8%	99.3%	98.7%	99.4%
D. & N. Haveli	45.6%	41.2%	91.0%	77.0%	70.5%	96.1%	98.7%	97.8%	99.0%
Daman and Diu	71.4%	56.9%	86.8%	96.3%	94.9%	98.9%	91.6%	84.3%	98.4%
Delhi	95.8%	91.0%	96.2%	97.2%	90.1%	97.7%	95.0%	87.9%	95.2%
Lakshadweep	11.9%	3.4%	18.8%	4.6%	4.6%	4.6%	22.8%	31.2%	20.2%
Puducherry	88.8%	92.9%	86.1%	95.9%	96.6%	95.5%	97.8%	99.6%	97.0%

Source: Office of the Registrar General of India, Ministry of Home Affairs

(*) All India figures excludes Jammu & Kashmir in 1991 census.

(**) These states created in the year 2001.

Attachment 3.9.6 Households Having Electricity

	2001			2011		
	Total	Rural	Urban	Total	Rural	Urban
All-India (*)	**55.9%**	**43.5%**	**87.6%**	**67.2%**	**55.3%**	**92.7%**
Andhra Pradesh	67.2%	59.7%	90.0%	92.2%	89.7%	97.3%
Arunachal Pradesh	54.7%	44.5%	89.4%	65.7%	55.5%	96.0%
Assam	24.9%	16.5%	74.3%	37.0%	28.4%	84.1%
Bihar	10.3%	5.1%	59.3%	16.4%	10.4%	66.7%
Chhattisgarh**	53.1%	46.1%	82.9%	75.3%	70.0%	93.7%
Goa	93.6%	92.4%	94.7%	96.9%	95.6%	97.7%
Gujarat	80.4%	72.1%	93.4%	90.4%	85.0%	97.2%
Haryana	82.9%	78.5%	92.9%	90.5%	87.2%	96.2%
Himachal Pradesh	94.8%	94.5%	97.4%	96.8%	96.6%	98.1%
Jammu and Kashmir	80.0%	74.8%	97.9%	85.1%	80.7%	98.0%
Jharkhand	**24.3%**	**10.0%**	**75.6%**	**45.8%**	**32.3%**	**88.0%**
Karnataka	78.6%	72.2%	90.5%	90.6%	86.7%	96.4%
Kerala	70.2%	65.5%	84.3%	94.4%	92.1%	97.0%
Madhya Pradesh	70.0%	62.3%	92.3%	67.1%	58.3%	92.7%
Maharashtra	77.5%	65.2%	94.3%	83.9%	73.8%	96.2%
Manipur	60.0%	52.5%	82.0%	68.3%	61.2%	82.4%
Meghalaya	42.7%	30.3%	88.1%	60.9%	51.6%	94.9%
Mizoram	69.6%	44.1%	94.4%	84.2%	68.8%	98.1%
Nagaland	63.6%	56.9%	90.3%	81.6%	75.2%	97.4%
Odisha	26.9%	19.4%	74.1%	43.0%	35.6%	83.1%
Punjab	91.9%	89.5%	96.5%	96.6%	95.5%	98.3%
Rajasthan	54.7%	44.0%	89.6%	67.0%	58.3%	93.9%
Sikkim	77.8%	75.0%	97.1%	92.5%	90.2%	98.7%
Tamil Nadu	78.2%	71.2%	88.0%	93.4%	90.8%	96.1%
Tripura	41.8%	31.8%	86.4%	68.4%	59.5%	91.6%
Uttar Pradesh	31.9%	19.8%	79.9%	36.8%	23.8%	81.4%
Uttarakhand	60.3%	50.4%	90.9%	87.0%	83.1%	96.5%
West Bengal	37.5%	20.3%	79.6%	54.5%	40.3%	85.1%
North Eastern States	NR	NR	NR	NR	NR	NR
Union Territories	NR	NR	NR	NR	NR	NR
A. & N. Islands	76.8%	68.1%	95.2%	86.1%	79.4%	97.7%
Chandigarh	96.8%	97.4%	96.7%	98.4%	97.3%	98.4%
D. & N. Haveli	86.0%	82.6%	95.8%	95.2%	91.7%	98.5%
Daman and Diu	97.8%	97.5%	98.3%	99.1%	98.3%	99.3%
Delhi	92.9%	85.5%	93.4%	99.1%	97.8%	99.1%
Lakshadweep	99.7%	99.7%	99.7%	99.7%	99.8%	99.7%
Puducherry	87.8%	81.0%	91.4%	97.7%	95.8%	98.5%

NR : Not reported.

(*) All India figures excludes Jammu & Kashmir in 1991 Census.

Source1: Office of the Registrar General of India, Ministry of Home Affairs (Col 2-7)

Source2: National Sample Survey Office, NSO, Ministry of Statistics & P.I.(Col 8 onwards)

Attachment 3.10.1 List of *Krish Vigyan Kendra* (KVK) in Jharkhand

Location of the KVK	Address / District	Year of establishment	Institutions that manage the KVK
Divyayan KVK	P.O. Morabadi, Ranchi, Pin-834008	1977	Ramkrishna Mission Ashram
KVK Jagannathpur	P.O. Jagannathpur, West Singhbhum, Pin-833203	1983	Birsa Agricultural University
KVK Hazaribagh	Hazaribagh, V.T.I., Pin -825 301	1984	Holycross
KVK Sujani	Sujani, P.O. Ghorlash, Deoghar, Pin -814152	1985	Santhal Paharia Seva Mandal
KVK Sindhri	Sindhri, Dhanbad, Pin-828122	1994	Birsa Agricultural University
KVK Chianki	Palamu	2002	Birsa Agricultural University
KVK Dumka	Zonal Agricultural Research Station, Khuttabandh, Dumka Dist., Pin-814101	2004	Birsa Agricultural University
KVK Maheshpur	Pakur	2004	Birsa Agricultural University
KVK Kisko	Lohardaga	2004	Birsa Agricultural University
KVK Bengabad	Giridih	2004	Birsa Agricultural University
KVK Petawar	Bokaro	2004	Birsa Agricultural University
KVK Darisai	East Singhbhum	2004	Birsa Agricultural University
KVK Sahebganj	Sahebganj	2004	Birsa Agricultural University
KVK Tapej	Chatra	2004	Birsa Agricultural University
KVK Garhwa	Garhwa	2004	Birsa Agricultural University
KVK Bishunpur	Bishunpur, Gumla, Pin-83533	2004	Vikas Bharti
KVK Koderma	Koderma	2005	Central Rice Research Institute (CRRI)
KVK Godda	Godda	2006	Gramin Vikas Trust
KVK Bena	Jamtara		Birsa Agricultural University
KVK Balumath	Latehar		Birsa Agricultural University
KVK Bano	Simdega		Birsa Agricultural University
KVK Kharsawan	Seraikela		Birsa Agricultural University

Attachment 3.10.2 NGOs Listed as the Resources of the Department of Agriculture in Jharkhand

Sl.	District/Block	Name of the NGO
1	Adilabad	Centre For Education And Agriculture Development
2	Bokaro	Bhartiya Vikas Shanti Kendra
3	Bokaro	Centre For Manpower Research
4	Bokaro	Jan Chetna Manch
5	Bokaro	Jan Shikshan Sansthan
6	Bokaro	Simanchal Jankalyan Samiti
7	Chalibasa	Marsal Vikas Kendra
8	Daltonganj	Mahila Samagra Utthan Samiti
9	Deoghar	Aanteeka
10	Deoghar	Aid India
11	Deoghar	Lokdeep
12	Deoghar	Manav Seva
13	Deoghar	Network For Enterprise Enhancement And Development Support
14	Deoghar	Phooleen Mahila Chetna Vikas Kendra
15	Deoghar	Sahara Arpan
16	Deoghar	Swarajya Ashram Deoghar
17	Deoghar	Trust For Rural Artisans And Communities Related Health Nutrition And Awareness
18	Deoghar	Yam India
19	Dhanbad	Arogya Educational And Health Foundation
20	Dhanbad	Jorapokhar Pacs Ltd
21	Dhanbad	Lifetech Development Institution Trust
22	Dhanbad	Maharshi Hariram Saran Shastri Educational And Social Trust
23	Dhanbad	Navyug Welfare Society
24	Dhanbad	Needs
25	Dhanbad	Prerana
26	Dhanbad	Randhir Verma Memorial Society
27	Dhanbad	Shree Om Sai Sanstha
28	Dindigul	Simcodess
29	Dumka	Adwaa
30	Dumka	People For Animals
31	Dumka	Social Welfare Development Organisation
32	Purbi Singhbhum	Rural Outright Development Society
33	Godda	Sewarth Nyas Parishad
34	Godda	Siksha Sanskriti Kendra
35	Godda	The Soul
36	Gumla	Association For Human Ecological And Agricultural Development
37	Gumla	Unique Social Health Association
38	Hazaribagh	Ashadeep

Attachment 3.10.2

Sl.	District/Block	Name of the NGO
39	Hazaribagh	Dharohar
40	Hazaribagh	Jan Jagran Kendra
41	Hazaribagh	Jan Sewa Parishad
42	Hazaribagh	Karnpura Gramin Vikash Kendra
43	Hazaribagh	Lok Jagriti Kendra
44	Hazaribagh	Maitri
45	Hazaribagh	Marksman Welfare Societyg
46	Hazaribagh	Social Upliftment Trust
47	Hazaribagh	Utsava Society
48	Hazaribagh	YMCA
49	Howrah	Aman Samaj Kalyan
50	Jamshedpur	Alhabib Society
51	Jamshedpur	Awake
52	Jamshedpur	Lakshya Development Society
53	Jamshedpur	Neev
54	Jamshedpur	Parents Association Of Mentally Handicapped
55	Jamshedpur	Rural Organisation For Socio Economic Development
56	Jamshedpur	Social And Healthy Action For Rural Empowerment
57	Jamshedpur	Socially Economic Welfare Association
58	Jamshedpur	Socially Educational Welfare Associationr
59	Jamshedpur	Society For Community Empowerment
60	Jamshedpur	Socio Economic And Education Development Society
61	Jamshedpur	Sparsh
62	Jamshedpur	Srijansheel
63	Jamshedpur	Tantushree Seva Sangh
64	Jamshedpur	Tantushri Seva Sangh
65	Jamshedpur	Uditya
66	Jamshedpur	Youth Unity For Voluntary Action
67	Jharkhand	Jharkhand Org In
68	Jharkhand	One Percent Humanity
69	Jharkhand	Prerana
70	Kharsawan	Samarpan
71	Khunti	Mission Development
72	Korba	Ankuran
73	Lohardaga	Plus Foundation a
74	Lohardaga	Sewa Mitra Kuru
75	Lohardaga	Sewa Mitra
76	Pakur	Aman Samaj Kalyan Evem Arthik Vikash Sansthan
77	Pakur	Rasta
78	Palamu	Society For Environment And Social Awareness

Sl.	District/Block	Name of the NGO
79	Patratu	Patratu School Of Economics
80	Ramgarh	Al Barkaat Educational And Charitable Trust
81	Ramgarh	Social Action For Peoples Empowerment
82	Ranchi	Anant Vikas Srott
83	Ranchi	Asmat The Human Development And Research Organization
84	Ranchi	Centre For Development
85	Ranchi	Chotanagpur Gram Vikas Sansthan
86	Ranchi	Chotanagpur Sanskritik Sangh
87	Ranchi	Deepshikha Institute For Child Development And Mental Health
88	Ranchi	Devnet
89	Ranchi	Enviroplan
90	Ranchi	Heritage Bharatdeep Foundation
91	Ranchi	Jan Sarokar
92	Ranchi	Jharkhand Swabhiman
93	Ranchi	Laser Legal Association For Social And Economic Reforms
94	Ranchi	Maharshi Menhi Kalyan Kendra
95	Ranchi	Missi
96	Ranchi	Nav Yuva
97	Ranchi	Nayee Roshni
98	Ranchi	Prerna
99	Ranchi	Rural Peoples Foundation
100	Ranchi	Samajik Kalyan Yojna Trust
101	Ranchi	Samvad i
102	Ranchi	Sanjeevni
103	Ranchi	Society For Rural Industrialisation
104	Ranchi	South Vihar Welfare Society For Tribals
105	Ranchi	Swatantra Samaj Sewa
106	Ranchi	Veena
107	Ranchi	Yugantar Bharati
108	Sahibganj	Shiksha Evam Kalyan Samiti
109	Shibganj	Swami Vevekanand Janjatiya Uthhan Samiti
110	Singhbhum	Bethel Outreach Ministry
111	Singhbhum	Christion Council For Rural Development And Research
112	Singhbhum	Parents Association Of Mentally Handicapped
113	Singhbhum	Resource Management Group Of India
114	Singhbhum	Tara Seva Sadan
115	Singhbhum	Temseca East
116	Singhbhum	Tribal Cultural Society

Source: DoA website (http://agri.jharkhand.gov.in/?ulink=resources/ngo.asp)

Potential SHG Profiling Survey

Purpose:
1) To gather basic information of potential SHG
2) To grasp water availability in open wells for MDI in potential project areas
3) To grasp the needs and problems of horticulture production and marketing among SHG households

Implementer: JSLPS District Office Staff / Block Office Staff and/or any other person who is capable to do this survey

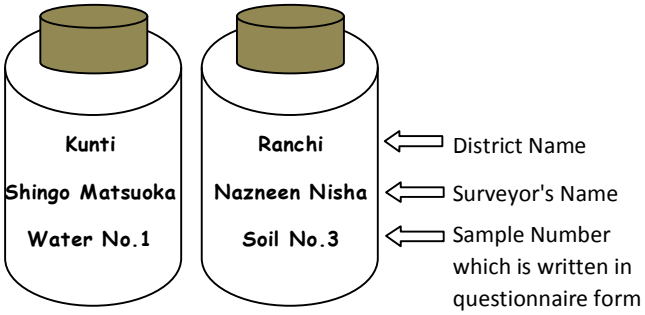
Sample Number: 300 SHGs in the target district of the I-HIMDI

SHG Selection Criteria:
a) Willing to install MDI facilities to members
b) Accessible to assembly market[1] in the block
c) Having more than 3 SHG members who own open wells

Survey Period: April 23-May 7 (15 days)

Target Area: Selected blocks in terms of market accessibility shown in the attachment

Procedure:
1) To select target SHGs that meet all of the above criteria in each block
2) To interview representatives of the SHG using the questionnaire form
3) To do water sampling and to take photograph of one well in their hamlet
   Write the name of district, surveyor's name and sample number on sampling bottles.
4) To do soil sampling in farm land and to take photograph of the farm land in their hamlet
5) To bring the questionnaires filled in and water & soil samples to JICA survey office (Room 108, Chanakya BNR Hotel, Ranchi)
   Submit the questionnaire and water & samples whenever all the samples allotted to the district are collected (even earlier than the deadline of submission). Early submission would be highly appreciated!



Example



Typical Image of Assembly Market

[1]Assembly market (or aggregating market) is located in/near production areas and primarily functions as a key nexus for farmers to access various traders leading their products to broader end-users.

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

Questionnaire for Potential SHG Profile Survey

Date of Interview: _____

Time of Interview: _____

Name of Interviewer: _____

1. Basic Information

Name of SHG					
Location	Village:	Block:		District:	
Membership	Total:	Male:		Female:	
Establishment	Month/Year:	By whom:			
President Name		**Tel. No.**			
Secretary Name & Tel No.		**Treasurer Name & Tel No.**			
Total No. of SHG in the Village		**Formation of Village Organization**		❑ Yes	❑ No
Total No. of Farmers' Club in the Village		**Formation of Farmer Producer Organization**		❑ Yes	❑ No
Name of Accessible Assembly Market					
Number of Members who own Open Wells which do not dry up during off-season horticulture cultivation season					person(s)

2. Organization

Five Disciplines of SHGs set by JSLPS	1) Regular saving	❑ Yes	❑ No	❑ Monthly	❑ Weekly	❑ Other
	2) Regular meeting	❑ Yes	❑ No	❑ Monthly	❑ Weekly	❑ Other
	3) Regular inter-loaning	❑ Yes	❑ No	❑ Monthly	❑ Weekly	❑ Other
	4) Regular repayment	❑ Yes	❑ No	❑ Monthly	❑ Weekly	❑ Other
	5) Regular book keeping	❑ Yes	❑ No	❑ Monthly	❑ Weekly	❑ Other
Weekly saving	Rs./week					
Revolving Fund	❑ Yes	❑ No	Amount: Rs.		Disbursed date:	
CIF	❑ Yes	❑ No	Amount: Rs.		Disbursed date:	
Corpus of SHG	In box: Rs.			In Bank: Rs.		
	In circulation among members (as inter-loan): Rs.					
Inter-loaning	No. of person taken loan till date?					person(s)
	No. of person of not taken loan till date?					person(s)
	How many times loan have been taken in the last 1 yr as an inter-loan?					time(s)
	How much amount of money was taken as inter-loan in last 1 yr?					(Rs.)
	How many due dates were in the last 1 year?					time(s)
	How many borrowers completed their repayment within the due date in last 1 year?					person(s)
	Defaulter	How many times?				time(s)
		Reason why?				
	Interest Rate	To members:				%/month
		To outsiders (if any):				%/month
		To defaulters:				%/month
	Interest taken in last 1 year	From members: Rs.				
		From outsiders: Rs.				
	Fine taken in last 1 year	From members: Rs.				
		From outsiders: Rs.				

Services from JSLPS	Community Coordinator	❑ Yes	❑ No
	Master Book Keeper	❑ Yes	❑ No
	Professional Resource Person	❑ Yes	❑ No
	Community Resource Person	❑ Yes	❑ No
	Trainings (last 2 years) ❑ Yes ❑ No	Specify:_____ Number of Participants: person(s)	
		Specify:_____ Number of Participants: person(s)	
	Exposure (last 2 years)	❑ Yes ❑ No Number of Participants: person(s)	
Bank Linkage	Bank Account ❑ Yes ❑ No		
	Name of financial institution/bank:		
	How many time loan taken: time(s)	Total Amount of loan taken: Rs.	
	Purpose of the loan:	Specify:_____ Specify:_____	
	Overdue(for over 3 months):	❑ Yes ❑ No	
	Outstanding debt:	Rs.	
Three Major Problems in SHG Operation	1.		
	2.		
	3.		

3. Vegetable Production in their Hamlet(s)

Vegetable Crop Calendar	Month / Crop (specify)	Timing (Sowing: ■ Harvest: □)											
		6	7	8	9	10	11	12	1	2	3	4	5
	(Example) Tomato	■	■			□	□			□	□		

Available Irrigation Water Source	❑ Well ❑ Tubewell ❑ Pond ❑ River ❑ Other, specify:_____ (Multiple answers are acceptable.)
Fertilizer Application	❑ Chemical Fertilizer ❑ Compost ❑ Other, specify:_____
Plant Protection	❑ Pesticide ❑ IPM ❑ Other, specify:_____

Average Size of Farm per Household		acre(s)
Average Household Income from Vegetable Production	Kharif in 2013	Rs./season
	Rabi in in 2013	Rs./season
	Summer in 2013	Rs./season
Experience in MDI Farming	❑ Yes, Specify No. of farmer: person(s)	❑ No
Experience in Poly Nursery	❑ Yes, Specify No. of farmer: person(s)	❑ No

Vegetable Production Trainings (last 5 years)	❑ Yes ❑ No	Specify:_____ by whom:_____ Number of Participants: person(s) Specify:_____ by whom:_____ Number of Participants: person(s)
Three Major Problems in Vegetable Production	1. 2. 3.	

4. Marketing and Post-harvest in their Hamlet(s)

Marketing	Traders come to the village?	❑ Yes	❑ No
	Sell at nearby (less than 5 km) market daily?	❑ Yes	❑ No
	Sell at nearby (less than 5 km) market weekly/occasionally?	❑ Yes	❑ No
	Sell at distant (more than 5 km) market daily?	❑ Yes	❑ No
	Sell at distant (more than 5 km) market weekly/occasionally?	❑ Yes	❑ No
	Individual SHG members collect market information like price before selling vegetables?	❑ Yes	❑ No
	SHG members ever sold your produce collectively?	❑ Yes	❑ No
Post-harvest	SHG members store vegetables before taking to market?	❑ Yes	❑ No
	SHG members grade your produce before taking to market?	❑ Yes	❑ No
	SHG members ever accessed cold storage?	❑ Yes	❑ No

Marketing Trainings (last 5 years)	❑ Yes ❑ No	Specify:_____ by whom:_____ Number of Participants: person(s)
Three Major Problems in Marketing & Post-harvest	1. 2. 3.	

5. Social Environment in their Hamlet(s)

Jaati of SHG Members				
Major Type of House	❑ Hut ❑ Semi Kutcha ❑ Kutcha ❑ Semi Pucca ❑ Pucca			
Electrification	❑ Yes	❑ No		
Major Source of Domestic Water Supply	❑ Well	❑ Tubewell (Hand Pump)	❑ River	❑ Other specify:_____
Seasonal Migration from the Village	❑ Yes (to Ranchi) ❑ Yes (to other city in Jharkhand) ❑ Yes (to outside Jharkhand)			❑ No
Major Emigrant Periods	From (month) / To (month)			
Requirement of Farming Labour	❑ Yes (in Kharif) ❑ Yes (in Rabi) ❑ Yes (throughout the year)			❑ No
Experience as Farming Labour	❑ Yes (in Kharif) ❑ Yes (in Rabi) ❑ Yes (throughout the year)			❑ No
Major Non-Farm / Off-Farm Income Source	❑ Mining worker ❑ Construction worker ❑ Trading & middleman ❑ Grocery store/shop	❑ Selling fuel wood & forest products ❑ Rural artisans ❑ Taxi & Rickshaw		❑ Other specify:_____ specify:_____ specify:_____
General Division of Labour in Farming Practice	Ploughing	❑ Male	❑ Female	❑ Both
	Sowing	❑ Male	❑ Female	❑ Both
	Transplanting	❑ Male	❑ Female	❑ Both
	Watering	❑ Male	❑ Female	❑ Both

	Weeding	❑ Male	❑ Female	❑ Both
	Insecticide/pesticide Application	❑ Male	❑ Female	❑ Both
	Transporting of Products	❑ Male	❑ Female	❑ Both
	Marketing	❑ Male	❑ Female	❑ Both

6. Well and Soil Condition in their Hamlet(s)

Well (select one well in their hamlet(s))	Type: ❑ Open Well ❑ Tube Well		
	Depth: m	Water Table from Ground Level: m	
	Diameter: m	Constructed Year:	
	Fund Source of Construction: by who, specify: _____		
	Owner of the well or Public: ❑ Individual, specify name: _____ ❑ Public		
	User of the Well: ❑ Family of the owner ❑ Public, specify number of users: _____ person(s)		
	Purpose of the well: (Plural answer is OK) ❑ Drinking ❑ Domestic ❑ Irrigation ❑ For Animal ❑ Other, specify: _____		
	Consumable water volume a day: Kharif (unit:)		
	Rabi (unit:)		
	Summer (unit:)		
	Does this water source dry up in the summer season? ❑ Yes ❑ No If Yes, specify month: From_____ To_____		
	Major Problems of the Well:		
	Photograph	1. Close up View of the Water Source	File Name:
		2. Distant view of the Water Source	File Name:
		3. Pump, if any	File Name:
	Water Sample No.		
Soil Condition (select one farm land in their hamlet(s))	Colour:		
	Previous Cropping:		
	Does this field have salt damage? ❑ Yes ❑ No		
	Major Problems of the Soil:		
	Photograph	1. Distance View of the field	File Name:
		2. Horticulture Products, if any	File Name:
		3. Irrigation system, if any	File Name:
	Soil Sample No.		

Operation Manual for Water and Soil Survey

Sampling (at Field):

- Water sampling : 100 cc/ location, to be kept in a container.
- Soil sampling : 100 g/ location, to be kept in a container.

Step-1: Visit to the target SHG and select an open well nearby.

Step-2: Interview to the farmer who owns the open well, and fill out the questionnaire.

Step-3: Take photographs of wells and farms as per the instruction-1shown below.
(File Name can be obtained by pressing a view bottom ▶ of the camera)

Step-4: Take samples of water and soil. For soil test, removing top soil by 5cm, and mixing soils corrected from the four corners of field

Step-5: Mark Sample Number on containers, for example, ###-W-01, ###-S-01, where ### is first three letters of the district name.

Stepe6: Samples shall be sent to the office of JICA Survey Team (#108, Chanakya BNR Hotel)

Testing (at Ranchi):

- Water quality : Items pH, EC and Arsenic
- Soil : Items pH and EC

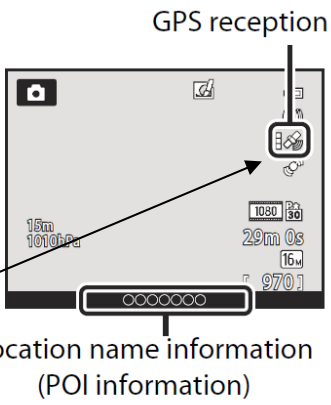
Note1: Equipment (Camera, pH meter, EC meter, Arsenic Test Kit and other appurtenances) should be returned to the JICA Study Team after finishing the survey.

Note2: Please contact Mr. ISEKI (JICA Team; Mobile No. 096-5089-1046) for any inquiry.

1. Check GPS status before taking photos,

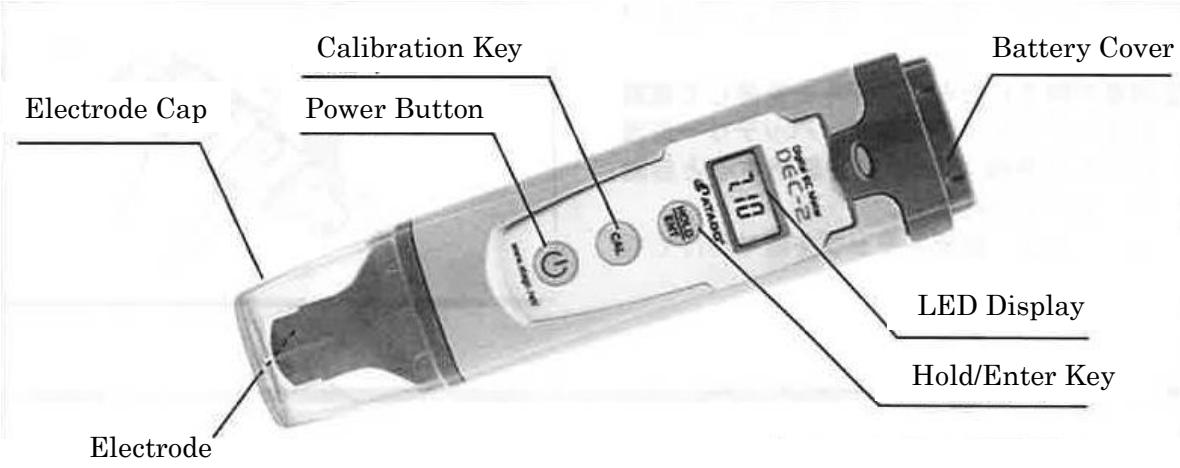
GPS Reception Indicator and Point of Interest (POI) Information

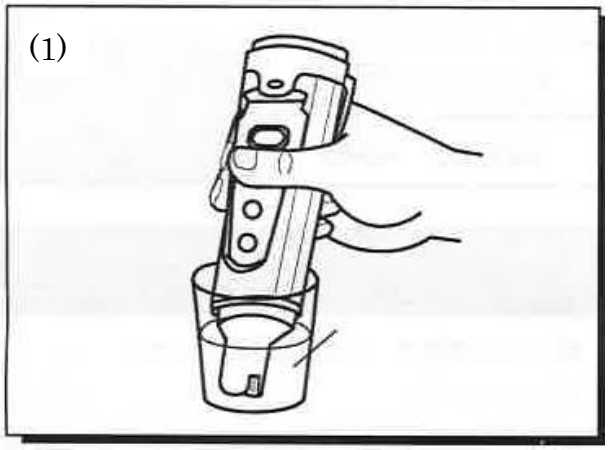
- GPS reception can be checked on the shooting screen.
  - : Signals are being received from four or more satellites and positioning is being performed. The position information is recorded on the image.
  - : Signals are being received from three satellites and positioning is being performed. The position information is recorded on the image.
  - : Signals are being received from the satellites, but positioning is not possible. The position information is not recorded on the image.
  - : Signals cannot be received from the satellites, and positioning is not possible. The position information is not recorded on the image.



2. EC meter

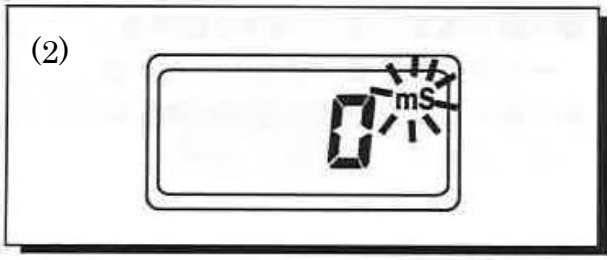
◆ Calibration has already done.



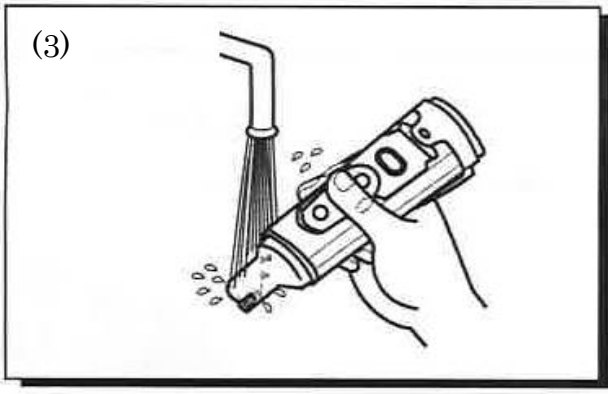


Turn on by pushing "Power Button".

Put electrode part of this equipment into the sample liquid.
Wait a few minutes to stable the value.



Write down the value in the Data Input Form.

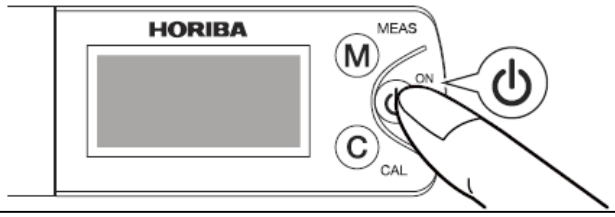


After measurement, turn off the equipment and wash it by clean water.

3. pH Meter

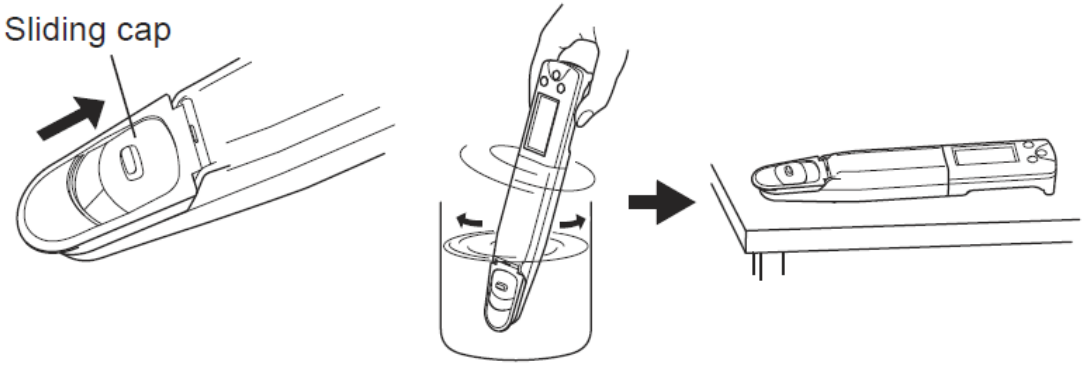
① Turn ON

Press the ON/OFF button over 2 seconds to turn ON the meter.



Scooping

1. Open the sliding cap on the light shield cover.
2. Immerse the sensor into the sample and stir gently 2 or 3 times, and then scoop up some of the sample with the sensor.
3. Place the meter flat and confirm that the sample covers the entire flat sensor.
4. Close the light shield cover.



⑤ Press the MEAS button to enter the measurement mode.

With using the reading locking function

1. **Confirm that the meter is in the measurement mode, and set a sample on the sensor.**
2. **After ☺ appears, press the MEAS switch for 0.5 seconds.**
   The reading locking function is activated. MEAS blinks until the measured value is stabilized.
   When the measured value is settled, MEAS stops blinking and the displayed value is locked with MEAS and ☺ lighting steadily.

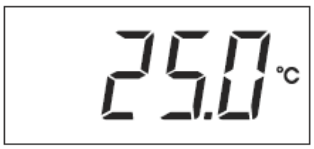
3. **Read the displayed value.**
4. **Press the MEAS switch for 0.5 seconds.**
   The reading locking function is deactivated and MEAS disappears.

7.1 Temperature display mode

Displays the ambient temperature measured with the internal temperature sensor. The measurement accuracy is unwarranted. Use the value only as a guide.

1. **Press and hold the MEAS switch for over 3 seconds in the measurement mode to enter the special setting mode.**
   All items appear on the LCD, and then the display changes as shown right.

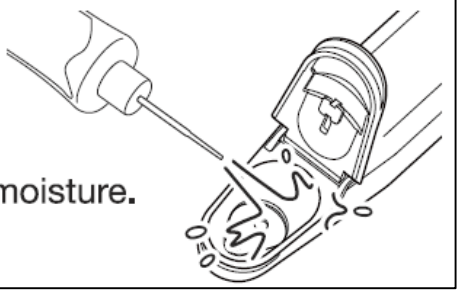
2. **Press the MEAS switch for 0.5 seconds.**
   The ambient temperature measured using an internal temperature sensor is displayed.



3. **Press the MEAS switch to return the measurement mode.**

④ After Use

Clean the sensor with water,
and then turn OFF the power.
Close the light shield cover before storage.
Make sure to store the sensor without any moisture.



Reference: Measurement of pH and EC of Soil Sample

1. Take soil sample from container.

2. Make the sample dry.

3. Take approx. 20g of sample, and put 5 times volume of pure water.

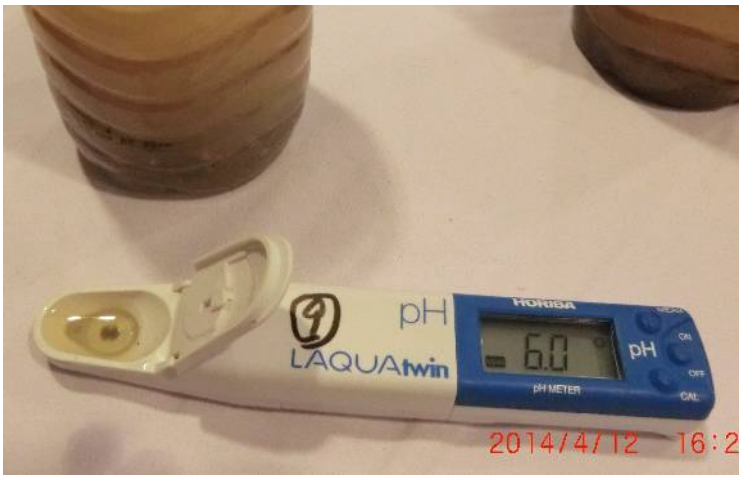
4. Wait upper portion of the mixed soil water until clear

5. Measure pH and EC.

Soil Sample

Add 5 times volume of water

Stir it well



Attachment 5.8.4 Results of SHG Sample Survey

1. Basic Information

The questionnaire was distributed to 347 SHGs of 337 villages of 56 blocks in 12 districts, which had total 4,338 members (all females). Within 347 samples, 209 SHGs were established in 2010 or before.

Table A-5.8.1 Year of Establishment of the SHGs

Year	No. of SHGs	% of SHGs	Year	No. of SHGs	% of SHGs
'96	1	0.3%	'06	25	7.6%
'97	0	0.0%	'07	17	5.2%
'98	0	0.0%	'08	21	6.4%
'99	1	0.3%	'09	53	16.1%
'00	4	1.2%	'10	22	6.7%
'01	6	1.8%	'11	28	8.5%
'02	6	1.8%	'12	40	12.1%
'03	16	4.8%	'13	52	15.8%
'04	13	3.9%	'14	10	3.0%
'05	15	4.5%	Total	330	100%

Source: JICA Survey Team

196 SHGs (56.5%) were founded by external initiatives like the Government agencies (including the programs like SGSY), NGOs, JSLPS and NABARD. The balance 150 SHGs (43.2%) were self-established.

Table A-5.8.2 Institutional Support in the Formation of the SHGs

Supported by	No. of SHGs	% of SHGs
SHG themselves	146	42.1%
NGO	141	40.6%
Government Institutions	27	7.8%
JSLPS (including Sanjivani)	16	4.6%
NABARD	6	1.7%
No Answer	11	3.2%
Total	347	100%

Source: JICA Survey Team

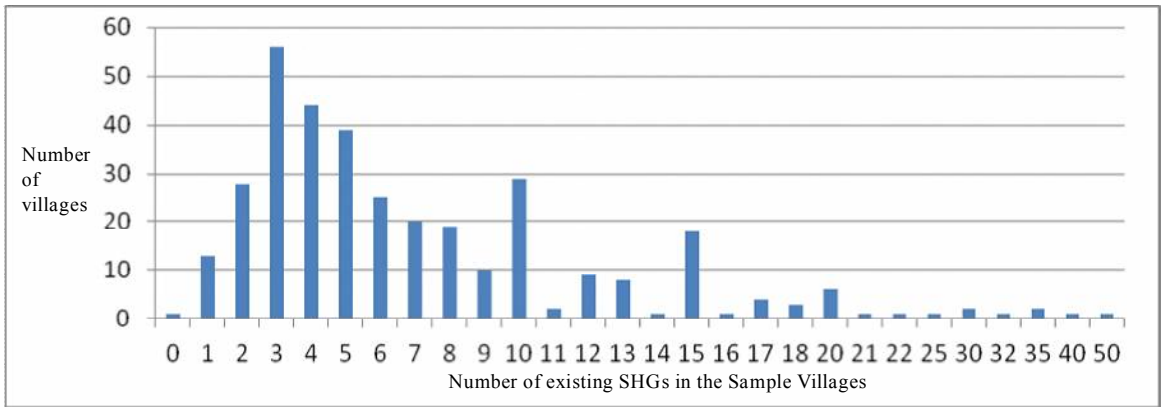
The reason why 42.1% of sample SHGs were self-established was that firstly the sample SHGs had slightly better socio-economic conditions (having usable water resource, land holder/ available land, market access) among the poor and an interest in MDI horticulture. As well, they responded to have been aware of the benefits and advantages obtained by formulating a SHG before getting external interventions.

Table A-5.8.3 Sample Size and Average Membership of the SHG

Sample Number of SHG	Total Membership	Male Membership	Female Membership	Average Membership per SHG
347	4,354	0	4,354	12.55

Source: JICA Survey Team

The total number of SHG in the village in the samples is 7.3 SHGs on average and 5 SHGs in median. The villages having Farmers' Club and Farmers' Producer Organization are negligible in the sample villages. Regarding market access, the majority of the sample villages have some market access, but 15 villages do not. 92.2% of the sample SHGs whose members had perennial source for irrigation.



Source: Sample SHG Survey

Figure A-5.8.1 Existing SHGs in the Sample Villages

The total number of SHG in the village in the samples is 7.3 SHGs on average and 5 SHGs in median. The villages having Farmers' Club and Farmers' Producer Organization are negligible in the sample villages. Regarding market access, the majority of the sample villages have some market access, but 15 villages do not. 92.2% of the sample SHGs whose members had perennial source for irrigation.

2. Organization

Table A-5.8.4 Observance of Panchsutra by the SHGs

Sl.	Panchsutra	No. of SHGs	% of SHGs
1	Weekly Meeting	236	68%
2	Weekly Saving	234	67%
3	Regular Inter Loaning	297	86%
4	Regular Repayment	303	87%
5	Regular and Up to Date Record entry	309	89%
6	No. of SHGs Following All the five principles of Panchsutra	222	64%

Source: JICA Survey Team

Table A-5.8.5 Status of Periodical Saving by the SHGs

Sl.	Saving	No. of SHG	% of SHGs	Range of amount of saving Per Individual per Meeting
1	Monthly Saving	106	30.5%	Rs. 5 to Rs. 110
2	Weekly Saving	234	67.4%	Rs. 2 to Rs. 100

Source: JICA Survey Team

Table A-5.8.6 Status of Taking Loan from Revolving Fund in the SHGs

Sl.	Question	Number of SHG	% of SHG
1	No. of person taken loan till date?	73	21%
2	No. of person of not taken loan till date?	269	78%
3	No Answer	5	1%

Source: JICA Survey Team

Attachment 5.8.4

TableA-5.8.7 Status of Availability of Community Investment Fund by the SHGs

Sl.	Item	Number of SHG	% of SHG
1	SHGs Who Got CIF	20	6%
2	SHGs Who Didn't Get CIF	322	93%
3	No Answer	5	1%

Source: JICA Survey Team

Table A-5.8.8 Status of Overall Corpus in the SHGs

Sl.	Item	Overall % of Corpus
1	Overall % of corpus in Box	8%
2	Overall % of corpus in Bank	40%
3	Overall % of corpus in Circulation	52%

Source: JICA Survey Team

Table A-5.8.9 Status of Corpus in Circulation by the SHGs

Sl.	% range of circulation	No. of SHG	% of SHG
1	90% to 100% of Corpus in Circulation	38	11%
2	80% to 100% of Corpus in Circulation	59	17%
3	70% to 100% of Corpus in Circulation	78	22%
4	60% to 100% of Corpus in Circulation	100	29%
5	50% to 100% of Corpus in Circulation	131	38%

Source: JICA Survey Team

Table A-5.8.10 Status of Inter Loaning in the SHGs

Sl.	Inter Loaning	No. of SHG	% of SHG
1	Not Enough Data	16	5%
2	100% members of SHGs have taken Loan in inter loaning	98	28%
3	90%-100% members of SHGs have taken Loan in inter loaning	119	34%
4	80%-100% members of SHGs have taken Loan in inter loaning	150	43%
5	70%-100% members of SHGs have taken Loan in inter loaning	179	52%
6	60%-100% members of SHGs have taken Loan in inter loaning	201	58%
7	50%-100% members of SHGs have taken Loan in inter loaning	226	65%

Source: JICA Survey Team

Table A-5.8.11 Status of Interest of Inter Loaning in the SHGs

Sl.	SHG who lend to their members	No. of SHG	% of SHG
1	On interest	331	95%
2	Without interest	10	3%
3	Data Not Available	6	2%

Source: JICA Survey Team

Table A-5.8.12 Status of Interest Rate of Inter Loaning in the SHGs

No.	Interest rate at which SHG lend to its members	No. of SHG	% of SHG
1	2% per Month	150	43.2%
2	3% Per Month	78	22.5%
3	4% Per Month	6	1.7%
4	5% Per Month	84	24.2%
5	10% Per Month	4	1.2%

Source: JICA Survey Team

Table A-5.8.13 To Whom SHGs Lend its Money

Sl.	To Whom SHG lend its Money	NO. of SHGs	% of SHGs
1	Only to its members	99	28.5%
2	To members as well as Outsiders	210	60.5%
3	Only to Outsiders	0	0%

Source: JICA Survey Team

Table A-5.8.14 Services from JSLPS which the SHGs have ever taken

Sl.	Services from JSLPS	No. of SHGs	% of SHGs
1	Community Coordinator	66	19.0%
2	Master Book Keepers	20	5.8%
3	Professional Resource Persons	18	5.2%
4	Community Resource Persons	64	18.4%

Source: JICA Survey Team

Table A-5.8.15 Services from JSLPS which the SHGs have ever taken

Sl.	Services from JSLPS	No. of SHGs	% of SHGs
1	By Community Coordinator	66	19.0%
2	By Master Book Keepers	20	5.8%
3	By Professional Resource Persons	18	5.2%
4	By Community Resource Persons	64	18.4%

Source: JICA Survey Team

Table A-5.8.16 Capacity Buildings which the SHGs have ever taken

Sl.	Capacity Building Events	No. of SHG	% of SHG
1	Training and Exposure in last two years	17	4.9%
2	Trainings in last two years	74	21.3%
3	Exposure in last two years	29	8.4%
4	No Training in last two years	273	78.7%
5	No Exposure in last two years	317	91.4%

Source: JICA Survey Team

Table A-5.8.17 Training Contents which the SHGs have ever taken

Sl.	Types of Training	No. of SHG	% of SHG
1	Training on the SHG concept and Management	34	9.8%
2	Training on Book Keeping	10	2.9%
3	Training on Agriculture and Vegetable growing	14	4.0%
4	other Livelihood Related Training	16	4.6%

Source: JICA Survey Team

Table A-5.8.18 Status of Bank Linkage of the SHGs

Sl.	Bank Linkage	No. of SHG	% of SHG
1	SHGs having Saving Bank Account	301	86.7%
2	SHG accessed bank Loan	104	30.0%
3	SHG accessed bank loan twice	20	5.8%
4	SHG accessed bank loan more than twice	5	1.4%

Source: JICA Survey Team

Table A-5.8.19 Major Purpose of Inter Loaning of the SHGs

Sl.	Purpose of the loan	No. of SHG	% of SHG
1	Agriculture crops and Vegetable cultivation	58	16.7%
2	Livestock Rearing	11	3.2%
3	Other Purpose	27	7.8%
4	Purpose Not Known	8	2.3%

Source: JICA Survey Team

TableA-5.8.20 Major Problems recognized by the SHGs in Organizational Aspect

Sl.	Problems	No. of SHG	% of SHG
1	Book Keeping Problem	188	54.34%
2	Attendance Problem	107	30.92%
3	Irregular inter lending and repayment	92	26.59%
4	Irregular Meeting	78	22.54%

5	Lack of Training	56	16.18%
6	Irregular Saving	37	10.69%
7	Bank related problem (Account opening problem, bank linkage, banker's support)	29	8.38%
8	Problem in infrastructure and equipment support	12	3.47%
9	Communication Problem	10	2.89%
10	Distance from Bank and Office	9	2.60%
11	Monitoring Problem	7	2.02%
12	Other Problems (Coordination Problem, fund from JSLPS, Education etc)	7	2.02%

Source: JICA Survey Team

3. Vegetable Production

3.1 Vegetable Crops

Survey conducted with members of 347 SHGs of 12 districts, revealed that crops like potato and tomato are grown widely and by majority of farmers (by almost 75%). Farmers of 60 SHGs (23.9%) reported that they grow potato in kharif while those of 185 (73.7%), grow in rabi (main season). In case of tomato growers (n=239), farmers were almost evenly distributed for growing kharif (34.7%), rabi (30.1%) and summer season (35.1%) crops. In case of brinjal (n=126), growing in kharif was more prevalent (49.2%), than rabi (23.8%) and summer (27.0%). Onion (91.5%), French bean (81.9%), pea (77.8%), were mostly grown in rabi, whereas, crops like radish (85.7%), ginger (75%) cowpea (61.5%), okra (46%) were the preferred kharif crops. Main summer crops grown in the project area, reported were capsicum, pumpkin, watermelon, garlic (100%), cucumber (91.4%), bitter gourd (82%), bottle gourd (78.1%), and chilli (58.2%).

Most farmers practice farming in normal season and for this reason their produce arrive in the market at the time when produce of majority of other farmers also arrive. In case of potato, inadequate storage facility near production sites compels them to market fresh on low price. The coincidence of bulk arrival of potato from March onwards from West Bengal further pushes the market down. Crops like brinjal, onion and okra are grown only by 30-40% farmers. Similarly crops with higher market demand like chilli, cauliflower, cucumber, pea, bitter gourd are grown only by 10-30% farmers. Farmers growing crops like French bean, capsicum, and carrot are still fewer (2-10%). About 2-3% farmers grow spice crops like ginger and garlic. In order to gain the advantage of off-season price, it is essential to manipulate the date of sowing of different vegetable crops and time crop-production to the advantage of farmers.

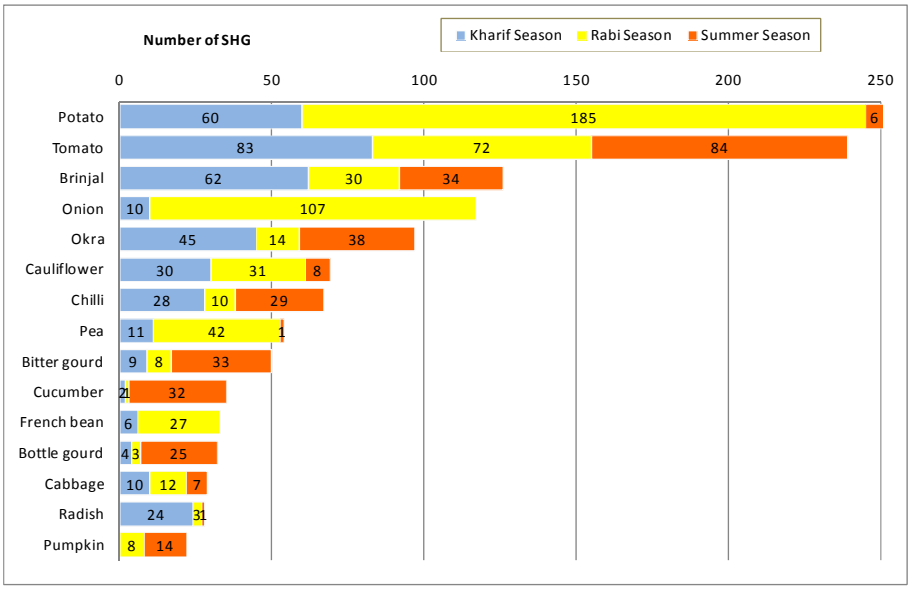
MDI will offer this flexibility to the farmers for scheduling crops to his/her advantage. Shifting dates of sowing for early or late season cropping is now possible in many photo and thermo-insensitive crops for the reason that day length neutral varieties with genes for tolerance to low or high temperature are available in crops like tomato, cauliflower, cabbage, cucumber, capsicum and progressive farmers have started growing them successfully.

Table A-5.8.21 Number of SHGs which produces each Horticulture Crop

Sl.	Crop	No. of SHG	% of SHG
1	Tomato	262	75.5%
2	Potato	259	74.6%
3	Brinjal	135	38.9%
4	Onion	130	37.5%

5	Okra	101	29.1%
6	Cauliflower	88	25.4%
7	Chilli	73	21.0%
8	Cucumber	56	16.1%
9	Pea	55	15.9%
10	Bitter gourd	54	15.6%
11	Bottle gourd	34	9.8%
12	French bean	34	9.8%
13	Radish	31	8.9%
14	Cabbage	30	8.6%
15	Pumpkin	25	7.2%
16	Water Melon	15	4.3%
17	Cowpea	14	4.0%
18	Garlic	11	3.2%
19	Carrot	10	2.9%
20	Ginger	9	2.6%
21	Spinach	9	2.6%
22	Capsicum	8	2.3%

Source: JICA Survey Team



Source: JICA Survey Team

Figure A-5.8.2 Season-wise Number of SHGs which produces Horticulture Crop

3.2 Sources of Irrigation Water

The field survey captured information on sources of irrigation-water available and utilized by members of SHGs. It was noted the majority of members (91.6%) use well water. Water from tube-well was used by 8.1% members, and that of river in the vicinity of fields was utilized by 7.5% and ponds by 6.1%. Canal irrigation is now not prevalent in Jharkhand and so only in a negligible 0.6% cases, water from this source is used.

Table A-5.8.22 Major Water Source for Irrigation of the SHGs

Sl.	Water Source for Irrigation	No. of SHG	% of SHG
1	Well	316	91.6%
2	Tubewell	28	8.1%
3	River	26	7.5%
4	Pond	21	6.1%

5	Canal	2	0.6%

Source: JICA Survey Team

3.3 Nutrients Use

Members of 329 SHGs responded to the query on kind of nutrients they generally use for raising crops. Majority of them (73.9%) informed that they use chemical fertilizers, 3% inform that they use only compost and 23.1% informed that they use combination of chemical fertilizers with compost. The survey brings out the fact that large number of farmers are dependent on chemical fertilizers, which is not eco-friendly practice and will seriously affect the soil fertility parameters in short/long run. This information also indicated that availability of compost with farmers is grossly inadequate forcing them to practice chemical farming.

It is pertinent to mention that as per the report Jharkhand Regional Profile (2014) of International Plant Nutrition Institute, the consumption of NPK in the state is 111.1kg/ha with lopsided $N:P_2O_5:K_2O$ ratio of 4.2:1.2:1.0 . The structured promotion of vermin-compost in this project will help enhancing nutrient use efficiency of chemical fertilizers and will also address the adverse effects on factor productivity due to growing lop-sidedness of improper nutrients use.

Table A-5.8.23 Nutrient Use of the SHGs

Sl.	Method	No. of SHG	% of SHG
1	Chemical Fertilizer only	243	73.9%
2	Chemical Fertilizer & Compost	76	23.1%
3	Compost only	10	3.0%
	Total	329	100%

Source: JICA Survey Team

3.4 Plant Protection

Farmers mostly used the chemical pesticides but a vast knowledge gap in pest identification, pesticide selection and right methods of application was evident in the survey.

3.5 Farm size per Household

Average holding size is 1.11 acre in the surveyed households.

3.6 Household Income from Vegetable Farming

Farmers reported to have average earnings in from crops in kharif (Rs 14,793), rabi (Rs 12,432) and during summer season (Rs10,052)

Table A-5.8.24 Average Household Income from Vegetable Farming of the SHGs (Rs.)

Khalif 2013	Rabi 2013	Summer 2013
14,793	12,432	10,052

Source: JICA Survey Team

3.7 Experience with MDI and PNH

During the field survey farmers' experience on use of drip irrigation system and community poly nursery was also recorded. A small number of such facilities have been created in the villages under

different government schemes. Eight farmers (2.5%) reported to have their direct experience of using the drip irrigation and only two farmers (0.6%) reported to have availed the community poly nursery.

Table A-5.8.25 The SHG's Experience with MDI and PNH

MDI			Poly Nursery		
Answer	No. of SHG	% of SHG	Answer	No. of SHG	% of SHG
YES	8	2.5%	YES	2	0.6%
NO	314	97.5%	NO	314	99.4%
Total	322	100.0%	Total	316	100.0%

Source: JICA Survey Team

3.8 Training of Farmers

The extent of Institutional training provided to the farmers for different farming practices was recorded during the survey. It was noted that only in 8.9% cases (n=326) training was imparted. These trainings were imparted by public sector institutions like Krishi Vigyan Kendra, DRDA, ATMA, and NGOs like Indian Grameen Services, Mahila Vikas Kendra, and Tata Steel Rural Development Society. A vast majority of farmers (91.1%) reported that they did not receive training on aspects of farming.

Table A-5.8.26 Number of SHGs which have ever taken any Trainings

Method	No. of SHG	% of SHG
YES	29	8.9%
NO	297	91.1%
Total	326	100.0%

Source: JICA Survey Team

3.9 Problem Mapping

Members of 347 SHGs shared list of their major problems encountered in crop cultivation with the interview team. Water shortage for irrigation in summer crops ranked out to be the most critical as reported by 99.4% farmers. Other problem listed were lack of knowledge of new farming technologies (32.7 %), lack of capital needed for improved farming (28.1%), lack of availability of good seeds (25.6%), and difficulty in pest management (18.9%). Lack of training for production for profit (9.6%), problems due to open grazing by farm cattle including small ruminants (6.4%), availability of labor in time (5.8%), and timely availability of fertilizers (5.5%) were expressed by several farmers. Issues like lack of electricity supply or low electric voltage in rural supply leading to difficulty in operation of irrigation pumps, availability of limited plant protection agro-chemicals, limited availability of compost, difficult market access, declining soil fertility, lack of decision making capacity for selection of advantage crops, lack of infrastructure for storage of fresh vegetables and fluctuation in market price, and inadequate farm protection by existing fencing were also mentioned.

Table A-5.8.27 Major Problems recognized by the SHGs

Sl.	Problem	No. of SHG	% of SHG
1	Water Shortage	345	99.4%
2	Lack of Technology	113	32.7%
3	Lack of Capital	97	28.1%
4	Lack of Good Seeds	88	25.6%
5	Pest & Disease	65	18.9%
6	Lack of Training	33	9.6%

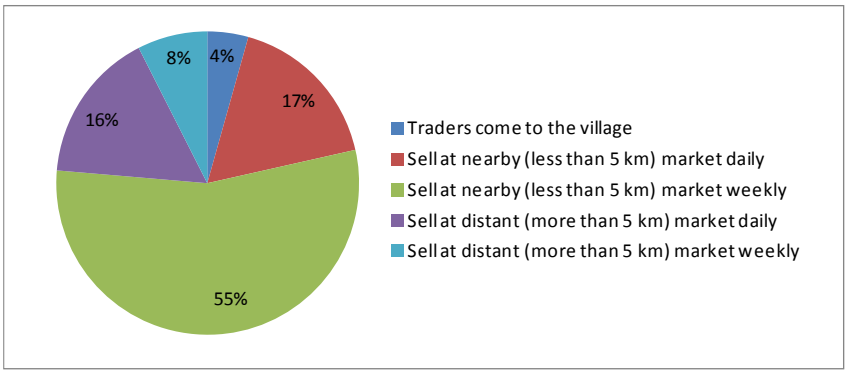
7	Animal Grazing	22	6.4%
8	Lack of Labor	20	5.8%
9	Lack of Fertilizer	19	5.5%
10	Unavailability of Agro Chemical	16	4.7%
11	Low Voltage	15	4.4%
12	Lack of Compost	13	3.8%
13	Accessibility to Market	12	3.5%
14	Poor Soil Fertility	9	2.6%
15	Improper Crop Planning	8	2.3%
16	Lack of Storage	8	2.3%
17	Lack of Electricity	5	1.5%
18	Low Market Price	4	1.2%
19	Fund Management	3	0.9%
20	Conflict on Farm Boundary	2	0.6%

Source: JICA Survey Team

4. Marketing and Post-harvest

4.1 Marketing

Farmers across villages in Jharkhand sell their vegetables in different markets which may vary with extent of production at family and village level. They carry their vegetables to market located in close proximity to village or at a distant place. Such markets functions either daily or weekly basis i.e. one or two times in a week. In some cases, there is practice of traders coming to the village to buy vegetables from farmers. During the SHG survey, data was collected from sample SHGs on the predominant practice by SHG members related to marketing i.e. where most of the families sell their vegetables.



Source: JICA Survey Team

Figure A-5.8.3 Major Market of the SHGs

The survey revealed that in case of majority (55%) of the SHGs, there is practice of selling vegetables in nearby (up to 5 km) weekly market. In 33 % SHGs there is preference of accessing market that functions daily, which may be located near or far off from the village. The practice of selling to traders in the village is followed by only 4 % of SHGs. Interaction with MDI farmers also indicate that most of the farmers sell vegetables outside their own village. Amongst them, nearly fifty (48.4 %) % of the MDI farmers travel more than 10 km to reach the market. Usually, such farmers carry vegetables in hired autos.

4.2 Accessing Market Information prior to Marketing

In majority (55 %) of the SHGs, members' access market information like prevailing price, before selling their vegetables. Most of the farmers (93%) accessing market information, sell their vegetables

in weekly market situated within 5 km from village.

Most of the SHGs (65 %) expressed, that their members are not able to get expected price in the market. This implies that access to prior information related to price may support marketing decision, but may not lead to getting higher price, which may also depend on market arrivals. Moreover, as farmers accessing price information are selling in local weekly market i.e. not in market functioning on daily basis, the price tends to fluctuate, by the time they arrive with their produce.

4.3 Collective Marketing

Most of the farmers prefer to sell their vegetables on individual basis. About 20 % SHGs reported practice of collective marketing of their produces which may include both selling as one aggregated lot and/or sharing transportation cost to carry vegetables. Amongst the SHGs that have experienced collective marketing, 80 % SHGs sell in nearby weekly market. About 10 % SHGs sell in markets that function on daily basis i.e. more of assembly markets. During study of assembly markets, it was also observed that there is increasing preference of farmers to collectively market by sharing transportation cost.

4.4 Grading of Vegetables

During the field study, it was observed that some farmers remove the vegetables that are spoiled and affected by pest, before carrying to the market. This is mainly to fetch better price for the remaining vegetables. The practice of grading vegetables was reported by 53 % of SHGs. It was observed that majority (89%) of those SHGs sell the vegetables in nearby weekly market. Such grading practices including grading based on size could benefit farmers that are already collectively accessing daily assembly markets.

4.5 Storing of Vegetables

The practice of storing vegetables prior to taking to market was reported only by 27 % of SHGs. The sample SHGs that reported 'practice of storing' sell their produce in weekly market which may be nearer or far off from the village. About 71 % of the SHGs whose members store vegetables, prior to taking to market sell in nearby weekly market, other SHGs selling in far off weekly market. Overall, it implies that requirement of storing vegetables is minimal, as farmers are able to access local markets.

4.6 Access to Cold Storage Facility

In Jharkhand, the cold storage facilities are generally used by farmers for storing potatoes, preferably potato seeds. In some cases, cold storage is used by traders for storing potatoes and Non Timber Forest Produces (NTFPs) like Mohua flower and Tamarind (with seeds). Such facilities are generally not used for storing vegetables like tomatoes, cauliflowers and beans. During the survey, about 12 % SHGs shared that in the past, their members have utilized cold storage facility. Among those SHGs availed cold storage facilities, most of them i.e. 92 % sell vegetable in local weekly market. This indicates that utilization of cold storage facilities is generally not linked to accessing major distant market.

Overall, there is limited demand for cold storage facilities to store vegetables, as vegetables get sold in local market on a regular basis. The problem of not having access to cold storage was shared by only 12 % SHGs.

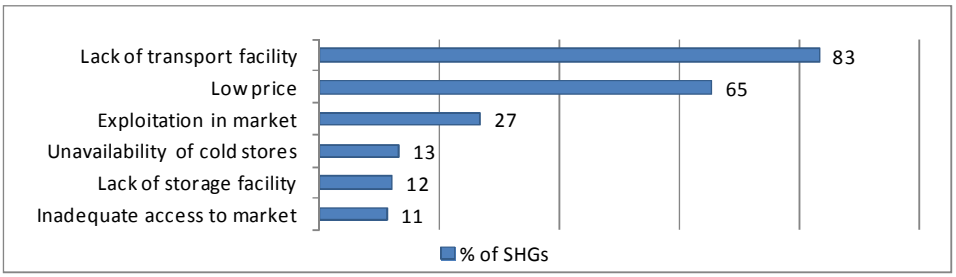
4.7 Access to Training related to Marketing

Review of different schemes related to promotion of marketing indicates efforts for strengthening market infrastructure like existing Agriculture Produce Marketing Committee (APMC) market yards. There is near absence of efforts related to training on post harvest management and marketing. During SHG survey, only 1 % SHGs shared experience of having received training related to marketing in last 5 years.

It is also important to note that farmers do not perceive the importance of marketing training, as only 1 % SHGs shared not having access to guidance and training as a problem related to marketing. Nevertheless, members of 27 % of SHGs continue to have weak bargaining power in the market and face exploitation by brokers and traders. Similarly, majority i.e. 65 % of SHGs complain of getting lower price in the market, which could be improved by enhancing access to market information and training.

4.8 Problem faced related to Marketing

During the SHG survey, SHGs were asked to share up to 3 problems related to marketing. Inadequate or lack of access to transport facilities is considered as a problem by majority (83 %) of the SHGs. About 65 % of SHGs shared that their members do not get appropriate price while selling their vegetables. Similarly, limited bargaining power and exploitation by traders and brokers has been experienced by 27 % of SHGs. Small proportion of SHGs shared problem with regard to storage including cold storage.



Source: JICA Survey Team

Figure A-5.8.4 Problems related to Marketing facing the SHGs

It seems most of the SHGs have ready access to market, although transportation continues to be bottleneck faced by members of most of the SHGs. Inadequate access to market, including not having access to large markets was considered as a problem by only 11 % of sample SHGs. The other problems expressed by SHGs include quality of roads and long distance to market. In few SHGs, members shared lack of capital as a problem, which may be leading distress sale of vegetables. The other problems shared by some of the SHGs include lack of access to market information, unavailability of guidance and training; and inability to maintain records related to marketing. Some of the SHGs shared that marketing involves lot of time and hard work.

4.9 Lack of Access to Transport Facilities

As mentioned above, the survey revealed inadequate or lack of transport facilities as problem faced by most of the SHGs. Among the SHGs experiencing problem related to transportation, 52 % are accessing local weekly market, and 35 % accessing daily market. This further indicates that SHGs accessing daily market including daily assembly market continue to face problem of accessing transportation services. At present, auto is key mode of transport of vegetable, as shared by 50 % of MDI farmers. Such practices of transporting vegetables were also quite evident during study of assembly markets. The other mode of

transport includes bicycle and bike. It seems there is limited use of public transport services to carry vegetables to market.

4.10 Low Price for Vegetables

Members of 65 % of SHGs experience 'not getting appropriate price' as a problem faced by their members. About 46 % of the SHGs experiencing low price sell their produce in local weekly market, followed by 23 % in local daily market and 20 % in distant daily market. It seems experience of getting low price more relates to accessing local weekly market than daily market. Ready access to daily market including assembly markets may support realization of higher price including production planning, staggered harvesting and reduction in need for storage.

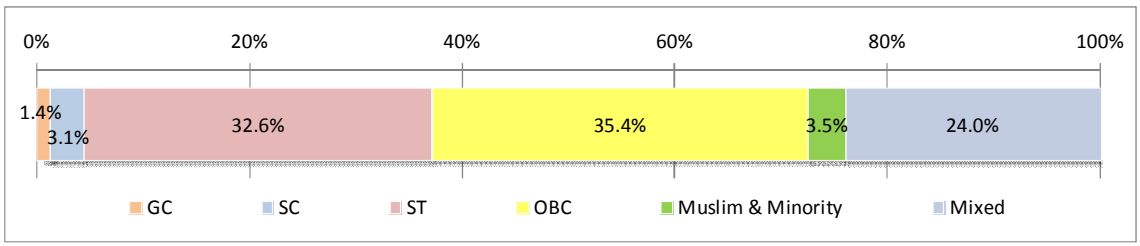
4.11 Limited Negotiation Skills including Exploitation by Traders and Brokers

About 27 % of SHGs shared that their members experience exploitation by traders and brokers. This is mainly because of low negotiation skills of farmers visiting the market. It is important to note that longer the distance to market, more is the exploitation by buyers in the market. Among the SHGs experiencing exploitation in the market, 33 % of SHGs sell in weekly distant market, 28 % in daily distant market, 23 % in local weekly market and 13 % in daily local market. The data reveals that access to daily local assembly market may also lead to reduction in exploitation of farmers by market players.

5. Social Environment

5.1 Social Category and Caste Composition of the SHGs

Out of 347 SHGs surveyed 32.6 % have members from ST communities and 35.4 % from other backward castes. The membership of SC is limited to 3 %. The presence of Muslims and other minorities in SHGs is as low as 3.5 %. 24 % of the SHGs have members drawn different caste groups. The majority of the SHGs have been constituted with members from ST, SC and OBC communities.

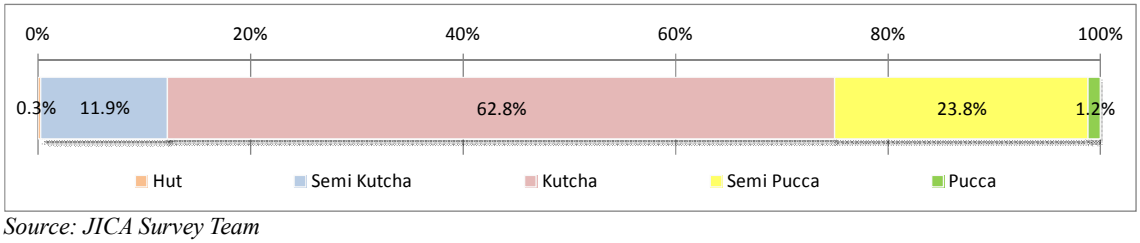


Source: JICA Survey Team

Figure A-5.8.5 Caste Composition of SHGs

5.2 Housing and Basic Facilities

63 % of the SHG members live in *Kutcha* houses. The SHG members having *semi pucca* and *semi kutcha* houses are 24 and 12 % respectively. Only 1 % of the members of 347 SHGs have *pucca* houses.



Source: JICA Survey Team

Figure A-5.8.6 Housing Pattern of SHG Members

97 % of SHG members have access to electricity in their houses. Wells and tube wells are the major sources of water for domestic use. While 64 % of the SHG members depend on wells, 52 % do use tube wells. Only 3 % of the SHG members use river water for their domestic purposes.

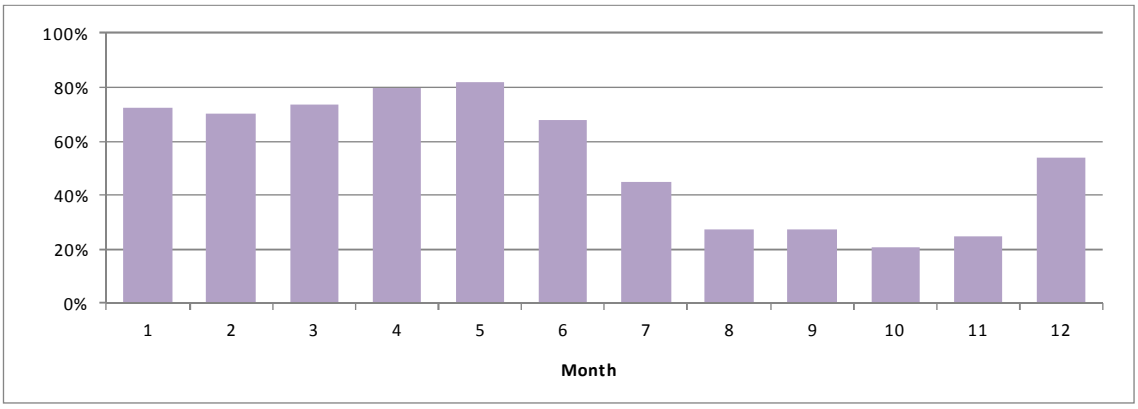
5.3 Status of Seasonal Migration

Table A-5.8.28 Seasonal Migration

Sl.	Destination	No of SHGs	% of SHGs
1	Ranchi	155	45
2	Other cities of Jharkhand	47	14
3	Places outside the state	127	37
4	No migration	80	23
	Total	347	100

Source: JICA Survey Team

Migration in search of wage employment is common in the study area. Family members from 45 % of SHGs surveyed migrate to Ranchi. While 14 % move to other cities in Jharkhand, 37 % migrate to different places outside the state. People migrate to far off places in Punjab, Haryana, Karnataka, Maharastra, Gujarat and Odisha for wage employment. December and January are the peak period of migration. The following presents the period/ duration of seasonal migration by the family members of SHGs. Around 80 % of migrants stay outside the village for about 4-5 months in a year.



Source: JICA Survey Team

Figure A-5.8.7 Tenure/ Periodicity of Migration

5.4 Availability of Farm Labor

Requirement of farm labour by the SHGs is as high as 83 % during the *Kharif* season. While 26 % of the SHGs require farm labour during the *Rabi* cropping season, 14 % of the SHGs require farm labour throughout the year.

Table A-5.8.29 Requirement of Farm Labour by the SHGs

Sl.	Cropping Season	No of SHGs require farm labour	%	SHGs don't require farm labour	%
1	Kharif	288	83	16	5
2	Rabi	90	26	8	2
3	Throughout the year	47	14	10	3
	Total	347		347	

Source: JICA Survey Team

SHG members do work as farm labourers by themselves. In case of 84 % of the SHGs, the members work as labourers in agriculture farms during the *Kharif* cropping season. Members from 92 SHGs (27%) work as farm labour during the *Rabi* cropping season. In case of 53 SHGs (15%), the members work as farm labour all through the year.

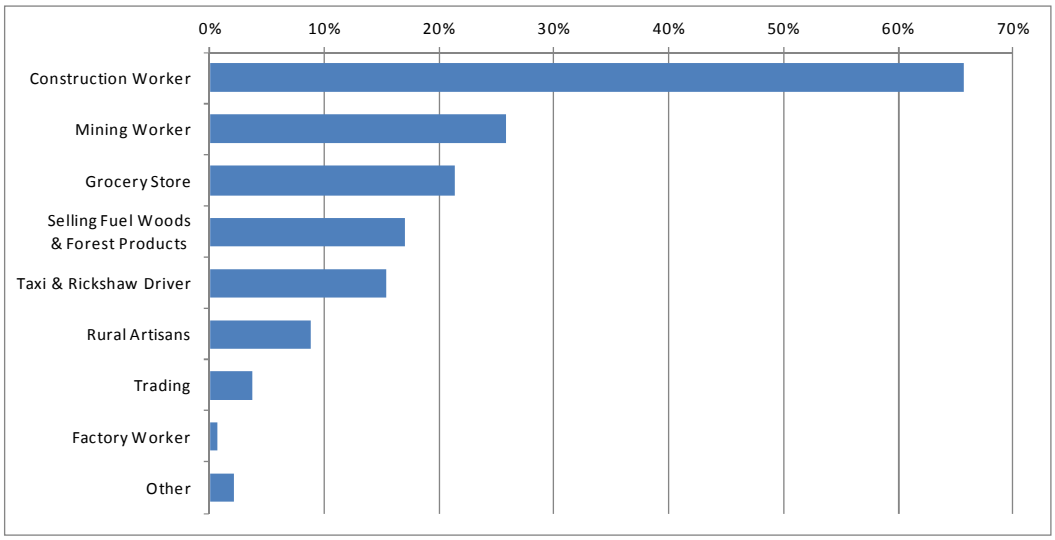
Non-farm/ Off-farm income sources: The members of SHGs as well as their family members are engaged in a variety of non-farm and off-farm occupations. The following figure portrays the % of SHG members involved in different activities. Construction work is a major source of livelihood for

the SHG members. More than 65 % of the SHGs and their family members work as construction workers. About 26 % of the SHGs and their family members work as mining workers. Grocery store is another important source of income for the SHG members. More than 20 % of the SHGs have Grocery stores/ shops. While sale of fuel wood and other forest products is a source of income for about 17 % of the SHGs, around 15 % of the SHGs/family members subsist on driving taxis and rickshaws. Around 9 % of the SHGs have members working as rural artisans.

Table A-5.8.30 SHGs - Experience as of Farm Labour

Sl.	Cropping Season	SHGs work as farm labour	%	SHGs don't work as farm labour	%
1	Kharif	290	84	6	2
2	Rabi	92	27	1	0
3	Throughout the year	53	15	1	0
	Total	347		347	

Source: JICA Survey Team

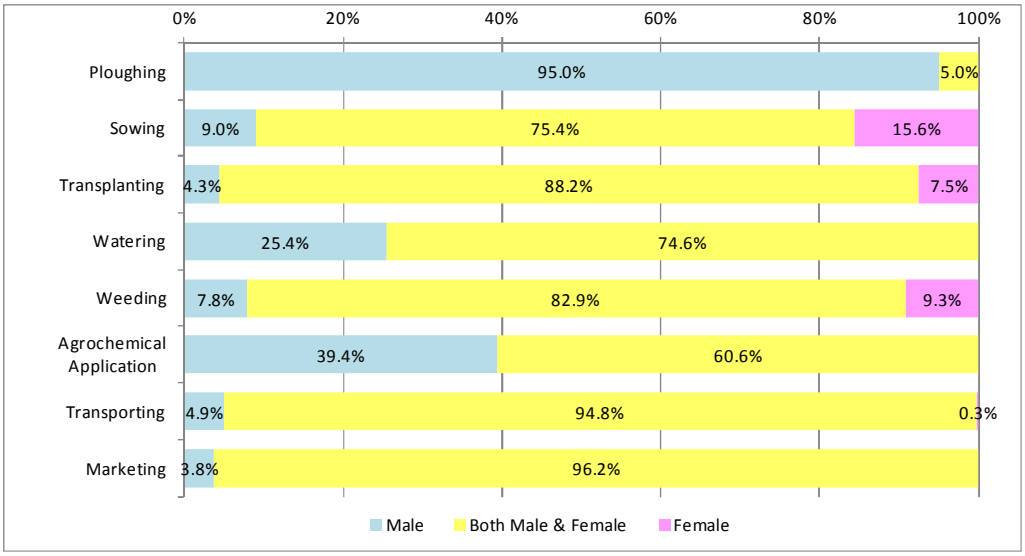


Source: JICA Survey Team

Figure A-5.8.8 Details of Non-farm/Off-farm Income Sources

5.5 Gender Division of Farm Labor

The SHGs were consulted on 8 parameters to study the gender division of farm labour. Ploughing is an exception, which is mostly a male activity in farming i.e. in 95 % of SHGs ploughing is done by men. The rest other farming related activities are done jointly by men and women.



Source: JICA Survey Team

Figure A-5.8.9 Gender Division of Farm Labour

Sowing and transplanting activities are done by both men and women in 75 and 88 % of the SHGs. In case of 16% of SHGs, sowing is done by only women. In case of 75 % of SHGs watering is done by both men and women, and in 25% of the SHGs watering is done by men. In 83 % of SHGs weeding is done by both men and women. For agrochemical applications, both men and women carry out this activity in 61% of the SHGs. In the rest cases men do the application of agrochemicals. Transportation and marketing of harvested crops are done largely by both men and women.

6. Well and Soil Condition

6.1 Water Quality Analysis

Water samples which are taken from each water source were analyzed about electrical conductivity (EC), pH and arsenic (As). The result is summarized in the following table.

Table A-5.8.31 Water Quality of Water Sources in the SHG Profile Survey

District	Number of Data	EC (mS/cm)			pH			As (mg/L)		
		Average	Max	Min	Average	Max	Min	Average	Max	Min
Giridih	30	0.84	1.8	0.2	7.04	8.2	6.7	0.0003	0.005	0.000
Pakur	12	0.50	1.8	0.1	7.65	9.3	6.5	0.0063	0.050	0.000
Lohardaga	30	0.60	3.4	0.1	7.06	7.9	6.4	0.0002	0.005	0.000
Palamu	16	1.64	2.5	0.7	7.43	7.9	7.1	0.0003	0.005	0.000
Latehar	23	0.88	1.9	0.2	7.17	7.6	6.6	0.0000	0.000	0.000
Hazaribagh	32	1.04	2.4	0.3	7.34	7.9	6.5	0.0009	0.005	0.000
Dumka	19	0.72	1.6	0.3	7.40	8.0	6.7	0.0000	0.000	0.000
Ranchi	88	0.41	1.7	0.1	6.93	8.9	5.3	0.0009	0.025	0.000
Khunti	40	0.31	2.0	0.0	7.12	7.9	6.2	0.0004	0.005	0.000
Gumla	25	0.50	1.4	0.1	7.24	8.2	6.4	0.0000	0.000	0.000
Paschimi Singhbhum	18	0.46	0.9	0.2	7.36	8.2	6.6	0.0006	0.005	0.000
Saraikela	14	1.31	3.0	0.4	7.44	7.8	7.0	0.0004	0.005	0.000
Total	347	0.66	3.4	0.0	7.16	9.3	5.3	0.0007	0.050	0.000

Source: JICA Survey Team

The EC shows slightly higher value in Palamu district, Hazaribagh district and Saraikela district. It is recommended that the usage of groundwater for irrigation in monsoon season in the areas which shows high EC value to avoid the salt damage. Especially, the EC value of the sample taken from

Chati village, Bhandra block, Lohardaga district is 3.4, this water is expected high salinity. The pH shows about natural value. Arsenic shows slightly higher value in Pakur district. But it is not serious as irrigation water source.

6.2 Soil Survey

At the same time with water source survey, soil in the farm was sampled and analyzed about the EC and the pH.

Table A-5.8.32 Soil Analysis Result in the SHG Profile Survey

District	Number of Samples	EC (mS/cm)	pH	Salt Damage	
				Number of Answer	Number of "Yes"
Giridih	30	0.13	6.61	30	0
Pakur	12	0.14	6.09	11	3
Lohardaga	30	0.22	6.26	22	0
Palamu	16	0.27	8.05	16	0
Latehar	23	0.09	7.40	13	0
Hazaribagh	32	0.14	7.09	24	0
Dumka	19	0.06	5.23	4	0
Ranchi	88	0.09	6.37	45	3
Khunti	40	0.08	6.19	40	0
Gumla	25	0.09	5.39	9	0
Paschimi Singhbhum	18	0.08	6.35	16	1
Saraikela Karsawan	14	0.29	6.94	12	2
Total	347	0.12	6.45	242	9

Source: JICA Survey Team

Attachment 5.9.1

MANUAL OF QUESTIONNAIRE SURVEY ON WILLINGNESS OF FARMERS TO PARTICIPATE IN I-HIMDI

1. Objectives of the Survey

The objectives of the survey are:

1) To grasp the ratio of farmers who have willingness to participate in I-HIMDI, and
2) To grasp farmers' feeling on the repayment condition of O&M fund.

2. Outline of the Survey

2.1 Survey Method and Process

As method of the survey, "interview survey" shall be adopted. Namely, each interviewer shall visit sample farmers and interview according to the questionnaire in attachment. The survey shall be carried out for "individual farmers" who meet all the criteria and randomly selected from the designated villages, blocks and districts in advance.

Overall process of the survey is outlined below, and the JSLPS head office shall supervise all activities in collaboration with JSLPS Block officers.

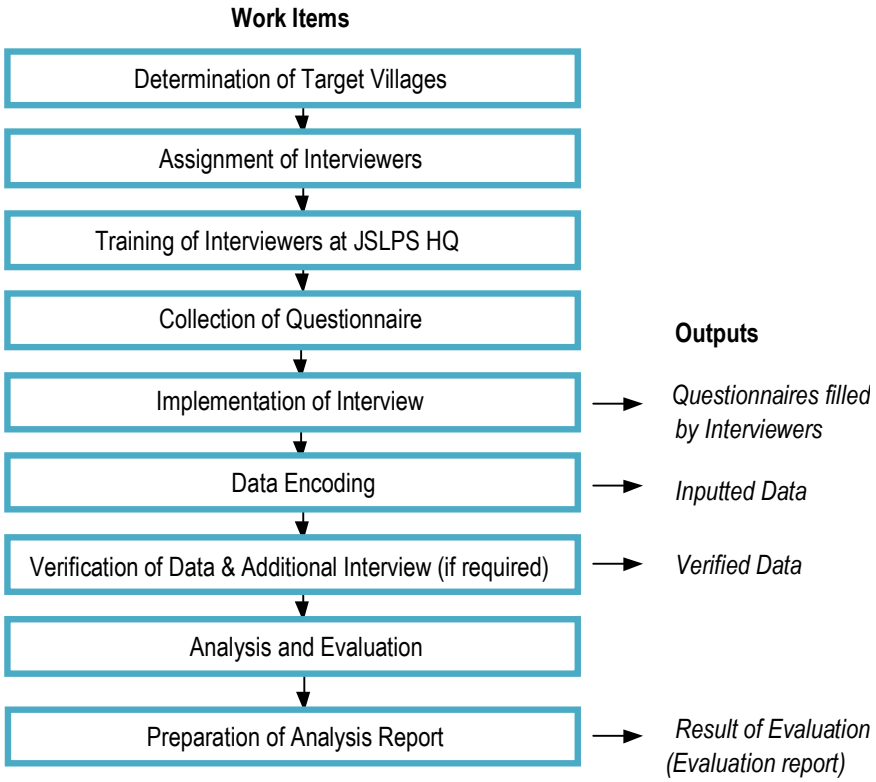


Figure Overall Process of the Survey

2.2 Survey Period

Survey Period: In October 2014

Deadline of the submission of the analysis report: By the end of October 2014

(In case that the analysis report cannot be completed in time, JSLPS head office shall inform to the JICA survey team to consult on the postponement of the schedule by 24 October.)

2.3 Criteria of Target Area

Villages where MDI facilities has been installed under the UNDP project, SGSY/NRLM programme, other government programmes

2.4 Size and Allocation of Sampling

Target villages shall be randomly selected from the list of JSLPS. To disperse sampling farmers, following allocation shall be adopted.

- At least 5 target district/state
- At least 3 target blocks/district
- At least 5 target villages/block
- At most 5 individual farmers/village
- 1 individual farmer/household

(5 districts x 3 blocks x 5 villages x 5 farmers = 375 farmers +)

Total number of sample farmers shall be more than **400.**

2.5 Criteria of Interviewee (individual farmers)

Target interviewee shall meet all the criteria as follows.

- SHG member
- Owing a farmland or leased farmland over 1,000 sqm (25 dismil or 0.1ha)
- Having open well or tube-well available for Micro Drip Irrigation (MDI)
- Having a pump for MDI

2.6 Items in the Questionnaire

Items in the Questionnaire are as follows.

(1) Basic Information

- Name of Interviewee (Individual farmer)
- Tel. Number
- Name of SHG
- Location (Village, Block and District)

(2) Willingness to participate in I-HIMDI

- Do you have a willingness to participate in I-HIMDI? (Yes / No)
- If "No", why?

(3) Permission by All Family Members to participate in I-HIMDI

- Getting permission by all your adult family members (your husband, grandparents, brother & sisters etc.) are obligation to participate in the Project especially for repayment for O&M fund in SHG. Can you get their permission? (Yes / No)
- If "No", why?

3. Procedure of the Survey

3.1 Training of Interviewee

JSLPS field officers shall be nominated as interviewer for each area in designated areas. At the beginning, interviewers shall be gathered at JSLPS head office in Ranchi and trained by a person in charge of the survey. The following information shall be explained to all interviewers to get consensus among them.

- Purposes of the survey
- Contents of all items in the questionnaire
- Sample Number of each assigned area
- Selection criteria of interviewee
- Survey period
- Procedure of the survey
- Submission method of filled questionnaires to JSLPS head office

3.2 Implementation of Interview

The interviewers shall implement interview survey for each individual farmer. It shall be done individually (not in group interview) and interviewer shall fill in a questionnaire according to the farmers' answers.

Images of Interview Survey

Before the interview on willingness to participate in I-HIMDI and permission by all family members to participate in I-HIMDI, interviewers shall show the pictures of

facilities in questionnaire and explain the project component in advance. Project components are as follows.

Table Project Summary of I-HIMDI

Main component	MDI Facility for 1,000 sqm (25 dismil or 0.1ha) for all participants
Obligation of participant	Repayment of 15,000 Rs. (60% of MDI facility cost) with 1.5% monthly interest in 3 years for O&M fund in SHG, which will be mainly used for future maintenance cost of your MDI facility
Your benefits **(for free)**	- A series of trainings on off-season vegetable cultivation & collective marketing, O&M for agri-support facilities and institution building for SHG - Poly Nursery House (2m x 3m) with 35 nursery trays, cocopeat, fertiliser, pesticide and vegetable seeds to support off-season MDI farming - Vermin Compost Unit made of high density poly ethylene (HDPE) with earthworms to support off-season MDI farming  **Poly Nursery House & Nursery Trays** (For healthy seedling production and mitigation of transplanting damage)  **Vermin Compost Unit** (For acceleration of compost making and enhancement of soil fertility)

3.3 Encoding and Verification of Data

All data in the questionnaires obtained from the all interviewees shall be encoded to computer data. The software used in encoding shall be “Excel.” In general, the data and those encoding works have following “unavoidable error.”

- Mishearing of interviewer
- Misreading by computer operator

The JSLPS head office shall review and verify all questionnaires. If necessary, additional interview through mobile phone shall be carried out to confirm the result of interview.

Questionnaire for Willingness to participate in I-HIMDI

Date of Interview: _____ Time of Interview_____

Name of Interviewer: _____

1. Basic Information

Name of Interviewee		Tel. Number:	
Name of SHG			
Location	Village:	Block:	District:

2. Criteria of Interviewee (must meet following criteria)

SHG member	❑ Yes
Owing a farmland or leased farmland over 1,000 sqm (25 dismil or 0.1ha)	❑ Yes
Having open well or tube-well available for Micro Drip Irrigation (MDI)	❑ Yes
Having a pump for MDI	❑ Yes

3. Understanding of Project Components and Obligation of Participants (Please explain following items to interviewee)

Main component	MDI Facility for 1,000 sqm (25 dismil or 0.1ha) for all participants
Obligation of participant	Repayment of 15,000 Rs. (60% of MDI facility cost) with 1.5% monthly interest in 3 years for O&M fund in SHG, which will be mainly used for future maintenance cost of your MDI facility
Your benefits **(for free)**	- A series of trainings on off-season vegetable cultivation & collective marketing, O&M for agri-support facilities and institution building for SHG - Poly Nursery House (2m x 3m) with 35 nursery trays, cocopeat, fertiliser, pesticide and vegetable seeds to support off-season MDI farming - Vermin Compost Unit made of high density poly ethylene (HDPE) with earthworms to support off-season MDI farming

Poly Nursery House & Nursery Trays
(For healthy seedling production and mitigation of transplanting damage)

Vermin Compost Unit
(For acceleration of compost making and enhancement of soil fertility)

4. Willingness to participate in I-HIMDI

Do you have a willingness to participate in I-HIMDI?	❑ Yes	❑ No
If "No", why?		

5. Permission by All Family Members to participate in I-HIMDI

Getting permission by all your adult family members (your husband, grandparents, brother & sisters etc.) are obligation to participate in the Project especially for repayment for O&M fund in SHG. Can you get their permission?	❑ Yes	❑ No
If "No", why?		

Result of the Questionnaire Survey on Willingness to participate in I-HIMDI

District	Block	Total Number of Answer	Yes	No	Reasons of the Negative Answer
Gumla	Gumla	20	20	0	-
	Basia	26	26	0	-
	Sisai	30	30	0	-
Hazaribagh	Barhi	26	26	0	-
	Churchu	18	18	0	-
	Ichak	26	26	0	-
Khunti	Karra	25	25	0	-
	Torpa	25	23	2	Repayment amount should be less than Rs. 10,000.
	Muhru	25	25	0	-
Ranchi	Angara	25	22	3	Repayment amount should be Rs. 10,000 with 1.0 % monthly interest. Cannot understand the project contents.
	Ormanjhi	26	26	0	-
	Silli	29	29	0	-
West Singhbhum	Manoharpur	25	24	1	Repayment amount to O&M fund is too high.
	Anandpur	25	25	0	-
	Goilkera	25	25	0	-
Total		**376***	**370**	**6**	**-**
%			**98.4%**	**1.6%**	

*Note: Reliability 95%, Sampling Error: ±5%

Attachment 6.5.1 Tentative Assignment Schedule of the Consultants

Position		1st Year												2nd Year												3rd Year												4th Year												5th Year												6th Year												Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	M/M
					Preparation Stage												Phase-1: Demonstration												Phase-2: Expansion												Phase-3: Expansion												Phase-4: Expansion																						
																	(5,000 MDIs)												(15,000 MDIs)												(20,000 MDIs)												(20,000 MDIs)																						
	Selection of Target MDI Farmers																																																																							
	Construction of MDIs																																																																							
	1st Vegetable Cultivation																																																																							
International Consultants (Professional A)																																																																								
A1	Team Leader	1	1	1	1	1		1	1	1	1	1			1	1	1	1		1	1	1	1	1			1	1	1	1		1	1	1	1	1			1	1	1	1		1	1	1	1	1			1	1	1	1		1	1	1	1	1	1										1	1	1	50
A2	Monitoring and Evaluation Expert	1	1	1	1								1	1											1	1											1	1											1	1																								12
A3	Construction Management Expert											1	1	1	1	1	1							1	1	1	1	1	1							1	1	1	1	1								1	1	1	1	1	1																					23
A4	Institutional and Capacity Development Expert	1	1	1	1	1	1			1	1	1	1							1	1	1	1	1	1							1	1	1	1	1	1							1	1	1	1	1	1							1	1	1	1	1	1													34
A5	Irrigation and O&M Expert		1	1	1	1	1			1	1	1	1							1	1	1	1	1	1							1	1	1	1	1	1							1	1	1	1	1	1							1	1	1	1	1	1													33
A6	Horticulture Expert		1	1	1	1	1			1	1	1	1							1	1	1	1	1	1							1	1	1	1	1	1							1	1	1	1	1	1							1	1	1	1	1	1													33
A7	Market Expert				1	1	1				1	1	1										1	1	1										1	1	1										1	1	1										1	1	1													18
	Sub-total	3	5	5	6	5	4	1	1	4	5	6	6	2	2	2	2	1	0	4	4	4	5	6	6	2	2	2	2	1	0	4	4	4	5	6	6	2	2	2	1	1	0	4	4	4	5	6	6	2	2	2	2	1	0	4	4	4	5	5	5	0	0	0	0	0	0	0	0	0	1	1	1	**203**
National Consultants (Professional B)																																																																								
B1	Co-Team Leader	1	1	1	1	1	1	1		1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	66
B2	Monitoring and Evaluation Expert				1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1										1	1	1	55
B3	Institutional and Capacity Development Expert	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1		1	1	1	1	1													55
B4	Irrigation and O&M Expert		1	1	1	1	1			1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1													53
B5	Horticulture Expert		1	1	1	1	1			1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1													53
B6	Market Expert				1	1	1				1	1	1							1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1													45
	Sub-total	2	4	4	6	6	6	3	1	4	6	6	6	5	5	5	4	5	3	6	5	5	6	6	6	6	6	6	5	6	3	6	6	4	6	6	6	6	6	6	5	6	3	6	5	5	6	6	6	6	6	6	5	6	3	5	5	6	6	6	6	0	1	1	1	1	1	1	1	1	2	2	2	**327**
Supporting Staff																																																																								
1	Administrator	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1		1	1	1	1	1	1	1	1	1	1	1	66
2	Secretary	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1													55
3	Computer Operator	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1													55
4	Driver	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		1	1	1	1	1	1	1	1	1	1	1	251
5	Clerk	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	71
	Sub-total	8	8	8	8	8	8	7	7	7	8	8	8	8	8	8	8	8	8	7	7	7	8	8	8	8	8	8	8	8	8	7	7	7	8	8	8	8	8	8	8	8	8	7	7	7	8	8	8	8	8	8	8	8	8	7	7	7	8	8	8	0	3	3	3	3	3	3	3	3	3	3	3	**498**

Source: JICA Survey Team

Attachment 6.5.2 Draft Terms of Reference for Consulting Services on Initiative for Horticulture Intensification by Micro Drip Irrigation in Jharkhand

1. Background

The Government of India has received a loan from the Japan International Cooperation Agency (hereinafter referred to as "JICA") to finance the Horticulture Intensification by Micro Drip Irrigation in Jharkhand (hereinafter referred to as "the Project"). The Government of India intends to use part of the proceeds of the loan for eligible payments for consulting services for which this ToR is issued.

(1) Objectives

The objective of the Project (I-HIMDI) is to improve living standards of 60,000 small and marginal farmers in the target12 districts of Jharkhand through promotion of advanced practices of irrigation and agriculture technologies. It provides micro drip irrigation (MDI) systems and relevant agriculture facilities, and technical assistance for enhancement of productivity and marketability of horticulture crops. Consequently, the Project could contribute toward activation of agriculture sector and poverty alleviation in Jharkhand.

From the implementation of the Project, the following benefits and social economic impact could be expected.

Table 1 Exepcted Benefits and Impact of the Project

Benefits	Social Economic Impacts
- Increased crop yield and production - Off-season crop production - Increment of net farm income - Saving on water and other agriculture inputs such as fertilizers and agro-chemicals, etc.	- Reduced out mitigation - Increased on-farm and off-farm employment - Enhanced food security - Improvement of living standards - Gender empowerment, etc.

(2) Project Components

The project comprises of the following 5 components, of which the top four components will be financed by JICA, with terms and conditions set forth in the loan agreement and the rest shall be totally funded by the Government of India.

Table 2 Project Components

Component 1	Institution Building Programme
Component 2	Farmers Support Programme
Component 3	Agriculture Infrastructure Development Programme
Component 4	Consulting Services
Others	Administration and Others

(3) Scope of the Project

The scope of the Project is as stated below:

Attachment 6.5.2

Table 3 Scope of the Project

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	Preparation of Trainings a) Preparation of materials for public dissemination and awareness; b) Preparation of training Programme 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 Programme for training to MDI farmers by trainers, etc. Execution of Trainings a) Public dissemination and public consultation meetings; 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.
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 *A direct pumping type including venture unit, screen filter, main line, drip lines with NPC drippers and other accessories.* b) Poly Nursery House : 60,000 units *A house type (2.0 m wide, 3.0 m long, 1.5 m high) with UV stabilized transparent vinyl sheet, anti-insect net, including plastic nursery trays, cocopeat, fertilizer, pesticide, seed for one crop season.* c) Vermin Compost Production Unit : 60,000 units *A bag type (1.2 m wide, 3 m long, 0.5 m high) made of high density poly ethylene, including earthworms.* d) Agriculture Tools : 1,200 lots *Sprayers, plastic crates, etc. for common uses.* e) Multi-Purpose Community Center : 38 units *Floor area of 50 m2 with office and store room, including weigh scale, grader, whiteboard, etc.* f) Market Center (Godown and Cold Storage) : 1 unit *Floor area of 100 m2 with 2 units of cold storages and one light vehicle and 1,000 plastic crates.*

SN.	Component	Scope of Work
		g) Zero Energy Cool Chamber : 2,400 units *A pusa zero energy cool chamber type (1.0 m wide, 1.5 m long, 0.6 m high). A roof shall be constructed by the beneficiary.*
4.	Consulting Services	The project consultant will assist the PMU in the following activities: a) Overall project management; b) Installation and management of agriculture infrastructure; c) Institution building of PMU staff; d) Prepataion of training programme; d) Capacity building of target MDI farmers in O&M and farm management..
5.	Others to be provided by the Government of Jharkhand	a) Project administration; b) Taxes and duties; c) Front end fees, etc.

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

(4) Implementation Schedule

The project implementation period is 7 years from the effective date of loan agreement. Against contingency during the project implementation, the loan would be provided for 10 years. The expected completion of the Project is May 2022 as shown below.

Table 4 Oveall Implementation Schedule

Item	**Expected Time Schedule**
Loan Agreement	June 2015 (10 years)
Establishment of PMU	June 2015 to May 2016 (12 months)
Selection of Consultants	August 2015 to May 2016 (10 months)
Consulting Services	June 2016 to May 2022 (72 months)
Institution Building Programme	June 2016 to May 2022 (72 months)
Farmers Support Programme	June 2016 to May 2022 (72 months)
Agriculture Infrastructure Development Programme	February 2017 to May 2021 (52 months)
Project Completion	May 2022
Loan Closing	May 2025

(5) Location of the Project

The Project will cover 12 districts out of 24 districts in Jharkhand, namely Ranchi, Khunti, Pashchimi Singhbhum, Saraikela Kharsawan, Latehar, Palamu, Hazaribagh, Giridih, Dumka, Pakur, Gumla and Lohardaga as shown in **Attachment-1** *(refer to Location Map).*

(6) Executing Agency

The executing agency of the Project is the Jharkhand State Livelihood Promotion Society (JSLPS), under general supervision of the Rural Development Department (RDD) of the Government of Jharkhand. The Project Management Unit (PMU) would be established at JSLPS at the state level, which is to bear the overall responsibilities of project implementation and monitoring, by overseeing the operations at district, block and village levels, while coordinating with other relevant

administrative and technical agencies whose services and assistance may be mobilized in the implementation of the Project. The Organisational structure of the Project is shown in **Attachment-2** *(refer to Figure 7.1.1)*.

(7) Technical Information

Materials, products and designs of agriculture infrastructures shall be compliant with the Indian Standards (IS).

(8) Related Programs

The following programs are related to the Project.

- National Rural Livelihood Mission (NRLM)
- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
- Integrated Watershed Management Program (IWMP)

2. Objectives of Consulting Services

The consulting services shall be provided by an international consulting firm (hereinafter referred to as "the Consultant") in association with national consultants in compliance with Guidelines for the Employment of Consultants under Japanese ODA Loans, April 2012. The objective of the consulting services is to achieve the efficient and proper preparation and implementation of the Project through the following works:

- Overall project management
- Installation and management of agriculture infrastructure
- Institution building
- Preparation of training programme
- Capacity building of target MDI farmers in O&M and farm management

3. Scope of Consulting Services

The scope of the project consultant is to assist the PMU in the following activities:

(1) Overall Project Management

1-1 Preparation of Overall Project Management Plan;

1-2 Preparation of Annual Work Plan and Budget Estimate;

1-3 Monitoring and evaluation of physical and financial progress;

1-4 Preparation of Monthly and Annual Progress Reports;

1-5 Baseline Survey and Follow-up Evaluation on annual basis, and Terminal Impact Assessment;

1-6 Technical Reports related to the project if any;

1-7 Preparation of the Project Completion Report; and

1-8 Coordination between PMU and JICA.

(2) Installation and Management for Agriculture Infrastructure

2-1 Screening and Appraisal of target SHGs and MDI farmers;

2-2 Preparation of Infrastructure Development Plan;

2-3 Preparation of Standard Bid Documents, Bid Evaluation and Contract Documents;

2-4 Review of design drawings and cost estimate;

2-5 Construction supervision of the works in accordance with the specifications and drawings;

2-6 Commissioning test for completed facilities;

2-7 Review of the completion reports to be submitted by contractors.

(3) Institution Building

3-1 Orientation Workshop to PMU staff;

3-2 Training to PMU staff and Exposure Visits to similar projects;

3-3 Screening and Appraisal of target MDI farmers;

3-4 Planning of Action Plan of the Project;

3-5 Establishment of Project Management Information System, etc.

(4) Preparation of Training Programme

4-1 Preparation of materials for Public Dissemination and Awareness;

4-2 Preparation of Training Modules and materials for each scheme;

4-3 Preparation of Audio-Visual Training Materials;

4-4 Development of Evaluation Method for Trainings;

4-5 TOT training to TOs, FOs and CRPs;

4-6 Preparation of Training Programme to MDI farmers by trainers, etc.

(5) Capacity Building of Target MDI Farmers in O&M and Farm Management

5-1 Public Dissemination and Public Consultation meeting;

5-2 Training to SHGs/MFG and Exposure Visits to similar projects;

5-3 Training on O&M of MDIs and Exposure Visits to similar projects;

5-4 Training on Horticulture Farming Technology and Exposure Visits to similar projects;

5-5 Training on Processing and Marketing of horticulture products and Exposure Visits to similar projects;

5-6 Follow-up Workshop for Trainings.

4. Expected Time Schedule

The total duration of consulting services will be 72 months; starting on 1st June 2016 and ending on 31st May 2022.

5. Expert Requirement

The minimum person-months (P/M) input of the consultants is estimated at 203 P/M of Professional

(A) and 327 P/M of Professional (B), and 498 P/M of supporting staff for the contract period of 72 months. A detailed schedule of consulting services and a distribution of man-months is shown in **Attachment-3** *(refer to Attachment 6.5.1)*.

5.1 Consulting Inputs

The consulting services will include overall project management, installation and management of agriculture infrastructure, institutio building, preparation of training programme, capacity building of target MDI farmers in O&M and farm management, which will be performed by the following experts together with supporting staff. The allocation of person-months of the experts excluding supporting staff is shown in Table 5 below.

Table 5 Allocation of Person-Months

Designation	No.	Total Person-Months (P/M)
Professional (A) : International Expert		
Team Leader	1	50
Monitoring and Evaluation Expert	1	12
Construction Management Expert	1	23
Institution Capacity Building Expert	1	34
Irrigation and O&M Expert	1	33
Horticulture Expert	1	33
Market Expert	1	18
Professional (B): National Expert		
Co-Team Leader	1	66
Monitoring and Evaluation Expert	1	55
Institution Capacity Building Expert	1	55
Irrigation and O&M Expert	1	53
Horticulture Expert	1	53
Market Expert	1	45

5.2 Qualification of Experts

The minimum qualification of key team members is shown in Table 6 below.

Table 6 Minimum Qualification of Key Team Members

Designation	Qualification
Professional (A): International Expert	
Team Leader	Education: • BS in irrigation or civil engineering. Experience: • 15 years' work experience in irrigation-related projects; • 1 comprehensive irrigation-related project in which he/she served as team leader or co-team leader for more than 3 years; • 3 irrigation-related projects in South Asian countries, preferably India; • 10 years' work experience in Japanese ODA loan projects.

Monitoring and Evaluation Expert	Education: • BS in irrigation engineering or agriculture. Experience: • 10 years' work experience in monitoring and evaluation, planning, design and construction supervision of irrigation-related projects or similar; • 2 irrigation-related projects in South Asian countries, preferably India; • 5 years' work experience in Japanese ODA loan projects.
Construction Management Expert	Education: • BS in irrigation or civil engineering. Experience: • 10 years' work experience in bid documents, bid evaluation, planning, design and construction supervision of irrigation-related projects or similar; • 2 irrigation-related projects in South Asian countries, preferably India; • 5 years' work experience in Japanese ODA loan projects.
Institution Capacity Building Expert	Education: • BS in sociology, economy or agriculture. Experience: • 10 years' work experience in agriculture development, preferably institutional development, capacity building, community development or rural development; • 2 agriculture development projects in South Asian countries, especially India is preferable; • 3 years' work experience in Japanese ODA projects.
Irrigation and O&M Expert	Education: • BS in irrigation or civil engineering. Experience: • 10 years' work experience in agriculture development, preferably irrigation water management and O&M; • 2 agriculture development projects in South Asian countries, especially India is preferable; • 3 years' work experience in Japanese ODA projects.
Horticulture Experts	Education: • BS in agriculture. Experience: • 10 years' work experience in agriculture development, preferably vegetable and fruit cultivation; • 2 agriculture development projects in South Asian countries, especially India is preferable; • 3 years' work experience in Japanese ODA projects.
Market Experts	Education: BS in agriculture or commerce. Experience: • 10 years' work experience in agriculture development, preferably agricultural processing and marketing; • 2 agriculture development projects in South Asian countries, especially India is preferable; • 3 years' work experience in Japanese ODA projects.
Professional (B): National Expert	
Co-team Leader	Education:

	• BS in irrigation or civil engineering. Experience: • 15 years' work experience in irrigation-related projects; • 1 comprehensive irrigation-related project in which he/she served as team leader or co-team leader for more than 3 years; • 3 years' experience in foreign funded projects.
Monitoring and Evaluation Expert	Education: • BS in irrigation engineering or agriculture. Experience: • 10 years' work experience in monitoring and evaluation, planning, design and construction supervision of irrigation-related projects; • 3 years' experience in national funded projects.
Institution Capacity Building Expert	Education: • BS in sociology, economy or agriculture. Experience: • 10 years' work experience in agriculture development, preferably institutional development, capacity building, community development or rural development; • 3 years' experience in national funded projects.
Irrigation and O&M Expert	Education: • BS in irrigation or civil engineering. Experience: • 10 years' work experience in agriculture development, preferably irrigation water management and O&M; • 3 years' experience in national funded projects.
Horticulture Experts	Education: • BS in agriculture. Experience: • 10 years' work experience in agriculture development, preferbaly vegetable and fruit cultivation; • 3 years' experience in national funded projects.
Market Experts	Education: BS in agriculture or commerce. Experience: • 10 years' work experience in agriculture development, preferbaly agricultural processing and marketing; • 3 years' experience in national funded projects.

Consultant may propose other experts and supporting staffs required to accomplish the tasks outlined in the ToR. It is the Consultant's responsibility to select the optimum team and to propose the professionals which he believes best meets the needs of JSLPS.

5.3 Scope of Works for the Respective Experts

The major tasks and duties of each expert of the consultant team are described in Table 7 below.

Table 7 Major Tasks and Duties of Each Expert

No	Position	Major Tasks and Duties
A-1 B-1	Team Leader Co-team Leader	1) Setting-up an effective organizational structure for the Consultant Team. Preparing and implementing all administrative systems and procedures needed to ensure the effective implementation in accordance with the scope of works with accesptable international standards; 2) Being responsible for overall direction of the Consultant Team, coordination of inputs, and management of individual experts; 3) Being responsible for the overall management of planning, design, construction supervision of agriculture infrastructure, and trainings on institution building and farmers support; 4) Having overall responsibility for the timely delivery and quality of all outputs; 5) Managing the relationships with the government, PMU, JICA and all other stakeholders; 6) Advising to the PMU on construction and contracting methods, and performing a comprehensive analysis of options, benefits, risks, mobilization and implementation schedules; 7) Assisting the PMU to prepare invitation for tender; preparing bid evaluation criteria, initially evaluating and providing advice to the PMU on alternative proposals, and elaborating on recommendations with a ranking of all contractors concluding with a suggestion of the technically and economically qualified bidder; 8) Identifying important technical and managerial issues which affect progress, safety, qaulity and compliance with safeguards; 9) Reviewing mobilization of the Contractor's resources (experience of the personnel, equipment and tools, quality and quantity of material, funds, etc.) and recommending additional resources to be mobilized; 10) Guiding, coordinating and supporting program activities and providing overall guidance and direction, and ensure that the Consultant works in harmony with other ongoing and planned programs; 11) Advicing the PMU in coordinating the planning, management, monitoring and reporting of all project activities including supporting the developemnt and implementation of progress monitoring systems; 12) Advising the PMU with packaging contracts and finalizing tender documents. 13) Coordinating with and assisting the PMU on any relevant activities for the Project; 14) Preparing overall project management plan; 15) Preparing annual work plans and budget estimates in a form agreed with the PMU and JICA (in PSR), and submit the reports; 16) Preparing monthly progress reports and quarterly progress reports in a form agreed with the PMU and JICA (in PSR), and submit the reports; 17) Preparing technical reports related to the Project if ay; 18) Preparing a services completion report.
A-2 B-2	Monitoring and Evaluation Expert	1) Carrying out a review of the existing monitoring and evaluation (ME) and management information system (MIS); 2) Supporting the Team Leader and PMU in ensuring that the project is implemented in accordance with the overall project management plan; 3) Setting up ME and MIS frameworks for overall project activities; 4) Working with the PMU to develop (i) operation and effect indicators, (ii) database for effective data collection and management, (iii) method for evaluation and analysis, and (iv) procedure for audit and control; 5) Setting up standards, contents and schedules for assistance to the PMU for ME to ensure the project components are implemented as scheduled and outputs are as specified in the overall project management plan; 6) Preparing ME manual for monitoring and assesment; 7) Collecting necessary data, monitor and routinely evaluate project implementation results and impacts as part of the MIS; 8) Preparing standardized reporting formats and templates; 9) Assisting the Team Leader in annual updating the ME and MIS;

Attachment 6.5.2

No	Position	Major Tasks and Duties
		10) Assisting the PMU in baseline survey and follow-up survey, and teminal impact assessment.
A-3	Procurement and Contract Expert	1) Reviewing the procurement plan and contract packages with regard to procurement and financial management, and drawing attention to changes which may have become necessary since their preparation; 2) Assisting the PMU with procurement, review the progress, recommend adjustments and identify lessons learnt that can be applied to procurement of all other remaining packages in the procurement plan; 3) Annualy updating the procurement plan according to actual implementation schedule and agreed changes, accounting for content, schedule, resources, contract awards and disbursement; 4) Preparing a procurement handbook in accordance with JICA procurement policies and guidelines and government regulation. The handbook should include guidelines for effective implementation of the procurement, and providing guidance on bid notification and bid submission, bid eveluation and contract award, contract supervision and payment; 5) Guiding, supporting and monitoring the PMU in procurement and financial management in accordance with the procurement handbook; 6) Finalizing tender documents and bill of quantities; 7) Preparing standard criteria and checklists for evaluation of the tenders and assist the PMU in preparation of the bid evaluation reports, and assist them in reviewing the selection process of bidders; 8) Assisting the PMU with contract negotioations, preparation of contracts and contract awards; 9) Managing complete and updated files on all contractual issues including submittals, securities, insurance, and related dcouments; 10) Examining contractor's claims and support the PMU with determination of need for contract variations, etc.; 11) Updating, monitoring and evaluating the payment and disbursement of all packages in the project and identifying the causes of existing problems, delays and proposed remedial meaures; 12) Assisting the PMU in preparing monthly reports for procurement and contract awards, contract management and perforamnce of each contract package; 13) Providing advice as required helping resolve contractual and construction matters. 14) Assisting the PMU in review of design drawings and cost estimate of agriculture infrastructure development; 15) Assisting the PMU in construction supervision of the works in accordance with specifications and drawings; 16) Assisting the PMU in commissioning test for completed facilities; 17) Assisting the PMU in review of completion reports to be submitted by contractors.
A-4 B-3	Institution Capacity Building Expert	1) Preparing a training needs assessment and designing a training program to strengthen the staff of PMU, CRPs and MFGs in collaboration with other experts; 2) Preparing training modules and materials in relation to institution capacity building; 3) Carrying out capacity building trainings to the PMU staff; 4) Supervising and advising capacity building trainings to CRPs and MFGs; 5) Providing advice and guidance to the PMU on exposure visits for inter-blocks and inter-districts in collaboration with other experts; 6) Carrying out public dissemination and awareness on the Project in collaboration with other experts; 7) Preparing screening and appraisal manual for target SHGs andMDI farmers. and also MDI plans in collaboration with other experts; 8) Screening and appraisal of target SHGs and MDI farmers in collaboration with other experts; 9) Preparation of MDI plans in collaboration with other experts; 10) Eveluation of training inputs, outputs, and outcomes in terms of institution

No	Position	Major Tasks and Duties
		capacity building; 11) Assistting the PMU with implementing the training program by providing logistical support;
A-5 B-4	Irrigation and O&M Expert	1) Preparing a training needs assessment and designing a training program to strengthen the staff of PMU, CRPs and MFGs in collaboration with other experts; 2) Preparing training modules and materials in relation to irrigation and O&M; 3) Carrying out trainings on installation and O&M of MDIs to the PMU staff; 4) Supervising and advising trainings on installation and O&M of MDIs to CRPs and MFGs; 5) Eveluating training inputs, outputs, and outcomes interms of irrigation and O&M;
A-6 B-5	Horticulture Expert	1) Preparing a training needs assessment and designing a training program to strengthen the staff of PMU, CRPs and MFGs in collaboration with other experts; 2) Preparing training modules and materials in relation to horticulture production; 3) Carrying out horticulture production trainings to the PMU staff; 4) Supervising and advising horticulture production trainings to CRPs and MFGs; 5) Eveluating training inputs, outputs, and outcomes in terms of horticulture production.
A-7 B-6	Market Expert	1) Preparing a training needs assessment and designing a training program to strengthen the staff of PMU, CRPs and MFGs in collaboration with other experts; 2) Preparing training modules and materials in relation to marketing of horticulture products; 3) Carrying out marketing trainings to the PMU staff; 4) Supervising and advising marketing trainings to CRPs and MFGs; 5) Eveluating training inputs, outputs, and outcomes in terms of marketing.

6. Reporting

Within the scope of consulting services, the Consultant shall prepare and submit reports and documents to PMU as shown in Table 8. The Consultant shall provide an electronic copy of each of these reports.

Attachment 6.5.2

Table 8 Summary of Reports to be submitted by the Consultant

Category	**Type of** Report	Timing	**No. of Copies**
Consultancy Services	Inception Report	Within 3 months after commencement of the Services	5
	Monthly Progress Report	Monthly, by the 7th of each following month	5
	Quarterly Progress Report	Quarterly, by the 15th of the following month	5
	Annual Work Plan	Annually, by the 15th of the following month	5
	Services Completion Report	At the end of Services	5
Planning	Manual for Selection and Appraisal of MDI farmers	Within 6 months after commencement of the Services	5
	Selection and Appraisal Report for MDI farmers	Annually, by the 15th of the following month	5
Monitoring and Evaluation	Manual for Monitoring and Evaluation	Within 3 months after commencement of the Services	5
	Manual for Management Information System	Within 6 months after commencement of the Services	5
	Annual Baseline Survey Report	Within 1 month after commencement of the Services	5
	Annual Follow-up Survey Report	Annually, by the 15th of the following month	5
	Terminal Impact Assesment Report	3 months before the completion of services	5
Bidding	Procurement Handbook	Within 3 months after commencement of the Services	5
	Bid Documents of Agriculture Infrastructure including sample design drawings	At appropriate timing in accordance with bid schedule	5
	Bid Evaluation Report of Agriculture Infrastructure	At appropriate timing in accordance with bid schedule	5
Construction Supervision	MDI Installation Mannual	Within 6 months after commencement of the Services	5
	Completion Report	At the end of each contract period	5
Training	Annual Training Program	Annually, by the 15th of the following month	5
	Training Module and Materials	Within 6 months after commencement of the Services	5
	Evaluation Report for Trainings	Annually, by the 15th of the following month	5
Environment and Social Management System*	Environmental Management Plan	Within 6 months after commencement of the Services	5
	Environmental Monitoring Plan	Annually, by the 15th of the following month	5
Other Report	Technical Report	As required or upon request	As required

Note: *) to be prepared by JSLPS

Contents to be included in each report are as follows:

(1) Inception Report (5 sets)

Inception report, to be submitted within 3 months after the commencement of the services, shall contain overall project management plan, work schedule, work plan, administrative arrangement, results of review of available data and information, relevant to the project during the inception period,

and so on.

(2) Monthly Progress Report and Quarterly Progress Report (5 sets)

Monthly progress report and quarterly progress report, to be prepared monthly by the 7th of the following month and quarterly by the 15th of the following month, shall contain detailed information of physical and financial progress of the project components, issues and problems, consultant's input and activities, and schedule of works for the next period.

(3) Annual Work Plan (5 sets)

Annual work plan, to be prepared annually by the 15th of the following month, shall contain detailed information of packaging plan, activities, schedule and budeget estimate for the next physical year.

(4) Services Completion Report (5 sets)

Based on the monitoring and evaluation records of the project activities, the Consultant shall prepare and submit the services completion report which covers the results of all the project activities at the end of the services.

(5) Selection and Appraisal Manual of MDI farmers (5 sets)

Selection and appraisal manual of MDI farmers, to be prepared within 6 months after the commencement of the services, shall contain items, process and procedure, method, criteria, evaluation, etc with appropriate forms.

(6) Selection and Appraisal Report of MDI farmers (5 sets)

Report on selection and appraisal of MDI farmers, to be prepared annualy after compeletion of the survey, shall contain the results of selection and appraisal of MDI farmes including MDI plans based on the manual.

(7) Manual for Monitoring and Evaluation (5 sets)

Manual for monitoring and evalutation, to be prepared within 3 months after the commencement of the services, shall contain items, process and procedure, method, criteria, evaluation, etc with appropriate forms.

(8) Manual for Management Information System (5 sets)

Manual for management information system, to be prepared within 6 months after the commencement of the services, shall contain items, process and procedure, method, criteria, evaluation, etc with appropriate forms.

(9) Annual Baseline Survey Report (5 sets)

Annual aseline survey report, to be prepared annually within 1 month after the completion of selection of MDI farmers, shall contain basic information, cropping pattern and production, marketing and post-harvesting activities, social environmental background, water source and soil condition, to be used as benchmark for terminal impact assessment at the end of the project.

(10) Annual Follow-up Survey Report (5 sets)

Annual follow-up survey report, to be prepared annually, by the 15th of the following month, shall contain basic information, cropping pattern and production, incomes, marketing and post-harvesting activities, etc. for the relevant yeaer, to be used as a part of the terminal impact assessment at the end

of the project.

(11) Terminal Impact Assessment Report (5 sets)

Terminal impact assessment report, to be prepared 3 months before the completion of the services, shall contain various aspects; basic information, cropping pattern and production, incomes, marketing and post-harvesting activities, social environmental background, water source and soil condition to be used as benchmark for impact assessment at the end of the project.

(12) Procurement Handbook (5 sets)

Procurement handbook, to be prepared in accordance with JICA's procuremnt guidelines and the government regulation within 3 months after the commencement of theservices, shall contain invitation for tender, standard tender documents, criteria and checklist for evaluation, contract negotiations, preparation of contracts and contract awards, etc.

(13) Bid Documents of Infrastructure Packages (5 sets)

Bid documents, to be prepared after the completion of design review/modification of proposed infrastructure, and if required PQ documents as well.

(14) Bid Evaluation Report (5 sets)

Bid evaluation report, to be prepared after the completion of bid evaluation, and if required PQ evaluation report as well.

(15) MDI Installation Manual (5 sets)

MDI installation manual, to be prepared within 6 months after the commencement of the services, shall contain parts and system, components, installation process and procedure including trenches, laying of PVC pipes, pipe fittings, installation of valves, laying of driplines, testing and commissioning.

(16) Completion Report (5 sets)

Completion report, to be prepared by the respective contractors within 1 month after the completion of each contract package, shall contain contract amount and actual payment, contract amendment if any, scope of works, bills of quantities, work schedule and progress, photographs, ect.

(17) Annual Training Programme Report (5 sets)

Annual training Programme report, to be prepared annually by the 15th of the following month, shall contain training details such as overall training plan, respective training subject, schedule, trainees, number of trainers and cost.

(18) Training Modules and Materials (5 sets)

Training modules and materials, to be prepared within 6 months after the commencement of the services, shall contain training modules and materials for installation and O&M of MDI systems, horticalture production skill, processing and marketing, MFG capacity building and O&M fund management, etc..

(19) Evaluation Report for Trainings (5 sets)

Evaluation report for trainings, to be prepared annually by the 15th of the following month, shall contain list of training program, cost, number of participants, level of intelligibility, degree of

satisfaction, etc.

(20) Environmental Management Plan (5 sets)

Environmental management plan, to be prepared by the JSLP within 6 months after the commencement of the project implementation, shall contain objectives, scope, inventory of natural resources, issues related to environmental conservation, risk and mitigation meaures, roles of stakeholders, monitoring metod, cost, etc..

(21) Environmental Monitoring Plan (5 sets)

Environmental monitoring plan, to be prepared by the JSLP annually by the 15th of the following month, shall contain water qaulity, soil condition, fertilizer application, usage of forest products, etc..

(22) Other Technical Reports (5 sets)

Technical Reports, as required, shall be prepared on the specific technical issues with the aim to enhance and upgrade technical understandings and skill of the executing agencies and managing agency concerned for the project implementation.

7. Obligation of the Executing Agency

A certain range of arrangements and services will be provided by the Executing Agency to the Consultant for smooth implementation of the Consulting Services. In this context, the JSLPS will:

(1) Report and data

Make available to the Consultant existing reports and data related to the Project.

(2) Office space

Provide an office space in the Headquarters of the JSLPS with necessary equipment, furniture and utility. However, the Consultant's requirement for office space, including necessary equipment, furniture and utilities, should be clearly stated in the proposal with its rental cost for the case where JSLPS would be unable to provide such facilities;

(3) Cooperation and counterpart staff

Appoint counterpart officials, agent and representative as may be necessary for effective implementation of the Consulting Services;

(4) Assistance and exemption

Use its best efforts to ensure that the assistance and exemption, as described in the Standard Request for Proposal issued by JICA, will be provided to the Consultant, in relation to

- work permit and such other documents;
- entry and exit visas, residence permits, exchange permits and such other documents
- clearance through customs;
- instructions and information to officials, agent and representatives of the Borrower's Government;
- exemption from any requirement for registration to practice their profession; and
- privilege pursuant to the applicable law in the Borrower's Country.

Attachment 6.5.3 Project Status Report

(Note) The portion with "(P/R and PCR)", "(P/R)", and "(PCR)" should be filled in Progress Reports (P/R) and/or Project Completion Reports (PCR).

1: Project Description (Relevance)

1-1 Project Objective

Original:
The objective of the Project is to improve livelihoods of small and marginal farmers in Jharkhand by providing agriculture infrastructure including micro drip irrigation (MDI) systems with intensive technical support for enhancement of productivity and marketability of horticulture crops.
Consequently, the Project could contribute toward activation of agriculture sector, poverty alleviation and also gender empowerment in Jharkhand.

Modified objective and its reason(s):(*P/R and PCR)*

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

Original:
(1) Being 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. 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. Meanwhile, 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. Thus, it is noteworthy to implement this project.

(2) Being consistent with State Twelfth Five Year Plan

Major policy of agriculture sector under 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. In compliance with this policy, National Rural Livelihood Mission (NRMN) and National Horticulture Mission (NHM) are executing in Jharkhand. This project, which is also consistent with the state development policy, is significant to be implemented. Thus, it is consistent with Jharkhand State Twelfth Five Year Plan.

(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 Empoyment Measure (GEM) = 0.435 (10th lowest in all India). Moreover, literacy rate of Jharkhand State is 67.6% (lowest third potion 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.

(5) Being 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.

Actual: *(P/R, PCR)*
Attachment(s): required only when they are revised.

1-3 Rationale of the Project Design

- Timing, scale, technology of the project

Original: *(P/M)*

(1) Selection of target districts and blocks

12 target districts; two each from agro-climatic zones were selected taking into account SC/ST population rate, small and population of marginal farmers, vegetable cultivation area and JSLPS's operations.

61 blocks were selected within 10 km of 19 assembly/city markets in consideration of market access, groundwater potential map and soil maps as well as security condition.

(2) Selection of target farmers

The target farmers were screened taking into account willingness of farmers, institution capacity of SHGs and availability of wells in the target districts. As the result, it was estimated at 86,000 potential farmers. Moreover, it was confirmed by additional interview survey that xx% out of 400 farmers expressed their positive participation willingness to the project on condition of repayment of Rs. 15,000 for O&M funds. Consequently, 60,000 target farmers have been judged to be reasonable.

(3) Project scope

MDI package consisting of a drip irrigation system, poly nursery house and vermin compost unit will be installed in phase; 5,000 units in 3rd year, 15,000 units in 4th year and 20,000 units each in 5th and 6th year. There is no problem in supply side of these facilities since the ready-made goods have been coming into wide use in Jharkhand. Besides the MDI packages, 38 units of multi-purpose community centers, one unit of market center with godown and cold storage, 1,200 units of agriculture tools and 2,400 zero energy cool chambers. In addition to the above, technical support for agriculture infrastructure development, institution building program and farmers support program will be provided by the project.

(4) Project period

The project period will be 10 years from 2015; divided into 3 phases; (i) Preparatory phase: 1st one year mainly for establishment of PMU and procurement of consultant; (ii) Implementation phase: 2nd to 7th year mainly for agriculture infrastructure development; institution building program and farmers support program; and (iii) Closing phase: 8th to 10th year mainly for contingency and follow-up activities.

(5) Project organization

The executing agency is JSLPS under Rural Development Department of Jharkhand State.

JSLPS will set up (i) one state PMU (15 staffs) and (ii) 12 district PMUs (39 staffs) with technical officers (120 TOs), field officers (240 FOs) and community resources persons (1,200 CRPs); one CRP will be attached to one village (about 50 farmers), one FO will cover five villages (5 CRPs) and one TO will cover 10 villages (10 CRPs) in a cascade manner.

For technical support, a series of training of trainers (TOT) will be conducted to TOs and FOs, and they will train CRPs. Thereafter, CRPs will transfer their skills and know-how to their member farmers routinely and/or regularly.

(6) Consulting services

The consultant will be employed for six years from 2nd year to assist PMU in overall project management and technical support for agriculture infrastructure development, institution building program and farmers support program.

(7) Project sustainability

The project itself builds in a mechanism to ensure the project sustainability. In concrete terms, installment of O&M funds would create ownership, similarly selection of matured SHGs ensure O&M fund installment, O&M funds make MDI systems sustainable, vermin compost unit make soils sustainable, accessibility to markets assure incomes, etc.

After completion of the project, MDI farmer groups (MFGs) will be unified into a village organization (VO) and/or cluster federation (CF) to be established by NRLM.

(8) Project evaluation and impact

EIRR of the project is estimated at 26.5%, which is economically good enough to justify the project. Besides, the annual incremental net return of the project will reach at Rs. 1,386 million from 7th year of the project, and similarly annual net farm income will increase to Rs. 44,000 with project condition from Rs. 22,000 without project condition.

This project is social and environment friendly; (i) no land acquisition and resettlement would be required, (ii) drip irrigation itself is adaptation measures for climate change, and (iii) water saving effect, reduction in fertilizer and agro-chemical application, and soil improvement.

Taking the above into account, it can be said that the project is technically viable, economically feasible, institutionally sustainable and environmentally friendly.

Actual: (*P/R,PCR)*

2: Project Implementation (Efficiency)

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	**Original:** *(P/M)* State of Jharkhand ➢ 12 districts. ◆ Ranchi, Khunti, Pashchimi Singhbum, Saraikela Kharsawan, Latehar, Palamu, Hazaribagh, Giridih, Dumka, Pakur, Fumula and Lohardaga ➢ 61 blocks as the first priority group ◆ As shown in location map **Attachment 1: Location Map**	**Actual:** *(P/Rand PCR)* **Attachment(s):Map**

Attachment 6.5.3

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
1. Institution Building Program		
Preparatory Works		
➢ Establishment of SPMU	1 SPMU	
➢ Establishment of SPMU	12 DPMU	
➢ Recruitment of SPMU staff	16 staff including COO	
➢ Recruitment of DPMU staff	39 staff	
Selection and Appraisal of MDI Farmers		
➢ Target Districts	12 districts	
➢ Target Blocks	61 blocks as 1st priority	
➢ Target Farmers	60,000 farmers	
Capacity Development		
➢ Project orientation for TOs and FOs	48 times	
➢ Training on baseline survey in the target villages and registration of MDI farmers	48 times	
➢ Project orientation for CRPs and MDI farmers	as routine works	
➢ Training on group management for TOs and FOs	48 times	
➢ Training on group management for CRPs	96 times	
➢ Training on making a MDI plan for TOs and FOs	48 times	
➢ Training on making a MDI plan for CRPs and MFGs	as routine works	
➢ Training on O&M fund management for FOs	48 times	
➢ Training on O&M fund management for CRPs and MFGs	as routine works	
➢ Training on program convergence for TOs and FOs	96 times	
➢ Training on program convergence for CRPs	96 times	
➢ Training on rick mitigation aspect of the MDI program for TOs and FOs	48 times	
➢ Training on rick mitigation aspect of the MDI program for CRPs and MFGs	as routine works	
MIS Development	1 L.S.	
Procurement of Equipment and Tools	1 L.S.	
MIS Development	1 L.S.	
2. Farmers Support Program		
Preparatory Works		
➢ Recruitment of TOs	120 TOs	
➢ Recruitment of FOs	240 FOs	
➢ Recruitment of CRPs	1,200 CRPs	
Trainings		
➢ Project orientation for horticulture and marketing for SPMU and DPMUs	1 time	
➢ Project orientation for post harvest for SPMU and DPMUs	1 time	
➢ Project orientation for horticulture and marketing for TOs	48 times	
➢ Project orientation for horticulture and marketing for CRPs	108 times	
➢ Advanced marketing training for market cluster	1 time	
➢ Other horticulture and market trainings to MFGs	as routine works by CRPs	
➢ Orientation on MDI, PNH and VCU for TOs and FOs	4 times	
➢ Operation and maintenance of MDI, PNH and VCU for	4 times	

TOs ➢ Orientation on MDI, PNH and VCU for CRPs ➢ Operation and maintenance of MDI, PNH and VCU for CRPs ➢ Orientation on MDI, PNH and VCU for MFGs ➢ Preparation for installation of MDI, PNH and VCU for MFGs ➢ Other MDI trainings	 96 times 4 times 48 times 48 times to be provided by contractors/ suppliers	
3. Agriculture Infrastructure Development Program		
a) Micro Drip Irrigation System (0.1 ha model) : b) Poly Nursery House : c) Vermin Compost Production Unit : d) Agriculture Tools : e) Multi-Purpose Community Center : f) Market Center (Godown and Cold Storage) : g) Zero Energy Cool Chamber :	60,000 units 60,000 units 60,000 units 1,200 lots 38 units 1 unit 2,400 units	
4. Consulting Services		
a) Professional (A): International Expert b) Professional (B): National Expert c) Supporting Staff	203 P/M 327 P/M 498 P/M	

2-1-2 Reason(s) for the modification if there have been any.

(P/R and PCR)

2-2 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original	Actual
Loan Agreement	June 2015	
Establishment of PMU	June 2015 - May 2016	*(P/R,PCR)*
Selection of Consultants	August 2015 - May 2016	As of (Date of Revision) Please state not only the most updated schedule but also other past revisions chronologically.
Institution Building Program	June 2016 - May 2022	
Farmers Support Program	June 2016 - May 2022	
Agriculture Infrastructure Development Program	February 2017 - May 2021	
Consulting Services	June 2016 - May 2022	
Project Completion	May 2022	
Loan Closing	May 2025	

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

(P/R and PCR)

Attachment 6.5.3

2-3 Project Cost

2-3-1

Table 2-3-1a: Comparison of Original and Actual Cost BY ITEM

Breakdown of Cost (Mil. Yen)	Foreign Currency Portion			Local Currency Portion			Total		
	Total	JICA Portion	Others	Total	JICA Portion	Others	Total	JICA Portion	Others
・Institution Building Program	0	0	0	218	218	0	369	369	0
・Farmers Support Program	0	0	0	292	292	0	493	493	0
・Agriculture Infrastructure Development Program	0	0	0	2,266	2,266	0	3,830	3,830	0
・Price Escalation	0	0	0	618	618	0	1,045	1,045	0
・Physical Contingency	0	0	0	170	170	0	287	287	0
・Consulting Services	726	726	0	237	237	0	1,127	1,127	0
・Land Acquisition	0	0	0	0	0	0	0	0	0
・Administration Cost	0	0	0	212	0	212	358	0	358
・VAT	0	0	0	178	0	178	301	0	301
・Service Tax	0	0	0	82	0	82	139	0	139
・Interest during construction	514	0	514	0	0	0	514	0	514
・Front End Fee	14	0	14	0	0	0	14	0	14
Total	1,255	726	529	4,274	3,801	472	8,477	7,151	1,327

(Note) Total figures are not necessarily tallied due to half adjustment.

1. Exchange Rate: US$1=Rs. 60.1, US$1=101.72 Japanese yen, Rs.1 = JPY 1.69
2. Price Escalation (a) Foreign Currency Portion: 2.0% p.a.
   (b) Local Currency Portion: 4.2% p.a.
3. Physical Contingency: 5.0%
4. Base Year for Cost Estimation: July, 2014

Breakdown of Cost	Actual								
	Foreign Currency Portion			Local Currency Portion			Total		
	Total	JICA Portion	Others	Total	JICA Portion	Others	Total	JICA Portion	Others
Item	( )	( )	( )	( )	( )	( )	( )	( )	( )
(P/R,PCR)									
Total									

(Note): Exchange Rate: US$1=Rs. =¥ (Rs.1=¥)

Base Year for Cost Estimation:

Table 2-3-1b: Comparison of Original and Actual Cost BY YEAR

Breakdown of Cost	Original			Actual		
	Total	JICA Portion	Others	Total	JICA Portion	Others
Fiscal Year	(Mil. Yen)	(Mil. Yen)	(Mil. Yen)	( )	( )	( )
2015	37	20	17	*(P/R,PCR)*	*(P/R,PCR)*	*(P/R,PCR)*
2016	359	309	50			
2017	910	805	105			
2018	1,799	1,594	205			
2019	2,322	2,047	275			
2020	2,436	2,126	310			
2021	360	248	112			
2022	84	0	84			
2023	84	0	84			
2024	84	0	84			
Total	8,477	7,151	1,326			

(Note): Total figures are not necessarily tallied due to half adjustment.

1. Exchange Rate: US$1=Rs. 60.1, US$1=101.72 Japanese yen, Rs.1 = JPY 1.69

You can use any currencies in this chart, i.e. you may use your local currency as well as Yen for each figure.
If there were the portion of the financial resources such as of World Bank, ADB and so forth, other than your own budget, please fill in another column between "JICA Portion" and "Others" and fill in the figures of them

2-3-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

(P/R, PCR)

2-4 Organizations for Implementation

2-4-1 Executing Agency:

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original:

Executing Agency:

Jharkhand State Livelihood Promotion Society (JSLPS)

Original:
Executing Agency
Jharkhand State Livelihood Promotion Society (JSLPS)

Organization's Role
The Project will be implemented by the Project Management Unit (PMU) to be established in the JSLPS; an autonomous Society. It is overall responsible for management and implementation of the Project. The Executing Committee (EC) and Chief Executive Officer (CEO) of JSLPS would be a governing body for the Project. All the PMU staff will be hired from open market.

PMU is comprised of State PMU (SPMU) and District PMU (DPMU). SPMU will be established at Ranchi. SPMU headed by Chief Operating Officer (COO) bears overall responsibility for management and implementation of the Project, with support of Project Managers, Accountants, MIS Officer, Computer Operator, Procurement Officer, Human Resources Development Assistant and other supporting staff.

DPMU will be set up in all of the 12 target districts. DPMU headed by District Coordinator (DC), is responsible to implement and supervise field operations with support of one MIS assistant and one accountant. Under the management of respective DPMU, Technical Officers (TOs) and Field Organizers (FOs) will be deployed for the Project to guide and train Community Resource Persons (CRPs) and MDI farmers groups (MFGs). TO is to provide technical guidance to CRPs on O&M of MDI systems as well as horticulture production, while FO is to provide guidance to CRPs in terms of organizational and financial management of MFGs. Thereafter, CRPs will transfer their skills and know-how to their member farmers routinely and/or regularly.

Coordination with other programs
It is expected for JSLPS to make a good coordination and cooperation with NRLM for social mobilization and capacity building of SHGs, MGNREGA for well construction and IWMP for watershed management..

Actual, if changed: *(P/R and PCR)*

2-4-2 Contractor(s)/ Supplier(s), and Consultant(s) and Their Performance:
2-4-2-1 Procurement and Consultant

Table 2-4-2: Procurement of Contractor(s)/Supplier(s) and Consultant(s)

Contract Package		Selection Method	
		Original: *(P/M)*	**Actual:** *(P/R and PCR)*
1	**Contractor(s)**	Local competitive bidding (LCB) for micro drip irrigation systems, multi-purpose community centers and market center.	
2	**Supplier(s)**	Local competitive bidding (LCB) or price quotation or direct contract basis for poly nursery houses, vermin compost units, zero energy cool chambers, agriculture tools.	
3	**Consultant(s)** - Project Management	Short-list method for selecting an international engineering consultant	

	Consultant	by international competitive bidding (ICB).	

2-4-2-2 Performance

(P/R and PCR) **Name(s) and Nationality(s) of the Contractor(s)/ Supplier(s):**
Evaluation:
Name(s) and Nationality(s) of the Consultant(s):
Evaluation:

2-5 Photographs of Output of the project (P/R and PCR): Attachment

3: Benefit Derived from the Project (Effectiveness)

3-1 Operational and physical condition of each facility developed/supplied by the project.

Facilities	Description of condition	Problems, its Background and Remedial Action Plan
(P/R and PCR)	*(P/R and PCR)*	*(P/R and PCR)*

3-2 Precautions (Measures To Be Adopted/Points Which Require Special Attention)

- Risks and issues, if any, which may affect the project implementation and outcome, and planned countermeasures to be adapted.

(Note) Please state environmental and social impacts (e.g., land acquisition, resettlement, HIV awareness and prevention program, gender consideration and EIA clearance) and Environmental Checklist or report of monitoring indicator in the following section "3-3 Environmental and Social Impacts".

Original issues and Countermeasure(s)	Actual issues and Countermeasure(s)
- Delay in PMU formation will affect the implementation of the Project. Therefore, PMU shall be formed by June 2015, and staff recruitment shall be completed by June 2016 for SPMU and in accordance with recruitment plan for DPMU. - Delay in procurement of consultant will affect the implementation of the Project. Therefore, the consultant shall be employed by May 2016. - Overall Project Management Plan shall be prepared by August 2016. - Selection of first group of MDI farmers shall be completed by October 2016. - Coordination and cooperation with other programs such as NRLM, MGNREGA and IWMP. - Proper budget allocation and management is required by the Executing Agency and PMU at the time of establishment of PMU for initial implementation of the Project.	*(P/R and PCR)*

3-3 Environmental and Social Impacts

Original issues and Countermeasure(s)	Actual issues and Countermeasure(s)
- No land acquisition and resettlement will be required in the project. - Neither preparation of Environment Impact Assessment report nor obtaining an Environmental	*(P/R and PCR)*

Clearance for the Project is required.	

3-4 Qualitative and Quantitative Data of Monitoring Indicators

Indicators	Original (Yr 2015)	Present (Yr ____)	Target (Yr 2025)
1. MDI Beneficiary Farm Households			➢ 60,000 farmers 1st Group: 5,000 2nd Group: 15,000 (20,000) 3rd Group: 20,000 (40,000) 4th Group: 20,000 (60,000) *(Note: the actual proportion of the above four divisions are to be subject to change, in accordance with the actual field conditions)*
2. Vegetable Cultivation Area			➢ 6,000 ha 1st Group: 500 ha 2nd Group: 1,500 ha (2,000 ha) 3rd Group: 2,000 ha (4,000 ha) 4th Group: 2,000 ha (6,000 ha)
3. Cropping Intensity			➢ 300% (= 3 times per year)
4. Training			➢ 937 times
5. MFG Organization Rate			➢ 95% at the end of the Project
6. Repayment (O&M Funds) Rate			➢ 95% at the end of the Project
7. Total Vegetable Production			➢ To be specified by crop For example, - Tomato: 360,000 ton/year - French Beans: 150,000 ton/year - Cauliflower: 330,000 ton/year
8. Average Unit Yield			➢ To be specified by crop For example, - Tomato: 6,000 kg/season - French Beans: 2,500 kg/season - Cauliflower: 5,500 kg/season
9. Average Net Return of MDI farmer			➢ Rs. 43,807 /0.1ha/year For example, - Tomato: Rs. 16,003/Kharif - French Beans: Rs. 13,221/Rabi - Cauliflower: Rs. 14,583 /Summer

(Note 1) The original data of the above indicators will be collected by annual baseline survey and similarly the present data by annual follow-up survey.

EIRR	**Original:** EIRR: 26.5% - Cost: Project direct cost (excluding tax and duties, price escalation, IDC and FEF) and O&M cost - Benefit: Incremental net return by horticulture produce - Project Life: 20 years	**Actual:** *(PCR)* _____% Cost: Benefit: Project Life: **Attachment(s): Supporting data for computing EIRR**

3-5 Monitoring Plan for the indicators

- Monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term and so forth.

Original*:*
(1) Monthly and Quarterly Reporting by PMU
(2) Annual Monitoring and Evaluation by PMU
(3) Terminal Impact Assessment by PMU
(4) Quarterly Reporting to JICA and Yearly Monitoring by JICA

JICA would carry out the evaluation activities 2 years and 7 years after the project completion.

Actual*:(P/R and PCR)*

3-6 Achievement of the Project Objective

(PCR)

4: Operation and Maintenance (O&M) (Sustainability)

4-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number, qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original*:*
JSLPS has a responsibility of O&M and management of the assets created through the project implementation. To secure the continued O&M and management after the completion of the Project, JSLPS shall take the following measures;
- Management and monitoring of O&M funds,
- Spare parts by contractors/suppliers
- Empowerment of SHGs/MFGs under NRLM,
- Converging MFGs into VO/CF under NRLM.

Actual: (*PCR)*

4-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

(PCR)

5: Evaluation

5-1 JICA and Borrower/Executing Agency Performance

Please evaluate the performance of the two bodies.

JICA: *(PCR)*
Borrower/Executing Agency: *(PCR)*

5-2 Overall evaluation

Please describe your evaluation on the overall outcome of the project.

(PCR)

5-3 Lessons Learnt and Recommendations

Please raise any lessons learned from the *project experience, which might be valuable for the future JICA assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.*

(PCR)

Attachment 8.4.1 ESMS Checklist

An Environmental and Social Management Systems (ESMS) Checklist has been completed as a required output of the environmental and social considerations assessment during project preparation and following the format provided by JICA Environmental and Social Considerations Division1

	Questions	Answer	Improvement Plan
1. Policy (environmental and social policy)			
(1)	Does the financial intermediary / executing agency have any formal environmental policy or procedures? If yes, please describe them and provide appropriate documentation. If no, does the financial intermediary /executing agency have any plan to set such policy or procedures?	JSLPS does not itself have environmental policies or procedure. However, India has a well development legal policy framework for environmental and social consideration. National policies which are relevant to this survey are as follows; Environment (Protection) Act, 1986 and EIA notification, 2006 Wildlife (Protection) Act, 1972 Forest (Conservation) Act, 1980 The Scheduled Tribes and other traditional forest dwellers Act, 2006 Insecticides Act, 1968 The Fertilizer (Control) Order, 1985 The Seed Act, 1966 Biological Diversity Act, 2002	JSLPS would take permission from Jharkhand State Pollution board to get approval on environmental and social consideration as per JICA norms.
(2)	Are there any types of projects in which the financial intermediary / executing agency will not take part due to the environmental risks? (e.g. projects involving handling of hazardous wastes or endangered plants or animals).	No. JSLPS does not have any plan to carry out this project at area where it may be possible to occur environmental risks.	N/A
2. Procedures (screening category classification and review procedures)			
(3)	Does the financial intermediary / executing agency have any environmental procedures such as screening, categorization and environmental review? If yes, please describe.	JSLPS itself is not responsible for implementation of environmental procedures. However as mention above, clear guidelines and procedures exist in India as per the relevant laws. The key institutions are; **Impact Assessment Authority** under MOEF at Central level; setting guideline, legislative development, appraisal of EIA reports and projects / granting approval. **Central Pollution Control Board**: has no direct role in environmental clearance process, though it acts as a research organization, which by collecting and analyzing information. **State Level EIA Authority**: Certain projects may be appraisal/approved at the state level and this is done by SEIAA and SEAC at Jharkhand **Jharkhand State Pollution Control Board**: supports national EC process by conducting	According to the discussion with Jharkhand SEIAA, SEAC and Jharkhand State Pollution Control Board, EIA is not required on this project because it does not fall under the sectors that required it on EIA notification, 2006. JSLPS would check the amount of fertilizer and pesticide. And JSLPS under NRLM would be preparing Environment Management Framework to ensure that the livelihood activities supported by JSLPS are environmentally sustainable besides meeting all regulatory requirements. The project would have to be approved from Jharkhand State Pollution Control Board.

[1] Application of JICA Guidelines (2010) for correspondence during project implementation and environmental review of loan assistance category FI projects.

	Questions	Answer	Improvement Plan
		investigations or research as instructed by IAA.	
(4)	Please describe how you ensure that your subproject companies and their subprojects are operated in compliance with the national laws and regulations and applicable JICA's requirements.	Environment (Protection) Act, 1986 and EIA notification, 2006 : Emission or discharge of pollutants beyond the specified standards is not permissible. Environmental impact assessment (EIA) required for specified categories of industry, no such intervention under MDI project. Wildlife (Protection) Act, 1972 Destruction, exploitation or removal of any wild life including forest produce from National Park and sanctuary or the destruction or diversification of habitat of any wild animal not done by JSLPS under any project. Forest (Conservation) Act, 1980 The JSLPS is unlikely to involve diversion of forest land for non-forest purposes. However, while supporting activities for construction of infrastructure, it is necessary to ensure that the land is not forest land. The Scheduled Tribes and other traditional forest dwellers Act, 2006 The ST and traditional forest dwellers responsibility would be for sustainable use of, conservation of biodiversity, maintain ecological balance ensuring food security and livelihood option within the forest area. JSLPS would be working for livelihood option for these forest dwellers in line of the act. Insecticides Act, 1968 The use of certain insecticides are prohibited or restricted under this Act. JSLPS would not use the prohibited insecticides but for MDI project insecticides would be procured and used for control. The Fertilizer (Control) Order, 1985 Registration is required for selling fertilizer at any place as wholesale dealer or retail dealer. Under MDI farmer clubs may be involved in such activity on very small scale. The Seed Act, 1966 Selling, bartering or otherwise supplying any seed of any notified kind or variety, requires that ; a)	JSLPS would work on using the barren patches with green corridor development and the SHGs and Farmer clubs promoted under programme would be trained on agroforestry model in which forest plants would be planted along with fruit and vegetable crops. The MDI project have use of insecticides for crop management thus JSLP would work on reducing the involvement of pesticides and insecticides by crop management and biological control methods. This would be done by training the SHG and Farmers clubs on biological control and use of organic pesticides and insecticide. The SHGs and Farmer clubs promoted under programme by JSLPS would be trained on use of fertilizer in fertigation under MDI with low involvement of fertilizer. Work and initiation would be done on use of organic fertilizer and preparation of organic fertilizer by local available biological items. The SHGs and Farmer clubs promoted under programme by JSLPS would be trained on this aspect of seed acts.

Attachment 8.4.1

	Questions	Answer	Improvement Plan
		Such seed is identifiable as to its kind or variety; b) Such seed conforms to the minimum limits of germination and purity specified, and c) the container of such seed bears in the prescribed manner, the mark or label containing the correct particulars. This will be applicable if the farmer club/SHG purchases the seed on large scale. Biological Diversity Act, 2002 The act focuses on conservation and preservation of biological diversity in the state, the state has biodiversity board. JSLPS would not work on damaging the biodiversity of the flora and fauna of the state under this project	JSLP would create awareness on biodiversity conservation with the help of SHGs, Village Organization and federations.
(5)	How are environmental considerations taken into account in the credit review and approval process for project loans or equity investments?	All criteria for select target VO, SHG and FC should be taken into account in equality such as tribes and castes, vulnerable people and gender. In addition, JSLPS will supervise a set of those selection process.	Discussion between JSLPS and partnership and support agencies would be carried out, if necessary.
(6)	How are environmental issues taken into account in deciding whether to offer or extend commercial credit, working capital finance, trade finance, payment services and other financial services to a company?	None of these issue will arise in project implementation. JSLPS will not offer or extend commercial credit, working capital finance, trade finance, payment services and other financial services to any company under the project.	N/A
3. Organization and Staff			
(7)	Please provide us with the organization chart of the financial intermediary / executing agency's Environmental and Social Management System (ESMS).	Organogram provided (see CHAPTER 3)	Based on EMP, VO/Federation will prepare EMP with facilitation by JSLPS as PFTs (Project Facilitation Team).
(8)	Who is responsible for environmental and social management within the financial intermediary / executing agency? (name/role and title)	Chief executive officer and Chief operating officer with respective State Program Manager. 1. Chief Executive Officer : Name: Sri Paritosh Upadhyay Role: Support in policy formulation. Managing the programme at State level, Line department convergence and support. Policy decisions, Overall responsibility for environmental management. 2. Chief Operating Officer: Name : Bishnu Parida Role: Support in managing programme, Support in interdepartmental convergence, policy its implementation, support in implementation of MDI 3. State Programme Manager: Name: Dr. Praveen Kumar Singh Role: Diagnosis of livelihood intervention, develop annual intervention plan, monitoring and support implementation of	JSLPS would prepare additional staff if necessary.

	Questions	Answer	Improvement Plan
		MDI programme, Develop training materials on environmental and social management	
(9)	Are there any staff with training for environmental and social considerations in the financial intermediary / executing agency? If so, describe.	The Governing body of JSLPS and Executive Committee of JSLPS have trained staff of environmental and social consideration. 1. Chief Executive Officer : Sri Paritosh Upadhyay CEO is from the forest department and form Indian Forest Services so he has understanding of environmental and social management. 2. SPM: Dr. Praveen Kumar Singh has PhD qualification in forestry for forest research institute so he has understand of Policy of for environmental management and experience in social management	Specific training would be done to respective state and field staff on environmental and social considerations.
(10)	Are there any technical staff with an engineering/industry background responsible for technical analysis of credit proposals?	N/A	N/A
(11)	What experience, if any, does the financial intermediary / executing agency have of hiring or dealing with environmental consultants?	N/A. Since this project will not be expected environmental adverse impact, consultants are not required.	N/A
(12)	What was the budget allocated to the ESMS and its implementation during a year? Please provide budget details including staff costs and training as well as any actual costs.	No budget.	There would be some allocation of budget towards environmental and social consideration under the project, mainly in form of capacity building/training (e.g, Green Opportunities).
4. Monitoring and Reporting (Reporting procedures and monitoring)			
(13)	Do you receive environmental and social monitoring reports from subproject companies that you finance?	N/A .Since this project will not be expected environmental adverse impact, consultants are not required.	VO/Federation would prepare EMP prior to project, and update annually based on the EMF procedure.
(14)	Please describe how you monitor the subproject company and their subprojects' social and environmental performance.	N/A.	VO/Federation would prepare EMP based on the internal monitoring results at village with facilitation by JSLPS periodically.
(15)	Is there an internal process to report on social and environmental issues to senior management?	Yes, the report of social issue is being reported from block staffs to district and finally to State offices. In accordance with MIS (Management Information System), Monthly and Quarterly report prepare Block level then submit to District and State level. State level prepare annually report and submit to NRLM.	N/A
(16)	Do you prepare any social and environmental reports: - For other multilateral agencies or other stakeholders	This reports can be prepared as per requirement.	N/A

Attachment 8.4.1

	Questions	Answer	Improvement Plan
	- E&S reporting in the Annual Report		
5. Experience (Results of the environmental and social management)			
(17)	Has the financial intermediary / executing agency signed any national or international agreements or declarations concerning environmental issues?	JSLPS itself has not signed any international agreements or declarations on environmental issues but a number have been signed by the Gov. of India and are thus applicable, including; - Conservation on International Trade of Endangered Species (CITES) - Ramsar Convention on Wetlands of International Importance - Bonn Convention on Conservation of Migratory Species - Convention on Biological Diversity - Indigenous and Tribal Peoples Convention - Nagoya Protocol - Kyoto Protocol	N/A
(18)	Has the financial intermediary / executing agency ever received any criticism of its environmental record? If so, what was the criticism?	No	N/A
(19)	Does the financial intermediary / executing agency carry out environmental audits of its properties to analyze health and safety issues, waste disposal, etc.?	No as the work is not related to environment concern so such concerns are not addressed.	N/A
(20)	Please state any difficulties and/or constraints related to the implementation of the ESMS.	No. JSLPS will follow all the norm which is related to ESMS, in case.	Through implementing the project, VO/Federation supported by JSLPS will build their capacity and experience for ESMS.
6. Need of Capacity Development and Improvement Plan (Improvement and the need for capacity building measures)			
1. Training to JSLPS staffs viz related to livelihoods on various ESMS. 2. Training to community on various aspects of environmental concern.			

Attachment 8.4.2 JICA Environmental Checklist

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) N (b) N (c) N (d) N	(a) As per the EIA notification of 14th Sep 2006 of Ministry of Environment and Forest, no Environmental Clearance (EC) is required for Agriculture project under 'Category 'B2'. The Project does not require preparation of Environment Impact Assessment report. (b) Not applicable (c) Not applicable (d) There is no need for obtaining any environmental permit.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) There is no formal public consultation organised during the preparatory survey. But the Survey Team had series of meetings with the SHGs and Farmers on the local issues, proposed interventions of the Project and potential impacts. While preparation of the Project other Departments and Civil Society Organisations were interacted. (b) A survey of 347 SHGs was conducted and the results were incorporated into the project design. The local requirements were thoroughly considered while designing the Project.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) N	(a) Since there would be little adverse social and environment impact on the Project Environment, no alternative plans were examined. Rather the Project shall reduce the wastage of water through MDI package and address the concerns of sustainable agriculture through the use of vermi-compost. The Project shall contribute to the increase in income and enhancement of livelihood opportunities.
2 Pollution Control	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate use/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a) Y (b) N	(a) MDI package shall include a) micro drip irrigation facility for irrigating vegetable crops over 0.1 ha per farmer, b) vermi-compost and c) poly house nursery. Advantage of drip irrigation is that there won't be any wastage of water, water leaches, discharge of effluents. Efforts shall be made to regulate and control the use of chemical fertilizers and pesticides through fertigation. Manuals for the farmers shall be prepared, adequate training programmes shall be organised for the farmers to understand and practise the manual so that it won't pollute the environment, water bodies etc. The farmers shall be using their own dug wells for MDI. (b) There is a monitoring framework established to regularly monitor the water and soil quality - especially water used by farmers (from the wells) for their toxicity and contamination level and take appropriate measures to improve the quality of water and soil, and address the environmental concerns. There is no monitoring mechanism established for monitoring of pollution of river and ground water. The State Pollution Control Board as part of its regular functions periodically conducts the tests in specific locations.
	(2) Wastes	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a) N	(a) The Project is promoting MDI package for farmers and each farmer would be cultivating 0.1 ha. Drip irrigation shall be used and vermi-compost shall be promoted. The agriculture crop residues shall be used as fodder, fuel and compost. So hardly there would be any waste. Rather the leaf litter available in the nearby forest areas and outside the forest areas, which were not used shall be used for composting.
	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemicals management plans prepared? Are any usages or any implementation structures organized for proper use of the plans?	(a) N (b) Y (c) Y	(a) The possibility of salinization of soil is remote as water use is minimized and there won't be any water logging. The micro drip irrigation system shall promote controlled application of water and fertilizers. Water consumption shall be reduced atleast by 50 per cent. Precise application of nutrients through drip irrigation shall reduce the losses of soluble nutrients. Soil and water shall be tested periodically to avoid salinization of soil. If needed leaching fraction shall be managed to reduce the soil salinity. Drip irrigation reduces the accumulation of foliar salt in comparison to other irrigation systems. (b) The farmers targeted under the Project shall be using water from the wells. The MDI Farmers Groups (MFGs) as well as SHGs shall monitor the proper maintenance of these wells to avoid chemical and biological contamination of water. Periodically water samples shall be tested to ensure that desired quality parameters (pH, iron, arsenic, flouride, TDS etc.) are maintained and if needed water shall be treated. Fertigation method shall be followed in application of fertilizer to reduce the consumption and wastage. The MFGs as well as SHGs shall monitor the
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	(a) The Project shall promote MDI package to reduce the consumption and wastage of water. Mostly the surface and sub-surface water sources shall be used for horticulture. Adequate measures shall be taken up to monitor the appropriate use of water and monitoring of environmental features. MFGs shall be sensitized on rain water harvesting and possibilities of measures for recharge of ground water through convergence with MGNREG Scheme and integrated watershed project, wherever possible.
	(5) Odor	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants?	(a) N	(a) There shall not be any problems relating to odor. Small household level vermi-compost units shall be established for their own use. This shall not create any odor problem.
3 Natural Environment	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The Villages located within the Protected Areas shall be excluded from the Project Area. Out of 12 districts selected as Project in 4 districts Protected Areas are there.
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(a) N (b) N (c) N (d) N (e) N	(a) The Project sites shall be located within the revenue areas of the target village, which are already used for agriculture. (b) The Project does not involve activities which are going to have huge discharge of wastes and effluents. It is no way going to affect any protecte habitat of endangered species. (c) The Project sites are not located near to the Protected Areas. (d) The Project does not have any component or sub-projects related to promotion of livestock. Rather the Project sites shall produce more agricultural crop residues, which can be used for fodder. (e) No significant ecological impacts are anticipated. The Project shall prepare Environmental and Social Management Framework and Plan for smooth monitoring of environmental and social concerns and take up protection and mitigation measures, when necessary.

Attachment 8.4.2

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Is the compensations going to be paid prior to the resettlement? (e) Is the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the impacts of resettlement? (j) Is the grievance redress mechanism established?	(a) N (b) NA (c) NA (d) NA (e) NA (f) NA (g) NA (h) NA (i) NA (j) NA	The Project shall not have any activity, which involves involuntary resettlement or relocation of villages/ habitations.
	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary? (b) Is proper allotment made for rights to agricultural land use? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources? (c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources? (d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely the downstream fisheries and water uses? (e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?	(a) N (b) NA (c) NA (d) NA (e) N	(a) The Project shall not adversely affect the living condition of the inhabitants. On the otherhand, the Project shall contribute to the increase in income, which ultimately improve the living condition and enhance the livelihood opportunities for the target group of the Project. The agriculture production shall be increased; opportunities for wage employment shall be enhanced and the migration to other places in the state and outside the state shall be reduced in the project target villages. (b) There is no allotment of land or land rights to the Project beneficiaries for agriculture. The Project shall target the farmers, who are already having land and are into farming. (c) The Project is also not going to allot water rights to any beneficiaries. The beneficiaries, who have already water source with them (Dug Wells), shall be included in the Project as beneficiaries. (d) The Project shall promote Micro Drip Irrigation for horticulture and vegetable farming, which shall reduce the wastage of water and also consumption of water for farming. The water source, which shall be primarily used is the dug well. So it may not affect the fisheries and water use in the downstream areas.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) The Project does not involve any activity, which is going to damage the heritage sites.
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) The Project is not going to adversely affect the local landscape. Rather there shall be more greenery round the year. Out of 365 days farming shall be continued for about 300 days. The farmland, which were cultivated for once, shall be put in to cultivation for 3 crops. Fruit bearing trees shall be planted by the farmers. Farmers shall be supported for MDI package to enhance the production of vegetables and fruits through Micro Drip Irrigation and other technical support. Efforts shall be made to ensure that no trees are cut to convert the land for agriculture. The land, which is already being cultivated, shall be taken up for further improvement in farming.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) Y (b) Y	(a) The Project shall be working with the ethnic minority groups and indigenous peoples, who have land and wells, and are willing to take up vegetables cultivation and horticulture activities. The Project shall not introduce any activities which are not culturally and socially acceptable. The activities of the Project shall be implemented through SHGs and MFGs. Each Group shall prepare its plan - cultivation and business with the help of Project Staff and Community Resource Persons. (b) The Project shall in no way challenge the rights of ethnic minorities and indigenous people in relation to land and other resources. The Project shall work with SHGs to help the farmers set up micro drip irrigation for vegetable and horticulture farming. The Project shall also work with SHGs with members from ethnic minorities and indigenous peoples. The Project has prepared a Forest Dwellers Development Framework to guide the Project Staff and Target Communities to prepare Forest Dwellers Development Plan at the village level to ensure that the rights of the forest dwellers (who are basically the indigenous people) are protected and the Project activities don't affect them negatively. If there are some potential negative impacts on the forest dwellers then mitigation measures shall be incorporated in the Forest Dwellers Development Plan.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) Y (b) NA (c) NA (d) NA	(a) The Project Proponent is a Society operating under the auspices of Rural Development Department. Being a Government Organisation it has to adhere to the laws of land associated with the working conditions. (b) There is no installation of huge industrial machineries and tools. Micro Drip Irrigation facility shall be installed at the farmer's field. This shall be installed by the specialized contractors, who have their own safety standards to be followed. The Project shall ensure that the individual farmers follow the safety norms and standards in operation and maintenance of MDI facility. The SHGs and CRPs shall monitor the adherace of safety standards by the farmers. (c) The Project Proponent has its own human resource management manual and accordingly all the staffs engaged in the Project shall be managed. The SHGs and Famers shall be engaging wage labour to assist them in farming and they shall follow the Minimum Wages Act, 1948, which shall be monitored by the Field Organisers and CRPs. (d) No security guards shall be employed in the Project.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) NA (b) NA (c) NA	(a) The Project does not involve big construction activities. One Multipurpose Community Centre shall be constructed at VO level. There would be 38 such community centres each of 50 sq. meters. These are low cost building to be constructed in selected villages with lot of open space for community meetings. (b) NA (c) NA
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Y (b) Y (c) Y (d) NA	(a) Although the Project would not have potential negative impact on the environment of significant nature, the Project has developed an Environment and Social Management Framework (ESMF), which would guide the preparation of environment management plan at the village level (MFG level). The Plan shall include potential environmental impacts and risks, and mitigation measures to be taken up; institutional arrangements for monitoring of environmental norms and standards, mitigation measures etc.; and capacity building of the community institutions to ensure environmental safeguards. (b) The Project shall monitor the pollution of water/ contamination of water; proper management of water use; land management; soil salinity; application of fertilizers; proper maintenance of MDI facility; waste disposal and composting; felling of trees/ forest clearance for agriculture etc. The ESMF shall guide the project for monitoring. The Environment Management Plan shall provide the details of monitoring items, methods and frequencies. (c) The Project Proponent has its monitoring and evaluation system established. The Project shall also use the same system and procedures with some customization for the Project. This has been mentioned in the Survey Report. (d) The Project does not involve activities, which are going to create pollution and other environmental impact of substantial nature. Agriculture projects are not bound by any regulation to submit reports to authorities like State Pollution Control Board and others.
6 Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and Reservoirs checklist should also be checked.	(a) NA (b) NA	(a) There is no need for cross reference to other checklists as the activities are limited to creation of MDI facility, vermi-compost, poly nursery house at the individual farmer's level. (b) NA
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) NA	(a) NA

Note 1) Regarding the term “Country's Standards” mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.

Source: JICA Survey Team

Attachment 8.6.1 Forest Dwellers Development Framework

1. Introduction

Forest Dwellers Development Framework (FDDF) is an instrument for the Project Executing Agency to ensure the interests of the forest dwellers are protected in project design as well as implementation of project and sub-projects. This framework has been prepared based on the JICA's Guidelines for Environmental and Social Considerations and with reference to the World Bank's Operational Manual – OP 4.10 for the Indigenous Peoples (the World Bank Safeguards Policy).

The Guidelines of JICA on ESC, April 2010 – Appendix 1 clearly states that any adverse impacts of a project on the indigenous peoples are to be avoided when feasible by exploring all viable alternatives. When adverse impacts can't be avoided then effective measures must be taken to minimize the impacts and to compensate indigenous peoples for their losses. All the rights of the indigenous peoples in relation to land and resources must be respected and efforts must be made to obtain the consent of indigenous peoples in a process of free, prior and informed consultation. An Indigenous Peoples Plan must be prepared to determine the measures to be taken up for minimization of the adverse impacts of the Project on the Indigenous Peoples. This Plan shall be prepared in consultation with the Indigenous Peoples with reference to the Annex B of World Bank Safeguard Policy, OP 4.10.

The FDDF is a part of Environmental and Social Management Framework of the Project specially designed to ensure the rights of forest dwellers are protected in all the stages of project designing and implementation. It shall guide the Project Executing Agency to prepare the Forest Dwellers Development Plan at the village/ habitation level, wherever the Project interventions are going to significantly affect the forest dwellers.

The Forest Dwellers Development Framework has been presented in the following sections:

1. Introduction to the FDDF
2. Defining the forest dwellers
3. Project description and categorization
4. Legal framework for the protection of rights of forest dwellers
5. Administration of tribal areas
6. Status of forest dwellers in Jharkhand/ Project area
7. Potential impacts and risks of Project interventions on the forest dwellers and measures to be taken up for mitigation of potential negative impacts and risks
8. FDDF Activities and Implementation Schedule
9. Institutional arrangement for implementation of FDDF
10. Preparation of Forest Dwellers Development Plan

2. Defining the Forest Dwellers

In common parlance it is understood that whoever is staying within the forest or close to the forest and depend on the forestland, forest products and forestry development activities for socio-economic-cultural and religious purposes, is considered as a forest dwellers. Forest dwellers have not been constitutionally defined. The Forest Right Act 2006 made an attempt to define the forest dwellers as below:

The Preamble to the FRA - "to recognize and vest the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded; to provide for a framework for

recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land."

Sections 2(c) and (o) of the Act define the eligibility of STs and Other Traditional Forest Dwellers as:

2(c) forest dwelling Scheduled Tribes means the members or community of the Scheduled Tribes who primarily reside in and who depend on the forests and forest lands for bona fide livelihood needs and includes the Scheduled Tribe pastoralist communities.

2(o) Other traditional forest dweller means any member or community who has for at least three generations prior to 13th day of December 2005 primarily resided in and who depends on the forest or forest land for bona fide livelihood needs (Explanation – For the purpose of this clause, 'generation' means a period comprising of twenty five years).

The Scheduled Tribes in India are also commonly referred as Adivasi – meaning the original inhabitants of the land or the indigenous people. But the Constitution of India does not use the term Adivasi or Indigenous People. Communities based on their primitive traits, geographical isolation, economic backwardness, shyness of contact with community at large and cultural distinctiveness are categorized and notified by the President of India under Art 342 of Constitution of India as Scheduled Tribes. Initially 744 communities have been notified as Scheduled Tribe. ST is an administrative term used for administering constitutional privileges, protection and benefits meant for specific section of peoples who have been historically considered disadvantaged and backward.

For the scope and purpose of the Project the forest dwellers shall include communities belonging to ST, SC and OBC, who live in and around forest and depend on forestland and forest resources for livelihood and cultural purposes.

3. Project Description and categorization

The Project – IHIMDI shall promote micro drip irrigation for vegetable farming and horticulture intensification in 12 districts of the state. The project is going to work with 60,000 farmers from 61 community development Blocks for installation of MDI facilities, capacity building and technology dissemination for vegetables and horticulture intensification etc. The Project shall be implemented through SHGs and MDI Farmers Groups (MFG). The important components and sub-projects have been mentioned below:

Table 1: Details of the Sub-Projects

Sl.	Sub-Projects	Physical target (nos.)
1	Micro Drip Irrigation (Individual farmer level for 0.1 ha area)	60,000
2	Poly Nursery House (Individual farmer level)	60,000
3	Vermi-Compost Production unit (Individual farmer level)	60,000
4	Pusa Zero Energy Cool Chamber	2,400
5	Multi-purpose Community Centre (Cluster level)	38
6	Agriculture Tools (SHG / cluster level)	1200
7	Training and Capacity building	60,000 MDI farmers SHGs, CRPs and Project Staff at the State, District and Cluster level
8	Godown cum Cold Storage	1

The Project has been categorized as FI. The Project shall be implemented by JSLPS and the precise number of beneficiaries in different locations and exact locations of project interventions are to be identified during the implementation of the Project. The Project shall have positive environmental and social impacts in the project area as it is going to work with marginal and small farmers from ST, SC and Backward Communities to help them enhance their infrastructure, production of vegetable crops

and access to market. There may be some environmental and social risks, which shall be analyzed during the preparation of sub-projects/ MDI Plan. The Project shall not have any adverse impact on the forest, protected areas, heritage sites etc. It does not involve huge construction activities, setting up processing facilities – industrial machineries and tools, land acquisition, involuntary displacement and resettlement etc. No activities shall be promoted on the forestland and other protected areas.

Since Jharkhand is a land of forest and forest dwellers, the need for preparation of Forest Dwellers Development Framework as part of the ESMF was felt necessary as per the requirements of JICA ESC Guidelines of April 2010. Although the project is not going to adversely impact them the FDDF shall assist the Project Executing Agency to proactively protect the rights of the forest dwellers and involve them in the project implementation.

4. Legal framework and safeguards for the Forest Dwellers

The Scheduled Tribes hold the major constituency of the forest dwellers in the state. The Constitution of India has laid down number of safeguards for them. It provides social, economic and political guarantees to the STs and SCs. Some of the provisions/ guarantees have been mentioned below:

- Equality before law [Article 14]
- The State to make special provisions for the advancement of any socially and educationally backward classes of citizens or for the Scheduled Castes and the Scheduled Tribes [Article 15(4)]
- Equality of opportunity for all citizens in matters relating to employment or appointment to any office under the State [Article16]. The State to make provisions for reservation in appointment, posts in favour of any backward class citizens which in the opinion of the State is not adequately represented in the services under the State [Article 16(4)]. The State to make provisions in matters of promotion to any class or classes of posts in the services in favour of the Scheduled Castes and the Scheduled Tribes [Article 16 (4A) and 16(4B)]
- Appointment of a Commission to report on the administration of the Scheduled Areas and the welfare of the Scheduled Tribes in the States [Article 339(1)]
- Specify the tribes or tribal communities to be Scheduled Tribes [Article 342]
- The State to promote with special care the educational and economic interests of the weaker sections of the society and in particular, of the Scheduled Castes and Scheduled Tribes and shall protect them from social injustice and all forms of exploitation [Article 46]
- Grants-in-aid from the Consolidated Fund of India each year for promoting the welfare of the Scheduled Tribes and administration of Scheduled Areas [Article 275(1)]
- Reservation of seats for STs and SCs in Lok Sabha [Article 330]; Reservation of seats in State Legislatures [Article 337]; Reservation of seats in Panchayats [Article 243D] and Reservation of seats in Municipalities/ Urban Local Bodies [Article 243T]
- Creation of Agencies for monitoring the safeguards for the STs and SCs – National Commission for ST and National Commission for SC [Article 338 and 338A]

Some of the laws for the safeguards of the forest dwellers have been mentioned below:

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 - This Act popularly known as Forest Rights Act (FRA) recognizes rights of forest dwellers (ST and other Traditional Forest Dwellers) on forest land and forest resources. The forest dwellers can submit their claims for individual entitlement over forestland cultivated by them as well as for community forest rights. Rights under FRA which are claimed by a village community such as rights of nistar or those used during Zamindari/other intermediary regimes, right of access, use and disposal of non-timber forest produce (NTFP), and rights over the products of water bodies and grazing grounds, are referred to as Community Forest Rights.

The Panchayats (Extension to Scheduled Areas), Act 1996 - The Act extends the provisions of

Panchayats contained in Part IX of the Constitution to the Schedule Areas. The Act redefines a village based on its people and their customs and traditions. It empowers the Gram Sabha to ensure people centric governance and govern the common property resources.

Chhota-Nagpur Tenancy (CNT) Act, 1908 - The CNT Act was enacted in 1908 to stop land alienation and is applicable in North Chhota Nagpur, South Chhota Nagpur and Palmau divisions. On January 25, 2013, the Jharkhand High Court asked the State Government to bring Scheduled Castes under the purview of the Act. The act restricts and regulates transfer of land belonging to ST, SC and OBC.

Santhal Pargana Tenancy Act, 1949 – Similar to CNTA, this Act prohibits transfer of tribal land to non tribals and protects traditional governance and emphasizes preservation of culture.

The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Rules, 1995 - This Act provides for specific provisions to prevent atrocities on the Scheduled Castes and the Scheduled Tribes and suggests State Governments to frame rules for the same.

5. Administration of Tribal Areas

5.1 Scheduled Areas under 5th Schedule of the Constitution

The Fifth Schedule under article 244 (2) of the Constitution defines Scheduled Areas as areas declared by the President to be Scheduled Areas after consultation with the Governor of the concerned State. The criteria for declaring any area as Scheduled Area under the Fifth Schedule are:

- Preponderance of tribal population,
- Compactness and reasonable size of the area,
- Available administrative entity such as district, block or taluk, and
- Economic backwardness of the area as compared to neighbouring areas.

The Governor of a State having Scheduled Areas is empowered to make regulations in respect of prohibition or restriction in transfer of land from tribals and to regulate the business of money lending to the members of STs. In making any such regulation, the Governor may repeal or amend any Act of Parliament or of the Legislature of the State, which is applicable to the area in question. The Governor may by public notification direct that any particular Act of Parliament or Legislature of the State shall not apply to a Scheduled Area or any part thereof in the State or shall apply to such area subject to such expectations and modifications as may be specified. Tribes Advisory Council shall be set up in States having Scheduled Areas. The TAC consists of more than twenty members of whom, as nearly as may be, three fourth are from the representatives of Scheduled Tribes in the Legislative Assembly of the State. The role of TAC is to advise the State Government on matters pertaining to the welfare and advancement of the Scheduled Tribes in the State as may be referred to it by the Governor.

Table 2: Fifth Schedule Areas of Jharkhand

Sl.	Name of the District	No. of Blocks in Scheduled Areas	Name of the Blocks in Scheduled Areas
1	Dumka	10	Saraiyahat, Jarmundi, Jama, Ramgarh, Gopikandar, Kathikund, Dumka, Sikaripara, Raneswar and Masalia
2	Saraikela – Kharswan	8	Govindpur (Rajnagar), Adityapur (Gamhariya), Saraikela, Kharsawan, Kuchai, Chandil, Ichagarh and Nimdih
3	Latehar	7	Barwadih, Manika, Balumath, Chandwa, Latehar, Garu and Mahuadarn
4	Sahebgunj	7	Sahebganj, Borio, Taljhari, Rajmahal, Barharwa, Pathna and Barhet
5	Pakur	6	Littipara, Amrapara, Hiranpur, Pakur, Maheshpur, and Pakuria
6	Ranchi	14	Burmu, Mandar, Chanho, Bero, Lapung, Ratu, Namkum, Kanke, Ormanjhi, Angara, Silli, Sonahatu, Tamar and Bundu

7	East Singhbhum	9	Golmuri-Jugsalai, Patamda, Potka, Dumaria, Musabani, Ghatsila, Dhalbhumgarh, Chakulia and Bahragora
8	West Singhbhum	15	Bandgaon, Chakradharpur, Sonua, Goelkera, Manoharpur, Noamundi, Jagannathpur, Manghgaon, Kumardungi, Manjhari, Tantnagar, Jhickpani, Tonto, Khutpani and Chaibasa
9	Gumla	11	Bishunpur, Ghagra, Chainpur, Dumri, Raidih, Gumla, Sisai, Bharno, Kamdara, Basia and Palkot
10	Simdega	7	Simdega, Kolebira, Bano, Jaldega, Thethaitangar, Kurdeg and Bolba
11	Lohardaga	5	Kisko, Kuru, Lohardaga, Bhandra and Senha
12	Palamu	1	2 GPs of Satbarwa block (Rabda and Bakoria GPs)
13	Garhwa	1	Bhandaria block
14	Godda	2	Sundar Pahari and Boarijor blocks
15	Jamtara	4	Kundhit, Nala, Jamtara and Narainpur
16	Khunti	6	Arki, Khunti, Murhu, Karra, Torpa and Rania
		113	

Source: Annual Report 2011-12, Ministry of Tribal Affairs, GOI

5.2 ITDAs/ ITDPs, Modified Area Development Approach (MADA) Pockets and clusters

The Department of Welfare is the nodal department for welfare of ST, SC, OBC and Minorities. Tribal Welfare Commissioner is responsible for the implementation and supervision of all the schemes taken up at the field level for the tribals. There are 4 divisional offices in Santhal Paraganas, Ranchi, Hazaribagh and Palamu headed by Deputy Director. All the 24 districts have District Welfare Officers, Sub-divisional Officers and Block Welfare Officers.

During 5th Five Year Plan the Tribal Sub Plan was introduced for development of tribals. Integrated Tribal Development Agencies were created to implement Integrated Tribal Development Programmes. In Jharkhand there are 14 ITDAs/ ITDPs. Since the 8th Five Year Plan (1992-97), the concept of TSP has been modified by extending the coverage to the entire ST population outside the scheduled areas, but including those who live in contiguous areas. Three criteria are laid down for identification of tribal pockets under MADA approach. These include (i) a minimum population of 10,000 (ii) 50% of ST population in the pockets (iii) contiguity of villages in the pockets. There are 34 MADA pockets in Jharkhand to emphasize development of tribals outside the Scheduled Areas. There are also clusters with about 5000 tribal population and cluster projects have been implemented in 7 clusters of Jharkhand in addition to the MADA pockets – which are outside the Scheduled Areas.

5.3 Programmes for welfare of ST, SC and OBCs

The State has major emphasis on creation of educational facilities, health support systems, employment opportunities and infrastructure development for enhancement of socio-economic status of the forest dwellers (ST, SC and OBCs). The Department of Welfare is the nodal Department for welfare of ST, SC and OBCs. The multi-prong strategies followed for the welfare of ST, SC and OBCs, are a) strengthening of ITDAs, b) working with NGOs for service delivery as well as livelihood enhancement, c) lobbying with the Central Government for timely and adequately release of funds and matching grants, d) forging Public-Private Partnership for efficient and effective management of health and education programmes and service deliveries, and e) enhancing the skills of ST, SC and OBC to effectively harness the opportunities for income generation and employment. Some of the programme thrust areas of Welfare Department have been mentioned below:

Table 3: Programmes of Welfare Department for ST, SC and OBC

Thrust areas	Programmes
Housing	Indira Awas Yojana (IAY) Birsa Awas Yojana for the PTGs
Education	Provisions of stipends

	Residential schools, hostels Bicycles to boys and girls from BPL families Free uniforms to school children Vocational training on a variety of trades Infrastructural support to schools
Health	Setting up and management of MESO Hospitals and Health Centres in tribal areas Paharia health centres in Santhal Pargana Ayurvedic health centres Medical aid etc.
Livelihood	Assistance for Income Generation Activities

Source: Annual Plan of State, 2012-13

In addition to the Welfare Department, other Departments do implement activities for the development of ST, SC and OBCs. The flagship programmes of Government of India have their own share of activities targeting the ST, SC and OBCs. Most important among them are the MGNREGS, IAY, NRLM, PMGSY, NRHM, NHM, TSC, SSA etc.

The 12th Five Year Plan has earmarked a sum of Rs. 537,704 million for Tribal Sub Plan (TSP) and Rs. 115,934 million for Special Component Sub Plan (SCSP). TSP is prepared for the development of the tribal areas and SCSP is the plan for development of SCs.

6. Status of Forest Dwellers

6.1 Basic information on the forest dwellers

Jharkhand is commonly known as the land of forest. The Economic Survey of Jharkhand, 2011-12 makes a mention about the forest dwelling population. Approximately more than 50% of the state population lives in forest and forest fringe areas and 70 per cent of them are categorized as BPL. These people largely depend on forest, forestland and forest products for their basic livelihood. From the available information on forest fringe villages with Forest Survey of India, there were 17,044 forest fringe villages in undivided Bihar. After the bifurcation the major chunk of forest is in Jharkhand and the large majority of 17,044 forest fringe villages are assumed to be in Jharkhand. According to the sources of the Forest Department there are 10,903 Joint Forest Management Committees with a membership of 1.28 million families including 0.51 million of ST families.

Table 4: Some basic information on forest dwellers

Total population of the state	32.99 millions
Scheduled tribes (ST) population	8.65 millions
Scheduled caste (SC) population	3.99 millions
% of ST population	26.20
Project districts with more than 50% ST population	4 – Khunti, Lohardaga, Gumla and West Singhbhum
% of SC population	12.08
Communities listed under ST	32
Communities listed under SC	22
Primitive Tribal Groups	08
Literacy Rate – All communities	67.63
Literacy Rate – ST	51.35
Literacy Rate – SC	47.42

32 tribal communities of Jharkhand have been notified as ST. Santhal constitutes the majority i.e. 34 %. Santhal, Oraon, Munda and Ho together constitute about 90% of the total tribal population of the state.

Attachment 8.6.1

Table 5: Tribes of Jharkhand

1. Munda	8. Savar	15. Birhor	22. Kharwar	29. Mal-Paharia
2. Santhal	9. Asur	16. Birjia	23. Khond	30. Parhaiya
3. Oraon	10. Baiga	17. Chero	24. Kisan	31. Sauria-Paharia
4. Kharia	11. Banjara	18. Chick-Baraik	25. Kora	32. Bhumij
5. Gond	12. Bathudi	19. Gorait	26. Korwa	
6. Kol	13. Bedia	20. Ho	27. Lohra	
7. Kanwar	14. Binjhia	21. Karmali	28. Mahli	

Tribals of Jharkhand are globally well-known for their traditional governance system. They have a long history of struggle with outside forces to protect their own habitat, resources and traditional governance system. They had challenged the British Colonial forces against excessive taxation and interference in their own governance systems. Many of the tribes have their people centric governance systems and the decisions are made democratically at different level – at the village level by the village council, at the neighborhood level by the council of neighborhood and at the regional level by the assembly of people.

The following traditional governance systems still exist in different tribal regions of Jharkhand.

- Munda- Manki system in Ho areas.
- Parha system in Oraon villages.
- Munda- Manki system in Khuntkatti Munda dominated areas.
- Manjhi Pradhan system in Santhal.

6.2 Forest resources of the state

Forest, which is an important livelihood resource for the tribal people, constitutes nearly 30 per cent of the geographical area of the State. Forest and tree cover is nearly 33 per cent of the geographical area (State of Forest Report, 2013, Forest Survey of India). Forest acts as a safety-net for the forest dwellers for food and livelihood security. The major chunk of forest is located in Paschim Singhbhum, Palamu, Latehar, Gumla, Hazaribagh and Ranchi, and the I-HIMDI project is going to be implemented in these districts. Four project districts have more than 30 per cent of their geographical area under forest cover. Tropical Dry Deciduous Forests constitute 93 per cent of the total forests of the state. The tribal people of the state had their traditional forest governance system, which is still practised in some places. The culture of preserving forest in SARNA (Sacred Grove) is still in vogue among the tribal communities.

Table 6: Status of Forest in the Project Districts

District	Geographical area in Ha.	Forest area in Ha.	% of G.A.
Dumka (includes Jamtara)	6,212	663	10.83
Giridih	4,963	885	18.72
Gumla (includes Simdega)	9,077	2,658	29.28
Hazaribagh	5,998	2,088	34.91
Lohardaga	1,491	499	33.47
Pakur	1,571	288	18.33
Palamu (includes Latehar)	8,657	3,586	41.42

The Projects shall be implemented in 61 blocks spread over in 12 districts. In 22 proposed blocks (36% of the target blocks) the tribal population is more than 50 per cent. The tribal population is more than 70 per cent in 6 proposed blocks. From the analysis of the total habitations in the target blocks, it

was found out that in 67% of target blocks, tribal habitations constitute more than 50% of the total habitations. More than 80% of the habitations in 17 target blocks (28% of the total) have exclusive tribal population. The probability of tribal farmers targeted by the Project is high in these blocks. It is apparent that the target areas have sizable forest dwellers population.

6.3 Problems of the forest dwellers

The forest dwellers have been facing multifaceted problems historically because of location of their villages/ habitations in and around forests. Their access to good quality infrastructure for socio-economic development is very poor. They depend on subsistence agriculture, gathering/ collection of forest produces for own consumption and sale, and wage employment for their livelihood. Landholding is mostly marginal. Agriculture continues to be the major source of livelihood and is characterized largely by low productivity, rainfed, low input and less intensive etc. People, those who have access to wells/ tube wells/small ponds/ river, cultivate pulses and vegetables during winter. People do cultivate in summer if they have irrigation facilities but their number in very small.

Degradation of forest resources have significantly contributed to decline in income of the forest dwellers from the sale of forest produces. People in many villages have to travel 15-20 km to collect forest products such as sal and siali/ Mahulan leaves, chironji/char etc. The people those who were subsisting on sale of fuel wood are also facing problem of getting adequate material near to their village. Despite the degradation of forest, Mahua flower and seed, chironji/ char, siali/ mahulan and sal leaf, kendu leaf, sal seed etc. still contribute to a great extent to the income of the forest dwellers. Lac is another important produce from the forest, being collected in selected places especially during the winter season. Efforts for higher level processing and value addition and marketing of NTFPs including medicinal plants are not common among the forest dwellers.

Since agriculture is largely rainfed people migrate out in search of wage employment. Migration is common for most of the forest dwellers and the period of migration varies from one month to 10 months. In the villages with irrigation facilities people especially the youth migrate for lesser period. People migrate to places in Odisha, Andhra Pradesh, Tamil Nadu, Gujarat, Punjab and Maharastra.

There are many development programmes and schemes being implemented in the tribal and backward regions of the state but the people are unable to maximize the benefits from these programmes because of poor awareness, lack of organisation and participation.

Forest Rights Act 2006 is being implemented in the state since 2008 but as of May 2014 only 17,791 forest dwellers have been given land deeds over forestland used by them and out of them only 90 (0.5%) belong to other traditional forest dwellers and the rest are Scheduled Tribes. Community Forest Rights under the Act has been given to only 571 communities. The majority of claims under FRA were submitted from West Singhbhum, Dumka, Simdega, Girdih and Latehar.

A rapid assessment was done in 5 villages – Panchpahya and Lailor from Manoharpur Block of West Singhbhum, 2 from Ranchi (Jidu from Angada and Nichitpur from Namkum) and Dhawda from Kudu Block of Lohardaga district to understand the problems of the forest dwellers especially in the context of their participation in the proposed I-HIMDI Project. Awareness on forest rights act is low and only 7 families from Dhawra, Kudu have got title over forestland. No village has claimed for community forest rights. In case of Jidu there are about 30 families who cultivate on the forestland in small proportion but they have not applied for land title.

Dependency on forest in these villages is common for fuel wood, dental brush sticks, house building materials and fencing materials for the farm. Animals are sent to the forest for grazing for 4 months. In case of Jidu village in Angada, people don't collect NTFPs but about 40 -50 women from the area go to the forest for collection of fuel wood, which is sold in Ranchi at least 2-3 times in a week. Income from sale of different forest produces is significant in case of the villages in West Singhbhum and Lohardaga. The common forest produces collected and sold are Mahua flower and seed, Kendu leaf, Kendu fruit, Myrabolans, Chironji, Mahulan leaf and fibre etc. A wide variety of leafy vegetables, berries, flowers and shoots are collected from the forest for own consumption a well as for sale in the local market. Average seasonal income from Kendu Leaf alone varies between Rs. 2,000 to Rs. 6,000 per family. Seasonal income from Mahua flower varies between Rs. 5,000 to Rs. 20,000 per family. In case of villages in Manoharpur, West Singhbhum, Chironji is collected by a majority of people and the

kernel is removed manually. One KG of Chironji kernel is exchanged for 18 to 22 kg of rice. The average collection of Chironji in a season varies between 1 to 4 kg per family. Collection and sale of Siali/ Mahulan leaf is also a major source of income for the poor forest dwellers. This activity is largely done by the women almost for 6-9 months in a year. A family earns about Rs. 700 to Rs. 1000 per week. Because of the degradation of forest women have to walk 15-20 km to collect the leaves. The collection and sale of medicinal plant products is not common because of lack of awareness. Although people in these villages depend on forest for own consumption needs as well as for cash income, no organised efforts have been made by them to protect and manage the forest.

In the context of agriculture, vegetable farming is common in all the villages. The income is significant in case of Dhawda, Lohardaga, Nichitpur, Ranchi and Panchpahiya, West Singhbhum. Most of the forest dwellers are growing vegetables using rain water. Those who have wells or land near the river/ stream also grow vegetable during winter. In case of West Singhbhum very few forest dwellers have wells and availability of water during summer is a major problem. There are 84 families in Dhawda and the village has 30 wells. In Panchpahiya there are more than 200 families but only 5 wells are there. The most important problem is that these wells don't hold water during summer.

7. Potential impact and risk of the Project interventions on the Forest Dwellers

7.1 Positive impact on Forest Dwellers

The detailed environmental and social concerns of the Project have been discussed in the ESMF. The key impacts of the Project on the forest dwellers have been flagged off below:

- Some of the forest dwellers shall have the opportunity to participate in the Project and there would be an increase in production of vegetable resulting in higher level returns to them from the sale of vegetables.
- There would be judicious use of land, water, fertilizers, pesticides etc. because of the project interventions safeguarding the environment.
- Higher volumes of production of vegetables would enhance the access of farmers to better markets. The volume would attract the market to come to the village.
- The Project would build the capacity of the farmers to adopt new technology and package of practices in farming.
- The Project would create opportunities for wage employment in the village, which might reduce the incidences of labour migration to far off places.

7.2 Potential risks/ negative impact on Forest Dwellers

- The Project is not likely to have any negative impact on the forest dwellers but they may not compete with other farmers to participate in the Project.
- Basic eligibility criteria for selection of MDI farmers may exclude the interested forest dwellers in case of the following situations:
    - Small and marginal farmers/ family members who are not part of any SHG as the Project is going to work with existing SHGs
    - Small and marginal farmers who don't have wells and lifting devices – the farmers who have wells and pumps shall be selected for MDI, and
    - Small and marginal farmers who can't afford to invest or take loan to pay for the contribution part – the farmers have to invest 60% of the cost of the MDI. This would lead to exclusion of poor farmers, who are interested for vegetable farming.
- The elite and influential farmers may become the priority beneficiaries of the Project. They may influence the decisions of the SHGs and MFG.
- How far the SHGs shall have control over MDI Farmers Group in a village to adhere to the environmental and social norms and standards is questionable?

- In some cases, forest dwellers, who subsist mostly on cultivation of forestland and/or collection and sale of forest produces, shall be excluded by the Project.
- The Project shall be working with the SHGs to promote MDI. There is hardly any role of traditional village organization until unless there is any conflict, which could not be settled by the SHGs and MDI Farmers Group.

7.3 Proactive measures for mitigation of potential risks/ negative impact

- The eligible farmers who are not part of any SHG may be included in the existing SHGs or new SHGs may be formed under different schemes of JSLPS. So the Project, in some cases, might have to support new SHGs or one year old SHGs, who fulfil the requirements and complete the process of gradation. Necessary emphasis shall have to be given to these SHGs for institution development.
- Adequate efforts have to be taken for social mobilization and institution development of SHGs to address the concerns of elite capture and effective coordination between the SHGs and MFG. The Field Organisers and CRPs have to consistently work with the SHGs and MDI Farmers Groups for institution development.
- For the small and marginal farmers, who don't have wells, the Executing Agency may help them to dig wells sourcing funds from other schemes such as MGNREGS.
- Farmers, who don't have pumps, may be provided loan from the revolving fund or linked to the financial institutions/ support agencies to procure pump.
- The CRPs and FOs may help the forest dwellers to access right over forestland under Forest Rights Act 2006 and then subsequently they may be supported under the Project for vegetable cultivation. If the land is not suitable for MDI/ vegetable cultivation then the Executing Agency may help them access benefits from other projects and schemes. The forest dwellers who can't be associated with the Project as MDI farmers may be given priority to work in the farms as wage labour; the Project may promote them as entrepreneurs to supply different farm inputs and also help in primary processing and marketing; since the MFG shall have a better access to market it may help the forest dwellers to market their forest produces (NTFPs).

8. FDDF – Activities and Project Implementation Schedule

The State PMU has to develop the overall framework for Forest Dwellers Development including the operational strategies. It has to emphasize capacity building of Project Staff at all levels for proper implementation of FDDF. The following activities shall be carried out by the Project Executing Agency for implementation of FDDF.

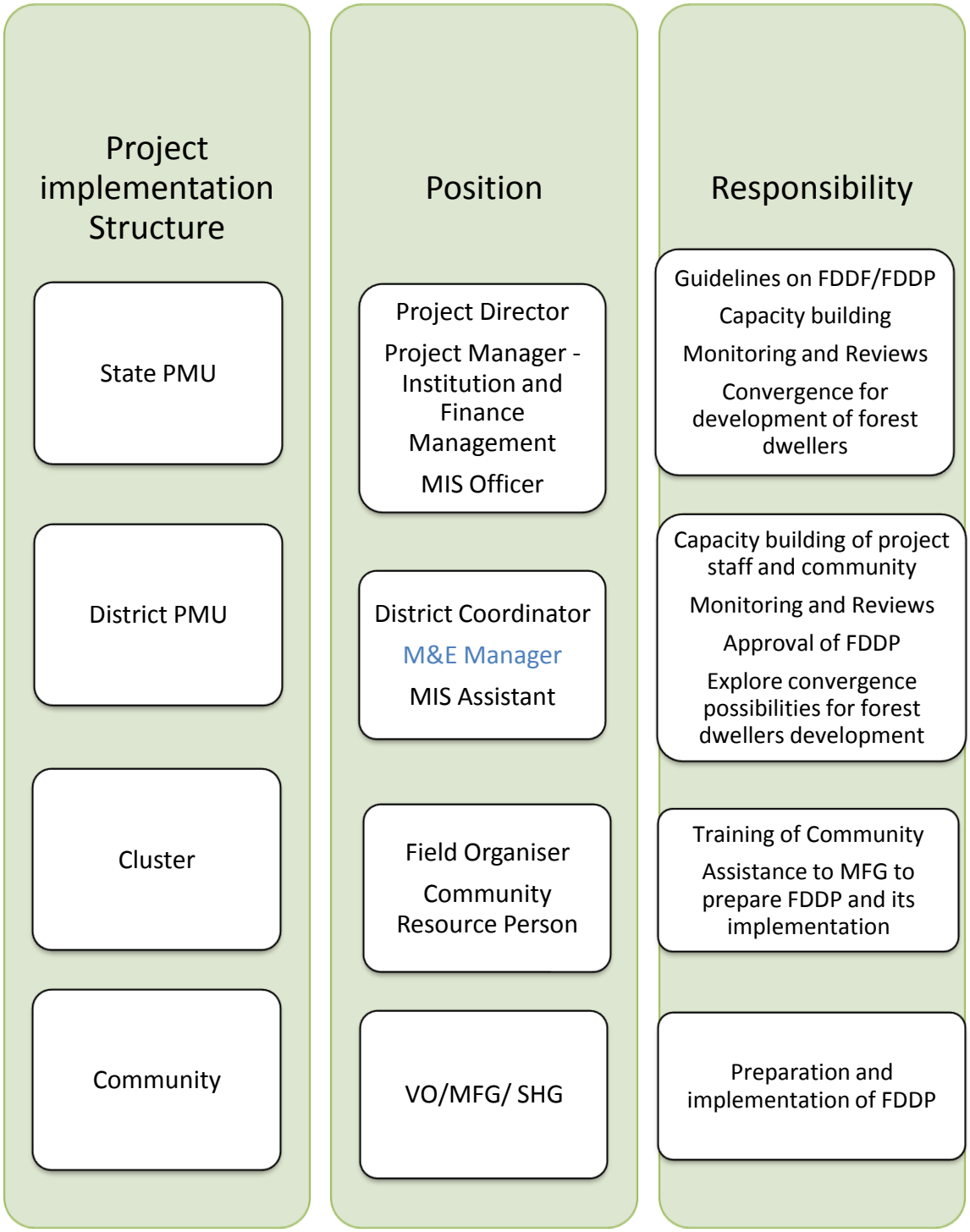
Table 7: Project Implementation Schedule

Sl.	Activity	Project Implementation Schedule						
		Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7
1	Finalisation of Forest Dwellers Development Framework and the strategies to be followed							
2	Guidelines for preparation of Forest Dwellers Development Plan							
3	Training of Project Staff on implementation of FDDF and preparation of FDDP							
4	Training of Community - VOs/MFGs/SHGs on preparation and implementation of FDDPs							
5	Preparation of FDDP at the community level							

6	Approval of FDDPs at the District level and preparation of plan for convergence, efforts for fund mobilization for implementation of FDDPs							
7	Monitoring and Reporting by the Project Staff on the preparation and implementation of FDDPs and implementation of FDDF							

9. Institutional Arrangement for Implementation of FDDF

9.1 Institutional arrangement



9.2 Responsibility and functions of Project Implementing Agencies

The following table presents the responsibilities and functions of different institutions associated with the Project for implementation of FDDF.

Table 8: Responsibilities and Functions at different level

Sl.	Organizations/ Agencies	Responsibility	Detailed functions/ activities
1	I-HIMDI State PMU	1. Ensure that the Forest Dwellers Development Framework is implemented properly 2. Ensure adequate budgetary provisions are made for capacity building of Project Staff, preparation of FDDP and its implementation	1. Prepare and circulate of guideline for preparation of forest dwellers development plan 2. Organise orientation programmes for the DPMUs and other Project Staff on the preparation of forest dwellers development plan 3. Monitor with the DPMUs the progress of preparation of FDDPs 4. Clarify the process of approval of FDDPs 5. Guide the DPMUs to compile the recommendations/ mitigation measures to be taken up for the safeguarding the rights of forest dwellers 6. Create budgetary provisions for implementation of recommendations/ mitigation measures and place funds with DPMUs. In case of non-availability of funds, efforts should be made to source funds from other schemes, projects (through convergence) 7. Periodically monitor the progress of implementation of FDDPs – it should be included in the project monitoring system and procedures 8. Ensure the periodical progress reporting formats of the Project include segregated data on implementation of forest dwellers development plan 9. Include forest dwellers development aspects in the scope of work and ToR of Impact Assessment/ Evaluations
2	I-HIMDI District PMU	1. Ensure FDDF is implemented in the Project Area 2. Ensure that the Project Staff are capacitated to implement FDDF and prepare Forest Dwellers Development Plan 3. Ensure all the target villages prepare FDDP (if required and implement these plans 4. Ensure adequate funds are sourced for implementation of FDDP (from the Project as well as through convergence with other agencies/ programmes)	1. Prepare the Annual Action Plans incorporating the activities for FDDF 2. Circulate the guidelines and manuals on FDDP to all the Project Staff 3. Organise training programmes for the Project Staff on the methods and processes involved in preparation of FDDP 4. Facilitate organisation of training programmes for the communities/ leaders on preparation and implementation of FDDP 5. Monitor the progress of preparation of FDDP and organise necessary support services to the Project Staff in preparation of these plan 6. Review the FDDPs and provide necessary guidance for improvements and take necessary action for approval of these plans 7. Monitor the implementation of FDDPs

			and suggest measures to be taken up 8. Facilitate compilation of recommendations and mitigation measures suggested in FDDPs 9. Estimate the requirement of funds for implementation of FDDPs 10. Negotiate with the State PMU and other Departments/ Agencies for sourcing of funds 11. Ensure progress related data related to the FDDP are collected from the villages/ target groups and built into the MIS 12. Prepare reports incorporating data on the progress of FDDPs submit them to the State PMU
3	VO/ MDI Farmers Group (MFG)	1. Prepare and implement of FDDP	1. Prepare the FDDP as part of their MDI Plan with the active participation of the SHGs and forest dwellers and with the help of CRP and FO 2. Implement the FDDP with the help of SHG, CRP, FO and other Departments, PRIs 3. Periodically review the progress of work and assist the Project Staff and Experts in conducting reviews and evaluations 4. Support the CRP and FO in preparation of periodical progress reports
4	SHG	1. Ensure preparation of FDDP 2. Ensure proper selection of Project beneficiaries giving emphasis to forest dwellers	1. Give priority to the poor forest dwellers to participate in the project activities 2. Work with the MDI Farmers Group to prepare MDI plan including FDDP 3. Assist the MDI Farmers Group to implement FDDP and work with the Project Staff and Gram Panchayat to mobilize resources for implementation of FDDP 4. Monitor the progress of implementation of FDDP 5. Provide reports on forest dwellers to the DPMU as and when required

9.3 Responsibility of different Project Staff in implementation of FDDF

Table 9: Responsibilities of Project Staff

Sl.	Staff	Responsibility
1	Chief Operating Officer, State PMU	1. Finalize the FDDF and manual for preparation of forest dwellers development plan and get them approved by the Executive Committee 2. Oversee capacity building of the Project Staff at all levels to implement FDDF 3. Facilitate creation of budgetary provisions for implementation of FDDF 4. Oversee the implementation of FDDF and provide guidance to the Project Staff at the State PMU 5. Periodically monitor the implementation of FDDF 6. Liaise with other Departments and Projects for convergence to implement activities identified in the FDDPs 7. Periodically update JSLPS Executive Committee, Jharkhand Government and JICA on the progress of work relating to FDDF

2	Project Manager - Institution and Finance Management – State PMU	1. Prepare the guidelines and manual for preparation of FDDP in consultation with other Project Staff and PMC 2. Circulate the guidelines to the DPMUs after approval by JSLPS 3. Plan for capacity building of Project Staff to prepare and implement FDDP 4. Provide necessary guidance to DPMUs in preparation of FDDP and its implementation 5. Work with the MIS Officer to develop monitoring mechanism for monitoring of preparation of FDDP; reporting on the progress of preparation and implementation of FDDP; compilation of FDDP – recommendation and mitigation measures etc. 6. Review the FDDPs and provide necessary guidance to DPMUs for preparation of FDDPs properly 7. Periodically update State PMU on the progress of work relating to FDDF/ FDDP 8. Work under the guidance of COO, State PMU to explore possibilities for convergence with other projects and schemes to implement different activities proposed in FDDP
3	MIS Officer – State PMU	1. To work under the guidance of Project Manager - Project Manager - Institution and Finance Management and PMC to prepare monitoring and reporting mechanism and formats 2. To compile the recommendations / mitigation measures/ activities proposed in FDDPs with the help of MIS Assistants at the District PMUs 3. To compile progress reports on FDDF/FDDP
4	I-HIMDI District Coordinator - District PMU	1. Prepare the Annual Action Plans incorporating the activities for FDDF in consultation with all the Project Staff at the DPMU 2. Circulate the guidelines and manuals on FDDP to all the Project Staff 3. Facilitate organisation of training programmes for the Project Staff on the methods and processes involved in preparation of FDDP 4. Facilitate organisation of training programmes for the communities/ leaders on preparation and implementation of FDDP 5. Monitor the progress of preparation of FDDP with the help of District M&E Manager 6. Review the FDDPs and provide necessary guidance for improvements and take necessary action for approval of these plans 7. Monitor the implementation of FDDPs and suggest measures to be taken up with the help of District M&E Manager 8. Estimate the requirement of funds for implementation of FDDPs with the help of District M&E Manager and MIS Assistant 9. Negotiate with the State PMU and other Departments/ Agencies for sourcing of funds 10. Ensure progress related data related to the FDDP are collected from the villages/ target groups and built into the MIS 11. Prepare reports incorporating data on the progress of FDDPs submit them to the State PMU
5	District M & E Manager – District PMU	1. To periodically monitor the progress of preparation and implementation of FDDPs
6	MIS Assistant – District PMU	1. To compile data on the progress of preparation and implementation of FDDPs 2. To compile data from the FDDPs to find out the activities to be carried out in the project and through convergence 3. To prepare progress reports on FDDF/ FDDP as and when required

7	Field Organiser	1. To orient MFG, VOs, SHGs on the preparation of MDI Plan and FDDP (Methods and processes) – FDDP is a part of MDI Plan 2. To assist the MDI Farmers Groups/ VOs to prepare FDDP 3. To assist the VO and MFG to implement the FDDP 4. To assist the SHGs, MFG and VOs to negotiate with Gram Panchayat and Line Departments to mobilize funds for implementation of FDDP 5. To prepare periodical progress reports on activities concerning forest dwellers and submit them to District PMU
8	CRP	1. To mobilize MFG and SHGs to prepare the MDI Plan including FDDP and provide necessary support to them 2. To mobilize the forest dwellers to participate in the preparation of FDDP 3. To mobilize the forest dwellers to participate in the Project activities (MDI) 4. To establish close coordination with Field Organiser for preparation of MDI Plan and implementation of activities for the forest dwellers 5. To prepare progress reports and submit to District PMU through the Field Officer

10. Preparation of Forest Dwellers' Development Plan

10.1 Process of preparation of Forest Dwellers Development Plan

The Forest Dwellers Development Plan shall be prepared at the Village Organisation/ MFG level and it should be a part of the MDI Plan to be prepared at the Village Organisation/ MFG level. The plan shall be prepared by the CRPs and VO/MFG under the guidance of the FO and with active participation of forest dwellers of the village/ habitation. The steps for preparation of FDDP have been explained below:

Table 10: Methods and Processes for preparation of FDDP

Step	Methods/ Processes	Responsibility
1 – Screening - Whether FDDP is necessary or not?	Collection basic information on the village/habitation; status of forest dwellers; possibility of forest dwellers' participation in the project; potential impact of the project on forest dwellers etc. Consultation with VO, SHGs and MFG on the need for FDDP	FO and CRP jointly
2 – If FDDP is necessary then – Social Assessment	Participatory Rural Appraisal tools	CRP under the guidance of FO and with the support of VO/ MFG/ SHGs
3 – Consultation with Forest Dwellers for identification of mitigation measures and other support activities	Community Workshop Focus Group Discussions	CRP under the guidance of FO
4 – Drafting of the Plan		CRP and FO
5 – Approval of the Plan by VO/ MFG	Meeting of VO/ MFG	CRP

Table 11: Social Assessment Framework

Step	Aspects to be covered	Methodology to be followed
Analysis of Social	• Demographic details – population,	• Social Mapping

Context	sex ratio, literacy etc. • Social diversity - castes, social interaction processes • Gender • Social, economic, cultural, political and historical factors – well-being analysis, poverty situation, occupations, income and expenditure, health, education, analysis of institutions etc.	• Socio-economic baseline survey – Household level (sample basis) • Historical timeline and trend analysis • Review of available secondary data on the area/ village – Block and Gram Panchayat
Analysis of the natural resource environment	• Land, water, forest and other resources used and managed by the Forest Dwellers • Dependency on forest • Status of agriculture	• Resource mapping • Transect walk • Focus Group Discussions with the resource users
Stakeholders' Analysis	• Identification of stakeholders • Procedures for consultation with the forest dwellers at different stages of planning and implementation	• Community workshops
Free, prior and informed consultations for potential effects of the Project on the forest dwellers	• Potential social and environmental effects – positive and adverse • Mitigation measures	• Focus Group Discussions

10.2 Contents of a forest dwellers development plan

1. **Basic Information**
   - Defining the forest dwellers in the context of the Village/ habitation
   - Baseline information on the demographic, social, economic and cultural characteristics of the forest dwellers
   - Baseline information on the natural resources (land, water and forest) managed and used by the forest dwellers
2. **Summary of the Social Assessment and Free, Prior and Informed Consultation with Forest Dwellers**
   - Identification of key project stakeholders
   - Consultation with the forest dwellers following culturally appropriate processes
   - Assessment of the potential adverse and positive effects of the project
3. **Action plan for measures to avoid and/or mitigate the potential adverse effects on Forest Dwellers and measures for proactive involvement of forest dwellers in the Project**
   - Measures to be taken up for avoiding and/ or mitigating the potential adverse effects of the Project
   - Activities to be carried out for supporting the forest dwellers to participate in the Project
4. **Cost estimates and financing plan**
   - Activities wise budget and possible sources of finance
5. **Monitoring of implementation of the plan**

Attachment 8.6.1

10.3 Forest Dwellers Development plan – suggested template

1. Basic information

a. Village/ Habitation and Households

1	Name of the Village/ Habitation:	2	Name of Gram Panchayat:
3	Name of the Block:	4	Name of the District:
5	Households - Total: ST: SC: OBC: Gen:	6	Population - Total: ST: SC: OBC: Gen:

b. Definition and Status of Forest Dwellers

i. Community to define who is a forest dweller?

ii. Identification of forest dwellers in the Village/ Habitation

Category	**Total Families**	**Total population**			**No of BPL families**	**Families submitted claims under FRA***	**Total families got *patta* under FRA**	
		Male	**Female**	**Total**			**No**	**Area (Acres)**
ST								
Other Traditional Forest Dwellers (Caste wise)								
Total								
Note: Whether claim submitted for Community Forest Rights? Yes/No. If yes, then what is the status?								

***FRA – Forest Rights Act 206**

c. Sources of livelihood of the Forest Dwellers

Sl.	Primary / Main Source of livelihood	Number of Households	Problems related to livelihood
1	Agriculture – Only Kharif		
2	Agriculture – Kharif and Rabi		
3	Agriculture – Kharif, Rabi and Summer		
4	Forestry – sale of NTFP, fuel wood, timber etc.		
5	Livestock – poultry, dairy, goatery etc.		
6	Wage labour – within or near the village		
7	Wage labour – outside the village – migration		
8	Small business		
9	Service/Job		
10	Any other – specify		

d. Resources used and managed by the Forest Dwellers

Sl.	Type of resource	Unit	Quantity	Current use and management by the Forest Dwellers
1	Forest (Reserve or Protected Forest)	Ha		
2	Agriculture land – un-irrigated	Ha		
3	Agriculture land – irrigated	Ha		
4	Water resources – Wells	No		
5	Water resources – Tube wells	No		
6	Water resources – Ponds	No		
7	Water resources – any other - specify			
8	Any other resource – Specify			

Attachment 8.6.1

2. Summary of the Social Assessment and Free, Prior and Informed Consultation with Forest Dwellers

a. Consultation with different stakeholders

Sl.	Key Stakeholders/ groups	Problems identified by the stakeholders/ group	Suggested interventions
1			
2			
3			

b. Potential social and environmental impact of project interventions on the forest dwellers

Activities to be carried out by MDI Farmers Groups	Positive environmental and social impact on the forest dwellers	Negative environmental and social impact on the forest dwellers
MDI Package		
Any other activity		

3. Action plan for measures to avoid and/or mitigate the potential adverse effects on Forest Dwellers and measures for proactive involvement of forest dwellers in the Project

Sl.	Activities	Physical target	Benefits

4. Cost estimates and financing plan

Sl.	Activities	Physical Target	Cost Estimate in Rs.	Possible sources for support - Departments/Agencies/ Schemes

5. Monitoring of implementation of the plan

Sl.	Activities for monitoring	Time frame	Responsibility

Annexure 1: Status of Implementation of Forest Rights Act in Project Districts

Sl.	District	Break - up of the number of individual and community claims filed at Gram Sabha level								Total		Report of PTG	
		Forest dwelling Scheduled Tribes				Other traditional forest dwellers							
		Individual (a)		Community (b)		(a) Individual		Community (b)					
		Total no. of claims filed	No. of titles given	Total no. of claims filed	No. of titles given	Total no. of claims filed	No. of titles given	Total no. of claims filed	No. of titles given	Total individual land deeds given	Total community land deeds given	No. of PTG family	No. of titles given to PTGs
1	Gumla	1017	495	0	0	17	8	0	0	503	0	3909	48
2	Hazaribag	1686	1250	3	3	1246	0	45	0	1250	3	672	60
3	Latehar	2649	1019	2	0	374	0	0	0	1019	0	4025	73
4	Lohardaga	375	148	0	0	0	0	0	0	148	0	526	1
5	West Singhbhum	4115	2743	3043	229	0	0	0	0	2743	229	200	0
6	Palamu	1080	661	0	0	42	0	0	0	661	0	2982	134
7	Saraikela	1639	570	2	1	0	0	0	0	570	1	433	34
8	Ranchi	970	881	0	0	0	0	0	0	881	0	837	609
9	Khunti	382	337	54	54	12	10	0	0	347	54	140	0
10	Giridih	3381	3262	2	2	743	39	0	0	3301	2	161	0
11	Dumka	3156	1374	31	7	1890	31	25	0	1405	7	7221	18
12	Pakur	766	134	0	0	0	0	0	0	134	0	11877	78
	Total	21216	12874	3137	296	4324	88	70	0	12962	296	32983	1055

Attachment 8.6.1

Annexure 2: ST and SC population in the proposed Blocks

Sl.	District	Blocks proposed	Total population	SC population	% of SC to total population	ST population	% of ST to total population	Total Habitation	SC habitation	% of SC habitation to total	ST habitation	% of ST habitation to total	PTG Villages	Population
1	Dumka	Dumka	210785	15609	7.41	72601	34.44	984	26	2.64	582	59.15	56	3416
2	Dumka	Jama	137963	7069	5.12	68021	49.30	834	16	1.92	454	54.44	87	3897
3	Dumka	Masaliya	124554	6348	5.10	72966	58.58	1264	40	3.16	868	68.67	44	1514
4	Dumka	Shikaripara	131464	5035	3.83	79522	60.49	550	9	1.64	419	76.18	73	4145
5	Giridih	Bengabad	153198	22107	14.43	27028	17.64	504	51	10.12	123	24.40	0	0
6	Giridih	Dumri	226006	23045	10.20	23547	10.42	321	9	2.80	54	16.82	0	0
7	Giridih	Pirtanr	109515	10181	9.30	49145	44.88	331	15	4.53	193	58.31	0	0
8	Giridih	Giridih	372570	58762	15.77	32547	8.74	429	77	17.95	84	19.58	0	0
9	Giridih	Jamua	271563	41800	15.39	2689	0.99	553	77	13.92	81	14.65	0	0
10	Gumla	Chainpur	56591	778	1.37	46320	81.85	321	0	0.00	297	92.52	21	1676
11	Gumla	Gumla	213620	8741	4.09	122290	57.25	398	2	0.50	336	84.42	0	0
12	Gumla	Sissai	116844	1221	1.04	75208	64.37	418	0	0.00	348	83.25	0	0
13	Hazaribagh	Barhi	131669	22696	17.24	3513	2.67	517	46	8.90	32	6.19	2	142
14	Hazaribagh	Barkagaon	136839	25521	18.65	16866	12.33	284	54	19.01	59	20.77	5	142
15	Hazaribagh	Daru	52305	10361	19.81	2038	3.90	186	39	20.97	28	15.05	0	0
16	Hazaribagh	Hazaribagh	290098	42291	14.58	12182	4.20	299	99	33.11	65	21.74	0	0
17	Hazaribagh	Ichak	112815	23607	20.93	2988	2.65	370	57	15.41	28	7.57	3	187
18	Hazaribagh	Katkamdag	82385	17309	21.01	2604	3.16	176	51	28.98	13	7.39	0	0
19	Hazaribagh	Katkamsa	108361	22699	20.95	7141	6.59	401	74	18.45	32	7.98	3	203

Attachment 8.6.1

Sl.	District	Blocks proposed	Total population	SC population	% of SC to total population	ST population	% of ST to total population	Total Habitation	SC habitation	% of SC habitation to total	ST habitation	% of ST habitation to total	PTG Villages	Population
		ndi												
20	Hazaribagh	Chauparan	161814	41933	25.91	4101	2.53	481	175	36.38	36	7.48	3	201
21	Khunti	Karra	109082	4325	3.96	80930	74.19	617	4	0.65	570	92.38	0	0
22	Khunti	Khunti	124388	6245	5.02	81837	65.79	526	1	0.19	490	93.16	0	0
23	Khunti	Torpa	92991	3752	4.03	68030	73.16	504	3	0.60	472	93.65	0	0
24	Latehar	Latehar	144495	24241	16.78	61872	42.82	808	62	7.67	524	64.85	16	1117
25	Latehar	Manika	88095	20199	22.93	43534	49.42	584	108	18.49	372	63.70	14	935
26	Lohardaga	Bhandra	57303	979	1.71	36633	63.93	224	0	0.00	182	81.25	0	0
27	Lohardaga	Kuru	84827	4343	5.12	40286	47.49	238	2	0.84	150	63.03	1	11
28	Lohardaga	Lohardaga	126009	4059	3.22	59539	47.25	262	0	0.00	231	88.17	0	0
29	Lohardaga	Senha	69768	2387	3.42	43491	62.34	248	0	0.00	216	87.10	15	829
30	Pakur	Hiranpur	84079	4186	4.98	33195	39.48	288	2	0.69	175	60.76	27	2729
31	Pakur	Maheshpur	208862	6074	2.91	102467	49.06	848	7	0.83	539	63.56	34	3139
32	Pakur	Pakur	327915	10957	3.34	43737	13.34	675	42	6.22	331	49.04	24	1770
33	Palamu	Chainpur	226550	47671	21.04	41451	18.30	775	120	15.48	221	28.52	21	2560
34	Palamu	Daltonganj	201596	30639	15.20	22324	11.07	423	103	24.35	90	21.28	2	248
35	Ranchi	Silli	113798	6555	5.76	28292	24.86	627	1	0.16	200	31.90	1	164
36	Ranchi	Bero	113090	2226	1.97	69959	61.86	346	0	0.00	303	87.57	0	0
37	Ranchi	Bundu	82975	6008	7.24	39928	48.12	260	0	0.00	186	71.54	2	230
38	Ranchi	Burmu	89889	7036	7.83	35245	39.21	333	16	4.80	175	52.55	0	0
39	Ranchi	Itki	50058	680	1.36	24241	48.43	171	0	0.00	117	68.42	0	0

Attachment 8.6.1

Sl.	District	Blocks proposed	Total population	SC population	% of SC to total population	ST population	% of ST to total population	Total Habitation	SC habitation	% of SC habitation to total	ST habitation	% of ST habitation to total	PTG Villages	Population
40	Ranchi	Kanke	1317499	59816	4.54	298304	22.64	410	19	4.63	185	45.12	0	0
41	Ranchi	Lapung	63053	2348	3.72	46797	74.22	377	0	0.00	372	98.67	0	0
42	Ranchi	Mandar	128585	1649	1.28	77143	59.99	291	0	0.00	261	89.69	0	0
43	Ranchi	Nagri	76442	2115	2.77	38326	50.14	204	0	0.00	152	74.51	0	0
44	Ranchi	Namkum	145841	7496	5.14	87472	59.98	422	0	0.00	379	89.81	0	0
45	Ranchi	Ormanjhi	94137	3974	4.22	33734	35.84	928	7	0.75	471	50.75	0	0
46	Ranchi	Ranchi Urban	0	0	0.00	0	0.00	0	0	0.00	0	0.00	0	0
47	Ranchi	Ratu	76565	2609	3.41	34676	45.29	191	2	1.05	140	73.30	0	0
48	Ranchi	Tamar	132672	15315	11.54	56925	42.91	607	46	7.58	402	66.23	5	225
49	Ranchi	Angara	112759	8855	7.85	62073	55.05	703	27	3.84	459	65.29	1	87
50	Ranchi	Chanho	107503	2171	2.02	57608	53.59	208	5	2.40	148	71.15	0	0
51	Ranchi	Rahe	53916	3502	6.50	17311	32.11	226	8	3.54	130	57.52	0	0
52	Ranchi	Sonahatu	77252	6115	7.92	18455	23.89	124	2	1.61	40	32.26	0	0
53	Saraikela Karsawan	Chandil	157949	7755	4.91	47748	30.23	667	24	3.60	370	55.47	12	970
54	Saraikela Karsawan	Gobindpur	136600	2918	2.14	71976	52.69	960	4	0.42	580	60.42	0	0
55	Saraikela Karsawan	Nimidih	78639	4053	5.15	29422	37.41	306	0	0.00	143	46.73	10	589
56	Saraikela Karsawan	Saraikela	93759	6479	6.91	40264	42.94	578	21	3.63	340	58.82	0	0
57	Saraikela Karsawan	Kharsawa	88642	6847	7.72	35371	39.90	423	22	5.20	200	47.28	0	0

Attachment 8.6.1

Sl.	District	Blocks proposed	Total population	SC population	% of SC to total population	ST population	% of ST to total population	Total Habitation	SC habitation	% of SC habitation to total	ST habitation	% of ST habitation to total	PTG Villages	Population
58	West Singhbhum	Goelkera	74019	1243	1.68	63206	85.39	546	11	2.01	508	93.04	2	146
59	West Singhbhum	Jhinkpani	53792	2835	5.27	32168	59.80	216	7	3.24	198	91.67	0	0
60	West Singhbhum	Khuntpani	83047	1205	1.45	69317	83.47	620	0	0.00	620	100.00	0	0
61	West Singhbhum	Manoharpur	90142	2567	2.85	60725	67.37	490	2	0.41	437	89.18	0	0
	Total		**8839542**	**751542**	**8.50**	**2959329**	**33.48**	**27875**	**1595**	**5.72**	**16211**	**58.16**	**484**	**31272**

Attachment 9.2 Cost Breakdown

Table A-9.2.1 Summary of Project Cost

Item			F/C Portion (Yen mil.)	L/C Portion (Rs. mil.)	Total Amount (Yen mil.)	Total Amount (Rs. mil.)	Share
1. Institution Building Program							
	1.1	Cost for PMU	0.0	139.4	235.6	139.4	
	1.2	Capacity Development	0.0	3.9	6.6	3.9	
	1.3	MIS Development	0.0	0.4	0.7	0.4	
	1.4	Procurement of Equipment and Tools to PMU	0.0	68.0	115.0	68.0	
	1.5	SPMU Office Rental Cost	0.0	6.7	11.4	6.7	
		Sub-total	**0.0**	**218.5**	**369.2**	**218.5**	**4.4%**
2. Farmer Support Program							
	2.1	Cost for Field Service	0.0	260.5	440.2	260.5	
	2.2	Training on Horticulture & Marketing	0.0	2.1	3.6	2.1	
	2.3	Training on MDI Operation & Maintenance	0.0	10.0	17.0	10.0	
	2.4	Exposure Visit	0.0	4.7	7.9	4.7	
	2.5	Training Material	0.0	14.4	24.3	14.4	
		Sub-total	**0.0**	**291.7**	**493.0**	**291.7**	**5.8%**
3. Agriculture Infrastructure Development Proram							
	3.1	MDI Package (MDI, PNH, VCU)	0.0	2,160.0	3,650.4	2,160.0	
	3.2	Agricultural Tools and Equipments	0.0	70.8	119.7	70.8	
	3.3	Agriculture Facilities	0.0	35.5	60.1	35.5	
		Sub-total	**0.0**	**2,266.3**	**3,830.1**	**2,266.3**	
	Sub-total of Items 1, 2 and 3		**0.0**	**2,776.5**	**4,692.3**	**2,776.5**	**55.4%**
4. Price Escalation (4.2%)			0.0	618.1	1,044.5	618.1	
5. Physical Contingency (5%)			0.0	169.7	286.8	169.7	
	Sub-total of Items 1 to 5*		**0.0**	**3,564.3**	**6,023.7**	**3,564.3**	**71.1%**
6. Consulting Services							
	6.1	Base Cost	639.9	189.8	960.6	568.4	
	6.2	Price Escalation (F/C: 2.0%, L/C: 4.2%)	51.8	36.1	112.7	66.7	
	6.3	Physical Contingency (5%)	34.6	11.3	53.7	31.8	
		Sub-total	**726.3**	**237.1**	**1,127.0**	**666.9**	**13.3%**
	Sub-total of Items 1 to 6 (Eligible Portion)**		**726.3**	**3,801.5**	**7,150.7**	**4,231.2**	**84.4%**
7. Administration Cost and Other Costs							
	7.1	Administration Cost (5%)	0.0	211.6	357.5	211.6	
	7.2	Tax and Duty (VAT: 5%, Service Tax: 12.36%)	0.0	260.6	440.5	260.6	
	7.3	Interest during Construction (1.4%)	514.3	0.0	514.3	304.3	
	7.4	Front End Fee (0.20%)	14.3	0.0	14.3	8.5	
		Sub-total	**528.6**	**472.2**	**1,326.6**	**785.0**	**15.6%**
	Grand Total of Items 1 to 7		**1,254.9**	**4,273.7**	**8,477.4**	**5,016.2**	**100.0%**

Note: Exchange Rate: Rs.1 = JPY 1.69
Proposed Budget by JSLPS for MDI Project: Rs. 3,417.7 mil.

Note: Exchange Rate Rs.1 = Yen 1.69

Source: JICA Survey Team

Table A-9.2.2 Cost Breakdown for Institution Building Program

Activity	Unit Cost ('000 Rs.)	Quantity		Amount ('000 Rs.)	Description
1.1 Cost for PMU					
(1) State PMU	646	66	months	42,654	6 years, Including 15% of TADA (field allowance)
(2) District PMU	1,466	66	months	96,773	6 years, Including 15% of TADA (field allowance)
			Sub-total	**139,427**	
1.2 Capacity Development					
(1) Project Orientation for State PMU staff	0.0	0	times	0	As their usual business
(2) Project Orientation for District PMU staff	0.0	0	times	0	As their usual business
(3) Thematic refresher training for State PMU staff	0.0	0	times	0	As their usual business
(4) Thematic refresher training for District PMU staff	0.0	0	times	0	As their usual business
(5) Project Orientation for TO and FO (District Level)	5.5	48	times	262	Once each district, from 3rd to 6th year (4 years)
(6) Training on baseline survey in target villages and registration of MDI farmers (District Level)	5.5	48	times	262	Once each district, from 3rd to 6th year (4 years)
(7) Project Orientation for CRP and MDI farmers (Village Level)	0.2	1,200	times	240	Once per 50 farmers
(8) Training on Group Management for TO & FO (District Level)	5.5	48	times	262	Once each district, from 3rd to 6th year (4 years)
(9) Training on Group Management for CRP (Block Level)	4.6	96	times	440	Twice each district, from 3rd to 6th year (4 years)
(10) Training on making a MDI Plan for TO &FO (District Level)	5.5	48	times	262	Once each district, from 3rd to 6th year (4 years)
(11) Training on making a MDI Plan for CRP & MFG (Village Level)	0.2	1,200	times	240	Once per 50 farmers
(12) Training on O&M fund management for FO (District Level)	4.6	48	times	221	Once each district, from 3rd to 6th year (4 years)
(13) Training on O&M fund management for CRP & MFG (Village Level)	0.2	1,200	times	240	Once per 50 farmers
(14) Training on program convergence for TO & FO (District Level)	5.5	96	times	523	Twice each district, from 3rd to 6th year (4 years)
(15) Training on program convergence for CRP (Block Level)	4.6	96	times	440	Twice each district, from 3rd to 6th year (4 years)
(16) Training on risk mitigation aspects of the MDI program for TO & FO (District Level)	5.5	48	times	262	Once each district, from 3rd to 6th year (4 years)
(17) Training on risk mitigation aspects of the MDI program for CRP & MFG	0.2	1,200	times	240	Once per 50 farmers
			Sub-total	**3,893**	
1.3 MIS Development					
(1) Designing and Installing MIS	400	1	L.S.	400	Arrangement of current MIS in JSLPS
			Sub-total	**400**	
1.4 Procurement of Equipment and Tools to PMU					
(1) Vehicle	64,200	1	L.S.	64,200	Refer to attachment 9.2.4
(2) Office equipment	2,640	1	L.S.	2,640	Refer to attachment 9.2.4
(3) Survey tools	1,208	1	L.S.	1,208	Refer to attachment 9.2.4
			Sub-total	**68,048**	
1.5 SPMU Office Rental Cost					
(1) Office rental cost	80	84	Month	6,720	Refer to attachment 9.2.4
			Sub-total	**6,720**	
			Grand-total	**218,487**	

Source: JICA Survey Team

Attachment 9.2

Table A-9.2.3 Unit Cost for PMUs

Activity	Initial Monthly Salary (Rs.)	Nos. of persons		Qty. (Month)	Amount (Rs.)	Description
(1) State PMU						
1) I-HIMDI Chief Operating Officer (COO)	126,500	1	person		8,349,000	
2) Project manager on livelihood (horticulture production)	63,250	1	person		3,630,000	
3) Project manager on marketing	63,250	1	person		3,630,000	
4) Project manager on institution development	63,250	1	person		3,630,000	
5) Project manager on rural infrastructures	63,250	1	person		3,630,000	
6) I-HIMDI fund manager	63,250	1	person		3,630,000	
7) I HIMDI accountants	25,875	2	persons	66	2,295,000	- Payment starts from 7th month of 2nd year and last 7th year. - Amount including 15% of TADA (field allowance)
8) I-HIMDI Human Resource assistant	34,500	1	person		1,980,000	
9) I-HIMDI MIS officer	63,250	1	person		3,630,000	
10) I-HIMDI computer operator	34,500	1	person		1,980,000	
11) I-HIMDI Procurement Officer	63,250	1	person		2,970,000	
12) Drivres	11,500	3	persons		1,980,000	
13) Attendants	11,500	2	persons		1,320,000	
				Sub-total	**42,654,000**	
(2) District PMU						
1) I-HIMDI District Coordinator (DC)	63,250	15	persons		60,340,500	
2) I-HIMDI MIS assistant	25,875	12	persons	66	20,493,000	- Payment starts from 7th month of 2nd year and last 7th year. - Amount including 15% of TADA (field allowance)
3) I-HIMDI accountant	20,125	12	persons		15,939,000	
				Sub-total	**96,772,500**	
				Grand-total	**139,426,500**	

Source: JICA Survey Team

Table A-9.2.4 Unit Cost for Capacity Development (1/3)

Activity	Unit Price (Rs.)	Quantity		Rate (Rs.)	Description
(1) Project Orientation for State PMU staff	-	-		0	As their usual business
(2) Project Orientation for District PMU staff	-	-		0	
(3) Thematic refresher training for State PMU staff	-	-		0	
(4) Thematic refresher training for District PMU staff	-	-		0	
(5) Project Orientation for TO and FO (District Level)					
1) Venue	1,500	1	Hall	1,500	- Once a year in each target district - Average nos. of attendance@each venue: 7.5 persons - 7.5 persons x 12 district = 90 persons - 90 persons x 4 times (4 years) =360 persons (TO:120 persons, FO: 240 persons) - At the very initial stage of the contract with Agronomists and Field Organizers
2) Training Material	100	7.5	Persons	750	
3) Refreshment	120	7.5	Persons	900	
4) Conveyance	120	7.5	Persons	900	
5) Multimedia Arrangement	500	1	Event	500	
6) Miscellaneous	900	1	Event	900	
			Sub-Total	**5,450**	
(6) Training on baseline survey in target villages and registration of MDI farmers (District Level)					
1) Venue	1,500	1	Hall	1,500	- Once a year in each target district - Average nos. of attendance@each venue: 7.5 persons - 7.5 persons x 12 district = 90 persons - 90 persons x 4 times (4 years) =360 persons (TO:120 persons, FO: 240 persons) - Upon selection of MDI Farmers
2) Training Material	100	7.5	Persons	750	
3) Refreshment	120	7.5	Persons	900	
4) Conveyance	120	7.5	Persons	900	
5) Multimedia Arrangement	500	1	Event	500	
6) Miscellaneous	900	1	Event	900	
			Sub-Total	**5,450**	
(7) Project Orientation for CRP and MDI farmers (Village Level)					
1) Venue				0	- Held at common/private space without any charge - "Training Material" is mentioned at Attachment 9.3.5 - Considered to be included in miscellaneous - Held at the village where attendance lives - CRP arranges the orientation as their usual business - After selecting MDI Farmer
2) Training Material				0	
3) Refreshment				0	
4) Conveyance				0	
5) Multimedia Arrangement				0	
6) Miscellaneous	200	1	L.S.	200	
			Sub-Total	**200**	
(8) Training on Group Management for TO & FO (District Level)					
1) Venue	1,500	1	Hall	1,500	- Once a year in each target district - Average nos. of attendance@each venue: 7.5 persons - 7.5 persons x 12 district = 90 persons - 90 persons x 4 times (4 years) =360 persons (TO:120 persons, FO: 240 persons) - At the formulation of MDI Group
2) Training Material	100	7.5	Persons	750	
3) Refreshment	120	7.5	Persons	900	
4) Conveyance	120	7.5	Persons	900	
5) Multimedia Arrangement	500	1	Event	500	
6) Miscellaneous	900	1	Event	900	
			Sub-Total	**5,450**	
(9) Training on Group Management for CRP (Block Level)					
1) Venue	1,000	1	Hall	1,000	- Once in each target district at two place - Average nos. of attendance@each venue: 12.5 persons - Qty = attendance x venue = 300 persons - 300 persons x 4 times (4 years) = 1,200 persons (CRP: 1,200 persons) - At the formulation of MDI Group
2) Training Material	60	12.5	Persons	750	
3) Refreshment	95	12.5	Persons	1,188	
4) Conveyance	60	12.5	Persons	750	
5) Multimedia Arrangement	0	0	Event	0	
6) Miscellaneous	900	1	Event	900	
			Sub-Total	**4,588**	

Source: JICA Survey Team

Attachment 9.2

Table A9-2.4 Unit Cost for Capacity Development (2/3)

Activity	Unit Price (Rs.)	Quantity		Rate (Rs.)	Description
(10) Training on making a MDI Plan for TO &FO (District Level)					
1) Venue	1,500	1	Hall	1,500	
2) Training Material	100	7.5	Persons	750	- Once a year in each target district
3) Refreshment	120	7.5	Persons	900	- Average nos. of attendance@each venue: 7.5 persons
4) Conveyance	120	7.5	Persons	900	- 7.5 persons x 12 district = 90 persons - 90 persons x 4 times (4 years) =360 persons (TO:120 persons, FO: 240 persons)
5) Multimedia Arrangement	500	1	Event	500	- At the preparation of MDI plan
6) Miscellaneous	900	1	Event	900	
			Sub-Total	**5,450**	
(11) Training on making a MDI Plan for CRP & MFG (Village Level)					
1) Venue				0	
2) Training Material				0	- Held at common/private space without any charge
3) Refreshment				0	- Included in "Training Material" of Attachment 9.3.4
4) Conveyance				0	- Considered to be included in miscellaneous - Held at the village where attendance lives
5) Multimedia Arrangement				0	- CRP arranges the orientation as their usual business
6) Miscellaneous	200	1	L.S.	200	
			Sub-Total	**200**	
(12) Training on O&M fund management for FO (District Level)					
1) Venue	1,500	1	Hall	1,500	
2) Training Material	100	5	Persons	500	- Once a year in each target district
3) Refreshment	120	5	Persons	600	- Average nos. of attendance@each venue: 5 persons
4) Conveyance	120	5	Persons	600	- Qty = attendance x venue = 60 persons - 60 persons x 4 times (4 years) = 240 persons (FO: 240 persons)
5) Multimedia Arrangement	500	1	Event	500	- After MDI package and others have installed
6) Miscellaneous	900	1	Event	900	
			Sub-Total	**4,600**	
(13) Training on O&M fund management for CRP & MFG (Village Level)					
1) Venue				0	
2) Training Material				0	- Held at common/private space without any charge
3) Refreshment				0	- "Training Material" is mentioned at Attachment 9.3.4
4) Conveyance				0	- Considered to be included in miscellaneous - Held at the village where attendance lives
5) Multimedia Arrangement				0	- CRP arranges the orientation as their usual business - After MDI package and others have installed
6) Miscellaneous	200	1	L.S.	200	
			Sub-Total	**200**	
(14) Training on program convergence for TO & FO (District Level)					
1) Venue	1,500	1	Hall	1,500	
2) Training Material	100	7.5	Persons	750	- Once a year in each target district
3) Refreshment	120	7.5	Persons	900	- Average nos. of attendance@each venue: 7.5 persons
4) Conveyance	120	7.5	Persons	900	- 7.5 persons x 12 district = 90 persons - 90 persons x 4 times (4 years) =360 persons (TO:120 persons, FO: 240 persons)
5) Multimedia Arrangement	500	1	Event	500	- After MDI package and others have installed
6) Miscellaneous	900	1	Event	900	
			Sub-Total	**5,450**	

Source: JICA Survey Team

Table A9-2.4 Unit Cost for Capacity Development (3/3)

Activity	Unit Price (Rs.)	Quantity		Rate (Rs.)	Description
(15) Training on program convergence for CRP (Block Level)					
1) Venue	1,000	1	Hall	1,000	
2) Training Material	60	12.5	Persons	750	- Twice a year in each target district
3) Refreshment	95	12.5	Persons	1,188	- Average nos. of attendance@each venue: 12.5 persons
4) Conveyance	60	12.5	Persons	750	- 12.5 persons x 12 district x 2 hall = 300 persons - 300 persons x 4 times (4 years) =1,200 persons (CRP:1,200 persons)
5) Multimedia Arrangement	0	0	Event	0	- After MDI package and others have installed
6) Miscellaneous	900	1	Event	900	
			Sub-Total	**4,588**	
(16) Training on risk mitigation aspects of the MDI program for TO & FO (District Level)					
1) Venue	1,500	1	Hall	1,500	
2) Training Material	100	7.5	Persons	750	- Once a year in each target district
3) Refreshment	120	7.5	Persons	900	- Average nos. of attendance@each venue: 7.5 persons
4) Conveyance	120	7.5	Persons	900	- 7.5 persons x 12 district = 90 persons - 90 persons x 4 times (4 years) =360 persons (TO:120 persons, FO: 240 persons)
5) Multimedia Arrangement	500	1	Event	500	- After MDI package and others have installed
6) Miscellaneous	900	1	Event	900	
			Sub-Total	**5,450**	
(17) Training on risk mitigation aspects of the MDI program for CRP & MFG					
1) Venue				0	
2) Training Material				0	- Held at common/private space without any charge
3) Refreshment				0	- "Training Material" is mentioned at Attachment 9.3.4
4) Conveyance				0	- Considered to be included in miscellaneous - Held at the village where attendance lives
5) Multimedia Arrangement				0	- CRP arranges the orientation as their usual business
6) Miscellaneous	200	1	L.S.	200	
			Sub-Total	**200**	

Source: JICA Survey Team

Table A-9.2.5 Unit Cost for MIS, Procurement of Equipment and Office Rental Cost

Activity	Unit Price (Rs.)	Quantity		Amount (Rs.)	Description
Designing and Installing MIS	400,000	1	L.S.	400,000	- Modifying current MIS - Unit price is quoted by JSLPS
			Sub-total	**400,000**	
Procurement of Equipment and Tools to PMU					
(1) Vehicle					
1) 4WD Vehicle (Purchase)	1,500,000	6	Nos.	9,000,000	1 for each 2 districts
2) 4WD Vehicle (Lease)	50,000	1,092	Month	54,600,000	1 for HQ, 1 for each district, 13 Nos. x 12 Month x 7 years
3) Motorcycle	50,000	12	Nos.	600,000	1 for each district
			Sub-total	**64,200,000**	
(2) Offiice equipment					
1) Desktop PC	30,000	12	Nos.	360,000	1 for each DPMU office
2) Laptop PC	76,000	12	Nos.	912,000	1 for each DPMU office
3) UPS	3,000	12	Nos.	36,000	1 for each DPMU office
4) Printer	25,000	12	Nos.	300,000	1 for each DPMU office
5) Hand scanner	10,000	2	Nos.	20,000	1 for HQ, 1 for field survey
6) Projector with screen	25,000	12	Nos.	300,000	1 for each DPMU office
7) Software	400,000	1	L.S.	400,000	MS Office, security software, etc.
8) Table	10,000	12	Nos.	120,000	1 for each DPMU office
9) Chair	2,000	36	Nos.	72,000	3 for each DPMU office
10) Fire fighting equipment	10,000	12	Nos.	120,000	1 for each DPMU office
			Sub-total	**2,640,000**	
(3) Survey tools					
1) Digital camera with GPS	20,000	12	Nos.	240,000	- 1 for each DPMU office - Actual price by which survey team purchased
2) Video camera	50,000	2	Nos.	100,000	- 1 for HQ, 1 for field activities - Actual price by which survey team purchased
3) Portable GPS	20,000	5	Nos.	100,000	- 1 for HQ, 1 for each 3 DPMU - Actual price by which survey team purchased
4) Tablets with customized software	10,000	12	Nos.	120,000	1 for each DPMU office
5) Soil testing kit	1,500	240	Nos.	360,000	1 for each 250 MDI fields
6) EC meter	9,000	12	Nos.	108,000	- 1 for each DPMU office - Price is same as the contracted price between JICA
7) pH meter	15,000	12	Nos.	180,000	- 1 for each DPMU office - Price is same as the contracted price between JICA and NK for this survey
			Sub-total	**1,208,000**	
SPMU Office Rental Cost	80,000	84	Month	6,720,000	- Area:200sq.m (current JSLPS office) - Rate:Rs.400/sq.m/month (by interview of C/P) - Period: 7years (84months, from 1st year to 7th year)
			Sub-total	**6,720,000**	

Source: JICA Survey Team

Table A-9.2.6 Cost Breakdown for Farmer Support Program

Activity	Unit Cost ('000 Rs.)	Quantity		Amount ('000 Rs.)	Description
2.1 Cost for Field Service					
(1) Field Service	4,134	63	months	260,453	
			Sub-total	**260,453**	
2.2 Training on Horticulture & Marketing					
(1) Project Orientation for Horticulture and Marketing	26.0	3	days	78	
(2) Project Orientation for Post Harvest	26.0	3	days	78	
(3) Project Orientation for Horticulture and Marketing for TO	5.5	48	times	264	
(4) Project Orientation for Horticulture and Marketing for CRP	4.6	108	times	497	
(5) Horticulture and Marketing Training (1): "Market Oriented Farming & MDI Crop Planning"	0.2	1200	times	240	
(6) Horticulture and Marketing Training (2): "Raising Seedlings & Plant Protection"	0.2	1200	times	240	
(7) Horticulture and Marketing Training (3): "Compost Making & Fertilization"	0.2	1200	times	240	
(8) Horticulture and Marketing Training (4): "Collective Marketing"	0.2	1200	times	240	
(9) Post Harvest and Storage Training (incl. Zero Energy Cool Chamber Demonstration)	0.2	1200	times	240	
(10) Advanced Marketing Training for Market Cluster	3.7	1	times	4	
			Sub-total	**2,121**	
2.3 Training on MDI Operation & Maintenance					
(1) Orientation on MDI, PNH and VCU for TO & FO (State Level)	49.5	4	times	198	
(2) Operation and Maintenance of MDI, PNH and VCU for TO (State Level)	21.3	4	times	85	
(3) Orientation on MDI, PNH and VCU for CRP (District Level)	8.7	96	times	830	
(4) Operation and Maintenance of MDI, PNH and VCU for CRP (District Level)	8.7	4	times	35	
(5) Orientation on MDI, PNH and VCU for MFG (Village Level)	87.7	48	times	4,210	
(6) Preparation for Installation of MDI, PNH and VCU	87.7	48	times	4,210	
(7) Installation of MDI Package by Supplier	0.2	1,200	times	240	
(8) Calibration of MDI system by Supplier	0.2	1,200	times	240	
			Sub-total	**10,047**	
2.4 Exposure Visit	78	120	times	**4,680**	
(1) Exposure Visit to Inter District	52	60	times	**3,120**	TO, FO & CRP
(2) Exposure Visit to Inter Block	26	60	times	**1,560**	TO, FO & CRP
2.5 Material	2,400	6	times	**14,400**	
			Grand-total	**291,701**	

Source: JICA Survey Team

Table A-9.2.7 Unit Cost for Field Service

Activity	Initial Monthly Salary (Rs.)	Nos.		Qty. (Month)	Amount (Rs.)
(1) Field Service					
1) Technical Officer (TO) including TADA15%	28,750	120	persons	63	104,363,000
2) Field Organizer (FO) including TADA15%	11,500	240	persons		83,490,000
3) Community Resource Person (CRP)	2,000	1,200	persons		72,600,000
				Sub-total	**260,453,000**

Source: JICA Survey Team

Attachment 9.2

Table A-9.2.8 Unit Cost for Training on Horticulture & Marketing

Activity	Unit Price (Rs.)	Quantity		Rate (Rs.)	Description
(1) Project Orientation for Horticulture and Marketing (State Level)					
1) Venue	2,000	1	hall	2,000	- Once in the project period
2) Training Material	120	51	persons	6,120	
3) Refreshment	150	51	persons	7,650	- nos. of staff in SPMU & DPMUare 51
4) Conveyance	150	51	persons	7,650	
5) Multimedia Arrangement	1,000	1	event	1,000	-held at very initial stage of formation of PMUs
6) Miscellaneous	1,200	1	event	1,200	
			Total	**25,620**	
(2) Project Orientation for Post Harvest (State Level)					
1) Venue	2,000	1	hall	2,000	- Once in the project period
2) Training Material	120	51	persons	6,120	
3) Refreshment	150	51	persons	7,650	- nos. of staff in SPMU & DPMUare 51
4) Conveyance	150	51	persons	7,650	
5) Multimedia Arrangement	1,000	1	event	1,000	-before installation of market infrastructure
6) Miscellaneous	1,200	1	event	1,200	
			Total	**25,620**	
(3) Project Orientation for Horticulture and Marketing for TO (District Level)					
1) Venue	1,500	1	hall	1,500	- Once a year in each target district
2) Training Material	100	7.5	persons	750	
3) Refreshment	120	7.5	persons	900	- Once in each target district at two place
4) Conveyance	120	7.5	persons	900	- Average nos. of attendance@each venue: 12.5 persons
5) Resource person fee	0	2	persons	0	- Qty = attendance x venue = 300 persons
5) Multimedia Arrangement	500	1	event	500	- 300 persons x 4 times (4 years) = 1,200 persons
6) Miscellaneous	900	1	event	900	(CRP: 1,200 persons)
			Total	**5,450**	- Resource person from KVK
(4) Project Orientation for Horticulture and Marketing for CRP (Block Level)					- When target SHGs are selected.
1) Venue	1,000	1	hall	1,000	
2) Training Material	60	12.5	persons	750	-Once in each target district at two place
3) Refreshment	95	12.5	persons	1,188	- Average nos. of attendance@each venue: 12.5 persons
4) Conveyance	60	12.5	persons	750	- Qty = attendance x venue = 300 persons
5) Resource person fee	0	1	person	0	- 300 persons x 4 times (4 years) = 1,200 persons
5) Multimedia Arrangement	0	1	event	0	(CRP: 1,200 persons)
6) Miscellaneous	900	1	event	900	After the selection of CRP
			Total	**4,588**	
(5) Horticulture and Marketing Training (1): "Market Oriented Farming & MDI Crop Planning" (Village Level)					
1) Venue				0	Held at common/private space without any charge
2) Training Material				0	"Training Material" is mentioned at Attachment 9.3.4
3) Refreshment				0	Considered to be included in miscellaneous
4) Conveyance				0	Held at the village where attendance lives
5) Resource person fee				0	CRP arranges the orientation as their usual business
6) Multimedia Arrangement				0	Before the 1st Season at CRP's Farm
7) Miscellaneous	200	1	event	200	
			Total	**200**	
(6) Horticulture and Marketing Training (2): "Raising Seedlings & Plant Protection" (Village Level)					
1) Venue				0	Held at common/private space without any charge
2) Training Material				0	"Training Material" is mentioned at Attachment 9.3.4
3) Refreshment				0	Considered to be included in miscellaneous
4) Conveyance				0	Held at the village where attendance lives
5) Resource person fee				0	CRP arranges the orientation as their usual business
6) Multimedia Arrangement				0	At the Beginning of the 1st Season
7) Miscellaneous	200	1	event	200	
			Total	**200**	
(7) Horticulture and Marketing Training (3): "Compost Making & Fertilization" (Village Level)					
1) Venue				0	Held at common/private space without any charge
2) Training Material				0	"Training Material" is mentioned at Attachment 9.3.4
3) Refreshment				0	Considered to be included in miscellaneous
4) Conveyance				0	Held at the village where attendance lives
5) Resource person fee				0	CRP arranges the orientation as their usual business
6) Multimedia Arrangement				0	At the Middle of the 1st Season
7) Miscellaneous	200	1	event	200	
			Total	**200**	
(8) Horticulture and Marketing Training (4): "Collective Marketing" (Village Level)					
1) Venue				0	Held at common/private space without any charge
2) Training Material				0	"Training Material" is mentioned at Attachment 9.3.4
3) Refreshment				0	Considered to be included in miscellaneous
4) Conveyance				0	Held at the village where attendance lives
5) Resource person fee				0	CRP arranges the orientation as their usual business
6) Multimedia Arrangement				0	At the End of the 1st Season
7) Miscellaneous	200	1	event	200	
			Total	**200**	
(9) Post Harvest and Storage Training(incl. Zero Energy Cool Chamber Demonstration) (Village Level)					
1) Venue				0	Held at common/private space without any charge
2) Training Material				0	"Training Material" is mentioned at Attachment 9.3.4
3) Refreshment				0	Considered to be included in miscellaneous
4) Conveyance				0	Held at the village where attendance lives
5) Resource person fee				0	CRP arranges the orientation as their usual business
6) Multimedia Arrangement				0	After Installation of Multipurpose Community Center
7) Miscellaneous	200	1	event	200	
			Total	**200**	
(10) Advanced Marketing Training for Market Cluster (Village Level)					
1) Venue				0	1 SHG where market infrastructure to be installed
2) Training Material	40	50		2,000	
3) Refreshment	30	50		1,500	
4) Conveyance				0	Held at the village where attendance lives
5) Resource person fee				0	CRP arranges the orientation as their usual business
6) Multimedia Arrangement				0	After Installation of Market Center
7) Miscellaneous	200	1	event	200	
			Total	**3,700**	

Source: JICA Survey Team

Table A-9.2.9 Unit Cost for Training on MDI O&M

Activity	Unit Price (Rs.)	Quantity		Rate (Rs.)	Description
(1) Orientation on MDI, PNH and VCU for TO & FO (State Level)					
1) Venue	2,000	1	hall	2,000	- Once a year
2) Training Material	120	90	persons	10,800	- Average nos. of attendance: 90 persons
3) Refreshment	150	90	persons	13,500	- 90 persons x 4 times (4 years) =360 persons
4) Conveyance	150	90	persons	13,500	(TO:120 persons, FO: 240 persons)
5) Resource person fee	7,500	1	person	7,500	- Professionals of universities, research institutes
6) Multimedia Arrangement	1,000	1	event	1,000	- When target SHGs are selected.
7) Miscellaneous	1,200	1	event	1,200	
			Total	**49,500**	
(2) Operation and Maintenance of MDI, PNH and VCU for TO (State Level)					
1) Venue	2,000	1	hall	2,000	- Once a year
2) Training Material	120	30	persons	3,600	- Average nos. of attendance: 30 persons
3) Refreshment	150	30	persons	4,500	- 90 persons x 4 times (4 years) =120 persons
4) Conveyance	150	30	persons	4,500	(TO:120 persons)
5) Resource person fee	4,500	1	person	4,500	- Suppliers, Professionals of universities, research institutes
6) Multimedia Arrangement	1,000	1	event	1,000	- After Tender Open, Before Installation
7) Miscellaneous	1,200	1	event	1,200	
			Total	**21,300**	
(3) Orientation on MDI, PNH and VCU for CRP (District Level)					
1) Venue	1,500	1	hall	1,500	- Once in each target district at two place
2) Training Material	100	12.5	persons	1,250	- Average nos. of attendance@each venue: 12.5 persons
3) Refreshment	120	12.5	persons	1,500	- Qty = attendance x venue = 300 persons
4) Conveyance	120	12.5	persons	1,500	- 300 persons x 4 times (4 years) = 1,200 persons
5) Resource person fee	1,500	1	person	1,500	(CRP: 1,200 persons)
6) Multimedia Arrangement	500	1	event	500	- Resource person from KVK
7) Miscellaneous	900	1	event	900	- When target SHGs are selected.
			Total	**8,650**	
(4) Operation and Maintenance of MDI, PNH and VCU for CRP (District Level)					
1) Venue	1,500	1	hall	1,500	- Once in each target district at two place
2) Training Material	100	12.5	persons	1,250	- Average nos. of attendance@each venue: 12.5 persons
3) Refreshment	120	12.5	persons	1,500	- Qty = attendance x venue = 300 persons
4) Conveyance	120	12.5	persons	1,500	- 300 persons x 4 times (4 years) = 1,200 persons
5) Resource person fee	1,500	1	person	1,500	(CRP: 1,200 persons)
6) Multimedia Arrangement	500	1	event	500	- Resource person from KVK (and Suppliers without fee)
7) Miscellaneous	900	1	event	900	- After Tender Open, Before Installation
			Total	**8,650**	
(5) Orientation on MDI, PNH and VCU for MFG (Village Level)					
1) Venue	0	1	hall	0	- Once a year in each district
2) Training Material	40	1,250	persons	50,000	- Average nos. of MDI farmer in a district: 1,250 persons
3) Refreshment	30	1,250	persons	37,500	- 1,250 x 12 x 4 = 60,000 farmer
4) Conveyance	0	1,250	persons	0	
5) Resource person fee	0	0	persons	0	- CRP (as their usual business)
6) Multimedia Arrangement	0	0	event	0	
7) Miscellaneous	200	1	event	200	- When target SHGs are selected.
			Total	**87,700**	
(6) Preparation for Installation of MDI, PNH and VCU					
1) Venue	0	1	hall	0	- Once a year in each district
2) Training Material	40	1,250	persons	50,000	- Average nos. of MDI farmer in a district: 1,250 persons
3) Refreshment	30	1,250	persons	37,500	- 1,250 x 12 x 4 = 60,000 farmer
4) Conveyance	0	1,250	persons	0	
5) Resource person fee	0	0	persons	0	- CRP (as their usual business)
6) Multimedia Arrangement	0	0	event	0	
7) Miscellaneous	200	1	event	200	- During the Tender Period
			Total	**87,700**	
(7) Installation of MDI Package by Supplier					
1) Venue				0	Held at common/private space without any charge
2) Training Material				0	"Training Material" is mentioned at Attachment 9.3.4
3) Refreshment				0	Considered to be included in miscellaneous
4) Conveyance				0	Held at the village where attendance lives
5) Resource person fee				0	CRP arranges the orientation as their usual business
6) Multimedia Arrangement				0	Upon installation of Infrastructures
7) Miscellaneous	200	1	event	200	
			Total	**200**	
(8) Calibration of MDI system by Supplier					
1) Venue				0	Held at common/private space without any charge
2) Training Material				0	"Training Material" is mentioned at Attachment 9.3.4
3) Refreshment				0	Considered to be included in miscellaneous
4) Conveyance				0	Held at the village where attendance lives
5) Resource person fee				0	CRP arranges the orientation as their usual business
6) Multimedia Arrangement				0	Before Cropping Seasons
7) Miscellaneous	200	1	event	200	
			Total	**200**	

Source: JICA Survey Team

Table A-9.2.10 Unit Cost for Exposure Visit and Training Material

Activity	Unit Price (Rs.)	Quantity		Rate (Rs.)	Description
Exposure Visit					
1) Exposure Visit to Inter District	2,000	26	persons	52,000	Once for TO, FO & CRP
2) Exposure Visit to Inter Block	1,000	26	persons	26,000	Once for TO, FO & CRP
			Total	**78,000**	
Material					
1) Training Material	40	60,000	persons	2,400,000	Once for MFG trainings
			Total	**2,400,000**	

Source: JICA Survey Team

Attachment 9.2

Table A-9.2.11 Unit Cost of Agriculture Infrastructure Development

Activity	Unit Cost ('000 Rs.)	Quantity		Amount ('000 Rs.)	Description
3.1 MDI Package (MDI, PNH, VCU)					
(1) MDI System	24.1	60,000	No.	1,446,000	
(2) Poly Nursery House	10.1	60,000	No.	606,000	
(3) Vermin Compost Unit	1.8	60,000	No.	108,000	
			Sub-total	**2,160,000**	
3.2 Agricultural Tools and Equipments					
(1) Agricultural Tools	50	1200	No.	60,000	
(2) Zero Energy Cool Chamber	4.5	2400	No.	10,800	
			Sub-total	**70,800**	
3.3 Agriculture Facilities					
(1) Multi-purpose Community Center	850	38	No.	32,300	
(2) Godown cum Cold Storage	3243	1	No.	3,243	
			Sub-total	**35,543**	
			Grand-total	**2,266,343**	

Source: JICA Survey Team

Table A-9.2.12 Reference of Unit Cost for Training

Level	Training material	Refreshment	Venue	Conveyance	Resource person fee	Multimedia arrange	Misc
State	120	150	2,000	150	1,500	1,000	1,200
Disrict	100	120	1,500	120	1,500	500	900
Block/Cluster	60	95	1,000	60	1,500	0	900
Village	40	30	0	0	1,000	0	200

Source: Indicative Financial Norms for Exposure visit, training and capacity building activity

Exposure Visit

Categories	Rates are including Travel cost (Rs)		Rates are excluding Travel cost (Rs)
All Participants (including Govt Officials, CBO, NGO, Bankers etc)	Inter district	Inter block	Inter state
Note: The rates mentioned herein are expenditure ceiling; payments shall be based on actuals.	2,000	1,000	4,500

Source: Indicative Financial Norms for Exposure visit, training and capacity building activity

Table A-9.2.13 Cost of Consulting Services

(Unit: '000)

Items			Unit	Q'ty	F/C Portion (Yen)		L/C Portion (Rs)		Total (Yen)	Total (Rs)
					Rate	Amount	Rate	Amount	Amount	Amount
A	**Remuniration**									
	A1	International Experts (Pro-A)	M/M	203	2,895	587,685			587,685	347,743
	A2	National Experts (Pro-B)	M/M	327			350	114,450	193,421	114,450
	A3	Supporting Staffs	M/M	498			50	24,900	42,081	24,900
		Sub-total				**587,685**		**139,350**	**823,187**	**487,093**
B	**Direct Costs**									
	B1	International Travel (round trip)								
		• International Experts (Pro-A)	Trip	45	450	20,250			20,250	11,982
		• Excess Baggage	kg	100	6	600			600	355
		• Travel Documents	Time	35	3	105			105	62
	B2	Domestic Travel (round trip)								
		• International Experts (Pro-A)	Trip	45			8	360	608	360
		• National Experts (Pro-B)	Trip	38			8	304	514	304
		• Excess Baggage	kg	830			0.3	249	421	249
		• Car Rent in Dehli	day	166			3.0	498	842	498
	B3	Perdiem and Accomodation Cost								
		• International Experts (Pro-A)	Month	203	154	31,262			31,262	18,498
		• National Experts (Pro-B)	Month	327			50	16,350	27,632	16,350
	B4	Procurement of Vehicles								
		• Vehicles	No.	4			1,500	6,000	10,140	6,000
		• Insurance	Vehicle	4			90	360	608	360
	B5	O&M of Vehicles	car-month	251			20	5,020	8,484	5,020
	B6	Car Rent in Jharkhand	car-day	360			3	1,080	1,825	1,080
	B7	International Communications	Month	72			30	2,160	3,650	2,160
	B8	Domestic Communication	Month	72			30	2,160	3,650	2,160
	B9	Office Rent (120m2)	Month	72			120	8,640	14,602	8,640
	B10	Office Running Cost	Month	72			50	3,600	6,084	3,600
	B11	Office Furniture and Equipment	LS	1			1,500	1,500	2,535	1,500
	B12	Report Preparation	Month	72			30	2,160	3,650	2,160
		Sub-total				**52,217**		**50,441**	**137,462**	**81,339**
		Grand Total				**639,902**		**189,791**	**960,649**	**568,431**

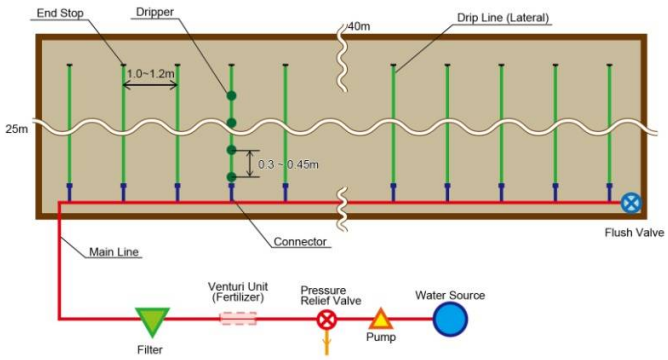
Source: JICA Survey Team

Attachment 9.2.1 Direct Cost of Agriculture Infrastructure Development

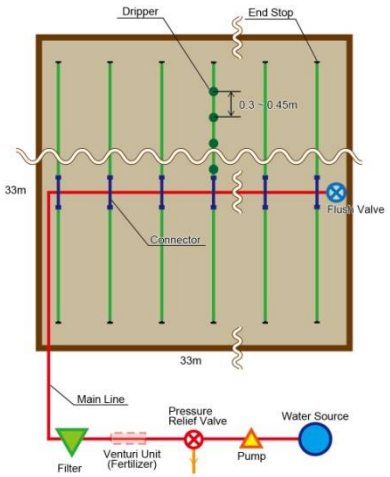
1. MDI System

Price quotations have been taken from three major MDI suppliers in Jharkhand based on the following two typical layouts.

Type-1



Type-2



Source: JICA Survey Team

Figure A-9.2.1 Typical Layouts of MDI

The necessary equipments are: control valve, bypass (excess water release in case of high pressure in the system), pressure gauge, manifold, venturi fertigation unit, screen filter, air valve, main line, sub-main line, connector and their parts such as grommet and joiner, laterals, flush valve and all necessary PVC fittings needed for fixating the system as per the requirements of the site.

Following conditions were given for system price quotations.

a) It is assumed that 1,000 units of MDI systems will be installed in each district every year.
b) Main line: PVC 63 mm dia.
c) Submain line: PVC 40 mm dia.
d) Lateral with inline Non Pressure Compensated drippers, 12 mm dia.
e) Dripper Discharge Rate: 2 liter/hr
f) Lateral Spacing: 1.2 m, Dripper Spacing: 30 cm
g) The supplier shall survey, design and install the MDI systems in consultation with JSLPS, SHGs and the farmers.
h) The cost for pump shall not be included in the quotation. It is assumed that the farmers already have water source and water lifting devices.
i) The water source is 5 m away from the MDI field.
j) The farmers shall provide their labor for trenching and backfilling upon the system installation.
k) The guarantee period of the system shall be one year.
l) The supplier shall offer the instruction and advices when the system is installed.

m) After-sales maintenance free service including system calibration is required for three years at the beginning of every crop season. Spare parts will be supplied at actual costs.

The summary of the price quotations are summarized in Table A-9.2.2 below.

Among the three suppliers, Supplier C presented rather low prices. Therefore and for safety motive, the average of the remaining two suppliers has been adopted for cost estimate.

Table A-9.2.2 Summary of Quotations for MDI (without tax)

(Unit: Rs.)

	Supplier A	Supplier B	Supplier C	Average	Average (A&B)
Type-1	24,115	22,656	18,484	21,752	23,386
Type-2	25,880	23,700	20,017	23,199	24,790
Average	24,998	23,178	19,251	22,475	**24,088**

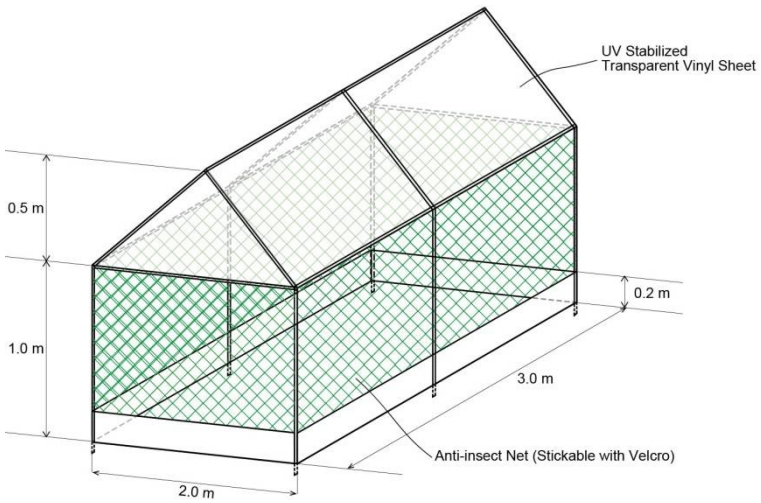
Source: JICA Survey Team

Accordingly, the unit price for micro drip irrigation system is estimated at Rs. 24,088 ≈ Rs. 24,100, and for the whole project, the cost will be 24,100 x 60,000 = Rs. 1,446 million.

The lifetime of the MDI system is assumed at 6 years.

2. Poly Nursery House (PNH)

Price quotations for PNH were obtained from two firms based on the sketch given in Figure A-9.2.2 and the conditions described hereunder.



Source: JICA Survey Team

Figure A-9.2.2 Proposed Poly Nursery House

a) The size of the PNH is 2 x 3 m with the height of 1 m and 0.5 m high rooftop.

b) The house shall be foldable.

c) The insect proof net will be able to be opened and closed with Velcro tape attached to it.

d) Together with the PNH, 35 nursery trays with 104 cells shall be provided.

e) MDI farming inputs such as cocopeat, fertilizer and pesticide for one crop season shall be provided.

The unit price of PNH is estimated at Rs. 10,100 as an average of two quotations including 35 nursery trays and input materials for one crop season such as cocopeat, fertilizer and pesticide. Vegetable seeds of HYV/hybrid as per the choice/demand of farmers but not exceeding a cost of Rs. 500 for one crop season shall also be provided to MDI farmers. Therefore, the unit cost for poly nursery house with

appurtenant input such as nursery trays, cocopeat, fertilizer, pesticide and seeds are estimated at Rs. 10,100. The estimated cost for 60,000 units of PNH is, thus, Rs. 606 million

It is assumed that the cladding of PNH is needed to be replaced every 3 years.

3. VCU

Quotations for vermin compost bed of the size 1.2 x 3 m with 0.6 m height were requested to three suppliers in India, and one responded at the price Rs. 1,300. In addition, earthworms to be supplied for each VCU will cost Rs. 500 for each VCU.

Therefore, the unit price for a VCU is estimated at Rs. 1,800, totaling Rs. 108 million.

The durability of VCU in proper shed is estimated at 3 years.

4. Agriculture Tools

According to the demand of MDI farmers, SHG requests to JSLPS for necessary fund up to the designated ceiling amount per SHG. JSLPS reviews the SHG's request together with the tool list and estimated cost, disburses the fund to SHG's account. Tentatively sprayers for pesticides and plastic crates for carrying products to market are proposed, however, other tools as per the requirements of farmers are acceptable as far as they are useful and helpful for MDI farming and marketing.

Within the ceiling amount Rs. 50,000, an MFG can purchase agriculture tools which are deemed useful for common use. Supposing the number of MFGs is 1,200, the total cost for agriculture tools is estimated at Rs. 60 million.

5. Multipurpose Community Center

Multipurpose community centers will be constructed in 38 locations. The cost will vary site by site, however, the cost for open shed structure is roughly estimated at Rs. 5,000/m^3. Therefore, the construction cost for a center of 50 m^2 and 3 m high becomes Rs. 750,000. Including appurtenant facilities such as weighing scales, sorting/grading facilities and whiteboard, total cost for a multipurpose community center is counted at Rs. 850,000, totaling Rs. 32,300,000 for 38 units.

6. Market Center (Godown cum Cold Chamber)

For a market center with 2 units of cool chambers, a vehicle and plastic crates, the cost was estimated by JSLPS at Rs. 3,243,000 as shown in Table A-9.2.3.

Table 9.2.3 Cost Estimate of Market Center with Cool Chambers

Component	Unit Price (Rs.)	Quantity	Amount (Rs.)	Remarks
Construction of mini godown for two cold chambers	1,224,000	1	1,224,000	10' x 6' x 8', 7' x 6' x 8'
Cool chamber facility				
- Insulation with 80mm PUF	230,000	1	230,000	
- Condensing units, evaporators and control panel	329,000	1	329,000	
- Humidifier, Installation and other costs	200,000	1	200,000	
- Miscellaneous electric equipments	60,000	1	60,000	

Component	Unit Price (Rs.)	Quantity	Amount (Rs.)	Remarks
Marketing support	300,000	1	300,000	Auto Rickshaw
Carriage support	400	1,000	400,000	Plastic Crates
Marketing shed	500,000	1	500,000	
Total			3,243,000	

Source: JSLPS

7. Zero Energy Cool Chamber (ZECC)

The necessary materials for a Pusa ZECC of the size 1.5 m x 1.0 m x 0.6 m high are bricks (400 pieces), sand, water tank, pipes, tubes, plastic crates (6 nos.) in addition to locally available free materials such as bamboo and leaves. Labor component needed for erecting and the locally available materials will be taken as the farmer's contribution.

In Odisha in 2011, the costs are estimated as shown in Table A-9.2.4.

Table A-9.2.4 Cost Breakdown of ZECC

Item	Cost (Rs.)
Brick (400 pieces)	1,000
Sand	100
Material for Top Cover (Bamboo, Grass Leaves, etc.)*	300
Thatched Shed*	500
Water Tanks, Pipes, Tube, Poly Sheet	600
Plastic Crates (6 nos.)**	2,400
Labor*	300
Total	5,200
Total excluding * items	4,100

*Note: * Farmer's contribution*
*** Actual market price*
Source: http://www.orihort.in/Download/ZeroEnergycoolChamber.pdf

Assuming the annual escalation rate at 3.1%, the updated unit cost and total cost at 2014 level are estimated as follows.

Unit Cost: $4,100 \times 1.031^3 = 4,493 \approx$ Rs. 4,500

Total Cost: 4,500 x 2,400 = Rs. 10.8 million

For a chamber of the internal dimension 1.5 m x 1.0 m x 0.6 m high, the construction cost will be Rs. 4,500, and 2,400 units will be installed in total at village level, totaling Rs. 10.8 million.

Attachment 9.3.1 Annual Disbursement Schedule

Item	Total			2015			2016			2017			2018			2019			2020			2021			2022			2023			2024		
	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total
A. ELIGIBLE PORTION																																	
Ⅰ) Procurement / Construction	0	3,564	6,024	0	12	20	0	43	72	0	355	601	0	816	1,379	0	1,082	1,829	0	1,128	1,906	0	128	217	0	0	0	0	0	0	0	0	0
1.1 Cost for PMU	0	139	236	0	0	0	0	13	21	0	25	43	0	25	43	0	25	43	0	25	43	0	25	43	0	0	0	0	0	0	0	0	0
1.2 Capacity Development	0	4	7	0	0	0	0	0	0	0	1	2	0	1	2	0	1	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
1.3 MIS Development	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.4 Procurement of Equipment and Tools	0	68	115	0	10	16	0	10	16	0	10	16	0	10	16	0	10	16	0	10	16	0	10	16	0	0	0	0	0	0	0	0	0
1.5 S-PMU Office Rental Cost	0	7	11	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	0	0	0	0	0	0	0	0	0
2.1 Cost for Field Service	0	260	440	0	0	0	0	12	21	0	50	84	0	50	84	0	50	84	0	50	84	0	50	84	0	0	0	0	0	0	0	0	0
2.2 Training on Horticulture & Marketing	0	2	4	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
2.3 Training on MDI Operation & Maintenance	0	10	17	0	0	0	0	0	1	0	2	3	0	2	3	0	2	3	0	2	3	0	2	3	0	0	0	0	0	0	0	0	0
2.4 Exposure Visit	0	5	8	0	0	0	0	0	0	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	0	0	0	0	0	0	0	0	0
2.5 Training Material	0	14	24	0	0	0	0	1	1	0	3	5	0	3	5	0	3	5	0	3	5	0	3	5	0	0	0	0	0	0	0	0	0
3.1-1 MDI Package (MDI, PNH, VCU) 1st batch	0	180	304	0	0	0	0	0	0	0	180	304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.1-2 MDI Package (MDI, PNH, VCU) 2nd batch	0	540	913	0	0	0	0	0	0	0	0	0	0	540	913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.1-3 MDI Package (MDI, PNH, VCU) 3rd batch	0	720	1,217	0	0	0	0	0	0	0	0	0	0	0	0	0	720	1,217	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.1-4 MDI Package (MDI, PNH, VCU) 4th batch	0	720	1,217	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	720	1,217	0	0	0	0	0	0	0	0	0	0	0	0
3.2 Agricultural Tools and Equipments	0	71	120	0	0	0	0	0	0	0	18	30	0	18	30	0	18	30	0	18	30	0	0	0	0	0	0	0	0	0	0	0	0
3.3 Agricultural Facilities	0	36	60	0	0	0	0	0	0	0	9	15	0	9	15	0	9	15	0	9	15	0	0	0	0	0	0	0	0	0	0	0	0
Base cost for JICA financing	0	2,777	4,692	0	11	18	0	37	63	0	299	506	0	659	1,114	0	839	1,418	0	839	1,418	0	92	155	0	0	0	0	0	0	0	0	0
Price escalation	0	618	1,045	0	0	1	0	3	5	0	39	66	0	118	199	0	192	324	0	235	397	0	31	52	0	0	0	0	0	0	0	0	0
Physical contingency	0	170	287	0	1	1	0	2	3	0	17	29	0	39	66	0	52	87	0	54	91	0	6	10	0	0	0	0	0	0	0	0	0
Ⅱ) Consulting services	726	237	1,127	0	0	0	173	38	237	133	42	205	137	47	215	136	48	218	135	50	220	12	11	32	0	0	0	0	0	0	0	0	0
Base cost	640	190	961	0	0	0	158	34	215	120	35	180	120	38	184	117	38	181	114	37	178	10	8	24	0	0	0	0	0	0	0	0	0
Price escalation	52	36	113	0	0	0	6	3	11	7	5	15	10	7	21	12	9	27	14	10	32	2	3	6	0	0	0	0	0	0	0	0	0
Physical contingency	35	11	54	0	0	0	8	2	11	6	2	10	7	2	10	6	2	10	6	2	10	1	1	2	0	0	0	0	0	0	0	0	0
Total (Ⅰ + Ⅱ)	726	3,801	7,151	0	12	20	173	81	309	133	397	805	137	863	1,594	136	1,131	2,047	135	1,178	2,126	12	140	249	0	0	0	0	0	0	0	0	0
B. NON ELIGIBLE PORTION																																	
a Procurement / Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.1 Well Construction 1st batch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.2 Well Construction 2nd batch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.3 Well Construction 3rd batch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.4 Well Construction 4th batch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base cost for India side financing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Price escalation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physical contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
b Land Acquisition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Price escalation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physical contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
c Administration cost	0	212	358	0	1	1	0	9	15	0	24	40	0	47	80	0	61	102	0	63	106	0	7	12	0	0	0	0	0	0	0	0	0
d VAT	0	178	301	0	1	1	0	2	4	0	18	30	0	41	69	0	54	91	0	56	95	0	6	11	0	0	0	0	0	0	0	0	0
e Service Tax	0	82	139	0	0	0	0	17	29	0	15	25	0	16	27	0	16	27	0	16	27	0	2	4	0	0	0	0	0	0	0	0	0
Total (a+b+c+d+e)	0	472	798	0	1	2	0	29	48	0	57	96	0	104	175	0	131	221	0	135	229	0	16	27	0	0	0	0	0	0	0	0	0
TOTAL (A+B)	726	4,274	7,949	0	13	22	173	110	358	133	454	901	137	966	1,770	136	1,261	2,268	135	1,314	2,355	12	156	276	0	0	0	0	0	0	0	0	0
C. Interest during Construction	514	0	514	0	0	0	1	0	1	10	0	10	29	0	29	55	0	55	81	0	81	84	0	84	84	0	84	84	0	84	84	0	84
Interest during Construction(Const.)	514	0	514	0	0	0	1	0	1	10	0	10	29	0	29	55	0	55	81	0	81	84	0	84	84	0	84	84	0	84	84	0	84
Interest during Construction (Consul.)	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D. Front End Fee	14	0	14	14	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL (A+B+C+D)	1,255	4,274	8,477	15	13	37	174	110	359	143	454	910	166	966	1,799	191	1,261	2,322	217	1,314	2,436	97	156	360	84	0	84	84	0	84	84	0	84
E. JICA finance portion (A)	726	3,801	7,151	0	12	20	173	81	309	133	397	805	137	863	1,594	136	1,131	2,047	135	1,178	2,126	12	140	249	0	0	0	0	0	0	0	0	0

Source: Prepared by JICA Survey Team using JICA Cost Estimate Kit

Attachment 9.6.1 Procurement of Agriculture Infrastructure

1. MDI System

1) PMU (I-HIMDI) will procure the MDI systems by the state competitive bidding (SCB) by district.
2) PMU will prepare a list of farmers to whom MDI be provided in the priority blocks.
3) PMU will call for tender for MDI systems by district, presenting standard layouts and specifications of the equipment with quantities of work items, installation schedule, requirements for training and aftercare services, and so on. The financial status, recent sales records, service network and spare parts distribution system will also be queried.
4) The interested suppliers who should have been registered in the state will submit technical proposals and price quotations to PMU.
5) After screening out non-eligible suppliers in technical proposal, the supplier who submitted the lowest bid is awarded the contract. A supplier will be selected for each district.
6) The contracted suppliers will survey the farmlands, design MDI systems in consultation with the farmers, SHG and PMU, submit the designs to PMU, and install the systems. The actual cost may vary due to specific condition of each farmland such as the distance of the field from the water source, proposed crops, shape and slope of MDI land and so on. MFG members shall offer the labor force for trenching and backfilling during installation of MDI facilities.
7) The beneficiary farmers, upon MDI installation, shall confirm that the system is well installed and instruction on system operation and maintenance are satisfactorily given, then, sign the installation certificate.
8) PMU shall disburse the actual cost to the supplier based on the beneficiary farmers' installation certificates to be submitted through the respective SHG.
9) The beneficiary farmers shall sign the loan acknowledgements of the loan of which the amount is equivalent to 60% of the MDI installation cost.

Out of the cost for 1,000 m^2 MDI system, 40% will be granted and 60% will be borne by the beneficiary farmer. As the unit cost for MDI is estimated at Rs. 24,100, the farmer will owe about Rs. 15,000, which has to be repaid to the respective SHG, as O&M funds for MDI systems, within three years after three months of grace period.

2. PNH

1) PMU (I-HIMDI) will procure the PNH including nursery trays, cocopeat, fertilizer and pesticide by the state competitive bidding (SCB) by district.
2) PMU will announce in the state press the tender for PNH specifying the size, material, quantity and delivery locations. Quotations for nursery trays, cocopeat, fertilizer and pesticide shall be also required.
3) Bidders shall present price quotations together with detailed specifications and drawings of PNH.

4) PMU will review the price quotations and designs, and then award the contract to the best bidder for each district.
5) The contracted suppliers will fabricate the PNHs and deliver to the location specified by the beneficiary farmers together with nursery trays, cocopeat, fertilizers and pesticides.
6) PMU will pay the contracted amount to the suppliers upon the arrival of delivery certificates duly signed by the beneficiary farmer and SHG.
7) As for seeds, the beneficiary farmers will purchase seeds for the first planting with the ceiling amount of Rs. 500 per unit at his or her own cost in consultation with the respective CRPs.
8) The beneficiary farmers will submit the receipts certified by the respective CRPs to PMU through the SHG for the reimbursement.

3. VCU

1) PMU (I-HIMDI) will procure the VCU including earthworms by the state competitive bidding (SCB) by district.
2) PMU will announce in the state papers the tender for vermin compost units showing the specifications, quantity and delivery locations.
3) Interested suppliers will submit their price quotations with specifications and drawings.
4) PMU will evaluate the quotations, and then select the lowest bids to subscribe the purchase contract with the suppliers.
5) The contracted suppliers will deliver the VCUs to the locations specified by the beneficiary farmers.
6) MFG members will sign the delivery certificates after verification of the products, and send them to PMU through the respective SHG.
7) PMU will pay the contract amounts to the suppliers.

4. Agriculture Tools

1) PMU (I-HIMDI) will procure the agriculture tools by the state competitive bidding (SCB) by district.
2) MFGs will select necessary tools for common use with ceiling amount of Rs. 50,000 from a shopping list of agriculture tools to be prepared by the PMU, and submit it to PMU through the respective SHG.
3) PMU will make up number of agriculture tools by district, and call for tenders.
4) Interested suppliers will submit their price quotations with drawings and specifications to PMU.
5) PMU will evaluate the quotations and other documents, and then select the lowest bid to subscribe a purchase contract with the supplier.
6) The contracted supplier will deliver the tools to the locations specified by the respective MFGs.
7) MFGs will sign the delivery certificates after verification of the tools, and submit it through the respective SHGs.
8) PMU will pay the contract amounts to the supplier.

5. Multipurpose Community Center

1) PMU (I-HIMDI) with help of field staff will select the locations of multipurpose communication center (MCC) for demonstration purpose, and decide the rough design and specifications. The land shall be arranged by PMU.
2) PMU will call for a tender, in the state papers, for procurement of the contractors for the construction of MCC including appurtenances such as weighing scales, sorting/grading facilities, plastic crates and a white board by the state competitive bidding (SCB) by district.
3) Interested firms will submit design proposals and cost estimates.
4) PMU will evaluate the proposals and estimated costs, and then contracts with the firm who presented the most attractive design and price.
5) PMU will supervise the construction works and pay to the contractor when completed.
6) The MCC will be managed by the respective MFG.

6. Market Center (Godown cum Cold Storage)

1) PMU (I-HIMDI) will select the location of market center. The location will be a state-owned land in Ranchi district.
2) PMU will make designs and specifications for the market center together with two cold storages and one vehicle.
3) PMU will call for a tender, in the state papers, for procurement of the contractors for the construction of the center including the cold storages and vehicle by the state competitive bidding (SCB).
4) The firms who interested in the tender will submit quotations with detailed designs and specifications.
5) After PMU's evaluation, the responsible firm will be selected for contract signing.
6) For the construction, PMU will supervise the work.
7) When the construction is completed, the cold storages are installed and the vehicle is delivered, PMU pays to the firms.
8) The operational guidelines will be drafted by PMU in consultation with user group.

7. Zero Energy Cool Chamber (ZECC)

1) The ceiling amount of Rs. 4,500 per unit will be reimbursed to the applicant by PMU (I-HIMDI) after the successful completion of a zero energy cool chamber (ZECC).
2) When a progressive MDI farmer wishes to have the ZECC for a temporary storage of farm products on the above condition, he or she shall submit an application form to PMU.
3) PMU will evaluate the application form, and notify to the applicant either it is approved or not.
4) If approved, the applicant will install the ZECC at his or her own cost under guidance and supervision by the respective TO.
5) Upon completion of the ZECC, the applicant will submit a completion certificate duly signed by the respective TO to PMU through the SHG for the reimbursement.

8. Implementation Process for Installation of MDI Systems

The implementation Process for installation of MDI systems would be as shown below.

	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year
Selection of MDI farmers		5,000	15,000	20,000	20,000	
Installation of MDIs			5,000	15,000	20,000	20,000

Item	Main Player	Year for Selection of MDI Farmers	Year for MDI Installation
Public Dissemination and Awareness of I-HIMDI	SPMU		
Selection of Target SHGs and MDI Farmers	DPMU (TO/FO)		
Formulation of MDI Farmer Group (MFG)	DPMU (TO/FO)		
Preparation of MDI Business Plan	MDI Farmer		
Application of MDI Installation	MDI Farmer		
Appraisal and Decision	SPMU		
Tender and Contract Award	SPMU		
Survey and Design	Contractor		
Installation and Commissioning of MDI	Contractor/ MDI Farmer		
Taking over of MDI systwm	Contactor/ DPMU and MDI farmer		
Final Payment	Contractor/ SPMU		
Recordin and Reporting	SPMU/ DPMU/ MFG		
Repayment from MDI Farmers to SHG			Grace period of 3 months; Rs. 600 x 36 months
Deposit of O&M Funds)			Approx. Rs. 5,000 per year
Periodic Inspection Services			For 3 years
Incremental Net Return with MDI			Approx. Rs. 16,000 per year

Source: JICA Survey Team

Figure A-9.6.1 Implementation Process for Installation of MDI Systems

Attachment-9.8.1 Draft Project Design Matrix (PDM) for Technical Assistance

PROJECT SUMMARY	INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
OVERALL GOAL Livelihoods of target farmers are improved through horticulture intensification by MDIs in the areas of Yen loan project.	a. Number of MDI farmers increases by xx% on average in the target area of Yen loan project. b. Cultivated area of horticulture crops increases by xx% on average in the target area of Yen loan project. c. Farm income of farmers increases by xx% on average in the target area of Yen loan project.	a. Statistics of Jharkhand b. Statistics of Jharkhand c. Statistics of Jharkhand	
PROJECT GOAL Livelihoods of target farmers are improved through horticulture intensification by MDIs in the areas of TCP.	a. Farm incomes of farmer increases by xx% on average in the target area of TCP. b. Horticulture production increases by XX% on average in the target area of TCP.	a. Baseline Survey and Impact Assessment b. Baseline Survey and Impact Assessment	- No drastic change in development policy in agriculture sector of the central government and the state government happens. - Yen Loan Project will be implemented as scheduled.
OUTPUTS 1. Planning and operational capacities of JSLPS and PMU are strengthened.	a. PMU staff at the state and districts is secured. b. Institution building training to PMU staff at the state and districts is conducted xx times in total. c. 5,000 MDI farmers are selected as a part of Yen loan project. d. Action plan of Yen loan project is prepared. e. MIS for JICA loan project is established.	a. Annual Report of JSLPS b. Progress Reports/ Project Completion Report c. Progress Reports/ Project Completion Report d. Progress Reports/ Project Completion Report e. Progress Reports/ Project Completion Report	- No drastic change in prices of farm inputs and outs happens. - No serious drought or flood damaged to agriculture production happens.
2. Training programs for institutional capacity building and promotion of horticulture intensification by MDI are formulated.	a. Sectoral training modules and materials targeting for SHG and MFG are prepared. b. Training-of-trainers (TOT) programs in different sectors are conducted xx times in total. c. 80% or more trainers of TOT program reach an achievement criteria. d. 90% or more TOT certified trainers formulate an appropriate training plan to MDI farmers.	a. Progress Reports/ Project Completion Report b. Progress Reports/ Project Completion Report c. Progress Reports/ Project Completion Report d. Progress Reports/ Project Completion Report	
3. Skill and know-how of MDI farmers for horticulture intensification are improved.	a. Training on institution building for SHG/MFG is conducted xx times in total. b. Training on water management and O&M is conducted xx times in total. c. Training on cultivation and farm management is conducted xx times in total. d. Training on agriculture processing and marketing is conducted xx times in total. e. More than XX% of MDI framers practice skills and techniques acquired through trainings.	a. Progress Reports/ Project Completion Report b. Progress Reports/ Project Completion Report c. Progress Reports/ Project Completion Report d. Progress Reports/ Project Completion Report e. Sampling Survey targeting Training Participants	

ACTIVITIES	INPUTS		IMPORTANT ASSUMPTIONS
	<JAPANESE SIDE>	<INDIAN SIDE>	
<Output-1> 1-1 Orientation workshop to PMU staff 1-2 Training to PMU staff and exposure visits to similar projects 1-3 Screening and appraisal of target MDI farmers 1-4 Preparation of action plan for the Project 1-5 Establishment of project management information system	(1) Japanese Experts - Team Leader/ Horticulture Expert - Institution Building Expert - Irrigation and O&M Expert - Market Expert - Coordinator/ Training	(1) Counterpart Personnel (C/P) - SPM- Livelihood (Farm) - SPM- Institutional Building & Capacity Development - SPM- Skill Development & Placement - Others as required.	- Trained staffs are continuously engaged in the project activities. - Coordination with other programs is maintained.
<Output-2> 2-1 Preparation of materials for public dissemination and awareness 2-2 Preparation of training modules and materials for each scheme 2-3 Preparation of audio-visual training materials 2-4 Development of evaluation method for trainings 2-5 TOT training to TOs, FOs and CRPs 2-6 Preparation of training programs for MDI farmers by trainers	(2) Exposure Visit to Japan (3) Provision for Equipment and Materials - Vehicles - Office Equipment - Training Equipment, etc. (4) Running Expenses for Japanese Experts	(2) Office Space (100 m2) (3) Data, information, documents and facilities relevant to the project (4) Running Expenses for Counterpart Personnel	**<Pre-conditions>** - Security in the target areas remains stable. - Farmers in the target areas are eager to introduce horticulture intensification by MDIs.
<Output-3> 3-1 Public dissemination and public consultation meeting 3-2 Training to SHGs/MFG and exposure visits to similar projects 3-3 Training on O&M of MDIs and exposure visits to similar projects 3-4 Training on horticulture farming technology and exposure visits to similar projects 3-5 Training on processing and marketing of horticulture products and exposure visits to similar projects 3-6 Field experiment and demonstration in sample areas 3-7 Monitoring and evaluation of activities in sample areas 3-8 Follow-up workshop for trainings			

Attachment 10.1 Financial Crop Budget

Table A-10.1.1 Financial Crop Budget for Pea Cultivation without MDI

	Particulars/Cost	Unit	Price Rs/Unit	Quantity Unit/1000m^2	Value Rs/1000m^2
A	Seeds/ Agro Chemicals				
	Seeds	kg	200	6	1,200
	Compost/ Vermicompost	kg	8	100	800
	Agri- lime	kg	4	10	40
	kananj Cake	kg	15	0	0
	Urea	kg	0	5	0
	DAP	kg	10	15	150
	MOP	kg	18	10	180
	Micronutrients	kg	1	130	130
	Energy	wh	3	27	81
	Stakes				0
	Sub total				2,581
B	Labour cost				
	Land preparation (Tractor)	hrs.	800	0.5	400
	Bed making	day	150	2	300
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	10	1,200
	Irrigation	hrs.	25	20	500
	Pestcide,Fungicide	Rs	150	4	600
	Harvesting	Day	120	8	960
	Grading/ Packing	Day	0	0	0
	Market and Transport	Rs	80	5	400
	Sub total				4,600
	Total cost = (A+B)				7,181
C	Total Yield	kg		700	
	Price	Rs/kg		12	
	Gross Income	Rs			8,400
	Net Income (Gross Income-Costs)	Rs			1,219

Source: JICA Survey Team

Table A-10.1.2 Financial Crop Budget for Pea Cultivation with MDI

	Particulars/Cost	Unit	Price Rs/Unit	Quantity Unit/1000m^2	Value Rs/1000m^2
A	Seeds	kg	200	3	600
	Compost/ Vermicompost	kg	8	50	400
	Agri- lime	kg	4	10	40
	Urea	kg	0	0	0
	SSP	kg	10	15	150
	MOP	kg	18	5	90
	Borex	kg	0	0	0
	Micronutrients	kg	1	130	130
	Stakes				0
	Energy	wh	3	101	303
	Sub total				1,713
B	Labour cost				
	Land preparation (Tractor)	hrs.	600	0.5	300
	Bed making	day	150	2	300
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	4	480
	Irrigation	hrs.	25	15	375
	Pestcide,Fungicide	Rs	150	3	450
	Fertigation by Drip	Rs	800	1	800
	Harvesting	Day	120	8	960
	Grading/ Packing	Day	0	0	0
	Market and Transport	Rs	80	5	400
	Sub total				4,305
	Total cost = (A+B)				6,018
C	Total Yield	kg		800	
	Price	Rs/kg		12	
	Gross Income	Rs			9,600
	Net Income (Gross Income-Costs)	Rs			3,582

Source: JICA Survey Team

Table A-10.1.3 Financial Crop Budget for Tomato Cultivation without MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	gm	300	1	300
	Nursery cost	no	500	1	500
	FYM	Trolly	1,500	1	1,500
	Agri- lime	kg	4	25	100
	DAP	kg	22	10	220
	MOP (Basel)	kg	18	15	270
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	1	130	130
	Energy	wh	3	38	114
	Sub total				3,134
B	Labour cost				
	Land preparation	hrs	800	0.5	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	1	120
	Weeding and Hoeing	Day	120	4	480
	F.Application at howing time		400	1	400
	Irrigation	hrs	25	40	1,000
	Pestcide,Fungicide	Rs	150	6	900
	Harvesting	Day	120	8	960
	Grading/ Packing	Day	120	4	480
	Market and Transport	Rs	80	6	480
	Sub total				5,670
	Total cost = (A+B)				**8,804**
C	Total Yield	kg		2,500	
	Price	Rs/kg		6	
	Gross Income	Rs			15,000
	Net Income (Gross Income-Costs)	Rs			6,196

Source: JICA Survey Team

Table A-10.1.4 Financial Crop Budget for Tomato Cultivation with MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	gm	300	2	600
	Cocopit	kg	22	5	110
	Compost/ Vermicompost	kg	8	25	200
	FYM	Trolly	1,500	1	1,500
	Agri- lime	kg	4	25	100
	kananj Cake	kg	15	25	375
	DAP	kg	22	10	220
	SSP (Basel)	kg	10	25	250
	MOP (Basel)	kg	18	15	270
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	2	130	260
	Stakes Bambu, Wire		2,500	1	2,500
	Energy	wh	3	134	402
	Sub total				6,787
B	Labour cost				
	Land prepration	hrs	800	0.5	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	3	360
	Weeding and Hoeing	Day	120	20	2,400
	Irrigation	hrs	25	40	1,000
	Pestcide,Fungicide	Rs	150	8	1,200
	Fertigation by Drip	Rs	2,600	1	2,600
	Harvesting	Day	120	10	1,200
	Grading/ Packing	Day	120	10	1,200
	Market and Transport	Rs	400	6	2,400
	Sub total				13,210
	Total cost = (A+B)				**19,997**
C	Total Yield	kg		6,000	
	Price	Rs/kg		6	
	Gross Income	Rs			36,000
	Net Income (Gross Income-Costs)	Rs			16,003

Source: JICA Survey Team

Attachment 10.1

Table A-10.1.5 Financial Crop Budget for Chili Cultivation without MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	gm	300	3	900
	Nursery cost	Rs	400	1	400
	FYM	Trolly	1,500	1	1,500
	Agri- lime	kg	4	25	100
	DAP	kg	22	10	220
	MOP (Basel)	kg	18	15	270
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	1	130	130
	Energy	wh	3	47	141
	Sub total				3,661
B	Labour cost				
	Land prepration	hrs	800	0.5	400
	Bed making	day	150	3	450
	F.Application at howing time	Rs	500	1	500
	Planting/ Sowing	Day	120	20	2,400
	Weeding and Hoeing	Day	120	4	480
	Irrigation	hrs	25	40	1,000
	Pestcide,Fungicide	Rs	150	8	1,200
	Harvesting	Day	120	40	4,800
	Grading/ Packing	Day	120	10	1,200
	Market and Transport	Rs	100	10	1,000
	Sub total				13,430
	Total cost = (A+B)				17,091
C	Total Yield	kg		2,499	
	Price	Rs/kg		20	
	Gross Income	Rs			49,980
	Net Income (Gross Income-Costs)	Rs			32,889

Source: JICA Survey Team

Table A-10.1.6 Financial Crop Budget for Chili Cultivation with MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	gm	300	2	600
	Cocopit	kg	22	5	110
	Compost/ Vermicompost	kg	8	25	200
	FYM	Trolly	1,500	1	1,500
	Agri- lime	kg	4	25	100
	kananj Cake	kg	15	25	375
	DAP	kg	22	10	220
	SSP (Basel)	kg	10	25	250
	MOP (Basel)	kg	18	15	270
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	2	130	260
	Energy	wh	3	168	504
	Sub total				4,389
B	Labour cost				
	Land prepration	hrs	800	0.5	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	3	360
	Weeding and Hoeing	Day	120	4	480
	Irrigation	hrs	25	40	1,000
	Pestcide,Fungicide	Rs	150	8	1,200
	Fertigation by Drip	Rs	2,500	1	2,500
	Harvesting	Day	120	120	14,400
	Grading/ Packing	Day	120	10	1,200
	Market and Transport	Rs	400	10	4,000
	Sub total				25,990
	Total cost = (A+B)				30,379
C	Total Yield	kg		3,500	
	Price	Rs/kg		20	
	Gross Income	Rs			70,000
	Net Income (Gross Income-Costs)	Rs			39,621

Source: JICA Survey Team

Table A-10.1.7 Financial Crop Budget for Cucumber Cultivation without MDI

	Particulars/Cost	Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	kg	150	3	450
	FYM	kg	1500	1	1500
	DAP	KG	22	10	220
	MOP	kg	18	15	270
	Phorate	kg	75	1	75
	Borex	kg	0	0	0
	Micronutrients	kg	1	130	130
	Energy	wh	3	33.6	100.8
	Sub total				2745.8
B	Labour cost				
	Land prepration	hrs	800	0.5	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	10	1200
	Irrigation	hrs	25	50	1250
	Pestcide,Fungicide	Rs	150	5	750
	Harvesting	Day	120	8	960
	Grading/ Packing	Day	120	2	240
	Market and Transport	Rs	150	8	1200
	Sub total				6690
	Total cost = (A+B)				**9435.8**
C	Total Yield	kg		4520	
	Price	Rs/kg		7	
	Gross Income	Rs			31,640
	Net Income (Gross Income-Costs)	Rs			22,204

Source: JICA Survey Team

Table A-10.1.8 Financial Crop Budget for Cucumber Cultivation without MDI

	Particulars/Cost	Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	kg	150	6	900
	Cocopit	kg	22	5	110
	Compost/ Vermicompost	kg	8	25	200
	kananj Cake	kg	15	10	150
	Urea	kg	0	0	0
	DAP	KG	22	10	220
	SSP	kg	10	15	150
	MOP	kg	18	20	360
	Borex	kg	0	0	0
	Micronutrients	kg	2	130	260
	Stakes (Bambu,Wire)		2,500	1	2,500
	Energy	wh	3	123	369
	Sub total				5,219
B	Labour cost				
	Land prepration	hrs	800	0.5	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	5	600
	Irrigation	hrs	25	25	625
	Pestcide,Fungicide	Rs	150	5	750
	Fertigation by Drip	Rs	2,600	1	2,600
	Harvesting	Day	120	2	240
	Grading/ Packing	Day	120	8	960
	Market and Transport	Rs	300	6	1,800
	Sub total				8,665
	Total cost = (A+B)				**13,884**
C	Total Yield	kg		6000	
	Price	Rs/kg		7	
	Gross Income	Rs			42,000
	Net Income (Gross Income-Costs)	Rs			28,116

Source: JICA Survey Team

Table A-10.1.9 Financial Crop Budget for Bitter Gourd Cultivation without MDI

	Particulars/Cost	Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	gram	70	29	2,030
	Compost/ Vermicompost	kg	1,500	1	1,500
	Urea	kg	10	10	100
	DAP	kg	22	10	220
	MOP	kg	18	15	270
	Borex	kg	0	0	0
	Micronutrients	kg	1	130	130
	Stakes (Bambu,Wire)		2,000	1	2,000
	Energy	wh	3	38	114
	Sub total				6,364
B	Labour cost				
	Top drasing				
	DAP	kg	22	8	176
	Urea	kg	10	5	50
	Land prepration	hrs	800	0.5	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	20	2,400
	Irrigation	hrs	25	30	750
	Pestcide,Fungicide	Rs	150	7	1,050
	Harvesting	Day	120	12	1,440
	Grading/ Packing	Day	120	4	480
	Market and Transport	Rs	100	12	1,200
	Sub total				8,410
	Total cost = (A+B)				14,774
C	Total Yield	kg		2,250	
	Price	Rs/kg		12	
	Gross Income	Rs			27,000
	Net Income (Gross Income-Costs)	Rs			12,226

Source: JICA Survey Team

Table A-10.1.10 Financial Crop Budget for Bitter Gourd Cultivation with MDI

	Particulars/Cost	Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	kg	70	20	1400
	Plug tray	Nos	10	12	120
	Cocopit	kg	22	3	66
	Compost/ Vermicompost	kg	8	10	80
	kananj Cake	kg	15	15	225
	Urea	kg	0	0	0
	SSP	kg	10	25	250
	MOP	kg	18	20	360
	Borex	kg	0	0	0
	Micronutrients	kg	2	130	260
	Stakes (Bambu,Wire)		2000	1	2000
	Energy	wh	3	134	402
	Sub total				5163
B	Labour cost				
	Land prepration	hrs	800	0.5	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	4	480
	Irrigation	hrs	25	30	750
	Pestcide,Fungicide	Rs	150	7	1050
	Fertigation by Drip	Rs	2400	1	2400
	Harvesting	Day	120	12	1440
	Grading/ Packing	Day	120	4	480
	Market and Transport	Rs	200	8	1600
	Sub total				9290
	Total cost = (A+B)				**14453**
C	Total Yield	kg		2,600	
	Price	Rs/kg		12	
	Gross Income	Rs			31,200
	Net Income (Gross Income-Costs)	Rs			16,747

Source: JICA Survey Team

Table A-10.1.11 Financial Crop Budget for Muskmelon Cultivation without MDI

	Particulars/Cost	Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	kg	555	4	2,220
	Cocopit	kg	22	5	110
	Compost/ Vermicompost	kg	8	10	80
	FYM	Trolly	1,500	1	1,500
	Agri- lime	kg	4	20	80
	kananj Cake	kg	15	10	150
	Urea	kg	0	0	0
	SSP	kg	10	15	150
	MOP	kg	18	15	270
	Borex	kg	0	0	0
	Micronutrients	kg	2	130	260
	Energy	wh	3	27	81
	Sub total				4,901
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	4	600
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	20	2,400
	Irrigation	hrs	25	20	500
	Pestcide,Fungicide	Rs	150	5	750
	Fertigation by Drip	Rs	2,000	1	2,000
	Harvesting	Day	120	6	720
	Grading/ Packing	Day	120	4	480
	Market and Transport	Rs	300	4	1,200
	Sub total				9,290
	Total cost = (A+B)				14,191
C	Total Yield	kg		1,319	
	Price	Rs/kg		18	
	Gross Income	Rs			23,742
	Net Income (Gross Income-Costs)	Rs			9,551

Source: JICA Survey Team

Table A-10.1.12 Financial Crop Budget for Muskmelon Cultivation with MDI

	Particulars/Cost	Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	kg	555	4	2,220
	Cocopit	kg	22	5	110
	Compost/ Vermicompost	kg	8	10	80
	FYM	Trolly	1,500	1	1,500
	Agri- lime	kg	4	20	80
	kananj Cake	kg	15	10	150
	Urea	kg	0	0	0
	SSP	kg	10	15	150
	MOP	kg	18	15	270
	Borex	kg	0	0	0
	Micronutrients	kg	2	130	260
	Energy	wh	3	101	303
	Sub total				5,123
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	4	480
	Irrigation	hrs	25	20	500
	Pestcide,Fungicide	Rs	150	5	750
	Fertigation by Drip	Rs	2,000	1	2,000
	Harvesting	Day	120	6	720
	Grading/ Packing	Day	120	4	480
	Market and Transport	Rs	300	4	1,200
	Sub total				7,220
	Total cost = (A+B)				12,343
C	Total Yield	kg		1,800	
	Price	Rs/kg		18	
	Gross Income	Rs			32,400
	Net Income (Gross Income-Costs)	Rs			20,057

Source: JICA Survey Team

Table A-10.1.13 Financial Crop Budget for Cauliflower Cultivation without MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	gm	300	3	900
	plug Tray	nos	10	60	600
	Cocopit	kg	22	12	264
	Compost/ Vermicompost	kg	8	40	320
	FYM	Trooly	1,500	1	1,500
	Agri- lime	kg	4	25	100
	DAP	kg	22	10	220
	SSP (Basel)	kg	10	10	100
	MOP (Basel)	kg	18	10	180
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	1	130	130
	Energy	wh	3	27	81
	Sub total				4,395
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	4	600
	Planting/ Sowing	Day	120	2	240
	F.Application at hoing time	RS	400	1	400
	Weeding and Hoeing	Day	120	20	2,400
	Irrigation	hrs	25	30	750
	Pestcide,Fungicide	Rs	150	5	750
	Harvesting	Day	120	4	480
	Grading/ Packing	Day	120	2	240
	Market and Transport	Rs	100	6	600
	Sub total				6,860
	Total cost = (A+B)				11,255
C	Total Yield	kg		3,957	
	Price	Rs/kg		5	
	Gross Income	Rs			19,785
	Net Income (Gross Income-Costs)	Rs			8,530

Source: JICA Survey Team

Table A-10.1.14 Financial Crop Budget for Cauliflower Cultivation with MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	gm	300	3	900
	plug Tray	nos	10	60	
	Cocopit	kg	22	12	264
	Compost/ Vermicompost	kg	8	40	320
	FYM	Trolly	1,500	1	1,500
	Agri- lime	kg	4	25	100
	DAP	kg	22	10	220
	SSP (Basel)	kg	10	15	150
	MOP (Basel)	kg	18	20	360
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	2	130	260
	Energy	wh	3	101	303
	Sub total				4,377
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	3	360
	Weeding and Hoeing	Day	120	4	480
	Irrigation	hrs	25	30	750
	Pestcide,Fungicide	Rs	140	5	700
	Fertigation by Drip	Rs	2,200	1	2,200
	Harvesting	Day	120	5	600
	Grading/ Packing	Day	120	5	600
	Market and Transport	Rs	400	5	2,000
	Sub total				8,540
	Total cost = (A+B)				12,917
C	Total Yield	kg		5,500	
	Price	Rs/kg		5	
	Gross Income	Rs			27,500
	Net Income (Gross Income-Costs)	Rs			14,583

Source: JICA Survey Team

Table A-10.1.15 Financial Crop Budget for French Bean Cultivation without MDI

	Particulars/Cost	Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	kg	610	3	1,830
	FYM	Trolly	1,500	1	1,500
	DAP	kg	22	8	176
	MOP (Basel)	kg	18	15	270
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	1	130	130
	Energy	wh	3	22	67
	Sub total				3,973
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	10	1,200
	Topdrasing fertlizer	Rs	200	1	200
	Irrigation	hrs	25	20	500
	Pestcide,Fungicide	Rs	140	5	700
	Picking	Day	120	4	480
	Grading packing	day	120	2	240
	Market and Transport	Rs	100	4	400
	Sub total				4,810
	Total cost = (A+B)				8,783
C	Total Yield	kg		1,624	
	Price	Rs/kg		10	
	Gross Income	Rs			16,240
	Net Income (Gross Income-Costs)	Rs			7,457

Source: JICA Survey Team

Table A-10.1.16 Financial Crop Budget for French Bean Cultivation with MDI

	Particulars/Cost	Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	kg	610	2	1,220
	FYM	Trolly	1,500	1	1,500
	Agri- lime	kg	4	25	100
	SSP (Basel)	kg	10	15	150
	MOP (Basel)	kg	18	15	270
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	1	130	130
	Energy	wh	3	78	234
	Sub total				3,604
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	3	360
	Weeding and Hoeing	Day	120	4	480
	Irrigation	hrs	25	25	625
	Pestcide,Fungicide	Rs	140	5	700
	Fertigation by Drip	Rs	1,200	1	1,200
	Harvesting	Day	120	8	960
	Grading/ Packing	Day	120	5	600
	Market and Transport	Rs	400	6	2,400
	Sub total				8,175
	Total cost = (A+B)				11,779
C	Total Yield	kg		2,500	
	Price	Rs/kg		10	
	Gross Income	Rs			25,000
	Net Income (Gross Income-Costs)	Rs			13,221

Source: JICA Survey Team

Table A-10.1.17 Financial Crop Budget for Potato Cultivation without MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	kg	18	250	4,500
	Compost/ Vermicompost	trolly	1,500	1	1,500
	Phorate	kg	75	2	150
	Agri- lime	kg	4	25	100
	DAP	kg	22	15	330
	SSP (Basel)	kg	10	10	100
	MOP (Basel)	kg	18	20	360
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	2	130	260
	Energy	wh	3	34	101
	Sub total				7,401
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	3	360
	Weeding and Hoeing	Day	120	4	480
	Irrigation	hrs	25	30	750
	Pestcide,Fungicide	Rs	140	4	560
	Top dreasing				0
	Urea	kg	10	8	80
	MOP	kg	18	5	90
	Harvesting	Day	120	5	600
	Grading/ Packing	Day	120	4	480
	Market and Transport	Rs	400	1	400
	Sub total				4,650
	Total cost = (A+B)				12,051
C	Total Yield	kg		2,110	
	Price	Rs/kg		12	
	Gross Income	Rs			25,320
	Net Income (Gross Income-Costs)	Rs			13,269

Source: JICA Survey Team

Table A-10.1.18 Financial Crop Budget for Potato Cultivation with MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	kg	18	200	3,600
	Compost/ Vermicompost	trolly	1,500	1	1,500
	Phorate	kg	75	2	150
	Agri- lime	kg	4	25	100
	DAP	kg	22	15	330
	SSP (Basel)	kg	10	10	100
	MOP (Basel)	kg	18	20	360
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	2	130	260
	Energy	wh	3	123	369
	Sub total				6,769
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	3	360
	Weeding	Day	120	3	360
	Irrigation	hrs	25	25	625
	Fertigation	Rs	1,200	1	1,200
	Pestcide,Fungicide	Rs	140	4	560
	Harvesting	Day	120	5	600
	Grading/ Packing	Day	120	5	600
	Market and Transport	Rs	600	1	600
	Sub total				4,650
	Total cost = (A+B)				11,419
C	Total Yield	kg		2,800	
	Price	Rs/kg		12	
	Gross Income	Rs			33,600
	Net Income (Gross Income-Costs)	Rs			22,181

Source: JICA Survey Team

Table A-10.1.19 Financial Crop Budget for Brinjal Cultivation without MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	gm	300	2	600
	Nursery cost	Rs	400	1	400
	FYM	trolly	1,500	1	1,500
	Karanj Cake	kg	15	25	375
	Agri- lime	kg	4	25	100
	DAP	kg	22	10	220
	MOP (Basel)	kg	18	25	450
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	2	130	260
	Energy	wh	3	38	114
	Sub total				4,019
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	3	450
	Planting/ Sowing	Day	120	2	240
	Weeding and Hoeing	Day	120	20	2,400
	Irrigation	hrs	25	40	1,000
	Pestcide,Fungicide	Rs	300	10	3,000
	Harvesting	Day	120	40	4,800
	Grading/ Packing	Day	120	10	1,200
	Market and Transport	Rs	100	10	1,000
	Sub total				14,490
	Total cost = (A+B)				18,509
C	Total Yield	kg		5,332	
	Price	Rs/kg		8	
	Gross Income	Rs			42,656
	Net Income (Gross Income-Costs)	Rs			24,147

Source: JICA Survey Team

Table A-10.1.20 Financial Crop Budget for Brinjal Cultivation with MDI

Particulars/Cost		Unit	Price	Quantity	Value
			Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	gm	150	2	300
	Nursery cost	Rs	400	1	400
	FYM	Trolly	1,500	1	1,500
	Karanj Cake	kg	15	25	375
	Agri- lime	kg	4	25	100
	DAP	kg	22	15	330
	MOP (Basel)	kg	18	20	360
	Borex	kg	0	0	0
	Micronutrients(Basel)	kg	2	130	260
	Energy	wh	3	134	402
	Sub total				4,027
B	Labour cost				
	Land prepration	hrs	800	1	400
	Bed making	day	150	3	450
	Planting	Day	120	2	240
	Weeding and Hoeing	Day	120	3	360
	Fertigation by drip	Rs	1,500	1	1,500
	Irrigation	hrs	25	35	875
	Pestcide,Fungicide	Rs	200	10	2,000
	Harvesting	Day	120	15	1,800
	Grading/ Packing	Day	120	10	1,200
	Market and Transport	Rs	100	12	1,200
	Sub total				10,025
	Total cost = (A+B)				14,052
C	Total Yield	kg		5,750	
	Price	Rs/kg		8	
	Gross Income	Rs			46,000
	Net Income (Gross Income-Costs)	Rs			31,948

Source: JICA Survey Team

Table A-10.1.21 Financial Crop Budget for Fruit Cultivation With MDI Condition on Edges of an Area of 1000m^2

Particulars/year			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Guava																						
	a	Plants/1000m^2 (Only on edges)[1)]	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	b	Yield /Plant/Kg	0	4	4	10	15	20	20	0	15	15	20	20	20	20	20	0	15	20	20	20
	c	Total Production	0	200	200	500	750	1,000	1,000	0	750	750	1,000	1,000	1,000	1,000	1,000	0	750	1,000	1,000	1,000
	d	Price/Kg	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	e	Gross Income	0	2,000	2,000	5,000	7,500	10,000	10,000	0	7,500	7,500	10,000	10,000	10,000	10,000	10,000	0	7,500	10,000	10,000	10,000
	f	Production Cost Lump Sum[2)]	5,000	0	0	0	0	0	0	1,250	0	0	0	0	0	0	0	1,250	0	0	0	0
	g	Net Income	-5,000	2,000	2,000	5,000	7,500	10,000	10,000	-1,250	7,500	7,500	10,000	10,000	10,000	10,000	10,000	-1,250	7,500	10,000	10,000	10,000
Papaya																						
	a	Plants/1000m^2 ((Only on edges)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	c	Yield /Plant/Kg	25	20	25	20	25	20	25	20	40	20	40	20	40	20	20	20	20	20	20	20
	d	Total Production	1,250	1,000	1,250	1,000	1,250	1,000	1,250	1,000	2,000	1,000	2,000	1,000	2,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	e	Price/Kg	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	f	Gross Income	12,500	10,000	12,500	10,000	12,500	10,000	12,500	10,000	20,000	10,000	20,000	10,000	20,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
	b	Production Cost Lump Sum	5,000			5,000			5,000			5,000			5,000			5,000			5,000	
	g	Net Income	7,500	10,000	12,500	5,000	12,500	10,000	7,500	10,000	20,000	5,000	20,000	10,000	15,000	10,000	10,000	5,000	10,000	10,000	5,000	10,000
Banana																						
	a	Plants/1000m^2 (Only on edges)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	c	Yield /Plant/Kg	15	15	15	15	15	15	15	10	10	10	10	10	10	10	10	10	10	10	10	10
	d	Total Production	750	750	750	750	750	750	750	500	500	500	500	500	500	500	500	500	500	500	500	500
	e	Price/Kg	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	f	Gross Income	7,500	7,500	7,500	7,500	7,500	7,500	7,500	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
	b	Production Cost Lump Sum	5,000			5,000			5,000			5,000			5,000			5,000			5,000	
	g	Net Income	2,500	7,500	7,500	2,500	7,500	7,500	2,500	5,000	5,000	0	5,000	5,000	0	5,000	5,000	0	0	5,000	0	5,000
Lemon																						
	a	Plants/1000m^2 (Only on edges)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	c	Yield /Plant/Kg	0	0	3	5	10	12	15	15	20	20	20	20	20	20	20	20	20	20	20	20
	d	Total Production	0	0	150	250	500	600	750	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	e	Price/Kg	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	f	Gross Income	0	0	1,200	2,000	4,000	4,800	6,000	6,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000
	b	Production Cost Lump Sum	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	g	Net Income	-5,000	0	1,200	2,000	4,000	4,800	6,000	6,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000

Note:

1) Trees are planted on the edges of plots under MDI

2) Production cost for Guavas and Lemon will occur only once at the plantation time and for Papaya and Banana will occur in every 3 years

Source: JICA Survey Team

Attachment 10.2 Economic Crop Budget

Table A-10.2.1 Economic Crop Budget for Pea Cultivation without MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds/ Agro Chemicals						
	Seeds	kg	200.0	0.967	193.4	6.0	1,160.4
	Compost/ Vermicompost	kg	8.0	0.967	7.7	100.0	773.6
	Agri- lime	kg	4.0	0.967	3.9	10.0	38.7
	kananj Cake	kg	0.0	0.967	0.0	0.0	0.0
	Urea	kg	0.0	0.967	0.0	0.0	0.0
	DAP	kg	10.0	0.967	9.7	15.0	145.1
	MOP	kg	18.0	0.967	17.4	10.0	174.1
	Micronutrients	kg	1.0	0.967	1.0	130.0	125.7
	Energy	wh	3.0	0.967	2.9	26.9	78.0
	Stakes						
	Sub total						2,495.5
B	Labour cost						
	Land prepration (Tractor)	hrs.	800.0	0.967	773.6	0.5	386.8
	Bed making	day	150.0	0.584	87.6	2.0	175.2
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	10.0	700.8
	Irrigation	hrs.	25.0	0.584	14.6	20.0	292.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	4.0	350.4
	Harvesting	Day	120.0	0.584	70.1	8.0	560.6
	Grading/ Packing	Day	0.0	0.584	0.0	0.0	0.0
	Market and Transport	Rs	80.0	0.967	77.4	5.0	386.8
	Sub total						2,882.3
	Total cost = (A+B)						5,377.9
C	Total Yield	kg				700.0	
	Price	Rs/kg	12.0	0.967		11.6	
	Gross Income	Rs					8,123
	Net Income (Gross Income-Costs)	Rs					2,745

Source: JICA Survey Team

Table A-10.2.2 Economic Crop Budget for Pea Cultivation with MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	kg	200.0	0.967	193.4	3.0	580.20
	Compost/ Vermicompost	kg	8.0	0.967	7.7	50.0	386.80
	Agri- lime	kg	4.0	0.967	3.9	10.0	38.68
	Urea	kg	0.0	0.967	0.0	0.0	0.00
	SSP	kg	10.0	0.967	9.7	15.0	145.05
	MOP	kg	18.0	0.967	17.4	5.0	87.03
	Borex	kg	0.0	0.967	0.0	0.0	0.00
	Micronutrients	kg	1.0	0.967	1.0	130.0	125.71
	Stakes						0.00
	Energy	wh	3.0	0.967	2.9	101.0	293.00
	Sub total						1,656.47
B	Labour cost						
	Land prepration (Tractor)	hrs.	600.0	0.967	580.2	0.5	290.10
	Bed making	day	150.0	0.584	87.6	2.0	175.20
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.16
	Weeding and Hoeing	Day	120.0	0.584	70.1	4.0	280.32
	Irrigation	hrs.	25.0	0.584	14.6	15.0	219.00
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	3.0	262.80
	Fertigation by Drip	Rs	800.0	0.584	467.2	1.0	467.20
	Harvesting	Day	120.0	0.584	70.1	8.0	560.64
	Grading/ Packing	Day	0.0	0.000	0.0	0.0	0.00
	Market and Transport	Rs	80.0	0.967	77.4	5.0	386.80
	Sub total						2,782.22
	Total cost = (A+B)						4,438.69
C	Total Yield	kg				800.0	
	Price	Rs/kg	12.0	0.967		11.6	
	Gross Income	Rs					9,283
	Net Income (Gross Income-Costs)	Rs					4,845

Source: JICA Survey Team

Attachment 10.2

Table A-10.2.3 Economic Crop Budget for Tomato Cultivation without MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	gm	300.0	0.967	290.1	1.0	290.1
	Nursery cost	no	500.0	0.967	483.5	1.0	483.5
	FYM	Trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	DAP	kg	22.0	0.967	21.3	10.0	212.7
	MOP (Basel)	kg	18.0	0.967	17.4	15.0	261.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	1.0	0.967	1.0	130.0	125.7
	Energy	wh	3.0	0.967	2.9	38.0	110.2
	Sub total						3,030.6
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	1.0	70.1
	Weeding and Hoeing	Day	120.0	0.584	70.1	4.0	280.3
	F.Application at howing time		400.0	0.584	233.6	1.0	233.6
	Irrigation	hrs	25.0	0.584	14.6	40.0	584.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	6.0	525.6
	Harvesting	Day	120.0	0.584	70.1	8.0	560.6
	Grading/ Packing	Day	120.0	0.584	70.1	4.0	280.3
	Market and Transport	Rs	80.0	0.967	77.4	6.0	464.2
	Sub total						3,495.1
	Total cost = (A+B)						6,525.7
C	Total Yield	kg				2,500.0	
	Price	Rs/kg	6.0	0.967		5.8	
	Gross Income	Rs					14,505
	Net Income (Gross Income-Costs)	Rs					7,979

Source: JICA Survey Team

Table A-10.2.4 Economic Crop Budget for Tomato Cultivation with MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	gm	300	0.967	290.1	2.0	580.2
	Cocopit	kg	22	0.967	21.3	5.0	106.4
	Compost/ Vermicompost	kg	8	0.967	7.7	25.0	193.4
	FYM	Trolly	1,500	0.967	1,450.5	1.0	1,450.5
	Agri- lime	kg	4	0.967	3.9	25.0	96.7
	kananj Cake	kg	15	0.967	14.5	25.0	362.6
	DAP	kg	22	0.967	21.3	10.0	212.7
	SSP (Basel)	kg	10	0.967	9.7	25.0	241.8
	MOP (Basel)	kg	18	0.967	17.4	15.0	261.1
	Borex	kg	0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	2	0.967	1.9	130.0	251.4
	Stakes Bambu, Wire		2,500	0.967	2,417.5	1.0	2,417.5
	Energy	wh	3	0.967	2.9	134.0	388.7
	Sub total						6,563.0
B	Labour cost						
	Land prepration	hrs	800	0.584	467.2	0.5	233.6
	Bed making	day	150	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120	0.584	70.1	3.0	210.2
	Weeding and Hoeing	Day	120	0.584	70.1	20.0	1,401.6
	Irrigation	hrs	25	0.584	14.6	40.0	584.0
	Pestcide,Fungicide	Rs	150	0.584	87.6	8.0	700.8
	Fertigation by Drip	Rs	2,600	0.584	1,518.4	1.0	1,518.4
	Harvesting	Day	120	0.584	70.1	10.0	700.8
	Grading/ Packing	Day	120	0.584	70.1	10.0	700.8
	Market and Transport	Rs	400	0.967	386.8	6.0	2,320.8
	Sub total						8,633.8
	Total cost = (A+B)						15,196.9
C	Total Yield	kg				6,000.0	
	Price	Rs/kg	6.0	0.967		5.8	
	Gross Income	Rs					34,812
	Net Income (Gross Income-Costs)	Rs					19,615

Source: JICA Survey Team

Table A-10.2.5 Economic Crop Budget for Chili Cultivation without MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	gm	300.0	0.967	290.1	3.0	870.3
	Nursery cost	Rs	400.0	0.967	386.8	1.0	386.8
	FYM	Trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	DAP	kg	22.0	0.967	21.3	10.0	212.7
	MOP (Basel)	kg	18.0	0.967	17.4	15.0	261.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	1.0	0.967	1.0	130.0	125.7
	Energy	wh	3.0	0.967	2.9	47.0	136.3
	Sub total						3,540.2
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	F.Application at howing time	Rs	500.0	0.584	292.0	1.0	292.0
	Planting/ Sowing	Day	120.0	0.584	70.1	20.0	1,401.6
	Weeding and Hoeing	Day	120.0	0.584	70.1	4.0	280.3
	Irrigation	hrs	25.0	0.584	14.6	40.0	584.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	8.0	700.8
	Harvesting	Day	120.0	0.584	70.1	40.0	2,803.2
	Grading/ Packing	Day	120.0	0.584	70.1	10.0	700.8
	Market and Transport	Rs	100.0	0.967	96.7	10.0	967.0
	Sub total						8,226.1
	Total cost = (A+B)						11,766.3
C	Total Yield	kg				2,499.0	
	Price	Rs/kg	20.0	0.967		19.3	
	Gross Income	Rs					48,331
	Net Income (Gross Income-Costs)	Rs					36,564

Source: JICA Survey Team

Table A-10.2.6 Economic Crop Budget for Chili Cultivation with MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	gm	300.0	0.967	290.1	2.0	580.2
	Cocopit	kg	22.0	0.967	21.3	5.0	106.4
	Compost/ Vermicompost	kg	8.0	0.967	7.7	25.0	193.4
	FYM	Trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	kananj Cake	kg	15.0	0.967	14.5	25.0	362.6
	DAP	kg	22.0	0.967	21.3	10.0	212.7
	SSP (Basel)	kg	10.0	0.967	9.7	25.0	241.8
	MOP (Basel)	kg	18.0	0.967	17.4	15.0	261.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	2.0	0.967	1.9	130.0	251.4
	Energy	wh	3.0	0.967	2.9	168.0	487.4
	Sub total						4,244.2
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	3.0	210.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	4.0	280.3
	Irrigation	hrs	25.0	0.584	14.6	40.0	584.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	8.0	700.8
	Fertigation by Drip	Rs	2,500.0	0.584	1,460.0	1.0	1,460.0
	Harvesting	Day	120.0	0.584	70.1	120.0	8,409.6
	Grading/ Packing	Day	120.0	0.584	70.1	10.0	700.8
	Market and Transport	Rs	400.0	0.967	386.8	10.0	3,868.0
	Sub total						16,710.2
	Total cost = (A+B)						20,954.3
C	Total Yield	kg				3,500.0	
	Price	Rs/kg	20.0	0.967		19.3	
	Gross Income	Rs					67,690
	Net Income (Gross Income-Costs)	Rs					46,736

Source: JICA Survey Team

Table A-10.2.7 Economic Crop Budget for Cucumber Cultivation without MDI

	Particulars/Cost	Unit	Financial Price Rs/Unit	CF	Economic Price Rs/Unit	Quantity Unit/1000m^2	Value Rs/1000m^2
A	Seeds	kg	150.0	0.967	145.1	3.0	435.2
	FYM	kg	1,500.0	0.967	1,450.5	1.0	1,450.5
	DAP	KG	22.0	0.967	21.3	10.0	212.7
	MOP	kg	18.0	0.967	17.4	15.0	261.1
	Phorate	kg	75.0	0.967	72.5	1.0	72.5
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients	kg	1.0	0.967	1.0	130.0	125.7
	Energy	wh	3.0	0.967	2.9	33.6	97.5
	Sub total						2,655.2
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	10.0	700.8
	Irrigation	hrs	25.0	0.584	14.6	50.0	730.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	5.0	438.0
	Harvesting	Day	120.0	0.584	70.1	8.0	560.6
	Grading/ Packing	Day	120.0	0.584	70.1	2.0	140.2
	Market and Transport	Rs	150.0	0.967	145.1	8.0	1,160.4
	Sub total						4,366.6
	Total cost = (A+B)						7,021.7
C	Total Yield	kg				4,520.0	
	Price	Rs/kg	7.0	0.967		6.8	
	Gross Income	Rs					30,596
	Net Income (Gross Income-Costs)	Rs					23,574

Source: JICA Survey Team

Table A-10.2.8 Economic Crop Budget for Cucumber Cultivation with MDI

	Particulars/Cost	Unit	Financial Price Rs/Unit	CF	Economic Price Rs/Unit	Quantity Unit/1000m^2	Value Rs/1000m^2
A	Seeds	kg	150.0	0.967	145.1	6.0	870.3
	Cocopit	kg	22.0	0.967	21.3	5.0	106.4
	Compost/ Vermicompost	kg	8.0	0.967	7.7	25.0	193.4
	kananj Cake	kg	15.0	0.967	14.5	10.0	145.1
	Urea	kg	0.0	0.967	0.0	0.0	0.0
	DAP	KG	22.0	0.967	21.3	10.0	212.7
	SSP	kg	10.0	0.967	9.7	15.0	145.1
	MOP	kg	18.0	0.967	17.4	20.0	348.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients	kg	2.0	0.967	1.9	130.0	251.4
	Stakes (Bambu,Wire)		2,500.0	0.967	2,417.5	1.0	2,417.5
	Energy	wh	3.0	0.967	2.9	123.0	356.8
	Sub total						5,046.8
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	5.0	350.4
	Irrigation	hrs	25.0	0.584	14.6	25.0	365.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	5.0	438.0
	Fertigation by Drip	Rs	2,600.0	0.584	1,518.4	1.0	1,518.4
	Harvesting	Day	120.0	0.584	70.1	2.0	140.2
	Grading/ Packing	Day	120.0	0.584	70.1	8.0	560.6
	Market and Transport	Rs	300.0	0.967	290.1	6.0	1,740.6
	Sub total						5,749.8
	Total cost = (A+B)						10,796.5
C	Total Yield	kg				6,000.0	
	Price	Rs/kg	7.0	0.967		6.8	
	Gross Income	Rs					40,614
	Net Income (Gross Income-Costs)	Rs					29,817

Source: JICA Survey Team

Table A-10.2.9 Economic Crop Budget for Bitter Gourd Cultivation without MDI

Particulars/Cost		Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	gram	70.0	0.967	67.7	29.0	1,963.0
	Compost/ Vermicompost	kg	1,500.0	0.967	1,450.5	1.0	1,450.5
	Urea	kg	10.0	0.967	9.7	10.0	96.7
	DAP	kg	22.0	0.967	21.3	10.0	212.7
	MOP	kg	18.0	0.967	17.4	15.0	261.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients	kg	1.0	0.967	1.0	130.0	125.7
	Stakes (Bambu,Wire)		2,000.0	0.967	1,934.0	1.0	1,934.0
	Energy	wh	3.0	0.967	2.9	38.0	110.2
	Sub total						6,154.0
B	Labour cost						
	Top drasing						
	DAP	kg	22.0	0.584	12.8	8.0	102.8
	Urea	kg	10.0	0.584	5.8	5.0	29.2
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	20.0	1,401.6
	Irrigation	hrs	25.0	0.584	14.6	30.0	438.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	7.0	613.2
	Harvesting	Day	120.0	0.584	70.1	12.0	841.0
	Grading/ Packing	Day	120.0	0.584	70.1	4.0	280.3
	Market and Transport	Rs	100.0	0.967	96.7	12.0	1,160.4
	Sub total						5,503.0
	Total cost = (A+B)						11,657.0
C	Total Yield	kg				2,250.0	
	Price	Rs/kg	12.0	0.967		11.6	
	Gross Income	Rs					26,109
	Net Income (Gross Income-Costs)	Rs					14,452

Source: JICA Survey Team

Table A-10.2.10 Economic Crop Budget for Bitter Gourd Cultivation with MDI

Particulars/Cost		Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	kg	70.0	0.967	67.7	20.0	1,353.8
	Plug tray	Nos	10.0	0.967	9.7	12.0	116.0
	Cocopit	kg	22.0	0.967	21.3	3.0	63.8
	Compost/ Vermicompost	kg	8.0	0.967	7.7	10.0	77.4
	kananj Cake	kg	15.0	0.967	14.5	15.0	217.6
	Urea	kg	0.0	0.967	0.0	0.0	0.0
	SSP	kg	10.0	0.967	9.7	25.0	241.8
	MOP	kg	18.0	0.967	17.4	20.0	348.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients	kg	2.0	0.967	1.9	130.0	251.4
	Stakes (Bambu,Wire)		2,000.0	0.967	1,934.0	1.0	1,934.0
	Energy	wh	3.0	0.967	2.9	134.0	388.7
	Sub total						4,992.6
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	4.0	280.3
	Irrigation	hrs	25.0	0.584	14.6	30.0	438.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	7.0	613.2
	Fertigation by Drip	Rs	2,400.0	0.584	1,401.6	1.0	1,401.6
	Harvesting	Day	120.0	0.584	70.1	12.0	841.0
	Grading/ Packing	Day	120.0	0.584	70.1	4.0	280.3
	Market and Transport	Rs	200.0	0.967	193.4	8.0	1,547.2
	Sub total						6,038.2
	Total cost = (A+B)						11,030.8
C	Total Yield	kg				2,600.0	
	Price	Rs/kg	12.0	0.967		11.6	
	Gross Income	Rs					30,170
	Net Income (Gross Income-Costs)	Rs					19,140

Source: JICA Survey Team

Table A-10.2.11 Economic Crop Budget for Muskmelon Cultivation without MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	kg	555.0	0.967	536.7	4.0	2,146.7
	Cocopit	kg	22.0	0.967	21.3	5.0	106.4
	Compost/ Vermicompost	kg	8.0	0.967	7.7	10.0	77.4
	FYM	Trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Agri- lime	kg	4.0	0.967	3.9	20.0	77.4
	kananj Cake	kg	15.0	0.967	14.5	10.0	145.1
	Urea	kg	0.0	0.967	0.0	0.0	0.0
	SSP	kg	10.0	0.967	9.7	15.0	145.1
	MOP	kg	18.0	0.967	17.4	15.0	261.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients	kg	2.0	0.967	1.9	130.0	251.4
	Energy	wh	3.0	0.967	2.9	26.9	78.0
	Sub total						4,739.0
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	4.0	350.4
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	20.0	1,401.6
	Irrigation	hrs	25.0	0.584	14.6	20.0	292.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	5.0	438.0
	Fertigation by Drip	Rs	2,000.0	0.584	1,168.0	1.0	1,168.0
	Harvesting	Day	120.0	0.584	70.1	6.0	420.5
	Grading/ Packing	Day	120.0	0.584	70.1	4.0	280.3
	Market and Transport	Rs	300.0	0.967	290.1	4.0	1,160.4
	Sub total						5,885.0
	Total cost = (A+B)						10,623.9
C	Total Yield	kg				1,319.0	
	Price	Rs/kg	18.0	0.967		17.4	
	Gross Income	Rs					22,959
	Net Income (Gross Income-Costs)	Rs					12,335

Source: JICA Survey Team

Table A-10.2.12 Economic Crop Budget for Muskmelon Cultivation with MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	kg	555.0	0.967	536.7	4.0	2,146.7
	Cocopit	kg	22.0	0.967	21.3	5.0	106.4
	Compost/ Vermicompost	kg	8.0	0.967	7.7	10.0	77.4
	FYM	Trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Agri- lime	kg	4.0	0.967	3.9	20.0	77.4
	kananj Cake	kg	15.0	0.967	14.5	10.0	145.1
	Urea	kg	0.0	0.967	0.0	0.0	0.0
	SSP	kg	10.0	0.967	9.7	15.0	145.1
	MOP	kg	18.0	0.967	17.4	15.0	261.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients	kg	2.0	0.967	1.9	130.0	251.4
	Energy	wh	3.0	0.967	2.9	101.0	293.0
	Sub total						4,953.9
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	4.0	280.3
	Irrigation	hrs	25.0	0.584	14.6	20.0	292.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	5.0	438.0
	Fertigation by Drip	Rs	2,000.0	0.584	1,168.0	1.0	1,168.0
	Harvesting	Day	120.0	0.584	70.1	6.0	420.5
	Grading/ Packing	Day	120.0	0.584	70.1	4.0	280.3
	Market and Transport	Rs	300.0	0.967	290.1	4.0	1,160.4
	Sub total						4,676.1
	Total cost = (A+B)						9,630.0
C	Total Yield	kg				1,800.0	
	Price	Rs/kg	18.0	0.967		17.4	
	Gross Income	Rs					31,331
	Net Income (Gross Income-Costs)	Rs					21,701

Source: JICA Survey Team

Table A-10.2.13 Economic Crop Budget for Cauliflower Cultivation without MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	gm	300.0	0.967	290.1	3.0	870.3
	plug Tray	nos	10.0	0.967	9.7	60.0	580.2
	Cocopit	kg	22.0	0.967	21.3	12.0	255.3
	Compost/ Vermicompost	kg	8.0	0.967	7.7	40.0	309.4
	FYM	Trooly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	DAP	kg	22.0	0.967	21.3	10.0	212.7
	SSP (Basel)	kg	10.0	0.967	9.7	10.0	96.7
	MOP (Basel)	kg	18.0	0.967	17.4	10.0	174.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	1.0	0.967	1.0	130.0	125.7
	Energy	wh	3.0	0.967	2.9	26.9	78.0
	Sub total						4,249.7
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	4.0	350.4
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	F.Application at hoing time	RS	400.0	0.584	233.6	1.0	233.6
	Weeding and Hoeing	Day	120.0	0.584	70.1	20.0	1,401.6
	Irrigation	hrs	25.0	0.584	14.6	30.0	438.0
	Pestcide,Fungicide	Rs	150.0	0.584	87.6	5.0	438.0
	Harvesting	Day	120.0	0.584	70.1	4.0	280.3
	Grading/ Packing	Day	120.0	0.584	70.1	2.0	140.2
	Market and Transport	Rs	100.0	0.967	96.7	6.0	580.2
	Sub total						4,236.0
	Total cost = (A+B)						8,485.7
C	Total Yield	kg				3,957.0	
	Price	Rs/kg	5.0	0.967		4.8	
	Gross Income	Rs					19,132
	Net Income (Gross Income-Costs)	Rs					10,646

Source: JICA Survey Team

Table A-10.2.14 Economic Crop Budget for Cauliflower Cultivation with MDI

	Particulars/Cost	Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m²	Rs/1000m²
A	Seeds	gm	300.0	0.967	290.1	3.0	870.3
	plug Tray	nos	10.0	0.967	9.7	60.0	580.2
	Cocopit	kg	22.0	0.967	21.3	12.0	255.3
	Compost/ Vermicompost	kg	8.0	0.967	7.7	40.0	309.4
	FYM	Trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	DAP	kg	22.0	0.967	21.3	10.0	212.7
	SSP (Basel)	kg	10.0	0.967	9.7	15.0	145.1
	MOP (Basel)	kg	18.0	0.967	17.4	20.0	348.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	2.0	0.967	1.9	130.0	251.4
	Energy	wh	3.0	0.967	2.9	101.0	293.0
	Sub total						4,812.8
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	3.0	210.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	4.0	280.3
	Irrigation	hrs	25.0	0.584	14.6	30.0	438.0
	Pestcide,Fungicide	Rs	140.0	0.584	81.8	5.0	408.8
	Fertigation by Drip	Rs	2,200.0	0.584	1,284.8	1.0	1,284.8
	Harvesting	Day	120.0	0.584	70.1	5.0	350.4
	Grading/ Packing	Day	120.0	0.584	70.1	5.0	350.4
	Market and Transport	Rs	400.0	0.967	386.8	5.0	1,934.0
	Sub total						5,753.4
	Total cost = (A+B)						10,566.1
C	Total Yield	kg				5,500.0	
	Price	Rs/kg	5.0	0.967		4.8	
	Gross Income	Rs					26,593
	Net Income (Gross Income-Costs)	Rs					16,026

Source: JICA Survey Team

Table A-10.2.15 Economic Crop Budget for French Bean Cultivation without MDI

Particulars/Cost		Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	kg	610.0	0.967	589.9	3.0	1,769.6
	FYM	Trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	DAP	kg	22.0	0.967	21.3	8.0	170.2
	MOP (Basel)	kg	18.0	0.967	17.4	15.0	261.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	1.0	0.967	1.0	130.0	125.7
	Energy	wh	3.0	0.967	2.9	22.4	65.0
	Sub total						3,842.1
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	10.0	700.8
	Topdrasing fertlizer	Rs	200.0	0.584	116.8	1.0	116.8
	Irrigation	hrs	25.0	0.584	14.6	20.0	292.0
	Pestcide,Fungicide	Rs	140.0	0.584	81.8	5.0	408.8
	Picking	Day	120.0	0.584	70.1	4.0	280.3
	Grading packing	day	120.0	0.584	70.1	2.0	140.2
	Market and Transport	Rs	100.0	0.967	96.7	4.0	386.8
	Sub total						2,962.2
	Total cost = (A+B)						6,804.3
C	Total Yield	kg				1,624.0	
	Price	Rs/kg	10.0	0.967		9.7	
	Gross Income	Rs					15,704
	Net Income (Gross Income-Costs)	Rs					8,900

Source: JICA Survey Team

Table A-10.2.16 Economic Crop Budget for French Bean Cultivation with MDI

Particulars/Cost		Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	kg	610.0	0.967	589.9	2.0	1,179.7
	FYM	Trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	SSP (Basel)	kg	10.0	0.967	9.7	15.0	145.1
	MOP (Basel)	kg	18.0	0.967	17.4	15.0	261.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	1.0	0.967	1.0	130.0	125.7
	Energy	wh	3.0	0.967	2.9	78.0	226.3
	Sub total						3,485.1
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	3.0	210.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	4.0	280.3
	Irrigation	hrs	25.0	0.584	14.6	25.0	365.0
	Pestcide,Fungicide	Rs	140.0	0.584	81.8	5.0	408.8
	Fertigation by Drip	Rs	1,200.0	0.584	700.8	1.0	700.8
	Harvesting	Day	120.0	0.584	70.1	8.0	560.6
	Grading/ Packing	Day	120.0	0.584	70.1	5.0	350.4
	Market and Transport	Rs	400.0	0.967	386.8	6.0	2,320.8
	Sub total						5,693.4
	Total cost = (A+B)						9,178.5
C	Total Yield	kg				2,500.0	
	Price	Rs/kg	10.0	0.967		9.7	
	Gross Income	Rs					24,175
	Net Income (Gross Income-Costs)	Rs					14,997

Source: JICA Survey Team

Table A-10.2.17 Economic Crop Budget for Potato Cultivation without MDI

Particulars/Cost		Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	kg	18.0	0.967	17.4	250.0	4,351.5
	Compost/ Vermicompost	trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Phorate	kg	75.0	0.967	72.5	2.0	145.1
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	DAP	kg	22.0	0.967	21.3	15.0	319.1
	SSP (Basel)	kg	10.0	0.967	9.7	10.0	96.7
	MOP (Basel)	kg	18.0	0.967	17.4	20.0	348.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	2.0	0.967	1.9	130.0	251.4
	Energy	wh	3.0	0.967	2.9	33.6	97.5
	Sub total						7,156.6
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	3.0	210.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	4.0	280.3
	Irrigation	hrs	25.0	0.584	14.6	30.0	438.0
	Pestcide,Fungicide	Rs	140.0	0.584	81.8	4.0	327.0
	Top dreasing			0.584	0.0		0.0
	Urea	kg	10.0	0.584	5.8	8.0	46.7
	MOP	kg	18.0	0.584	10.5	5.0	52.6
	Harvesting	Day	120.0	0.584	70.1	5.0	350.4
	Grading/ Packing	Day	120.0	0.584	70.1	4.0	280.3
	Market and Transport	Rs	400.0	0.967	386.8	1.0	386.8
	Sub total						2,868.8
	Total cost = (A+B)						10,025.4
C	Total Yield	kg				2,110.0	
	Price	Rs/kg	12.0	0.967		11.6	
	Gross Income	Rs					24,484
	Net Income (Gross Income-Costs)	Rs					14,459

Source: JICA Survey Team

Table A-10.2.18 Economic Crop Budget for Potato Cultivation with MDI

Particulars/Cost		Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	kg	18.0	0.967	17.4	200.0	3,481.2
	Compost/ Vermicompost	trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Phorate	kg	75.0	0.967	72.5	2.0	145.1
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	DAP	kg	22.0	0.967	21.3	15.0	319.1
	SSP (Basel)	kg	10.0	0.967	9.7	10.0	96.7
	MOP (Basel)	kg	18.0	0.967	17.4	20.0	348.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	2.0	0.967	1.9	130.0	251.4
	Energy	wh	3.0	0.967	2.9	123.0	356.8
	Sub total						6,545.6
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	3.0	210.2
	Weeding	Day	120.0	0.584	70.1	3.0	210.2
	Irrigation	hrs	25.0	0.584	14.6	25.0	365.0
	Fertigation	Rs	1,200.0	0.584	700.8	1.0	700.8
	Pestcide,Fungicide	Rs	140.0	0.584	81.8	4.0	327.0
	Harvesting	Day	120.0	0.584	70.1	5.0	350.4
	Grading/ Packing	Day	120.0	0.584	70.1	5.0	350.4
	Market and Transport	Rs	600.0	0.967	580.2	1.0	580.2
	Sub total						3,590.7
	Total cost = (A+B)						10,136.3
C	Total Yield	kg				2,800.0	
	Price	Rs/kg	12.0	0.967		11.6	
	Gross Income	Rs					32,491
	Net Income (Gross Income-Costs)	Rs					22,355

Source: JICA Survey Team

Table A-10.2.19 Economic Crop Budget for Brinjal Cultivation without MDI

Particulars/Cost		Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	gm	300.0	0.967	290.1	2.0	580.2
	Nursery cost	Rs	400.0	0.967	386.8	1.0	386.8
	FYM	trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Karanj Cake	kg	15.0	0.967	14.5	25.0	362.6
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	DAP	kg	22.0	0.967	21.3	10.0	212.7
	MOP (Basel)	kg	18.0	0.967	17.4	25.0	435.2
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	2.0	0.967	1.9	130.0	251.4
	Energy	wh	3.0	0.967	2.9	38.0	110.2
	Sub total						3,886.4
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting/ Sowing	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	20.0	1,401.6
	Irrigation	hrs	25.0	0.584	14.6	40.0	584.0
	Pestcide,Fungicide	Rs	300.0	0.584	175.2	10.0	1,752.0
	Harvesting	Day	120.0	0.584	70.1	40.0	2,803.2
	Grading/ Packing	Day	120.0	0.584	70.1	10.0	700.8
	Market and Transport	Rs	100.0	0.967	96.7	10.0	967.0
	Sub total						8,845.2
	Total cost = (A+B)						12,731.5
C	Total Yield	kg				5,332.0	
	Price	Rs/kg	8.0	0.967		7.7	
	Gross Income	Rs					41,248
	Net Income (Gross Income-Costs)	Rs					28,517

Source: JICA Survey Team

Table A-10.2.20 Economic Crop Budget for Brinjal Cultivation with MDI

Particulars/Cost		Unit	Financial Price	CF	Economic Price	Quantity	Value
			Rs/Unit		Rs/Unit	Unit/1000m^2	Rs/1000m^2
A	Seeds	gm	150.0	0.967	145.1	2.0	290.1
	Nursery cost	Rs	400.0	0.967	386.8	1.0	386.8
	FYM	Trolly	1,500.0	0.967	1,450.5	1.0	1,450.5
	Karanj Cake	kg	15.0	0.967	14.5	25.0	362.6
	Agri- lime	kg	4.0	0.967	3.9	25.0	96.7
	DAP	kg	22.0	0.967	21.3	15.0	319.1
	MOP (Basel)	kg	18.0	0.967	17.4	20.0	348.1
	Borex	kg	0.0	0.967	0.0	0.0	0.0
	Micronutrients(Basel)	kg	2.0	0.967	1.9	130.0	251.4
	Energy	wh	3.0	0.967	2.9	134.0	388.7
	Sub total						3,894.1
B	Labour cost						
	Land prepration	hrs	800.0	0.584	467.2	0.5	233.6
	Bed making	day	150.0	0.584	87.6	3.0	262.8
	Planting	Day	120.0	0.584	70.1	2.0	140.2
	Weeding and Hoeing	Day	120.0	0.584	70.1	3.0	210.2
	Fertigation by drip	Rs	1,500.0	0.584	876.0	1.0	876.0
	Irrigation	hrs	25.0	0.584	14.6	35.0	511.0
	Pestcide,Fungicide	Rs	200.0	0.584	116.8	10.0	1,168.0
	Harvesting	Day	120.0	0.584	70.1	15.0	1,051.2
	Grading/ Packing	Day	120.0	0.584	70.1	10.0	700.8
	Market and Transport	Rs	100.0	0.967	96.7	12.0	1,160.4
	Sub total						6,314.2
	Total cost = (A+B)						10,208.3
C	Total Yield	kg				5,750.0	
	Price	Rs/kg	8.0	0.967		7.7	
	Gross Income	Rs					44,482
	Net Income (Gross Income-Costs)	Rs					34,274

Source: JICA Survey Team

Table A-10.2.21 Economic Crop Budget for Fruit Cultivation With MDI Condition on Edges of an Area of 1000m^2

Particulars/year			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Guava																						
	a	Plants/1000m2 (Only on edges)[1]	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	b	Yield /Plant/Kg	0	4	4	10	15	20	20	0	15	15	20	20	20	20	20	0	15	20	20	20
	c	Total Production	0	200	200	500	750	1,000	1,000	0	750	750	1,000	1,000	1,000	1,000	1,000	0	750	1,000	1,000	1,000
	d	Price/Kg	0	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67
	e	Gross Income	0	1,934	1,934	4,835	7,253	9,670	9,670	0	7,253	7,253	9,670	9,670	9,670	9,670	9,670	0	7,253	9,670	9,670	9,670
	f	Production Cost Lump Sum[2]	4,452	0	0	0	0	0	0	1,209	0	0	0	0	0	0	0	1,209	0	0	0	0
	g	Net Income	-4,452	1,934	1,934	4,835	7,253	9,670	9,670	-1,209	7,253	7,253	9,670	9,670	9,670	9,670	9,670	-1,209	7,253	9,670	9,670	9,670
Papaya																						
	a	Plants/1000m2((Only on edges)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	c	Yield /Plant/Kg	25	20	25	20	25	20	25	20	40	20	40	20	40	20	20	20	20	20	20	20
	d	Total Production	1,250	1,000	1,250	1,000	1,250	1,000	1,250	1,000	2,000	1,000	2,000	1,000	2,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	e	Price/Kg	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67
	f	Gross Income	12,088	9,670	12,088	9,670	12,088	9,670	12,088	9,670	19,340	9,670	19,340	9,670	19,340	9,670	9,670	9,670	9,670	9,670	9,670	9,670
	b	Production Cost Lump Sum	4,452	0	0	4,452	0	0	4,452	4,452	4,452	4,452	4,452	4,452	4,452	4,452	4,452	4,452	4,452	4,452	4,452	4,452
	g	Net Income	7,636	9,670	12,088	5,218	12,088	9,670	7,636	5,218	14,888	5,218	14,888	5,218	14,888	5,218	5,218	5,218	5,218	5,218	5,218	5,218
Banana																						
	a	Plants/1000m2 (Only on edges)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	c	Yield /Plant/Kg	15	15	15	15	15	15	15	10	10	10	10	10	10	10	10	10	10	10	10	10
	d	Total Production	750	750	750	750	750	750	750	500	500	500	500	500	500	500	500	500	500	500	500	500
	e	Price/Kg	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67
	f	Gross Income	7,253	7,253	7,253	7,253	7,253	7,253	7,253	4,835	4,835	4,835	4,835	4,835	4,835	4,835	4,835	4,835	4,835	4,835	4,835	4,835
	b	Production Cost Lump Sum	4,452			4,452			4,452			4,452			4,452			4,452			4,452	
	g	Net Income	2,801	7,253	7,253	2,801	7,253	7,253	2,801	4,835	4,835	383	4,835	4,835	383	4,835	4,835	383	4,835	4,835	383	4,835
Lemon																						
	a	Plants/1000m2 (Only on edges)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	c	Yield /Plant/Kg	0	0	3	5	10	12	15	15	20	20	20	20	20	20	20	20	20	20	20	20
	d	Total Production	0	0	150	250	500	600	750	750	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	e	Price/Kg	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74
	f	Gross Income	0	0	1,161	1,935	3,870	4,644	5,805	5,805	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740
	b	Production Cost Lump Sum	4,452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	g	Net Income	-4,452	0	1,161	1,935	3,870	4,644	5,805	5,805	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740	7,740

Note:

1) Trees are planted on the edges of plots under MDI
2) Production cost for Guavas and Lemon will occur only once at the plantation time and for Papaya and Banana will occur in every 3 years
3) Total Production cost are lumpsum. It is estimated that about 20% is labour cost and 80% is material cost on material cost SCF of 0.967 and for labour cost 0.584 are applied respectively

Source: JICA Survey Team

Attachment 10.3 Economic Cost and Benefit

Table A-10.3.1 Economic Cost and Benefit Stream

EIRR:	**26.54%**	Net Present Value (Rs Million) (at 10% Discount Rate)			B/C Ratio
		Benefit	Cost	B-C	
		6,304	4,557	1,747	1.38

(Unit: Rs Million)

Year in Order	Year	Economic Cost			Economic Benefit	Net Cash Flow
		Initial Investment	Replacement O & M	Total Cost		
1	2015-16	10	0	10	0	-10
2	2016-17	149	0	149	0	-149
3	2017-18	388	0	388	69	-319
4	2018-19	769	47	816	300	-516
5	2019-20	987	190	1,177	670	-507
6	2020-21	1,025	380	1,405	1,109	-296
7	2021-22	120	570	690	1,294	605
8	2022-23		570	570	1,387	817
9	2023-24		570	570	1,387	817
10	2024-25		570	570	1,387	817
11	2025-26		570	570	1,387	817
12	2026-27		570	570	1,387	817
13	2027-28		570	570	1,387	817
14	2028-29		605	605	1,387	782
15	2030-31		570	570	1,387	817
16	2031-32		570	570	1,387	817
17	2032-33		570	570	1,387	817
18	2033-34		570	570	1,387	817
19	2034-35		570	570	1,387	817
20	2035-36		570	570	1,387	817

Source: JICA Survey Team

Table A-10.3.2 Economic Cost and Benefit Stream (Sensitivity Analysis: Cost up by 5%)

EIRR:	**23.83%**	Net Present Value (Rs Million) (at 10% Discount Rate)			B/C Ratio
		Benefit	Cost	B-C	
		6,304	4,785	1,520	1.32

(Unit: Rs Million)

Year in Order	Year	Economic Cost			Economic Benefit	Net Cash Flow
		Initial Investment	Replacement O & M	Total Cost		
1	2015-16	10	0	10	0	-10
2	2016-17	157	0	157	0	-157
3	2017-18	408	0	408	69	-338
4	2018-19	807	50	857	300	-557
5	2019-20	1,036	199	1,236	670	-565
6	2020-21	1,076	399	1,476	1,109	-366
7	2021-22	126	598	724	1,294	570
8	2022-23		598	598	1,387	789
9	2023-24		598	598	1,387	789
10	2024-25		598	598	1,387	789
11	2025-26		598	598	1,387	789
12	2026-27		598	598	1,387	789
13	2027-28		598	598	1,387	789
14	2028-29		636	636	1,387	751
15	2030-31		598	598	1,387	789
16	2031-32		598	598	1,387	789
17	2032-33		598	598	1,387	789
18	2033-34		598	598	1,387	789
19	2034-35		598	598	1,387	789
20	2035-36		598	598	1,387	789

Source: JICA Survey Team

Attachment 10.3

Table A-10.3.3 Economic Cost and Benefit Stream (Sensitivity Analysis: Cost up by 10%)

EIRR:	**21.54%**	Net Present Value (Rs Million) (at 10% Discount Rate)			B/C Ratio
		Benefit	Cost	B-C	
		6,304	5,013	1,292	1.26

(Unit: Rs Million)

Year in Order	Year	Economic Cost			Economic Benefit	Net Cash Flow
		Initial Investment	Replacement O & M	Total Cost		
1	2015-16	11	0	11	0	-11
2	2016-17	164	0	164	0	-164
3	2017-18	427	0	427	69	-358
4	2018-19	846	52	898	300	-597
5	2019-20	1,086	209	1,295	670	-624
6	2020-21	1,128	418	1,546	1,109	-436
7	2021-22	132	627	759	1,294	536
8	2022-23		627	627	1,387	760
9	2023-24		627	627	1,387	760
10	2024-25		627	627	1,387	760
11	2025-26		627	627	1,387	760
12	2026-27		627	627	1,387	760
13	2027-28		627	627	1,387	760
14	2028-29		666	666	1,387	721
15	2030-31		627	627	1,387	760
16	2031-32		627	627	1,387	760
17	2032-33		627	627	1,387	760
18	2033-34		627	627	1,387	760
19	2034-35		627	627	1,387	760
20	2035-36		627	627	1,387	760

Source: JICA Survey Team

Table A-10.3.4 Economic Cost and Benefit Stream (Sensitivity Analysis: Benefit down by 5%)

EIRR:	**23.70%**	Net Present Value (Rs Million) (at 10% Discount Rate)			B/C Ratio
		Benefit	Cost	B-C	
		5,989	4,557	1,432	1.31

(Unit: Rs Million)

Year in Order	Year	Economic Cost			Economic Benefit	Net Cash Flow
		Initial Investment	Replacement O & M	Total Cost		
1	2015-16	10	0	10	0	-10
2	2016-17	149	0	149	0	-149
3	2017-18	388	0	388	66	-322
4	2018-19	769	47	816	285	-531
5	2019-20	987	190	1,177	637	-540
6	2020-21	1025	380	1,405	1,054	-351
7	2021-22	120	570	690	1,230	540
8	2022-23		570	570	1,317	748
9	2023-24		570	570	1,317	748
10	2024-25		570	570	1,317	748
11	2025-26		570	570	1,317	748
12	2026-27		570	570	1,317	748
13	2027-28		570	570	1,317	748
14	2028-29		605	605	1,317	712
15	2030-31		570	570	1,317	748
16	2031-32		570	570	1,317	748
17	2032-33		570	570	1,317	748
18	2033-34		570	570	1,317	748
19	2034-35		570	570	1,317	748
20	2035-36		570	570	1,317	748

Source: JICA Survey Team

Attachment 10.3

Table A-10.3.5 Economic Cost and Benefit Stream (Sensitivity Analysis: Benefit down by 10%)

EIRR:	**21.1%**	Net Present Value (Rs Million) (at 10% Discount Rate)			B/C Ratio
		Benefit	Cost	B-C	
		5,674	4,557	1,117	1.25

(Unit: Rs Million)

Year in Order	Year	Economic Cost			Economic Benefit	Net Cash Flow
		Initial Investment	Replacement O & M	Total Cost		
1	2015-16	10	0	10	0	-10
2	2016-17	149	0	149	0	-149
3	2017-18	388	0	388	62	-326
4	2018-19	769	47	816	270	-546
5	2019-20	987	190	1,177	603	-574
6	2020-21	1025	380	1,405	998	-407
7	2021-22	120	570	690	1,165	475
8	2022-23		570	570	1,248	678
9	2023-24		570	570	1,248	678
10	2024-25		570	570	1,248	678
11	2025-26		570	570	1,248	678
12	2026-27		570	570	1,248	678
13	2027-28		570	570	1,248	678
14	2028-29		605	605	1,248	643
15	2030-31		570	570	1,248	678
16	2031-32		570	570	1,248	678
17	2032-33		570	570	1,248	678
18	2033-34		570	570	1,248	678
19	2034-35		570	570	1,248	678
20	2035-36		570	570	1,248	678

Source: JICA Survey Team

Table A-10.3.6 Economic Cost and Benefit Stream
(Sensitivity Analysis: Cost up by 5%, Benefit down by 5%)

EIRR:	**21.3%**	Net Present Value (Rs Million) (at 10% Discount Rate)			B/C Ratio
		Benefit	Cost	B-C	
		5,989	4,785	1,204	1.25

(Unit: Rs Million)

Year in Order	Year	Economic Cost			Economic Benefit	Net Cash Flow
		Initial Investment	Replacement O & M	Total Cost		
1	2015-16	10	0	10	0	-10
2	2016-17	157	0	157	0	-157
3	2017-18	408	0	408	66	-342
4	2018-19	807	50	857	285	-572
5	2019-20	1,036	199	1,236	637	-599
6	2020-21	1,076	399	1,476	1,054	-422
7	2021-22	126	598	724	1,230	505
8	2022-23		598	598	1,317	719
9	2023-24		598	598	1,317	719
10	2024-25		598	598	1,317	719
11	2025-26		598	598	1,317	719
12	2026-27		598	598	1,317	719
13	2027-28		598	598	1,317	719
14	2028-29		636	636	1,317	682
15	2030-31		598	598	1,317	719
16	2031-32		598	598	1,317	719
17	2032-33		598	598	1,317	719
18	2033-34		598	598	1,317	719
19	2034-35		598	598	1,317	719
20	2035-36		598	598	1,317	719

Source: JICA Survey Team

Attachment 10.3

Table A-10.3.7 Economic Cost and Benefit Stream
(Sensitivity Analysis: Cost up by 10%, Benefit down by 10%)

EIRR:	**16.60%**	Net Present Value (Rs Million) (at 10% Discount Rate)			B/C Ratio
		Benefit	Cost	B-C	
		5,674	5,013	661	1.13

(Unit: Rs Million)

Year in Order	Year	Economic Cost			Economic Benefit	Net Cash Flow
		Initial Investment	Replacement O & M	Total Cost		
1	2015-16	11	0	11	0	-11
2	2016-17	164	0	164	0	-164
3	2017-18	427	0	427	62	-365
4	2018-19	846	52	898	270	-627
5	2019-20	1,086	209	1,295	603	-691
6	2020-21	1,128	418	1,546	998	-547
7	2021-22	132	627	759	1,165	406
8	2022-23		627	627	1,248	621
9	2023-24		627	627	1,248	621
10	2024-25		627	627	1,248	621
11	2025-26		627	627	1,248	621
12	2026-27		627	627	1,248	621
13	2027-28		627	627	1,248	621
14	2028-29		666	666	1,248	582
15	2030-31		627	627	1,248	621
16	2031-32		627	627	1,248	621
17	2032-33		627	627	1,248	621
18	2033-34		627	627	1,248	621
19	2034-35		627	627	1,248	621
20	2035-36		627	627	1,248	621

Source: JICA Survey Team

Table A-10.3.8 Economic Cost and Benefit Stream
(Sensitivity Analysis: Cost up by 10%, Benefit down by 5%)

EIRR:	**19.1%**	Net Present Value (Rs Million) (at 10% Discount Rate)			B/C Ratio
		Benefit	Cost	B-C	
		5,989	5,013	976	1.19

(Unit: Rs Million)

Year in Order	Year	Economic Cost			Economic Benefit	Net Cash Flow
		Initial Investment	Replacement O & M	Total Cost		
1	2015-16	11	0	11	0	-11
2	2016-17	164	0	164	0	-164
3	2017-18	427	0	427	66	-361
4	2018-19	846	52	898	285	-612
5	2019-20	1,086	209	1,295	637	-658
6	2020-21	1,128	418	1,546	1,054	-492
7	2021-22	132	627	759	1,230	471
8	2022-23		627	627	1,317	691
9	2023-24		627	627	1,317	691
10	2024-25		627	627	1,317	691
11	2025-26		627	627	1,317	691
12	2026-27		627	627	1,317	691
13	2027-28		627	627	1,317	691
14	2028-29		666	666	1,317	652
15	2030-31		627	627	1,317	691
16	2031-32		627	627	1,317	691
17	2032-33		627	627	1,317	691
18	2033-34		627	627	1,317	691
19	2034-35		627	627	1,317	691
20	2035-36		627	627	1,317	691

Source: JICA Survey Team

Attachment 10.3

Table A-10.3.9 Economic Cost and Benefit Stream
(Sensitivity Analysis: Cost up by 5%, Benefit down by 10%)

EIRR:	**18.7%**	Net Present Value (Rs Million) (at 10% Discount Rate)			B/C Ratio
		Benefit	Cost	B-C	
		5,674	4,785	889	1.19

(Unit: Rs Million)

Year in Order	Year	Economic Cost			Economic Benefit	Net Cash Flow
		Initial Investment	Replacement O & M	Total Cost		
1	2015-16	10	0	10	0	-10
2	2016-17	157	0	157	0	-157
3	2017-18	408	0	408	62	-345
4	2018-19	807	50	857	270	-587
5	2019-20	1,036	199	1,236	603	-632
6	2020-21	1,076	399	1,476	998	-477
7	2021-22	126	598	724	1,165	441
8	2022-23		598	598	1,248	650
9	2023-24		598	598	1,248	650
10	2024-25		598	598	1,248	650
11	2025-26		598	598	1,248	650
12	2026-27		598	598	1,248	650
13	2027-28		598	598	1,248	650
14	2028-29		636	636	1,248	613
15	2030-31		598	598	1,248	650
16	2031-32		598	598	1,248	650
17	2032-33		598	598	1,248	650
18	2033-34		598	598	1,248	650
19	2034-35		598	598	1,248	650
20	2035-36		598	598	1,248	650

Source: JICA Survey Team