DEPARTMENT OF AGRICULTURE,
THE STATE GOVERNMENT OF HIMACHAL PRADESH,
REPUBLIC OF INDIA

TECHNICAL COOPERATION PROJECT FOR CROP DIVERSIFICATION IN HIMACHAL PRADESH

COMPLETION REPORT

NOVEMBER 2015

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

NIPPON KOEI CO., LTD.
NTC INTERNATIONAL CO., LTD.

ID
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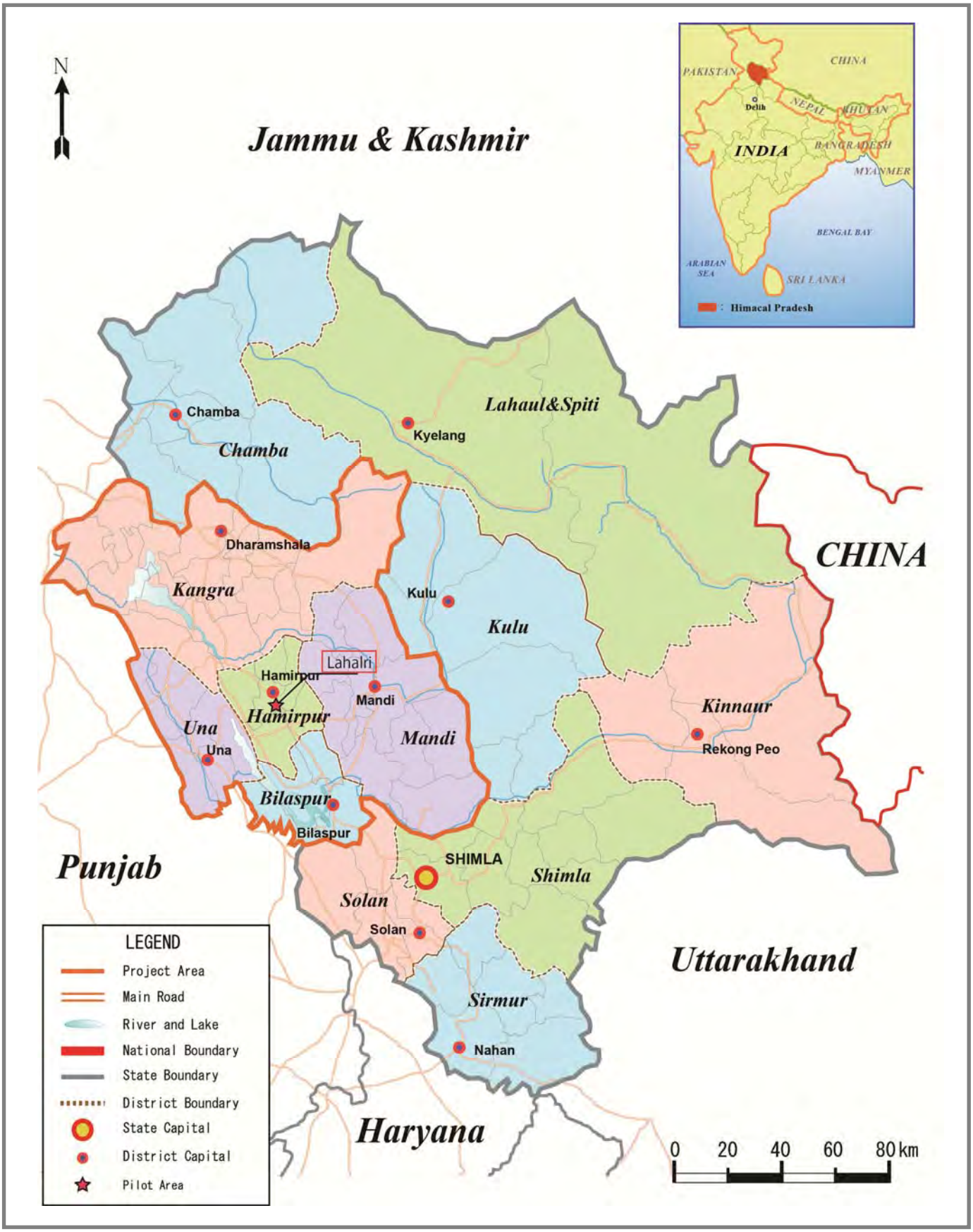

Technical Cooperation Project for Crop Diversification in Himachal Pradesh

PROJECT LOCATION MAP

Photograph Information

General

8th Joint Coordination Committee Meeting for Terminal Evaluation

Signing of Terminal Evaluation Reports

Discussion with Farmers by Terminal Evaluation Mission

Site Visit of Terminal Evaluation Mission

Extention

Workshops on feedback on the preparation of crop diversification plan BPMU, Sarkaghat (Phase4)

Training on Basic Skills and Knowledge of Protected Cultivation (Phase4)

Workshop of Guideline in Hamirpur (Phase4)

Workshop of Guideline in Hamirpur (Phase4)

Photograph Information

Vegetable Farming and Post-Harvest

Vegetable cultivation: Eggplant plantation with flood irrigation (Phase3)

Vegetable cultivation: Inducement of cucumber's vine (Phase3)

Vegetable cultivation
Good harvest of cucurbit and okra (Phase3)

Vegetable cultivation
Packing vegetable for transportation (Phase3)

Vegetable cultivation
Installation of mulch sheet (Phase3)

Vegetable cultivation
Growing fennel in poly house (Phase3)

Vegetable cultivationten
Tomato cultivation in poly house (Phase3)

Vegetable cultivation
Nursery of leek e (Phase3)

Photograph Information

Vegetable Farming and Post-Harvest

Training of farmers
Hands on training on staking in bottle gourd (Phase3)

Training of farmers and PMU staff:
Exposure visit of nursery farmers (Phase3)

Training of farmers and PMU staff:
Exposure visit of tomato farmers (Phase3)

On farm training
Training of application of fertilizer to farmers (Phase3)

Cutting training in Senji Kothi,
BPMU Sarkaghat (Phase4)

Cutting, grafting and sand nursery training in Padhiun,
BPMU Mandi (Phase4)

Cutting, grafting and sand nursery training in Landher Landeyan,
BPMU Una (Phase4)

Cutting, grafting and sand nursery training in Kahali,
BPMU Bilaspur (Phase4)

Photograph Information

Water Management and O&M of Irrigation Facilities

General Body meeting in Lahalri
Discussion for water distribution (Phase3)

Training for farmers
Training on water distribution (Phase3)

Field support to GMKVA
Hose irrigation (Phase3)

Field support GMKVA
Furrow irrigation (Phase3)

Monitoring to GMKVA activities
Irrigation record (Phase3)

Training for farmers
Training on cleaning of irrigation facilities (Phase3)

Field support to GMKVA
Maintenance of pumping facilities (Phase3)

Field support to GMKVA
Repair of pipeline leakage (Phase3)

Photograph Information

Water Management and O&M of Irrigation Facilities

Training for Core Extension Officer
Training provided by resource person of university(Phase2)

Training for Core Extension Officer
Exposure visit to Lahalri pilot site (Phase3)

Training for Core Extension Officer:
Training on Participatory Irrigation Management (Phase3)

Training for Core Extension Officer
Extension officers in the training (Phase3)

SPMU monthly meeting
Sharing the information on O&M of irrigation facilities (Phase3)

Training for Core Extension Officer
Training in BPMU office (Phase4)

Training for Core Extension Officer
Training on records keeping in HPCDP sub-project site (Phase4)

Training for Core Extension Officer
Training on maintenance in HPCDP sub-project site (Phase4)

Photograph Information

Gender and Social Inclusion

Training cum Exposure for Lahalri Women - KVK Bara (Phase1)

Training on accounting, budgeting & work management (Phase 1)

Cucurbit nursery of Naman SHG (Phase 2)

SHG Support and Development Training- (Phase 2)

Weeding and Urea fertilizer application (Phase 2)

Shiv-Shakti SHG members weighing Colocasia prior to marketing (Phase 3)

Bhole Shanker SHG members collecting the mulberry leafs (Phase 3)

Freshly packed Mulberry leaf tea - prepared by Bhole Shanker SHG (Phase 3)

Photograph Information

Gender and Social Inclusion

Naman members weeding onion nursery (Phase 3)

Naman SHG members putting bamboo frames over the onion nursery beds (Phase 3)

Preparation of business plan (cucurbit nursery) by Naman SHG (Phase 3)

Various types of Bari prepared by the Bhole Shankar SHG during trial production (Phase 3)

SHGs marketing their products- Hamir Utsav (Phase 4)

Gender Sensitization- GMKVA Workshop (Phase 4)

Extension staff working on problem analysis (Phase 4)

Lahalri SHGs sharing their experiences during the training for PMU Extension officers (Phase 4)

Photograph Information

Design and Construction

Consensus building with farmers
(Phase1)

Pre-Tender Meeting
(Phase1)

Contract agreement
(Phase1)

Under construction at pump house
(Phase1)

Laying of HDPE pipe
(Phase1)

Curing of water tank
(Phase1)

Photograph recording

Under construction of outlet

Photograph Information

Design and Construction

Site meeting with conflict farmers
(Phase1)

Under construction of intake
(Phase1)

Test run
(Phase1)

Intake Structure and Downstream Apron
(Phase1)

Irrigation facilities
(Phase1)

Auto CAD Training of core extension officer
(Phase2)

Training on survey instrument for core extension officer
(Phase3)

Training on irrigation facilities for core extension officers
(Phase3)

Photograph Information

Marketing

Packing of Broccoli
(Phase4）

Cleaning of vegetables before packing
(Phase4）

Cherry Tomato packed in small carton box.
(Phase4）

Radish, Cherry tomato and tomato packed for Shipping to Delhi(Phase4）

Resource person from ICCOA making presentation on Marketing of Strategic vegetables and related topics.(Phase4）

Core extension officers during visit to Apni Mandi, Sector 15 in Chandigarh.(Phase4）

Core extension officers interacting with farmers at their stalls in Apni Mandi.(Phase4）

Farmer from Lahore packing vegetables for Delhi.
(Phase4）

Photograph Information

Overseas Training in Japan

Matsumoto Agriculture Extension Center

Nomura Farm, Ltd.
(Advanced Farmer for Tomato Cultivation)

Yazawa Food Processing Factory
(Women's Group Activity)

Azusagawa Barrage
(Chushin-daira Irrigation Scheme)

Field Level Irrigation Facility
(Chushin-daira Right Bank LID)

JA Seba
(Pre-cooling facility for Lettuce)

Courtesy call to Director of Agriculture, Nagano Pref.

Training Team Member
at JICA Tokyo International Center

TECHNICAL COOPERATION PROJECT
FOR
CROP DIVERSIFICATION
IN
HIMACHAL PRADESH

COMPLETION REPORT

Project Location Map
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Abbreviations

ADA	Additional Director Agricultural
ADO	Agricultural Development Officer
ADP	Agriculture Development Plan
AE	Assistant Engineer
AEO	Agricultural Extension Officer
AEZ	Agro-ecological Zone or Zoning
APO	Agriculture Project Officer
A/P	Action Plan
APMC	Agricultural Producers' Market Committee
ASCO	Assistant Soil Conservation Officer
ATMA	Agriculture Technology Management Agency
BDO	Block Development Officer
BPMU	Block Project Management Unit
CA	Commission Agent
CCA	Culturable/Cultivable Command Area
CDM	Crop Diversification Model
CDP	Crop Diversification Plan
CEO	Core Extension Officer
CSKHPKV	Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishya Vidyalaya
DAO	District Agriculture Officer
DAP	District Agriculture Plan
DDA, DD	Deputy Director of Agriculture
D/D, DD	Detailed Design
DE	Divisional Engineer
DoA	Department of Agriculture of Himachal Pradesh State
DPMU	District Project Management Unit
DPR	Detailed Project Report
EE	Executive Engineer
ETP	Extension Training Plan
FIS	Flow Irrigation Scheme
FTC	Farmers Training Centre
F/S	Feasibility Study
GB	General Body
GDP	Gross Domestic Production
GI	Galvanized Iron
GIS	Geographic Information System
GoHP	Government of Himachal Pradesh
GoI	Government of India
GoJ	Government of Japan
GSDP	Gross State Domestic Product
HP	Himachal Pradesh
HPCDP	Himachal Pradesh Crop Diversification Promotion Project, the ODA Loan Project
HPMC	Himachal Pradesh Marketing Committee
IPH	Irrigation and Public Health Department of Himachal Pradesh State
IPM	Integrated Pest Management
JCC	Joint Coordination Committee
JE	Junior Engineer
JD	Joint Director
JICA	Japan International Cooperation Agency
LID	Land Improvement District
LIS	Lift Irrigation Scheme
MC	Management Committee (such farmers groups as KVS and WUA)
MCD	Mechanism for Crop Diversification
MIS	Micro Irrigation System
M/M, MM	Man Month or Minutes of Meeting
MoA	Ministry of Agriculture of Government of India

M/P	Master Plan
MPR	Minimum Project Report
NABARD	National Bank for Agriculture and Rural Development
NGO	Non Governmental Organization
NH	National Highway
NOC	Non Objection Certificate
O&M	Operation and Maintenance
OBC	Other Backward Caste
ODA	Official Development Assistance by Government
PDCA	Plan – Do – Check – Act
PDDKBSY	Diversification of Agriculture through Micro-irrigation and Related Infrastructure
PDM	Project Design Matrix
PMU	Project Management Unit
PO	Plan of Operations, Pomp Operator
POP	Package of Practices
PPP	Public Private Partnership
PQ, P/Q	Pre-qualification
PR	Public Relationship
PVC	Polyvinyl chloride
PWD	Public Works Department
RCC	Reinforced Cement Concrete
RIDF	Rural Infrastructure Development Fund
RMY	Regulated Market Yard
SAMETI	State Agricultural Management and Extension Training Institute
SAP	State Agricultural Plan
SC / ST	Scheduled Caste / Scheduled Tribe
SDSCO	Sub-Divisional Soil Conservation Officer
SE	Superintending Engineer
SH	State Highway
SHG	Self-help Group
SMS	Subject Matter Specialist
SMY	Sub Market Yard
SPMU	State Project Management Unit
SWC	Soil and Water Conservation
TCP	Technical Cooperation Project
TD, T/D	Tender Document
TES	Training of Extension Staffs
TIS	Tank Irrigation Scheme
TOR	Terms of Reference
TOT	Training of Trainers
WDC	Water Distribution Coordinator
WUA	Water Users' Association

Local Words

Crore	10 Million (10,000,000)
GMKVA	Gagan Memorial Krishak Vikas Association
Kanal	Unit of Area, Approximately 400 m^2
Kharif	Southwest monsoon cropping season (June to September)
KVK	Krishi Vigyan Kendras (Agriculture Science Centers)
KVA	Krishak Vikaas Association (Water Users' Association / Farmers' Group)
Lakh, Lac	100 Thousand (100,000)
Nallah	Small River and Stream (Seasonal and Perennial)
Rabi	Winter cropping season (October to May)
RKVY	Rashtriya Krishi Vikas Yojana

CHAPTER 1 INTRODUCTION

1.1 Authority

This is the Completion Report for the Technical Cooperation Project (The TCP or JICA TCP) for Crop Diversification in Himachal Pradesh, prepared at the end of the Project, which have been implemented based on the Record of Discussion (refer to Attachment-1) concluded between the Japan International Cooperation Agency (JICA) and the authorities concerned of the Government of India (GoI) through the State Government of Himachal Pradesh (GoHP) on October 1, 2010. The Completion Report provides the results of all activities performed by the TCP throughout the project period.

1.2 Background of the Project

The State of Himachal Pradesh (the State) is a hilly State located at the foot of the Western Himalayas, with an area of 556.7 million ha, and a population of approximately 6.8 million. Nearly 70% of the working population in the State is engaged in agriculture, but agriculture accounts for only 15% of the Gross State Domestic Products (GSDP). The low agriculture productivity partly attributes to the fact that the area available for crop cultivation is limited to 10% of the total land area of the State due to the hilly terrain, and therefore more than 80% of the farmers are marginal and small landholders with an area of less than 2.0 ha. Also, only 20% of the cultivable area has irrigation facilities, and the rest of the area has to depend on rainfed cultivation. Therefore, the majority of the farmers in the State remain engaged in traditional cultivation of food grains, and they are unable to diversify the farming to more profitable crops, such as vegetables and fruits.

Although it is not fully exploited, the State has a considerable potential for vegetable production, with an advantage of cool climate compared to other parts of the county, as well as the geographical proximity to the large cities such as Delhi, and Chandigarh. This would enable the farmers to produce off-season vegetables and fruits, which have a large market in the urban cities with better prices. The demand for fresh vegetables is expected to double by 2020, due to the rapid increase of population in the country, especially in the larger cities such as Delhi.

In order to boost the agricultural development and to enhance the farm income in the rural area, it is important to increase the productivity of the existing cultivated area, through shifting from self-subsistence food grain cultivation to diversified agriculture, by adopting cash crops such as vegetables which are suitable to hilly and highland areas. For such an accomplishment, it is essential to overcome the major constraints, such as shortage of irrigation facilities, farm roads and insufficient marketing facilities.

The promotion of crop diversification was also endorsed by the national development policy of India in the Eleventh Five-Year Plan (2007-2012). The GoI formulated nine priority policies in the agriculture sector including the policy which concerns the diversification of agriculture to high value crops such as vegetables and fruits. Also in the Eleventh Five-Year Plan of the State of Himachal

Pradesh, improvement of irrigation facilities and diversification from traditional crops to commercial crops are among the priority areas of the agriculture sector.

Under such circumstances, the GoHP formulated a crop diversification plan in March 2009, under the technical assistance of JICA, in order to enhance the farm income of small and marginal farmers. The plan consists of 3 programs including institutional development, farmers support, and infrastructure development. Based on the plan, the GoHP, through the GoI requested the Government of Japan for technical cooperation and financial assistance for the implementation of crop diversification in the 5 districts of the State. The Government of Japan through JICA signed the Record of Discussions with the concerned authorities of Government of India for the Technical Cooperation Project on October 1, 2010.

The TCP mainly focused on; 1) development of the Crop Diversification Model in the Pilot Area, and 2) capacity development of the extension officers. The Himachal Pradesh Crop Diversification Promotion Project under JICA Loan (the ODA Loan Project or HPCDP) for the expansion of Crop Diversification Model in the 5 districts of the State has been implemented in close coordination with the TCP.

1.3 Purpose and Scope of the Project

The purpose of the TCP was to establish the promotion mechanism for crop diversification in the State, in order to support the implementation of the Loan Project. The overall goal, project purpose, outputs and activities are listed below (refer to Project Design Matrixes, PDMs in Attachment-2 and Plan of Operation, PO in Attachement-3). PDM had revised twice during the Project period. The figure shows final version of PDM (Ver.2 revised in July 2015).

Overall Goal:
Crop diversification is promoted in the target area based on the advantageous climate conditions.

⇧

Project Purpose:
The promotion mechanism for crop diversification is established in DoA Himachal Pradesh.

⇧

Output:			
1: DoA's capacity to plan and implement crop diversification is strengthened.	2: Training system to promote crop diversification is developed.	3: The extension skill of the core extension officers is improved.	4: Crop diversification model is developed and practiced in the Pilot area.

Continue to next page

Activities:			
1-1. Review the existing plan on crop diversification and study, how the pilot project should be. 1-2. Conduct Plan-Do-Check-Act training on crop diversification 1-3. Facilitation in the preparation of annual plan on crop diversification 1-4. Develop Crop Diversification Guideline based on the lessons learned from crop diversification model practiced in the Pilot Area and Sub-pilot Area	2-1. Formulate annual plan on extension training 2-2. Review the existing training curriculum and materials on extension 2-3. Develop training curriculum and materials on extension of crop diversification 2-4. Revise curriculum and materials incorporating feedback from the Pilot Project	3-1. Conduct hands-on training to core extension officers assigned to the pilot area and highlighted 5 districts (Bilaspur, Hamirpur, Kangra, Mandi and Una) on: ・ Group formation ・ Crop cultivation ・ Farm management ・ Post-harvest/processing ・ Marketing ・ Infrastructure development/operation and maintenance 3-2. Conduct trainings for extension officers in Sub-Pilot Areas	4-1. Conduct baseline survey 4-2. Selection of a pilot area to be approved by JCC 4-3. Construct irrigation facilities and prepare demonstration plot in the pilot area. 4-4. Organize farmers groups and Self-help groups 4-5. Conduct trainings for farmers on: ・ Group formation ・ Crop cultivation ・ Farm management ・ Post harvest/processing ・ Marketing ・ Infrastructure development/operation and maintenance

Note: The target group will be the core extension officers of PMU staff.

Figure 1.3.1 Flow of Project Implementation

1.4 Project Area

The TCP covered the five districts of Bilaspur, Hamirpur, Kangra, Mandi and Una in the State, as shown in the project location map. In addition to this, in the other seven districts, trainings and support to DoA officers were also carried out as Sub-pilot area activities.

1.5 Implementation Schedule

The TCP have been implemented for 5 years from FY2011 to FY2015 with the following 4 phases:

Phase-1 (First Fiscal Year): February 2011 to May 2012

Phase-2 (Second Fiscal Year): July 2012 to April 2013

Phase-3 (Third Fiscal Year): May 2013 to April 2014

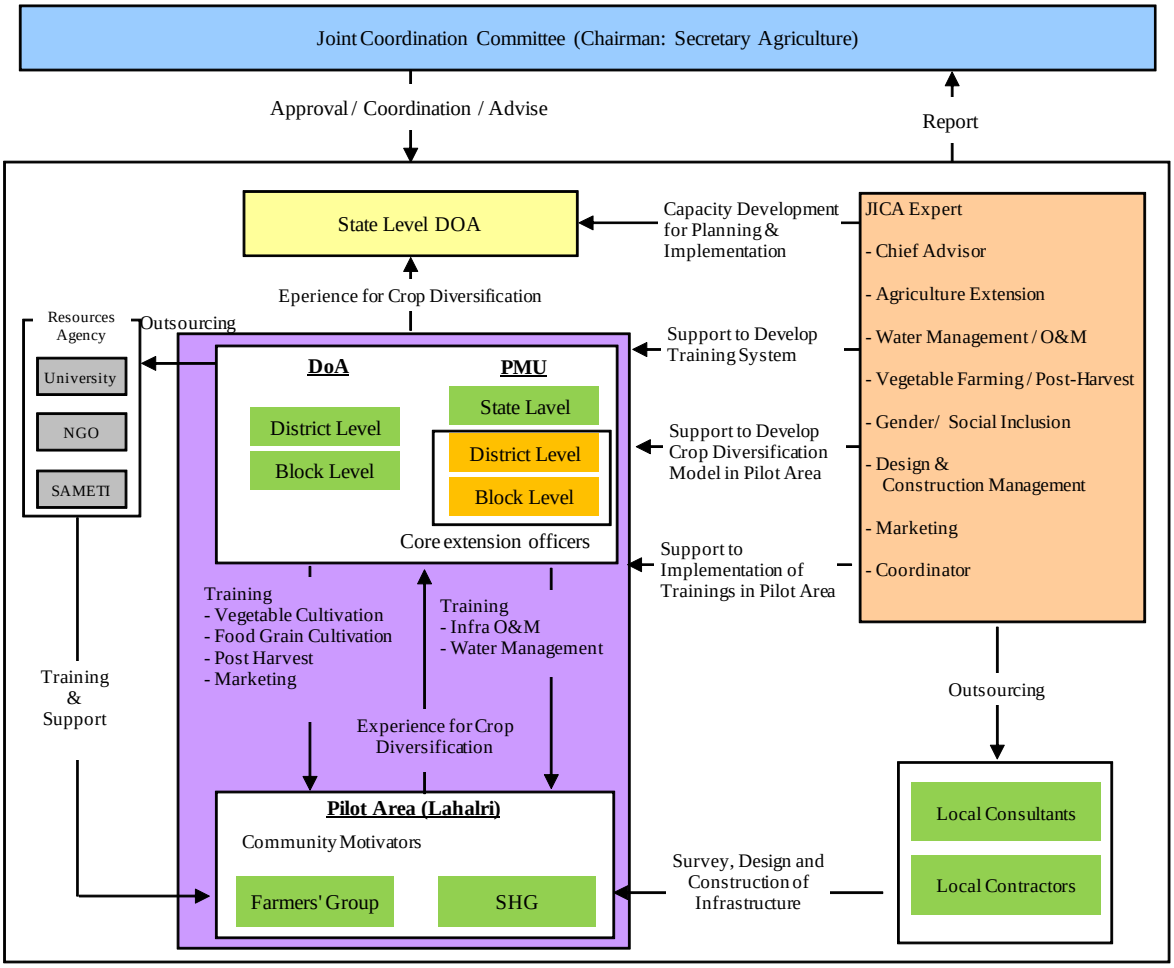
Phase-4 (Fourth Fiscal Year): May 2014 to November 2015

1.6 Project Implementation Structure

1.6.1 Overall Project Implementation Structure and Target Group

The TCP has been implemented under close cooperation with the Department of Agriculture (DoA), Himachal Pradesh, Project Management Unit (PMU) of the ODA loan project based on the project implementation structure as shown in the following Figure 1.6.1 for effective promotion of crop

diversification in Himachal Pradesh. The target group of the TCP was "core extension officers (CEOs)", which include both extension and engineering staffs of PMU of the ODA Loan Project.



Source: JICA TCP Team

Figure 1.6.1 Project Implementation Structure

1.6.2 Technical Trainings under the Project

For core extension officers, two types of trainings, namely, hands-on trainings by the TCP team and lectures & workshops by the resource persons and/or the TCP team were planned and carried out. The DoA officers in the target five districts also were able to join the trainings based on their requirement. The trainings of farmers in the pilot site were also carried out in three types of trainings, namely, hands-on trainings by the TCP team, theoretical training and workshops by the resource persons and/or the TCP team, and also exposure study tours to other advanced areas.

In addition to this, trainings to sub-pilot area officers of the seven districts were carried out. DoA and the TCP had agreed not to select specific sites in the seven districts as sub-pilot area. So these trainings were targeting at capacity development of DoA officers in seven districts who were not included in ODA Loan project area. The participants of the trainings from the seven districts were selected and

nominated by DoA. The trainings were planned to be conducted by the resource persons and/or the TCP team similar to the trainings to core extension officers of PMU. The summary of trainings conducted by the TCP is shown below.

Table 1.6.1 Summary of the Trainings Conducted by the TCP

Target of trainings	Participants of trainings	Type of trainings	Arrangement of budget
Core extension officers	District PMU officers and Block PMU officers in 5 districts	Hands-on training in Lahalri or lecture & workshop in one specific location (Hamirpur, Palampur, etc.)	Arranged by JICA-TCP: - TA/DA as well as boarding / lodging for trainees - Other expenses
DoA officers in ODA Loan districts	DoA officers in ODA Loan 5 districts (Bilaspur, Hamirpur, Kangra, Mandi, Una)	DoA officers in ODA Loan area joins the trainings to core extension officers based on their demand	Arranged by JICA-TCP: - TA/DA as well as boarding / lodging for trainees - Other expenses
Farmers in pilot area	Lahalri farmers including KVA members	Hands-on training in Lahalri, lecture & workshop or study tour to other area	Arranged by JICA-TCP: Full support
Sub-pilot area officers	DoA officers in 7 districts (Shimla, Kinnaur, Sirmaur, Chamba, Lahaul & Spiti, Kullu, and Solan)	Lecture / workshop in one specific location (Palampur, Shimla, etc.)	Arranged by JICA-TCP: - TA/DA as well as boarding / lodging for trainees - Other expenses

Source: JICA TCP Team

1.6.3 Joint Coordination Committee

For the smooth implementation of the TCP, a Joint Coordination Committee (JCC) was organized in accordance with the Record of Discussion of the Project. The functions of the Committee were to evaluate and decide measures on i) periodical review of the Project progress, and ii) issues of the TCP. The JCC was organized under the chairmanship of the Secretary of Agriculture with the members from the representatives of DoA, Ministry of Agriculture (GoA), JICA, the Project Team and the other concerned agencies. The member list of the JCC is shown in the Table 1.6.2.

Table 1.6.2 Members of Joint Coordination Committee

No.	Designation	Position
	Indian Side	
1.	Principal Secretary/Secretary (Agriculture), Govt. of HP	Chairman
2.	Director of Agriculture, HP (Project Director of TCP), Govt. of HP	Vice-Chairman
3.	Project Director of ODA Loan Project cum Project Manager of TCP	Member Secretary
4.	Representative of Ministry of Agriculture, Dept. of Agriculture & Cooperation, GoI	Member
5.	Managing Director, HP State Agricultural Marketing Board, Shimla	Member
6.	Director of Extension, CSK HPKV, Palampur	Member
7.	Superintending Engineer, Dept. of Agriculture, Govt. of HP	Member
8.	Director of State Agricultural Management and Extension Training Institute (SAMETI), HP	Member
9.	Representative from any other State Department Institutions as decided by the Chairperson	Member
	Japanese Side	
10.	Representative of Project Management Consultant for JICA ODA Loan Project	Vice-Chairman
11.	Representative, JICA India Office	Member
12.	Chief Advisor / Team Leader of Japanese Expert Team	Member

Source: JICA TCP Team

In the project period total 9 Joint Coordination Committee meetings were held as shown in the Table 1.6.3. The minutes of meetings of 7th and 8th JCC are attached as Attachment-4 and 5.

Table 1.6.3 List of Joint Coordination Committee Meetings under the TCP

JCC	Timing	Topic of Discussion
1st JCC	30 June 2011	● Approval of Work Plan of Phase-1 ● Approval of selection of pilot area
2nd JCC	6 February 2012	● Review of progress of Phase-1 activities
3rd JCC	18 August 2012	● Review of progress of Phase-1 activities ● Approval of Work Plan of Phase-2
4th JCC	8 April 2013	● Review of progress of Phase-2 activities ● Handing over of irrigation facilities in the pilot site
5th JCC	11 July 2013	● Approval of Work Plan of Phase-3
6th JCC	30 October 2013	● Mid-term Evaluation
7th JCC	18 June 2014	● Review of progress of Phase-3 activities ● Approval of Work Plan of Phase-4
8th JCC	8 July 2015	● Terminal Evaluation
9th JCC	9 November 2015	● Approval of Completion Report and Guidelines

Source: JICA TCP Team

1.6.4 Counterparts of the Project

For the smooth implementation of the TCP and expansion of knowledge of execution for ODA loan project, the counterparts were assigned as shown below as of the end of October 2015.

Table 1.6.4 Counterparts Personnel (as of October 2015)

No.	Name	Organization / Position
1.	Mr. J. C. Rana	Project Director, Director, DoA, Shimla
2.	Er. A. K. Bhardwaj	Divisional Engineer, DoA, Shimla
3.	Mr. R. S. Thakur	Deputy Director of Agriculture (DDA), Shimla
4.	Mr. Suresh Sharma	SMS, Project Cell, DoA, Shimla
5.	Mr. Jagdish R. Thakur	Project Director, PMU, Hamirpur
6.	Mr. V. K. Sharma	Deputy Project Director, PMU, Hamirpur
7.	Er. Pardeep Behl	Deputy Project Director, Senior Engineer, PMU, Hamirpur
8.	Mr. Jagjit K. Sharma	SMS, PMU, Hamirpur
9.	Mr. Shasi P. Sharma	SMS, PMU, Hamirpur

Source: JICA TCP Team

CHAPTER 2 PROJECT ACTIVITIES

2.1 Overall Implementation Schedule of the Project

The TCP was implemented for 5 years during the period from 2011 to 2015 with the following 4 phases. Summary of activities (activity number is based on PDM) in each phase is shown below:

(1) Phase-1: February 2011 to May 2012

1) Conduct baseline survey (Activity 4-1)
2) Review existing plan on crop diversification and study (Activity 1-1)
3) Conduct Plan-Do-Check-Action training on crop diversification (Activity 1-2)
4) Facilitation in the preparation of annual plan on crop diversification (Activity 1-3)
5) Review the existing training curriculum and materials on the extension (Activity 2-2)
6) Conduct hands-on training to core extension officers and farmers (Activity 3-1, 4-5)
7) Selection of pilot area and construction of irrigation facilities (Activity 4-2, 4-3)
8) Organize farmers groups and Self-help groups (Activity 4-4)

(2) Phase-2: July 2012 to April 2013

1) Review existing plan on crop diversification and study (Activity 1-1)
2) Conduct Plan-Do-Check-Action training on crop diversification (Activity 1-2)
3) Facilitation in the preparation of annual plan on crop diversification (Activity 1-3)
4) Formulate annual plan on extension training (Activity 2-1)
5) Develop training curriculum and materials on the extension (Activity 2-3)
6) Conduct hands-on training to core extension officers and farmers (Activity 3-1, 4-5)
7) Construction of irrigation facilities and demonstration farm (Activity 4-3)
8) Study on accesses farm road and collection center (Activity 4-3)
9) Trial operation of irrigation facilities in the pilot area (Activity 4-3)

(3) Phase-3: May 2013 to April 2014

1) Conduct Plan-Do-Check-Action training on crop diversification (Activity 1-2)
2) Facilitation in the preparation of annual plan on crop diversification (Activity 1-3)
3) Formulate annual plan on extension training (Activity 2-1)
4) Develop training curriculum and materials on the extension (Activity 2-3)
5) Conduct hands-on training to core extension officers and farmers (Activity 3-1, 4-5)
6) Conduct trainings to extension officers in Sub-Pilot Areas (Activity 3-2)
7) Develop Crop Diversification Guideline (Activity 1-4)
8) Mid-term impact survey and mid-term evaluation (Activity 4-1)
9) Preparation of overseas training in Japan

(4) Phase-4: May 2014 to November 2015

1) Facilitation in the preparation of annual plan on crop diversification (Activity 1-3)
2) Formulate annual plan on extension training (Activity 2-1)
3) Revise training curriculum and materials on the extension (Activity 2-3)

4) Conduct hands-on training to core extension officers and farmers (Activity 3-1, 4-5)
5) Conduct trainings to extension officers in Sub-Pilot Areas (Activity 3-2)
6) Develop Crop Diversification Guideline (Activity 1-4)
7) Terminal impact survey and terminal evaluation (Activity 4-1)
8) Implementation of overseas training in Japan

The overall project implementation schedule of the Project for four phases is shown in Plan of Operation (PO), also refer to Attachent-3.

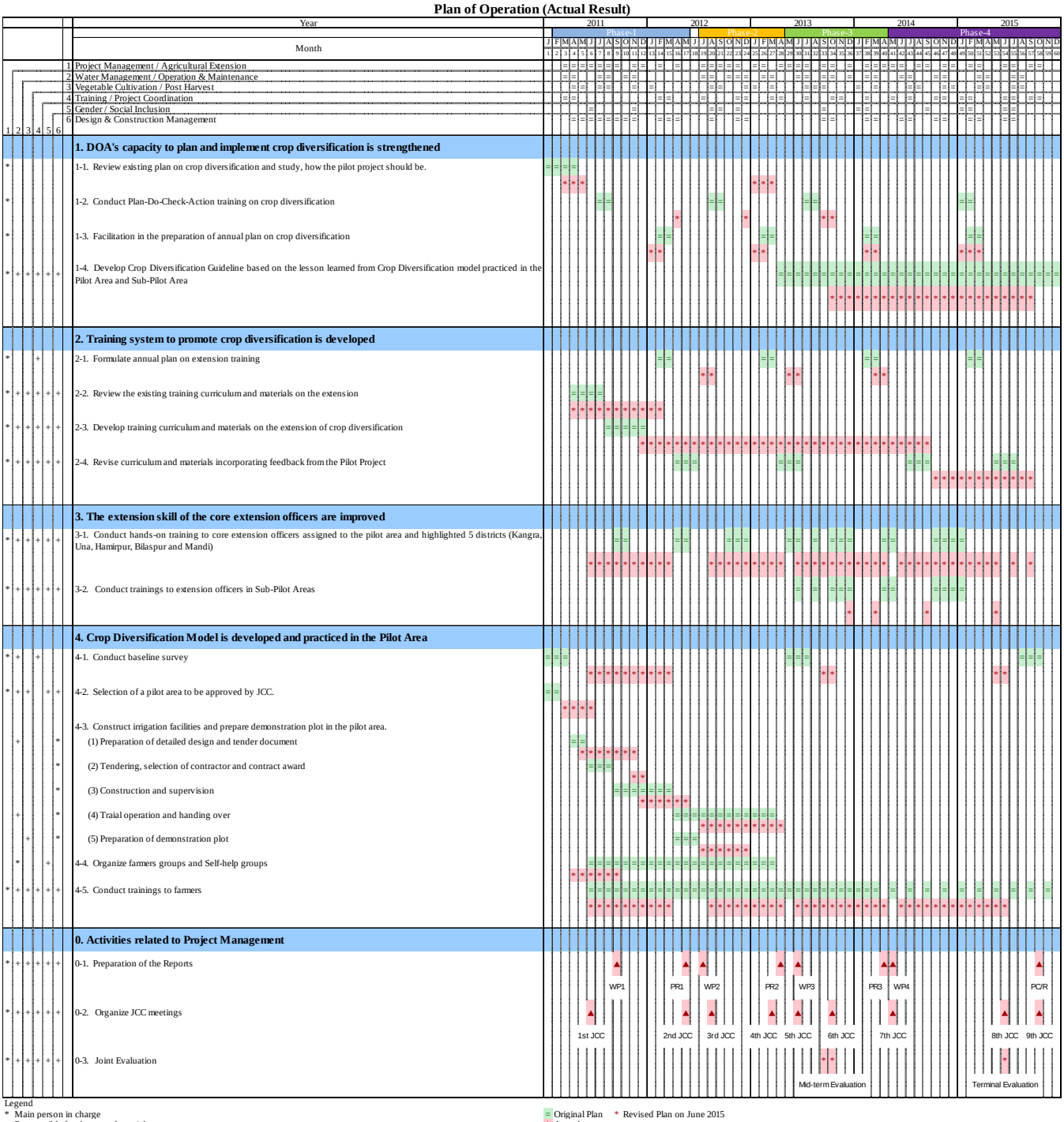


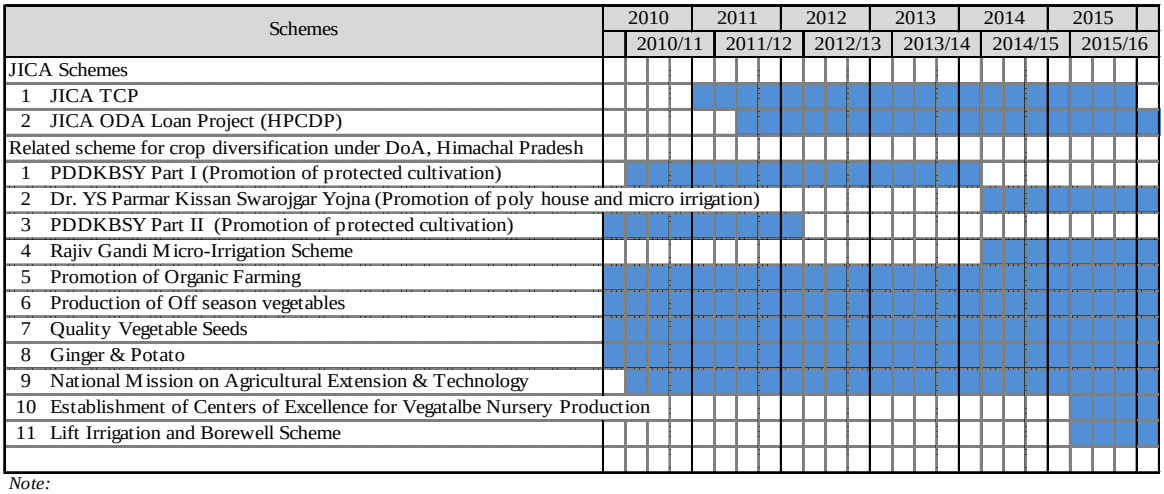
Figure 2.1.1 Plan of Operation (PO)

2.2 Activities for Output 1

2.2.1 Review of Existing Plan on Crop Diversification

Master Plan for crop diversification based on "the Study of Diversified Agriculture and Enhanced Farm Income in Himachal Pradesh" was formulated in 2008 under JICA's technical assistance. The Master Plan was still the fundamental Plan for Crop Diversification in the State. Based on the Master Plan, "Himachal Pradesh Crop Diversification Promotion Project (HPCDP)" and "Technical Cooperation Project for Crop Diversification (the TCP)" were being carried out in the State under financial and technical assistance by JICA. Besides them, under the concept of the Master Plan, several projects/schemes by national/state fund are also being implemented.

Pandit Deen Dayal Kisan Bagwan Samridhi Yojna, Part 1 (2010-11), funded by NABARD (National Bank of Agriculture and Rural Development) under RIDF (Rural Infrastructure Development Fund)-XIV has been started in 2008-09 for 4 years (2008-09 to 2011-12) by the Department of Agriculture, H.P and has been approved for Rs. 1,549.162 million .The project components include; Poly houses (framed structures), micro irrigation, (sprinkler/drip system), farm tanks with poly houses, shallow wells, shallow tube wells, deep tube wells, small lift, medium lift and pumping machinery with poly houses as per feasibility. The other project started for increasing the area under efficient methods of irrigation is 'Diversification of Agriculture through Micro-irrigation and Related Infrastructure (PDDKBSY/Part II)' was sanctioned for Rs. 1,980.885 million for three years i.e. 2009-10 to 2011-12. A new project on production of vegetables under protected cover (Dr. YS Parmar Kissan Swarojgar Yojna) has been started in 2013-14 by the Govt. of HP to promote cultivation of vegetables in the poly houses (on 85% subsidy) and to create water sources (on 50 % subsidy) individually or in groups. Besides these the DoA, HP is implementing State /Centrally sponsored schemes like Promotion of Organic farming , production of Off season vegetables, quality vegetable seeds, Ginger & Potato, National Mission on Agricultural Extension & Technology, Mission on Sustainable agriculture and Mass Media Support to Agriculture Extension for increasing the production and productivity of various agricultural crops. Summary of these projects/schemes is summarized in the figure below:



Note:

: Implementation period of the scheme

Source: DoA, Himachal Pradesh

Figure 2.2.1 Related Major Schemes for Promotion of Crop Diversification

Thanks to the challenge for crop diversification by these projects, area for vegetable cultivation in H.P. has increasing trend. Transition of vegetable cultivation in the State is shown in the tables below.

Table 2.2.1 Transition of Actual Area of Vegetables Production in Himachal Pradesh 2010-11 to 2014-15

(Unit : ha)

No.	District	2010-11	2011-12	2012-13	2013-14	2014-15
1	Bilaspur	2,430	2,535	2,565	2,693	2,932
2	Chamba	2,490	2,950	2,990	3,160	3,161
3	Hamirpur	2,890	3,100	3,178	3,606	3,794
4	Kangra	7,349	7,376	7,411	8,050	7,794
5	Kinnaur	3,383	3,453	3,485	3,494	3,499
6	Kullu	4,900	5,290	5,410	5,594	5,946
7	Lahaul &Spiti	4,128	4,164	4,155	4,213	4,186
8	Mandi	9,236	9,714	9,807	10,177	10,729
9	Shimla	11,153	11,986	12,177	12,636	12,659
10	Sirmaur	7,189	7,369	7,504	7,785	8,130
11	Solan	8,454	8,498	8,608	8,980	9,430
12	Una	1,473	1,533	1,575	1,613	1,634
	Total	65,075	67,968	68,865	72,001	73,894

Source) Statistical Office, DoA, H.P., 2015

Area and production by major vegetables in the State from 2012-13 to 2014-15 is also summarized in the table below

Table 2.2.2 Area and Production by Major Vegetables in Himachal Pradesh from 2012-13 to 2014-15

No	Major Vegetable	2012-13		2013-14		2014-15	
		Area (ha)	Production (ton)	Area (ha)	Production (ton)	Area (ha)	Production (ton)
1	Peas (green)	23,668	280,231	23,904	271,057	23,623	277,781
2	Tomato	9,930	413,709	10,373	430,789	10,800	475,965
3	Beans	3,436	40,879	3,749	46,372	3,760	47,203
4	Onion	2,268	39,362	2,338	43,706	2,439	46,257
5	Garlic	3,834	57,482	3,884	61,826	3,957	68,235
6	Cabbage	4,387	149,671	4,560	153,811	4,819	158,301
7	Cauliflower	4,351	101,710	4,526	100,071	5,191	117,012
8	Radish, Turnip, Carrot	2,261	46,919	2,542	51,410	2,769	57,349
9	Okra	2,522	30,344	2,756	34,028	2,838	35,847
10	Cucurbits	2,479	56,536	2,243	39,500	2,613	63,587
11	Capsicum, chilli	3,102	46,692	3,344	53,032	3,531	69,443
12	Brinjal (Eggplant)	1,088	23,518	1,160	26,682	1,187	27,166
13	Other vegetables	5,539	110,995	6,244	129,801	6,367	132,371
14	Total	68,865		72,001		73,894	

Source) Statistical Office, DoA, H.P., 2015

As shown in the above two tables, area under vegetables in H.P in 20010-11 was 65,075ha, further which has gone to 73,894ha in 2014-15. Area and production of major vegetables in the whole state of Himachal Pradesh showed increasing trend. Annual increase in total area over 2012-13 is round 4.5% in 2013-14, while 7% in 2014-15.

Meanwhile, area and Production of major vegetables in 5 districts of the State such as Bilaspur, Hamirupur, Kangra, Mandi, and Una also showed increasing trend but the rate of increase is law compared to the other districts as shown in the following tables.

Table 2.2.3 Area and Production of Major Vegetable in 5 Districts of Himachal Pradesh[1]

(1) Peas

No.	District	Cultivated Area (ha)			Production (ton)		
		2012-13	2013-14	2014-15	2012-13	2013-14	2014-15
1	Bilaspur	90	95	150	1,470	1,550	2,550
2	Hamirpur	165	165	170	1,192	1,200	1,240
3	Kangra	623	727	733	7,636	8,332	8,435
4	Mandi	3,479	3,602	3,690	49,679	45,052	48,988
5	Una	66	50	56	645	489	608
	Total	4,423	4,639	4,799	60,622	56,596	61,821

(2) Tomato

No.	District	Cultivated Area (ha)			Production (ton)		
		2012-13	2013-14	2014-15	2012-13	2013-14	2014-15
1	Bilaspur	780	730	790	2,9315	27,337	30,020
2	Hamirpur	105	118	125	4835	5,440	5,760
3	Kangra	416	475	450	15,426	19,125	18,538
4	Mandi	752	775	845	24,666	27,150	29,350
5	Una	114	114	117	3,966	3,966	4,172
	Total	2,167	2,212	2,327	78,208	83,018	87,840

(3) Okra

No.	District	Cultivated Area (ha)			Production (ton)		
		2012-13	2013-14	2014-15	2012-13	2013-14	2014-15
1	Bilaspur	210	210	285	4,210	3,660	5,130
2	Hamirpur	515	575	580	5,011	5,650	5,700
3	Kangra	858	902	850	9,801	11,267	11,305
4	Mandi	368	380	400	4,122	4,560	4,800
5	Una	80	90	98	1,073	1,207	1,334
	Total	2,031	2,157	2,213	24,217	26,344	28,269

(4) Cucurbits

No.	District	Cultivated Area (ha)			Production (ton)		
		2012-13	2013-14	2014-15	2012-13	2013-14	2014-15
1	Bilaspur	144	200	201	4,790	6,634	6,741
2	Hamirpur	408	410	410	7,519	7,585	7,590
3	Kangra	594	615	585	17,899	19,775	19,802
4	Mandi	302	317	350	5,436	7,133	7,300
5	Una	451	451	410	9,016	9,016	8,280
	Total	1,899	1,993	1,956	44,660	50,143	49,713

(5) Onion

No.	District	Cultivated Area (ha)			Production (ton)		
		2012-13	2013-14	2014-15	2012-13	2013-14	2014-15
1	Bilaspur	180	200	235	3,955	4,344	5,330
2	Hamirpur	260	280	280	4,522	5,040	5,040
3	Kangra	754	752	762	14,669	14,638	14,896
4	Mandi	459	477	509	6,335	9,540	10,428
5	Una	210	220	225	3,288	3,445	3,567
	Total	1,863	1,929	2,011	32,769	37,007	39,261

[1] *Source: Statistical Office, DoA, H.P., 2015*

(6) Cauliflower

No.	District	Cultivated Area (ha)			Production (ton)		
		2012-13	2013-14	2014-15	2012-13	2013-14	2014-15
1	Bilaspur	162	145	152	4,140	3,575	3,892
2	Hamirpur	238	280	280	3,753	4,450	4,450
3	Kangra	537	530	550	11,716	12,285	13,524
4	Mandi	686	720	780	22,461	15,900	16,770
5	Una	100	100	111	1,964	1,964	2,128
	Total	1,723	1,775	1,873	44,034	38,174	40,764

(7) Cabbage

No.	District	Cultivated Area (ha)			Production (ton)		
		2012-13	2013-14	2014-15	2012-13	2013-14	2014-15
1	Bilaspur	32	32	35	1,320	1,320	1,470
2	Hamirpur	105	55	60	1,560	820	895
3	Kangra	352	383	395	13,003	14,825	15,247
4	Mandi	949	990	1,045	30,702	28,750	29,500
5	Una	63	75	77	1,554	1,841	1,936
	Total	1,501	1,535	1,612	48,139	47,556	49,048

The TCP analyzed technological constraints of vegetable cultivation in 5 districts based on District Agriculture Plans (DAPs) prepared by DoA, which include plan for crop diversification.

An investigation of the yield reducing factors on the progressive and the average farm situations for cereals, pulses, oilseeds and vegetable crops revealed that the lack of technical know-how, non-availability of good quality inputs of seeds, plant protection materials, fertilizers etc., lack of irrigation and management of weeds in crops were the main factors for this gap. The poor yields of pulses and oilseeds in different districts were attributed to cultivation of these crops on the marginal lands. The imbalanced use of fertilizers was also stated to be one of the most important factors responsible for yield reduction in most of the crops. There was significant difference between the yields of progressive farmers and the average farmer of different districts despite the fact that both worked under similar set of situations with respect to climate, soil and infrastructural facilities. This suggested that the awareness of the average farmer about the latest technology be increased through proper trainings and demonstrations.

Technological constraints observed/encountered in major vegetables in the target District for the TCP are shown as follows:

Table 2.2.4 Technological Constraints for Major Vegetables

(1) Tomato

Major Constraints	Target Districts				
	Bilaspur	Hamirpur	Kangra	Mandi	Una
Improper spacing	∨	∨	-	-	-
Costly seed	∨	∨	-	∨	-
Pest and disease problems	∨	∨	∨	∨	-
Lack of irrigation	-	-	∨	∨	-
Poor marketing system and poor grading	-	-	∨	-	-

Source: District Agriculture Plan, Department of Agriculture, Himachal Pradesh, 2009

(2) Cauliflower

Major Constraints	Target Districts				
	Bilaspur	Hamirpur	Kangra	Mandi	Una
Poor pest and disease management	∨	∨	∨	∨	-
Imbalanced use of fertilizer	∨	∨	-	∨	-
Cultivation in small scale	∨	∨	-	-	-
Poor varieties	-	-	∨	∨	-

Source: District Agriculture Plan, Department of Agriculture, Himachal Pradesh, 2009

(3) Peas

Major Constraints	Target Districts				
	Bilaspur	Hamirpur	Kangra	Mandi	Una
Poor pest and disease management	∨	∨	∨	∨	-
Frost problem	∨	-	-	-	-
Imbalanced use of fertilizer	∨	-	-	-	-
Imbalanced use of fertilizer and lack of irrigation facilities		∨	∨	∨	-
White rot	-	∨	-	∨	-
Climatic condition	-	-	∨	-	-

Source: District Agriculture Plan, Department of Agriculture, Himachal Pradesh, 2009

(4) Capsicum

Major Constraints	Target Districts				
	Bilaspur	Hamirpur	Kangra	Mandi	Una
Flower drop	∨	∨	-	-	-
Frost problem	∨	-	-	-	-
Poor pest and disease management	∨	∨	-	-	-

Note: - : no data
Source: District Agriculture Plan, Department of Agriculture, Himachal Pradesh, 2009

Required interventions for these crops to tackle those problems are summarized in the following table:

Table 2.2.5 Major Interventions

Constraints	Major Intervention			
	Demonstration / Training program	Improvement of Infrastructure	Farm Inputs	System
Poor pest management	Proper pests control			
Poor disease management	Plant protection measures			
Lack of irrigation	Water management	Construction or rehabilitation of Irrigation facilities		
Climatic condition	Protected cultivation	Promotion of protected cultivation	Utilization of suitable varieties	
Poor varieties			Utilization of high yielding and quality cultivars	
Poor marketing system and poor grading				Organized marketing system and proper grading

Source: Based on District Agriculture Plan, Department of Agriculture, Himachal Pradesh, 2009

As described above, vegetable cultivation in the State has been conducted in the limited area as well as conditions, however it is concluded that there is some potentials on extension of cultivated area. Further it is expected that constraints mentioned above should be solved for promotion of crop diversification in the State. All of activities including trainings to core extension officers under the TCP were carried out with consideration of constraints and countermeasures mentioned above

2.2.2 PDCA Trainings

PDCA (Plan-Do-Check-Act) is a tool used for managing the project cycle during the implementation of the project, and it is effective in each stage of the project. During Phase-1, PDCA workshop for DoA staffs and PMU staffs of the ODA Loan Project was conducted as an introduction of this tool and for the purpose of capacity building of the officers on project planning.

From Phase-2 onwards, it was expected that the tool be used effectively for planning, strategy formulation and evaluation. On December 11, 2012, a workshop for PDCA training was carried out for PMU extension staff. In these training activities, importance of planning with PDCA cycle was explained. Further formats for planning and reporting were provided.

In Phase-3, we arranged PDCA-cycle training in September and October 2013, in order to inform core extension staff of importance and necessity of implementation of PDCA-cycle in their daily activities.

Training activities in Phases-1, 2, and 3 are summarized as follows:

Table 2.2.6 PDCA Cycle Training Activities for Core Extension Staff of PMU

Workshop on PDCA (April 17, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To familiarize extension staffs with PDCA cycle	● Workshop on PDCA (Plan-Do-Check-Act) cycle procedure ● How to use PDCA tool during implementation of the project	● Extension officers understood the implementation tool, PDCA cycle through lecture and mock training
Workshop on Experience Sharing of TCP on Institutional Development (December 11, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To share experiences of the TCP on PCDA cycle, and get some knowledge on planning with PDCA cycle	● Introduction to the PDCA cycle and planning an activity based on the PDCA cycle	● The Participants recognized the importance of PDCA, and practiced it while preparing the action plan for a given activity. ● Through the training materials and the references the participants were able to link up the workshop objective with their ongoing activities which resulted in developing better understanding and gaining valuable knowledge in regard to the ODA activities.
Training on PDCA Cycle (September 23 and 24, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To familiarize the extension officers about the concept of PDCA cycle for continuous improvement ● Impart participants an opportunity to get some practical knowledge on how to plan and execute (act) it to get high quality results	● Planning process covering exercise on process flow charts, 5-Why & 5W1H, paired comparison ● Doing or implementing process & exercise for continuous improvement ● Exercise on Do-Duties of extension officers	● Participants understood that PDCA cycle is useful in undertaking various project activities as well as daily routine work.
Training on PDCA Cycle (October 7, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To familiarize the EO about the concept of PDCA for continuous improvement. ● To impart practical knowledge on how to do Check (monitoring) .	● Project monitoring & evaluation.	● Participants could understand the concept and importance of PDCA cycle with special reference to ODA project. ● Application of different components with special reference to activities of ODA project. ● Exercises on different components helped the trainees to understand the relevance of monitoring & evaluation.

Source: JICA TCP Team

2.2.3 Facilitation in the Preparation of Annual Plan on Crop Diversification

The ODA Loan Project has two components that is construction of irrigation facilities and extension activities for farmers, focusing 210 candidate sub projects in 5 Districts. To harness the benefits of assured irrigation, the shift from food crops to vegetable cultivation has to be promoted in a phased manner keeping in view the resources available with the farmers and suitability of the area for the cultivation of these crops. In this context, The ODA Loan Project for the expansion of crop diversification has been implemented in close coordination with the TCP.

For the promotion of crop diversification in 210 sub projects of the ODA Loan Project in the field of extension, the two most important activities are (i) preparation of annual agriculture development plan (ADP), and (ii) preparation of annual extension training plan (ETP), as components of the Crop Diversification Plan (CDP). CDP is prepared in order to achieve appropriate extension activities in the sub-project area and monitoring of crop diversification. The PMU should prepare this CDP for all sub-projects by the completion of construction work. It is understood that the CDP needs to be revised whenever required[1]. The TCP conducted a series of activities to support PMU to prepare CDPs for sub-project area of the ODA Loan Project.

In Phase-2, basic information such as construction schedule, irrigable area by irrigation schemes, target crops and production, etc., was collected from PMU in the following table.

Table 2.2.7 Procedure for Formulation of Crop Diversification Plan (CDP) for the ODA Loan Area

Month	Activities	Remarks
March 2013	Arrangement of meetings: Purpose: Confirmation of implementation schedule of construction work	- Target: Core Extension Officer of PMU - Subjects in workshop to be confirmed ・ Construction schedule of irrigation facilities ・ Target area and production by priority schemes

Source: JICA TCP Team

Based on the basic information, the TCP prepared draft format of CDP for Bakroa Site of the ODA Loan Project. The TCP and PMU had discussion to finalize the format of CDP as an official document (refer to the Guidelines for the CDP Format). During the period from Phase 3 to Phase 4, the TCP supported the PMU, and assisted to formulate CDP as well as monitor and evaluate their work progress for promotion of crop diversification, considering the basic information obtained from a series of meetings with PMU offices (DPMUs and BPMUs). Especially, we arranged review workshops to discuss with core extension officers of BPMUs and DPMUs, in order to obtain feedback on preparation of CDP including ADP and ETP as well as implementation schedule for the execution of ADP, and enhance their capacity for preparation of CDP. As a result, we visited each BPMU four to five times (37 times in total).

As discussed above, CDP was prepared based on the concept of Plan-Do-Check-Act (PDCA) cycle. The adoption of PDCA cycle for the promotion of crop diversification will help in the identification and prioritization of farmers' needs, development components, indicators for monitoring, components of extension activities, etc. The TCP prepared a model procedure of activities for crop diversification for sub project of the ODA Loan Project based on PDCA cycle, which was included in CDP format. The model procedure of activities for crop diversification in a certain sub-project area under the ODA Loan Project applying PDCA cycle is shown in the following table.

[1] Refer to Updated Project Implementation Plan, October 2013, JICA ODA Loan Project

Table 2.2.8 Annual Procedure for Promotion of Crop Diversification in Sub-Project Areas

PDCA Cycle	Topics	Subjects	JICA ODA Loan Project	
			PMU	PMC
Plan	DPR Preparation	Survey / Investigation / Designing - Water availability - Farmers consent - Survey / Investigation - Designing - Cost estimation - Construction schedule - Feasibility, BC ratio - Annual maintenance cost for KVA	DPMU/ BPMU To be prepared by BPMU or outsource	Assistance & Approval
		Current situation by seasons - Cultivated area by crops - Unit yield by crops - Crop budget by crops		
		Proposed situation by seasons - Area to be cultivated by crops - Unit yield by crops - Crop budget by crops		
	Annual plan for agricultural development	Interest of farmers for vegetable farming	DPMU/ BPMU	Assistance
		Preferable crops by seasons		
		Annual increment - Area to be cultivated by seasons		
		- Unit yield by seasons		
		Current constraints and problems		
		Market rate		
		Marketing infrastructure		
	Annual plan for extension training of farmers	Training programs - Priority subjects - Timings & duration	BPMU	Assistance
		Demonstrations - Priority crops and subjects - Area and target yield by crops - Timing		
	Annual plan for monitoring and evaluation	Indicators - Crop status (area and production by crops) -Irrigation status (irrigation hours for LIS / TWIS, irrigation area for FIS) - Maintenance status (inspection, cleaning and repair) - KVA financial status (incomings / outgoings)	DPMU/ BPMU Community motivators	Assistance
		Tools - Monitoring sheet for crop cultivation (seasonal) - Monitoring sheet for securing the sustainability of irrigation project (Monthly)		
Do	Construction of irrigation facilities	Preparation of construction schedule	BPMU	Assistance
		Selection of contractor		
		Construction supervision		
	Training of farmers including demonstration activities	Preparation of Action Plan		
		Preparation of Evaluation Report		
	O&M of irrigation facilities by farmers	Field support to KVA		
	Vegetable cultivation in sub-project areas by farmers	Technical support for farmers		
		Following good crop management practices		
Check	Monitoring & Evaluation	Construction - Progress of construction work - Quality of material	DPMU/ BPMU	Assistance
		Agricultural status		
		Irrigation status		
		Maintenance status		
		KVA financial status		
Act	Reflection to the further plans	Construction - Modification of construction schedule	DPMU/ BPMU	Assistance
		Agricultural activities - Modification of the CDP(ADP& ETP) based on the result of the monitoring & evaluation		

Note) refer Part I of the Guidelines

Source) JICA TCP team

2.2.4 Development of Crop Diversification Guidelines

(1) Objectives of the Guidelines

The Himachal Pradesh Crop Diversification Promotion Project under JICA Loan for the expansion of Crop Diversification Model in the 5 districts of the State is under implementation in close coordination with the TCP. Experiences, training materials, manuals, etc. of the TCP were compiled as guidelines for promotion of crop diversification. The Guidelines are designed to support the implementation of crop diversification in the ODA Loan Project areas with 210 sub-project areas.

(2) Target Users

Main target users of these guidelines are core extension officers including both agricultural extension and engineering staff of PMU. Number of PMU staff as of the end of June 2015 was counted for 119 persons as shown in the following table:

Table 2.2.9 Summary of Target Users in PMU as of June 2015

Office	Core Extension Officers		
	Agricultural Extension Staff	Engineering Staff	Total
1. State PMU office	4	5	9
2. District PMU Hamirpur	4	5	9
2.1 Block PMU Hamirpur	5	7	12
2.2 Block PMU Bilaspur	4	7	11
2.3 Block PMU Una	3	7	10
3. District PMU Mandi	4	4	8
3.1 Block PMU Mandi	3	7	10
3.2 Block PMU Sarkaghat	4	7	11
4. District PMU Palampur	4	5	9
4.1 Block PMU Dehra	3	7	10
4.2 Block PMU Nurpur	3	6	9
4.3 Block PMU Baijinath	4	7	11
Total	45	74	119

Source: State PMU, Hamirpur, June 2015

These Guidelines include necessary information and knowledge for implementation of training activities for extension officers as well as farmers in promotion of crop diversification under ODA Loan Project, e.g. implementation process, technical subjects and the know-how, training curriculum and materials, useful formats, lessons learned from pilot project, good practices of crop diversification in H.P.

These guidelines consist of 2 parts, which is 1) PART-I on text part of guidelines and 2) PART-II on manuals, forms, and standards. Especially, in PART-I, there are 3 components that is thematic guidelines for extension officers, lessoned learned, and training curriculums for farmers. Outline of the guidelines are shown as follows:

Table 2.2.10 Outline of the Guidelines

Contents	Essential Contents in Each Chapter
PART I GUIDELINES	
CHAPTER 1 GENERAL GUIDELINES 1.1 Background 1.2 Outline of the Guidelines 1.3 Overview of Crop Diversification in the State of Himachal Pradesh 1.4 Model Procedures for Promotion of Crop Diversification 1.5 Activities for Crop Diversification to Farmers	- Outline, objectives, target users are mentioned in this chapter - Overall procedure and necessary activities by extension officers and engineers for promotion of crop diversification is described
CHAPTER 2 THEMATIC GUIDELINES 2.1 Agricultural Extension 2.2 Infrastructure Development 2.3 Water Management and Operation & Maintenance 2.4 Vegetable Cultivation and Post-harvest 2.5 Self Help Group (SHG) Development 2.6 Marketing	- This chapter describes mainly the process of crop diversification in each technical field namely 1) Agriculture Extension, 2) Infrastructure Development, 3) Water Management and Operation &Maintenance, 4) Vegetable Cultivation and Post-harvest, 5) Self Help Group (SHG) Development and 6) Marketing. - In each section, related manuals in Part-II are referred.
CHAPTER 3 TRAINING CURRICULUMS 3.1 Outline of Training Curriculums 3.2 Training Curriculums for Crop Diversification	- Training curriculums for farmers for crop diversification are summarized in this chapter. - It is expected that these curriculums shall be utilized under The ODA Loan Project with some modification depending on situation of each sub project area.
CHAPTER 4 LESSONS LEARNED 4.1 Outline of the Pilot Activities 4.2 Infrastructure Development 4.3 Water Management and Operation & Maintenance 4.4 Vegetable Cultivation and Post-harvest 4.5 Self Help Group (SHG) Development 4.6 Marketing	- Experiences of TCP which were obtained through pilot activities are summarized in this chapter - These experiences are expected to be referred by The ODA Loan project for better implementation of the project.
CHAPTER 5 VALUE ADDED SUBJECTS	- Some value added subjects transferred to the PMU, in order to effectively conduct training of farmers, and promote crop diversification under The ODA loan
PART II MANUALS / FORMS/ STANDARDS	
II-1 Agricultural Extension II-2 Infrastructure Développent II-3 Water Management and Operation & Maintenance II-4 Vegetable Cultivation and Post-harvest II-5 Self Help Group Development /Gender II-6 Marketing	- Manuals, forms, standards, etc., which are prepared and utilized for training of the extension officers and farmers are included.

Source: JICA TCP Team

(3) Preparation of the Guidelines

In August 2014 in Phase-4, Guidelines ver.1.0 with PART-I as well as PART-II was released, and delivered to PMU. The Guidelines were utilized for training of farmers as well as extension activities in the sub-projects. Furthermore, the TCP team collected feedbacks of the Guidelines from PMU after trial usage. In February 2015, Guidelines ver.2.0 was prepared and delivered to PMU with some improvement based on the feedbacks from PMU. Continuously monthly feedback for the Guidelines was collected from PMU, and the Guidelines ver.3.0 as the final version was prepared and submitted to PMU and DoA in September 2015. The TCP team also held a workshop for introducing the Guidelines ver.3 to Officers of both PMU and DoA on September 28, 2015 with about 65 participants. The officers agreed to utilize and update the Guidelines continuously after completion of the TCP.

2.3 Activities for Output 2

2.3.1 Formulation of Annual Plan on Extension Training

Major target for extension training in JICA TCP was core extension staff of PMU. Meanwhile, DoA extension staff of 5 Districts was also trained by JICA TCP. Regarding training activities for the district extension staff of DoA, we have tried to avoided any duplication of training subject with training programs which were formulated by DoA. Furthermore, we also have arranged some training program for extension staff of 7 Districts.

Annual plan on extension training to be conducted by JICA TCP in Phase-3 was prepared according to the procedure shown in the following table, based on needs and requirement obtained from PMU as well as each District.

Table 2.3.1 Procedure for Formulation of Annual Extension Training Plan in Phase-3

No.	Date	Activities	Remarks
1.	June, 8 2013	Arrangement of a workshop: Purpose: -Confirmation of additional training programs for extension staff in 5 Districts	- Target: Senior staff (SMS, SDSCO, etc.) from 4 Districts (Hamirpur, Kangra, Bilaspur, Una) - Subjects in workshop to be confirmed ・Lessons learnt from the extension activities ・Training subjects to be required for extension officers ・Priority subjects for training activities ・Tentative proposed training schedule
2.	June 14, 2013	Arrangement of a workshop: Purpose: -Confirmation of training subjects for core extension officers	- Target: Core Extension Officers of PMU - Subjects in workshop to be confirmed ・Training subjects to be required for core extension officers of SPMU as well as 3 DPMUs with BPMUs ・Priority subjects for training activities ・Tentative proposed training schedule
3.	July 6, 2013	Arrangement of a workshop: Purpose: -Confirmation of additional training programs for extension staff in 7 Districts	- Target: Senior staff (SMS, SDSCO, etc.) from 7 Districts (Shimla, Kinnaur, Solan, Chamba, Sirmaur, Kullu, and Mandi) - Subjects in workshop to be confirmed ・Lessons learnt from the extension activities ・Training subjects to be required for extension officers ・Priority subjects for training activities ・Tentative proposed training schedule
4.	June 2013	Preparation of Overall Extension Training Schedule	- Target : ・ Core Extension Officer in PMU (1st priority) ・ Extension officer in 5 Districts (2nd priority) ・Extension officer in 7 Districts (3rd priority)
5	July 2013	Formulation of Work Plan Phase-3	- Approved in 5th JCC meeting (July 11, 2013)

Source: JICA TCP Team

Further needs and requirement from PMU and DoA for training programs to be carried out in Phase-4 were collected through workshops in February and March 2014, and hence annual plan on extension training to be conducted by JICA TCP in Phase-4 was finalized at the initial stage of Phase-4, based on the collected needs and requirements as well as additional needs from the PMU and DoA as shown in the following table.

Table 2.3.2 Procedure for Formulation of Annual Extension Training Plan in Phase-4

No.	Date	Activities	Remarks
1.	February 7, 2014	Workshop with Extension staff of 6 Districts(Shimla, Kinnaur, Solan, Chamba, Sirmaur, Kullu) - Target: Extension staff (DAO, SMS, SDSCO, etc.)	- Subjects in workshop to be confirmed ・Constraints and countermeasures in the extension activities ・Training subjects to be required for extension officers
2.	February 19, 2014	Workshop with Extension staff of DPMU Hamirpur and BPMUs Hamirpur, Bilaspur, and Una - Target: Core extension officers including engineering staff	- Subjects in workshop to be confirmed ・Constraints and countermeasures in the extension activities ・Training subjects to be required for extension officers
3.	February 22, 2014	Workshop with Extension staff of 5 Districts (Hamirpur, Kangra, Mandi, Bilaspur, Una) - Target: Extension staff (DAO, SMS, SDSCO, etc.)	- Subjects in workshop to be confirmed ・Constraints and countermeasures in the extension activities ・Training subjects to be required for extension officers
4.	February 26, 2014	Workshop with Extension staff of DPMU Kangra and BPMUs Dehra, Nurpur, and Baijnath - Target: Core extension officers including engineering staff	- Subjects in workshop to be confirmed ・Constraints and countermeasures in the extension activities ・Training subjects to be required for extension officers
5.	March 7, 2014	Workshop with Extension staff of DPMU Mandi and BPMUs Mandi, and Sarkaghat - Target: Core extension officers including engineering staff	- Subjects in workshop to be confirmed ・Constraints and countermeasures in the extension activities ・Training subjects to be required for extension officers
6.	May 2014	Preparation of overall Extension Training Schedule	- Target : ・ Core Extension Officer in PMU (1st priority) ・ Extension officer in 5 Districts (2nd priority) ・Extension officer in 7 Districts (3rd priority)
7	June, 2014	Formulation of Work Plan Phase-4	- Approved in 7th JCC meeting

Source: JICA TCP Team

2.3.2 Development of Training Curriculum and Materials

The TCP developed training curriculums and materials in related subjects, namely 1) Water management and O&M, 2) Vegetable farming and post-harvest, 3) Gender & social inclusion and 4) Marketing for crop diversification in the State. These curriculums and materials are expected to be utilized under the ODA Loan Project when core extension officers provide trainings to farmers. The TCP team first has reviewed the existing training curriculums and materials utilized by related agencies such as Universities, Farmers Training Center (FTC), KVK, SAMETI etc. Based on the review results and experiences in pilot area (Lahalri), the TCP team modified and newly developed suitable training curriculum and materials.

Training curriculums developed by the TCP are summarized as follows:

Table 2.3.3 Training Curriculums Proposed by the TCP

No	Training Curriculum	Target	Contents	Training Method
1. Water management and O&M				
WM-1	Water Management by Water Users' Association (WUA)	Management Committee (MC) Member, Community Motivator, Farmers	➢ Organization of WUA and its establishment ➢ Activities of WUA ➢ O&M cost/Water Tariff ➢ Record Management ➢ Public Support	Lecture
WM-2	Establishment of WUA	MC member, Community Motivator	➢ Formation and registration of WUA ➢ Rules and Regulations of WUA ➢ Registration process in Lahalri Pilot Project	Lecture
WM-3	Water Distribution	MC member, Community Motivator, Farmers	➢ Rule and Principle of Water Distribution ➢ Water Distribution Method ➢ Timing and Quantity of Irrigation ➢ Water Distribution in Lahalri Pilot Project	Lecture
WM-4	Operation of Irrigation Facilities	MC member, Community Motivator	➢ Outline of Operating Irrigation Facilities ➢ Pump Operation ➢ Operation of Water Distribution ➢ Operation of Irrigation Facilities in Lahalri Pilot Project	Lecture and Hands-on
WM-5	Maintenance of Irrigation Facilities	MC member, Community Motivator	➢ Needs of Maintenance and Methods of Inspection ➢ Daily & Periodical Inspection and Maintenance ➢ Trouble shooting ➢ Keeping of Maintenance Records ➢ Cleaning of Storage Tank	Lecture and Hands-on
WM-6	Leadership Development	MC member, Community Motivator	➢ Importance of leadership ➢ Types of Leaders ➢ 5Cs in leadership ➢ Qualities of leader ➢ Leadership styles	Lecture
WM-7	Conflict Management	MC member, Community Motivator	➢ Definition of conflict ➢ Principle of conflict ➢ Types of people ➢ Causes of conflict ➢ Preventing conflict	Lecture
WM-8	Sprinkler Irrigation	Farmers	➢ Types of sprinkler Irrigation system ➢ Capacity of the system, Components of sprinkler irrigation system ➢ Sprinkler design, Irrigation Interval, System layout, Application rate, Nozzle discharge, Size of laterals, Pressure in the laterals, Optimum water application rate ➢ Advantages & disadvantages of sprinkler Irrigation	Lecture
WM-9	Drip Irrigation	Farmers	➢ Components and Types of Drip irrigation systems ➢ Design of Drip Irrigation ➢ Fertigation through drip irrigation system ➢ Control of clogging ➢ Advantages & disadvantages of Drip Irrigation	Lecture

2. Farming and Post-harvest				
FM-1	Cropping pattern arrangement	Farmers and PMU staffs	➢ Existing cropping pattern, soil and climate condition, cropping pattern arrangement	Lecture and PPT
FM-2	Farm management	Farmers and PMU staffs	➢ Record keeping, budget making, planning and result analysis	Lecture and Hands-on
FM-3	Land preparation and sanitation	Farmers and PMU staffs	➢ Field clearance, soil sanitation, tilling, and application of basal fertilizer	Lecture and Hands-on
FM-4	Nursery production	Farmers and PMU staffs	➢ Bed nursery, tray nursery, clay block nursery, pot and plug tray nursery	Lecture, PPT and Hands-on
FM-5	Cultivation techniques for kharif vegetables	Farmers and PMU staffs	➢ Fruit vegetables, root vegetables and leafy vegetables and condiments cultivation	Lecture, PPT and Hands-on
FM-6	Cultivation techniques for kharif cereals	Farmers and PMU staffs	➢ Maize and rice cultivation	Lecture, PPT and Hands-on
FM-7	Harvest and post harvest of kharif crops	Farmers and PMU staffs	➢ Right stage of harvesting, grading standard and right procedure of packing of kharif crops	Lecture, PPT and Hands-on
FM-8	Cultivation techniques for rabi vegetables	Farmers and PMU staffs	➢ Fruit (flower) vegetables, root vegetables and leafy vegetables and condiments cultivation	Lecture, PPT and Hands-on
FM-9	Cultivation techniques for rabi cereal	Farmers and PMU staffs	➢ Wheat cultivation	Lecture, PPT and Hand-on
FM-10	Harvest and post harvest of rabi crops	Farmers and PMU staffs	➢ Right stage of harvesting, grading standard and right procedure of packing of rabi crops	Lecture, PPT and Hands-on
FM-11	Protected cultivation	Farmers and PMU staffs	➢ Poly-house, mist, tube and drip irrigation, use of water soluble fertilizer, pest and disease control, use of shade net, use of insect net and use of poly-mulch	Lecture, PPT and Hands-on
FM-12	IPM	Farmers and PMU staffs	➢ Pest and disease control	Lecture, PPT and Hands-on
FM-13	Safe use of agro-chemicals	Farmers and PMU staffs	➢ Adequate and safe use of agro-chemicals	Lecture, PPT and Hands-on
FM-14	Organic farming	Farmers and PMU staffs	➢ Organic fertilizer production including vermin-compost, organic liquid fertilizer production, organic insecticide and pesticide	Lecture, PPT and Hands-on
FM-15	Exposure visit	Farmers	➢ Exposure visit to advanced area	Visit and Discussion
FM-16	Maize cultivation	Farmers	➢ How to improve maize cultivation	Lecture, PPT and hands-on
FM-17	Exotic and off-season vegetables	PMU staffs	➢ Basic knowledge and cultivation techniques of exotic and off-season vegetables and their marketing strategy in Mandi district	Lecture, PPT and discussion
FM-18	Exotic and off-season vegetables	PMU staffs	➢ Basic knowledge and cultivation techniques of exotic and off-season vegetables and their marketing strategy in Kangra district	Lecture, PPT and discussion
FM-19	Exotic and off-season vegetables	PMU staffs	➢ Basic knowledge and cultivation techniques of exotic and off-season vegetables and their marketing strategy in Hamirpur	Lecture, PPT and discussion
FM-20	Exotic and off-season vegetables	PMU staffs	➢ Basic knowledge and cultivation techniques of exotic and off-season vegetables and their marketing strategy in Bilaspur	Lecture, PPT and discussion
FM-21	Exotic and off-season vegetables	PMU staffs	➢ Basic knowledge and cultivation techniques of exotic and off-season vegetables and their marketing strategy in Una	Lecture, PPT and discussion

FM-22	Exotic and off-season vegetables	Farmers	➢ Basic knowledge and cultivation techniques of exotic and off-season vegetables and their marketing strategy in Lahalri	Lecture, PPT and discussion
FM-23	Protected cultivation	Extension staffs of DoA	➢ Skills and knowledge improvement of vegetable cultivation in protected condition	Lecture, PPT and discussion
FM-24	Harvest, post-harvest & seed preservation	PMU staffs	➢ Basic techniques of harvest, post harvest and seed preservation at field level in Mandi	Lecture, PPT and discussion
FM-25	Harvest, post-harvest & seed preservation	PMU staffs	➢ Basic techniques of harvest, post harvest and seed preservation at field level in Una	Lecture, PPT and discussion
FM-26	Vegetable promotion	PMU staffs & Children	➢ To promote consumption of vegetables, workshop (child play, PPT, cooking demonstration) was organized in KV school	Workshop and demonstration
FM-27	Exposure visit	PMU staffs	➢ Exposure visit to PAU Ludhiana and nearby area	Visit, lecture and interaction
FM-28	Harvest, post-harvest & seed preservation	PMU staffs	➢ Basic techniques of harvest, post harvest and seed preservation at field level in Hamirpur	Lecture, PPT and discussion
FM-29	Harvest, post-harvest & seed preservation	PMU staffs	➢ Basic techniques of harvest, post harvest and seed preservation at field level in Bilaspur	Lecture, PPT and discussion
FM-30	Harvest, post-harvest & seed preservation	PMU staffs	➢ Basic techniques of harvest, post harvest and seed preservation at field level in Kangra	Lecture, PPT and discussion
FM-31	Sensitization on vegetables	Women's group	➢ To get better understanding of more use of vegetables and to promote vegetable consumption, one workshop was organized for women	Workshop and demonstration
FM-32	Protected cultivation	PMU staffs	➢ Basic skills and knowledge of protected cultivation	Lecture, PPT and hands-on
FM-33	Implementation schedule	PMU staffs	➢ How to make crop schedule ➢ Activities to be included in implementation schedule ➢ How to implement practical schedule in each site	Lecture, PPT and practical exercise, presentation
FM-34	Implementation schedule	PMU staffs	➢ How to make crop schedule ➢ Activities to be included in implementation schedule ➢ How to implement practical schedule in each site	Lecture, PPT and practical exercise, presentation
FM-35	Implementation schedule	PMU staffs	➢ How to make crop schedule ➢ Activities to be included in implementation schedule ➢ How to implement practical schedule in each site	Lecture, PPT and practical exercise, presentation
FM-36	Improved techniques for exotic and off-season vegetable cultivation	Extension staffs of DoA from other 7 Districts	➢ Introduction of new techniques for off season and exotic vegetable cultivation ➢ Familiarization with new techniques (cutting and grafting) for multiplication of vegetables ➢ Pre and post-harvest techniques for quality improvement to increase competency ➢ Familiarization with promotion of exotic vegetables consumption in local market	Lecture, PPT, demonstration and hands-on training

3. Gender and Social Inclusion				
GD-1	Orientation and preparation workshop for SHG	Farmers and existing SHGs of the area	➢ Introduction of the project outline ➢ Formation/selection of SHGs for project support ➢ Motivation raising for implementing group activities ➢ Guidance on establishment of basic functions of SHGs	Lecture
GD-2	Training of SHG on credit management	SHG members	➢ Setting rules on inter-loaning ➢ Principals and practice of saving record ➢ Principals and practice of loan record	Lecture and Hands-on
GD-3	Training on book keeping / training of office bearers of SHG on book-keeping and accounts	SHG members SHG officials	➢ Introduction of accounting and bookkeeping ➢ Presentation on importance of accounting and maintenance of bookkeeping ➢ Practical session of cashbook entry	Lecture and Hands-on
GD-4	Training of Women members on leadership, communication, participation etc.	SHG members / Women members of GMKVA	➢ Planning activities and organising their work and responsibility ➢ Conflict management ➢ Budgeting and monitoring of their cash flow	Lecture and Hands-on
GD-5	Training of - organic fertilizer - seedling raising - food processing	SHG members	➢ Introduction of the concerned activity ➢ Lecture on the basic knowledge regarding the activity ➢ Practical session for the activity of their choice ➢ Way forward to implement the activity in their group	Lecture and Hands-on
GD-6	Training of budget making and monitoring for SHG	SHG members	➢ Introduction of the concept of value addition ➢ Different ways of value addition - Packaging, - Processing - Extra ingredients, taste and nutrition	Lecture and Hands-on
GD-7	Workshop of SHG members on Promotion and management of business micro enterprises	SHG members	➢ Developing business strategy with possible market ➢ Pricing of the products ➢ Record keeping in sales management	Lecture and Hands-on
4. Marketing				
MK-1	Basic information of marketing system/issues	All farmers	➢ Calculation of cost of cultivation of vegetable crops ➢ Importance of grading and packing in marketing of vegetables ➢ Information on marketing of produce and conventions in APMCs ➢ Price-trends based on monthly-average prices from APMCs ➢ Demonstration of grading/packing skills	Lecture and Hands-on
MK-2	Advanced concept for better marketing	Selected farmers	➢ Quality Control Standards in Vegetables ➢ Primary Processing and Value Addition ➢ Organic Certification Process ➢ Marketing Intelligence and Market Information Systems ➢ Basic methods of processing and value addition	Lecture
MK-3	Introduction of group marketing	All farmers	➢ Advantages and constraints of group marketing. ➢ Models (Cooperative/Society/Farmer Clubs etc.) modalities of group marketing ➢ Visit to Organization undertaking group marketing ➢ Brand building and quality control under group marketing	Lecture and Exposure Visit

Source: JICA TCP Team

For both core extension officers and farmers, the TCP prepared various training materials for each subject. Training materials developed by the TCP are summarized below.

Table 2.3.4 Training Materials Developed by the TCP

No	Name of Material	Target User	Description/Contents	Language
1. Water Management and O&M				
1.	Guidelines for Water Management by Water Users' Association	Management Committee (MC) Member, Community Motivator, Farmers, PMU officers	➢ Organization of WUA and its establishment ➢ Activities of WUA ➢ O&M cost/Water Tariff ➢ Public Support	English Hindi
2.	Guidelines for Water Distribution	MC member, Community Motivator, Farmers, PMU officers	➢ Rule and Principle of Water Distribution ➢ Water Distribution Method ➢ Timing and Quantity of Irrigation ➢ Water Distribution in Lahalri Pilot Project	English Hindi
3.	Guidelines for Operation of Irrigation Facilities	MC member, Community Motivator, PMU officers	➢ Outline of Operating Irrigation Facilities ➢ Pump Operation ➢ Operation of Water Distribution ➢ Operation of Irrigation Facilities in Lahalri Pilot Project	English Hindi
4.	Guidelines for Maintenance of Irrigation Facilities	MC member, Community Motivator, PMU officers	➢ Needs of Maintenance and Methods of Inspection ➢ Daily & Periodical Inspection and Maintenance ➢ Trouble shooting ➢ Keeping of Maintenance Records ➢ Cleaning of Storage Tank	English Hindi
2. Farming and Post-harvest				
1.	Training modules on farming and post harvest	PMU extension officers	➢ This is the guide for PMU officers how to conduct training towards farmers who need the help for farming and post harvest activities in sub pilot areas.	English & Hindi
2.	Technical manual on farm management	Farmers and PMU officers	➢ This technical manual covers record keeping, budget making, monitoring and result analysis ➢ To make farmers understand how to make an economic plan (budget) and check healthier farm management through monitoring. ➢ After closing the record, farmers can understand what their actual profit is and reflect the result to next plan.	English & Hindi
3.	Technical manual on field preparation techniques	Farmers and PMU officers	➢ This technical manual covers field clearance and soil sanitation, tilling, application of basal manure and bed making. ➢ In 5 districts, farmers apply not well matured backyard manure as a basal fertilizer in conventional practice. It sometimes damage crops. In addition, during kharif season, farmers suffer from soil-derived disease. This manual provides knowledge and techniques of soil sanitation to prevent such disease.	English & Hindi

No	Name of Material	Target User	Description/Contents	Language
4,	Technical manual on nursery production	Farmers and PMU officers	➢ This technical manual covers the techniques to produce nursery by 5 methods (nursery bed, clay block, tray, plug tray and pot). ➢ Production of nursery is not only for preparation of production but also for one option to income generation.	English & Hindi
5.	Technical manuals on vegetable cultivation	Farmers and PMU officers	➢ These manuals consist of 11 booklets for specific crops namely; Tomato, Capsicum, Brinjal, Potato, Gourd family (cucumber, bottle gourd, bitter gourd), Okra, Peas and French bean, Cole vegetables (cauliflower, broccoli and cabbage), Leafy vegetables (leaf lettuce, spinach and sarson) including direct sowing, Root vegetables (onion, garlic, ginger, turmeric, colocasia(taros), radish, carrot, turnip and elephant foot yam) including direct sowing, Condiments (fenugreek, coriander, tulsi) ➢ These manuals include pictures and illustrations for the help of understanding for farmers. Hints and tips in red letter are provided for extension staffs to understand the techniques deeply and to guide farmers practically.	English & Hindi
6.	Technical manual on cultivation techniques of cereals	Farmers and PMU officers	➢ To promote crop diversification, conversion from cereals to vegetables is indispensable. In this manual, there are hints to guide farmers to increase the harvest of cereals. ➢ This manual covers maize, rice and wheat cultivation.	English & Hindi
7.	Technical manual on water and fertilizer application	Farmers and PMU officers	➢ To increase the harvest, effective use of water and fertilizer are essential. This manual provides techniques to guide farmers in right way.	English & Hindi
8.	Technical manual on integrated pest management	Farmers and PMU officers	➢ As a State policy, organic farming is promoted. To control disease and insects, integrated pest management is one of the options to reduce the use of insecticide.	English & Hindi
9.	Technical manual on safe use of agro-chemicals	Farmers and PMU officers	➢ As a special care taking for environment including human being, safe use of agro-chemical is important strategy. In this manual, practical techniques and knowledge to reduce the risk of farmers and of environment are provided.	English & Hindi
10.	Technical manual on protected cultivation	Farmers and PMU officers	➢ To promote crop diversification, one important option is production of off season vegetables in protected condition. ➢ This manual guides farmers how to use poly-house, in addition, to use other materials such as shade net, insect net and poly-mulch.	English &Hindi
11.	Technical manual on organic farming	Farmers and PMU officers	➢ This manual provides knowledge and techniques to produce organic manure including vermicompost, organic liquid fertilizer and organic insecticide and fungicide.	English & Hindi
12.	Technical manual on cropping pattern arrangement	Farmers and PMU officers	➢ This manual provides important information to decide when and where farmers sow the seed.	English & Hindi

No	Name of Material	Target User	Description/Contents	Language
13.	Technical manual on post harvest techniques	Farmers and PMU officers	➢ This manual provides the knowledge and techniques from harvesting to shipping such as Collection, Washing, Sorting and selection, Grading, Storing and Packaging and Shipping.	English & Hindi
14	Technical manual on exotic & off-season vegetables cultivation	Farmers and PMU officers	➢ These manuals consist of 12 booklets for specific crops namely; ➢ Tomato (protected), Capsicum (protected), Cucumber (protected), Asparagus, Celery, Snap Peas, Swiss Chard, Brussels, Chicory (coloured lettuce), Musk Melon (open & protected) and Faba (Broad) Beans ➢ These manuals include pictures for the help of understanding for farmers. Hints and tips in red letter are provided for extension staffs to understand the techniques deeply and to guide farmers practically.	English
3. Gender and Social Inclusion				
1.	Training modules on SHG Development and Support	PMU extension officers	Training modules and facilitation materials to guide what kind of training can be conducted and tips for facilitating the trainings to support SHG activities. Training materials include PPT to be used for training of SHG members, and handouts for training participants of SHGs.	Main module in English, Training materials in Hindi
2.	Handbook for the Community Motivators on SHG support	Community Motivators	Manual for the community motivators to refer when they support SHG activities in field to assist intervention by the extension officers, ➢ Roles of community motivators in SHG support ➢ Supporting accounting and record keeping	English and Hindi
3.	Teaching materials for cashbook keeping	PMU extension officers and SHG	Reference and teaching materials that includes power point presentation for PMU officers to conduct accounting training for SHG, poster type teaching materials, exercise materials for participants, and handout for SHG members to refer after training.	English and Hindi
4.	Teaching materials for credit management (inter-loaning)	PMU officers and SHGs	Reference and teaching materials of inter-loaning that include power point presentation(ref No.1) for PMU officers to conduct accounting training for SHG, poster type teaching materials, exercise materials for participants, and handout for SHG members to refer after training.	English and Hindi
5.	Booklet for Food processing by SHGs	PMU officers and SHGs	Recipes of processing food using vegetable with value addition especially with nutritional value. Brief reference for storage, packaging and marketing for SHG activity	English and Hindi

4. Marketing				
1.	Marketing Survey Report	PMU Officers	Marketing Survey report provides important information regarding agricultural marketing system in H.P. ➢ Background of Market Supply of Vegetables ➢ Organization and Institution for Agricultural Marketing ➢ Distribution System and Infrastructure ➢ Market Yard ➢ Arrival Quantity and Wholesale Prices of Vegetables ➢ Profitability of Major Crops	English
2.	Agricultural Marketing Handbook	PMU Officers Farmers	Marketing handbook is prepared for farmers to overview the necessary information regarding marketing issues at glance. ➢ Outline of market channels in H.P. ➢ Cost and benefit ➢ Price trends of agro-products ➢ Grading/packing practices ➢ Quality control standards ➢ Group marketing etc.	English Hindi

Source: JICA TCP Team

2.4 Activities for Output 3

2.4.1 Trainings to Core Extension Officers

(1) Water Management and O&M

In phase-1, the TCP provided trainings mainly related to Water Users' Association (WUA) to let extension officers aware of method of establishment of WUA through workshop and on the job training.

In Phase-2, the trainings were conducted by employing external resource persons (university professors) based on the requirement of the counterparts. The TCP paid attention especially to the following items in discussion with the resource persons.

- The TCP arranged the trainings such that the resource persons provide training materials on each training subject discussed.
- The final targets of the trainings are the farmers even for the trainings conducted to the extension officers, and therefore it was emphasized to prepare the easy-to-understandable trainings and training materials.

From the experience of phase-2, it was found that resource person could provide enough level of lecture for theoretical part but they don't have practical knowledge for activities of Water Users' Association. Therefore trainings were provided not only by the resource persons, but also by the TCP based on lessons learned from Lahalri Pilot Area in Phase-3.

Regarding Phase-4, trainings were conducted focusing the sustainability of irrigation project / KVA in PMU. Specifically, records to be kept by KVA are placed as essential information related to the sustainability, and trainings were conducted for (1) records to be kept by KVA and (2) importance of monitoring their records by extension officers in a monthly base. In 8 sub-projects out of 210 sub-projects, visits to KVA for records keeping were directly conducted by JICA TCP with PMU extension officers and it is expected to have a ripple effect to the other sub-projects. Outline of trainings to core extension officers conducted during the project period in the field of water management and O&M are summarized below.

Table 2.4.1 Outline of Trainings to Core Extension Officers in Water Management and O&M

Subject category		Phase 1	Phase 2	Phase 3	Phase 4
Basic theory	Awareness campaign	⇨			
	Institutional development		⇨	⇨	
	Agricultural engineering		⇨	⇨	
Activities of KVA	Water distribution & water tariff			⇨	⇨
	Operation of irrigation facilities			⇨	⇨
	Maintenance of irrigation facilities			⇨	⇨
Strengthening the sustainability	Records keeping & monitoring				⇨

Source: JICA TCP Team

Details of trainings to core extension officers in water management and O&M were shown in the following table.

Table 2.4.2 Trainings to Core Extension Officers in Water Management and O&M

Phase-1		
Training Workshop on Community Participation in Development (August 26-27, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To increase the awareness of TCP and ODA Loan Project ● To develop the clarity on working in Project mode ● To discuss the role of the community participation in the implementation of the project.	● Introduction of ODA Loan Project ● Discussion on the difference between working in project mode and working in the departmental schemes ● Formation and Registration of Farmers' Association & Rules and Regulations of Water Users' Association (WUA) ● Factors Influencing the Sustainability of the Farmers' Association ● Training Needs Assessment	● Participants understood the relation between ODA loan project and TCP. ● Participants were aware of the importance of community participation. ● Participants understood the forming WUA
On the Job training to Core Extension Officers (In the latter period of Phase-1)		
Objectives	**Subject Covered**	**Outputs/results**
● To get the knowledge related to WUA through on the job training.	● Planning on awareness campaign for the ODA sub-project areas regarding the project activities ● Discussion on rules and regulation in relation to specific sites ● Practical training to form the WUA in the village ● Practical training to BPM Bilaspur to develop the IEC (Information Education and Communication) materials	● Participants understood roles and responsibilities of the core extension officers and the farmers. ● The site specific minor changes in the rules and regulation were made in consultation with the PMU core extension officers. ● The WUA was formed in one priority site Bakroa as a training to the ODA to develop the capacity of the core extension officers for the formation of the WUA. ● IEC materials were developed and distributed.
Phase-2		
Exposure Visit of Extension Officers of PMU to Pilot Project Site Lahalri (Dec 12, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To make them familiar on the Block rotation system followed by GMKVA for water distribution. ● To explain on the lock system to prevent the illegal use of water. ● To explain on the operation of pump and other facilities	● Three block system and the markings in the outlets and other tanks. ● Chains and lock system ● Irrigated plots in the pilot area ● Crop diversification by some farmers was shown to the visitors. ● Interaction with president GMKVA, pump operator, water distribution coordinator, president of SHG and the visitors.	● PMU officers understood the management of irrigation system including the block rotation system ● PMU officers recognized the importance of GMKVA participation in the project. ● PMU officers understood the activities of SHG from the SHG president.

Training on Soil Conservation and Water Management (February 15, and 16, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● The main objective of the training is the capacity development of PMU officers and DoA officers on Soil Conservation and Water Management Practices which are adapted for the planning and implementation of irrigation projects.	● Design and evaluation of irrigation systems including micro irrigation ● Crop water budgeting and irrigation scheduling ● Methods for estimating crop water requirements ● Conservation of soil moisture and rain water harvesting ● Types of soil erosion and control measures (vegetative & structural) ● CROPWAT: Stepwise methodology for calculation of crop water requirements ● Prospects, uses and importance of various farm equipment for conservation agriculture	● The major output of the training is that the PMU officers and DoA officers were trained and understood the soil conservation and water management practices which are adapted for the planning and implementation of irrigation projects.
Training on Institutional Aspects related to Water management and O&M (March 1, and 2, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● The main objective of the training is the capacity development of field functionaries including Community motivators, extension officers of PMU and DOA on Institutional aspects related to water management and O&M which are adapted to enhance their motivational skills, develop leadership capabilities and conflict management skills.	● Group formation, Group Management, Skill development, SHGs, JLGs, Microfinance, Financial inclusion & Conflict Management. ● Decision Making (Process & Skills). ● A Case-study with Quality Circle (Faulty Lift Irrigation Main Supply Channel, Monkey Menace & Stray Animals). ● Book Keeping, Disclosure & Transparency, Cash Practical, Exercise Book- Keeping entries. ● Communication Skills. ● Leadership Development & Enhancing Motivational Skills, Skill & Attitude, Management of facilitator. ● Practical: Water Management for Agriculture & Irrigation purposes.	● The major output of the training is that the community motivators, PMU officers and DoA officers were trained and understood the institutional aspects related to water management and operations and maintenance which are adapted for the planning and implementation of irrigation projects.
Phase-3		
Training on Irrigation and Water Management (July 19-20, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● The object of the training was the capacity development of the Engineering staff of the PMU in the field of Irrigation and Water Management Practices so that the knowledge acquired during the training can be applicable for the preparation of "Detailed Project reports (DPR)" of the irrigation schemes proposed under the ODA loan project, and thereafter construction of the schemes.	● Irrigation ● Micro-Irrigation in Himachal Pradesh - Sprinkler Irrigation ● Micro-Irrigation in Himachal Pradesh - Drip Irrigation ● Planning of Cropping pattern, Estimation of Crop Water Requirement & crop budgeting for the preparation of irrigation scheme to be constructed under JICA (ODA) ● Concepts and Meaning of Leadership Development ● Conflict Management	● The trainees are made aware about the technical details to be incorporated while designing & constructing the flow & micro irrigation schemes. They are also made aware about the details of the irrigational scheduling, planning of cropping pattern, calculation of water requirement, calculation of benefit cost ratio, a essential requirement for the preparation of Detailed Project Reports. ● In relation to institutional aspects, they are also trained for the leadership development & conflict management, the skill they require to handle the farmers association when construction works starts. ● At the end of the lecture on Estimation of Crop Water Requirement & crop budgeting, the trainees were given a exercise to be completed and submitted, to the O/o JICA-TCP.

Training on Participatory Irrigation Management- 1st batch (October 3, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● The main objective of training was capacity development of PMU officers on specific role and activities of WUA through the sharing experience of Lahalri pilot project so that the knowledge can be applicable for the strengthening WUAs under JICA (ODA) project.	● Water management by water uses' association ● Water distribution ● Operation of irrigation facilities ● Maintenance of irrigation facilities	● They have sincerely participated in the training and they followed the training as per the procedure described in the action plan. ● After each session, short test was conducted. There are 2 purposes of the short test. One is to check for understanding. The other is to enhance motivation level for participation. ● The average rate of correct answer was 74 %.
Training on Participatory irrigation management- 2nd batch (December 10, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● The main objective of training was capacity development of PMU officers on specific role and activities of WUA through the sharing experience of Lahalri pilot project so that the knowledge can be applicable for the strengthening WUAs under JICA (ODA) project.	● Water management by water uses' association. ● Water distribution. ● Operation of irrigation facilities. ● Maintenance of irrigation facilities. ● Field visit of Lahlari pilot project.	● They have sincerely participated in the training and they followed the training as per the procedure described in the action plan. ● After each session, short test was conducted. There are 2 purposes of the short test. One is to check for understanding. The other is to enhance motivation level for participation. ● The average rate of correct answer was 59 %. ● After the theoretical session, field visit of Lahlari pilot area was conducted.
Interactive workshop on Training manuals of Participatory Irrigation Management (January 29, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● The main purpose of the workshop is to finalize the recommendations given in the Training Manuals of Participatory Irrigation Management (PIM), based on the experiences of Lahalri pilot project.	● Water management by water uses' association ● Water distribution ● Operation of irrigation facilities ● Maintenance of irrigation facilities	● Every point of 4 manuals was explained to the participants in detail. In between there were many queries & detailed discussions were held on many topics & the reply were given to them to their satisfaction. Every participant was of the view that these manuals are very good to the extension staff/WUA & appreciated the effort of the TCP in this regard. ● Based on the comments, these 4 manuals will be modified and finalized.

Phase-4		
Monitoring System based on the Participatory Irrigation Management (1st & 2nd batches: July 3 & 5, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● The main objective of training was capacity development of PMU officers on setting up of monitoring system for securing the sustainability of irrigation project including the review of participatory irrigation management	● Guidelines for Core Extension Officers on Water Management and O&M for Crop Diversification ● Guidelines for Maintenance of Irrigation Facilities (Revised materials based on the comment of PMC & PMU) ● Setting up of Monitoring System for Securing the Sustainability of Irrigation Project in PMU	● Through the training, participants got detailed know-how regarding the monitoring system, records keeping, maintenance of irrigation facilities and the others. ● It is expected that the trainees will be exposed to the necessary records to be maintained for securing the monitoring and finally sustainability of the irrigation system created under the ODA project.
Comprehension of the actual status of KVA and discussion with KVA in sub-projects (July 10, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● The main purpose of the training is to check status of records keeping kept by KVAs in 2 sub-projects area and to discuss the desirable records keeping with extension officers and KVA MC members	● Checking the current status of records keeping and discussion on role of each records needed ● Discussion on Role of each stakeholder (MC member, Community Motivator and EO) ● Discussion on the monthly procedure to collect records	● Through the training, management committee members and community motivators got detailed knowledge about the records keeping and monitoring system of irrigation facilities. It is expected that the MC member/Farmers/Extension Officers will be exposed to the necessary records to be maintained for securing the monitoring and finally sustainability of the irrigation system created under the ODA project.
Consultation of Monitoring System in Sub-Projects (1st to 8th batches: December 15, 16, 17 and 18, 2014 & February 24, 25, 26 and 27, 2015)		
Objectives	**Subject Covered**	**Outputs/results**
● The main objective of the training is to review a previous training on monitoring system and to get more practical knowledge through discussion and field visit to sub-project.	● In the A.M. session, review of previous training was conducted in the BPMU office as shown in the follows ● Monitoring result of Lahalri pilot project and Discussion on both role of monitoring and data collection method ● Discussion on records needed for KVA and its explanation ● Major point for maintenance of irrigation facilities ● In the P.M. session, discussion with KVA on records keeping and sharing lessons learned of Lahalri pilot project was conducted in the field as shown in the follows ● Confirmation of records kept by KVA and its discussion ● Discussion on maintenance records and field explanation for maintenance ● Discussion on role of Community Motivator (CM) for records keeping and crop cultivation monitoring sheet to be kept by CM ● Sharing lessons learned of Lahalri pilot project for O&M aspects	● Through the visit to sub-project sites, it was found that most of KVA had started to keep their records. ● Through the discussion and field visit to the sub-project, extension officers got more practical knowledge for monitoring their sub-projects based on records kept by KVA. ● Moreover, in 8 sub-projects, KVA members also understood the importance of records keeping and got detailed knowledge for various records. ● It is expected that records are maintained by KVA properly and monitored by Extension Officers for securing the sustainability of the irrigation system created under the ODA project.

Source: JICA TCP Team

(2) Vegetable Farming and Post-harvest

Trainings conducted for core extension officers in the field of vegetable farming and post-harvest are summarized in the following table.

Table 2.4.3 Outline of Trainings to Core Extension Officers in Vegetable Farming and Post-harvest

Subject category		Phase 1	Phase 2	Phase 3	Phase 4
Basic theory	Dissemination of JICA TCP	→	→		
	Baseline Survey	→	→		
	Working group formation for farmer's training	→	→		
	Training needs assessment for farmers	→	→		
	Cropping pattern arrangement	→	→	→	→
	Farm management	→	→	→	→
	PDCA cycle	→	→	→	→
Exposure visit				△	△
Practical Theory and Hands-on Training	Cultivation techniques	→	→	→	→
	Value added cultivation		→	→	→
	Harvest and post-harvest techniques		→	→	→
Advanced skills and techniques	Exotic and off-season vegetable cultivation				→
	Advanced techniques of protected cultivation				→
	Harvest and Post harvest techniques and seed preservation				→
	Promotion of vegetables				→
Modification of Crop Diversification Plan for sustainability of project	Implementation schedule of crop diversification plan				→

Source: JICA TCP Team

In Phase-1, the training related to farming and post-harvest for the core extension officers were arranged by the TCP team and used outer resource persons for theoretical training.

In Phase-2, in consideration of the requirement of counterparts, trainings were conducted by employed external resource persons (mainly university professors from CSKHPKV and scientists from KVK Bara). To make the training more effective, the TCP paid attention especially to the following points in discussion with the resource persons.

- The TCP requested resource persons to arrange the trainings understandable with the help of Power Point and other visual aids.
- The TCP recorded the trainings by video camera to provide audio visual materials for the help of extension.

- The TCP collected available booklets related to each training.

In Phase-3, both theoretical trainings and practical on-the-job trainings in Lahalri pilot project area and KVK Bara were provided in order to reflect the lessons learned from Lahalri. Since the role of extension officers is to disseminate cultivation skills, techniques and information to farmers.

During Phase-3, trainings for core extension officers were mainly focused on basic and practical techniques of cultivation of vegetables to guide beginner farmers in the field.

In Phase-4, trainings provided for core extension officers were focused on advanced techniques to improve the skills and knowledge of them to let farmers get better profits.

The trainings conducted during the project period are shown in below table.

Table 2.4.4 Trainings to Core Extension Officers in Vegetable Farming and Post-harvest

Phase-1		
Workshops for Dissemination of JICA TCP (April 10, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize the role and works of JICA TCP	● The terms of reference of JICA TCP ● The component and expertise of JICA TCP ● Introduction of experts and the role and work in the JICA TCP	● PMU and DoA extension officers understood the role and work of JICA TCP
Workshop for Sharing the Findings of Household Survey (Baseline survey) (December 2, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To share the results of HHS in Lahalri ● To guide extension officers in PMU to conduct household survey	● Result analysis of HHS in Lahalri ● Procedure of HHS ● How to conduct HHS at respective 5 sites	● Extension officers understood procedure of HHS through Lahalri experience ● Extension officers participated in HHS at respective 5 sites later.
On-the-job training Participatory Rural Appraisal at Bakora (December 20, 2011)		
Objectives	**Subject covered**	**Out puts/results**
● To train extension officers at respective site, Bakora in order to conduct PRA through on-the-job training	● Procedure of participatory appraisal ● How to conduct PRA at their respective site	● Extension officers understood procedure of PRA through on-the-job training ● Extension officers developed their capability to guide other extension officers how to conduct PRA.
On-the-job training Participatory Rural Appraisal at Mathrehar (December 28, 2011)		
Objectives	**Subject covered**	**Out puts/results**
● To train extension officers at respective site, Mathrehar in order to conduct PRA through on-the-job training	● Procedure of participatory appraisal ● How to conduct PRA at their respective site	● Extension officers understood procedure of PRA through on-the-job training ● Extension officers developed their capability to guide other extension officers how to conduct PRA.
Training on formation of working group, farm management, cultivation techniques and post-harvest techniques (From April 2011 to April 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To develop capacity of extension officers of pilot area and Loan project Core extension officer (1) of the pilot area Core extension officers (2) of PMU in Loan Project	● The procedures to be followed in farmers' activities ● Collective work, farm management, cultivation techniques, post-harvest techniques and cropping pattern arrangement with SHG farming related activities	● Extension officers understood the activities to be followed in the pilot project site ● Extension officers understood how to guide farmers through serial on-the-job trainings. ● These extension officers developed their capability to train the other extension officers.

On-the-job Training on Training Needs Assessment for Farmers (March 14, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● Capacity development of extension officers to assess training needs of farmers	● The procedure of training needs assessment ● The points to be followed in training needs assessment	● Extension officers understood the procedure of training needs assessment for farmers. ● They developed their capability to conduct training needs assessment at their respective sites.
Workshop on cropping pattern arrangement of Lahalri (March 27, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To promote crop diversification, list up farmers who is interested in cultivation of vegetables ● To discuss how to convert from cereals to vegetables ● To list up possible crops for diversification ● To make a new cropping pattern for Lahalri	● Total area covered by constructed irrigation ● Farmers and their area who are interested in cultivation of vegetables ● Possible crops for conversion	● The annual plan for Lahalri was made. ● New cropping pattern and target of covered area was fixed.
Workshop on PDCA (April 17, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize extension staffs with PDCA cycle	● Workshop on PDCA (Plan-Do-Check-Act) cycle procedure ● How to use PDCA tool during implementation of the project	● Extension officers understood the implementation tool, PDCA cycle through lecture and mock training
Phase-2		
Training on Cropping Pattern Arrangement and Farm Management (November 16, and 17, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To improve the skill of making cropping pattern in each agriculture ecological zone in order to make farmers profitable ● To get information on farm management and understand its skill and techniques to train farmers	● Agricultural ecological zones ● Soil type ● Seed suitability to each ecological zone and sowing, harvesting season ● Crop rotation ● Combination of kharif crop and rabi crop ● Combination of grains and vegetables ● Basic bookkeeping skills and farm management (cost-profit analysis)	● PMU and DoA officers were trained and they understood the agricultural practices which are adapted for each agro-ecological zone. ● PMU and DoA officers could teach the farmers how to keep record for farm management
Training on Protected Cultivation of Vegetables (December 28, and 29, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To improve the skills and knowledge of extension officers to promote vegetable cultivation in protected environment	● Vegetable crops and their varieties for cultivation in poly-house ● Cultivation techniques of each crop ● Water use and fertigation in poly-house ● Insects and disease control in poly-house ● Nursery production in soilless media ● Practical: How to use micro irrigation system	● PMU and DoA officers were made aware of latest agricultural techniques and apprised of the cultivation techniques necessary to promote vegetable cultivation in poly-house
Training on Kharif Season Crop Cultivation (January 9, and 10, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To retrain and develop cultivation skills and knowledge of kharif crop	● Crops & their varieties of kharif season crop cultivation ● Water use and fertilization ● Insects and disease of kharif crops and their countermeasure ● Productivity of each crop	● PMU and DoA officers were retrained and they understood cultivation techniques in order to teach new techniques to farmers

Training on Organic Farming (February 6,7, and 8, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To renew the skills and knowledge of organic farming	● Organic manure and vermi-compost ● Organic insecticide and fungicide ● Integrated pest management by organic way ● Trend of organic farming ● Certification of organic products	● PMU and DoA officers were trained and they understood the skills of organic farming to promote organic farming among farmers
Training on	**a. Vegetable Promotion and Improvement of Food Grains Productivity b. Insect Pest Management (March 18, 19and 20, 2013)**	
Objectives	**Subjects Covered**	**Outputs/results**
● To develop capacity of PMU and DOA extension officers to promote vegetable cultivation and new agro techniques for kharif crop cultivation ● To improve skills and knowledge for insect pest control	● Improved varieties and agro-techniques for beans and okra ● Improved varieties and production technology for solanaceous vegetables & cucurbits ● Weed management, Integrated pest and disease management in vegetables and cereals ● Calculation of pesticide doses and calibration of spray equipments ● Prospective of Commercial cultivation of crops including tips and techniques of protected cultivation and visit to poly-houses	● Extension officers understood the ways of vegetable promotion and promote the vegetable cultivation among farmers ● Extension officers understood how to control insects and pests in poly-house.
Training on water use and fertilizer application (To be carried out in April 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To improve the knowledge of extension officers of PMU and DoA related to field of water use and fertilizer application in order to improve productivity of farmers	● Water requirement of each crop ● On time application of fertilizer ● Productivity according to the application of fertilizer	● PMU and DoA officers understood and developed their capacity to guide farmers
Phase-3		
Exposure Visit to Extension Education Institute, Nilokheri in Karnal-Haryana and Advanced Farmers in Haryana (August 22, 23, 24 & 25, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide an opportunity to visit some advanced farmers and gain practical knowledge ● To make aware of year round nursery production techniques ● To facilitate crop diversification in Himachal Pradesh by understanding and ideal model of crop diversification in nearby area ● To provide practical knowledge for protected cultivation and promote efficient management of it for farmers.	● Introductory lecture by Mr. Bhupinder Thakur of ISAP ● Interaction with inventor, innovative farmer, Mr. Dharamveer ● Visit to advanced farmer (poly-house, net house and open field) ● Visit to advanced farm owner, Mr. Rajbir Singh for milk production ● Visit to food processing unit for sweet corn and baby corn ● Interaction with Mr. Kamal Chauhan who is an owner of food processing unit of sweet corn and baby corn	● Participants got new information and techniques that would be used when they guide farmers. ● Participants will be able to learn the new techniques for healthy nursery raising and fertigation in open field condition.

Theoretical Training on Organic Certification (January 9,10 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● Interaction with specialist of organic certification ● To impart participants an opportunity to get some practical knowledge regarding strategic marketing by organic certification ● Familiarization with some techniques for marketing strategy of safe vegetable produce	● Organic standards and certification ● Process of grower group certification ● Record keeping and documentation by organic growers ● Organic certification and marketing of organic produce ● Marketing strategy for safe and quality vegetables ● Experience sharing on marketing strategy of safe vegetable produce	● Participants understood the concept of organic certification, procedure of certification and grower group formation ● They understood how to add value to organic produce by organic certification.
Theoretical and On-the-job Training for summer vegetables by JICA TCP (August 1, 2, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To impart participants an opportunity to get some practical knowledge regarding summer vegetable cultivation ● Familiarization with some techniques for vegetative propagation of vegetables like tomato ● Field experience through on the job training with farmers	● How to guide farmers on cultivation of Solanaceous and gourd family, root crops, beans and okra ● Insect-pest and disease management ● Vegetative propagation of solanaceous vegetables ● Field visit to pilot area Lahalri and on the job training with farmers ● Interaction with farmers ● Hands-on training towards farmers on tomato cutting	● They understood the new techniques and tips of vegetable cultivation ● They will promote these techniques to farmers at their respective site ● They understood how to guide farmers through hands-on training.
Theoretical and On-the-job Training on Protected Cultivation and Post-harvest by JICA TCP (September 30 and October 1, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To impart participants an opportunity to get some practical knowledge regarding protected cultivation ● Familiarization with some techniques for grafting of vegetables and use of plastic mulch in vegetable crop ● Field experience through on the job training with farmers	● How to guide farmers on protected cultivation (poly-house, poly-tunnel, net house and net tunnel) ● Effective use of poly-mulch in poly-house and open field ● Grafting in vegetable for quality improvement ● How to guide farmers on post-harvest activities ● Vegetable marketing ● Visit to poly-house and on the job training on bed preparation, mulching placement and transplanting of cherry tomato seedling ● On-the-job training with farmers in Lahalri ● Interaction with farmers	● Participants understood new techniques not only from lecture but also from demonstration and hands-on training by expert. ● They understood how to guide farmers through on the job training. ● They developed their capability to promote these techniques to farmers at their respective sites.
Theoretical and On-the-job Training for Winter Vegetables by JICA TCP (November 27,28, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To impart participants an opportunity to get some practical knowledge regarding cultivation of winter vegetables and some other crops like turmeric, ginger and elephant foot yam. ● Familiarization with some new techniques for cultivation like use of mulching in open field ● Field experience through on the job training and interaction with farmers	● How to guide farmers on cultivation of winter vegetables (Cole crops, root crops and leafy vegetables) with tips and techniques ● Insect-pest and disease control in winter vegetables ● Discussion on agricultural marketing strategy ● Field visit and elephant foot yam harvesting and practical demonstration in the fields ● On-the-job training (practical demonstration to farmers) in Lahalri ● Interaction with farmers	● They understood these techniques. ● They understood how to demonstrate new techniques in front of farmers. ● They will disseminate these techniques to farmers in their respective sites.

Theoretical Training for Summer Vegetables by JICA TCP (March 14, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● To confirm participants' knowledge on cultivation of summer vegetables ● To impart participants an opportunity to get some practical knowledge regarding cultivation of summer vegetables ● Familiarization with some new techniques like nursery preparation for good harvest ● Field experience through hands-on training	● How to guide farmers on cultivation of kharif vegetables ● How to make healthier nursery ● Insect-pest and disease control in summer vegetables ● Hands-on training in Lahalri	● Participants understood and developed their capacity to guide farmers regarding cultivation of summer vegetables. ● They will disseminate these techniques to farmers at their respective sites.

Phase-4

Training on exotic and off season vegetable cultivation at Mandi (July 18 and 19, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize with cultivation of exotic and off season vegetables ● Experience sharing on exotic and off season vegetables cultivation by Japanese expert ● Familiarization with some new techniques for improvement of off season and exotic vegetables ● Familiarization with marketing strategy for promotion of exotic and off season vegetables	● Cultivation and management aspects of exotic and off season vegetables ● Experience sharing and introduction of new techniques and new materials in exotic and off season vegetables ● Practical techniques for improvement of exotic vegetables (Grafting technique) ● Strategy to promote consumption of exotic vegetables (Nutritional value and medicinal properties for health)	● They understood the new techniques of cultivation and management aspects of exotic and off season vegetables, grafting techniques in tomato and capsicum, now they will promote these techniques at their respective sites. ● They were fully satisfied by the training provided by JICA-TCP team

Training on exotic and off season vegetable cultivation at Kangra (July 25 and 26, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize with cultivation of exotic and off season vegetables ● Experience sharing on exotic and off season vegetables cultivation by Japanese expert ● Familiarization with some new techniques for improvement of off season and exotic vegetables ● Familiarization with marketing strategy for promotion of exotic and off season vegetables	● Cultivation and management aspects of exotic and off season vegetables ● Experience sharing and introduction of new techniques in exotic and off season vegetables ● Practical techniques for improvement of exotic vegetables (Grafting technique)	● They understood the new techniques of cultivation and management aspects of exotic and off season vegetables, grafting techniques in tomato and capsicum, now they will promote these techniques at their respective sites. ● They were fully satisfied by the training provided by JICA-TCP team

Training on exotic and off season vegetable cultivation at Hamirpur (July 30 and 31,2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize with cultivation of exotic and off season vegetables ● Experience sharing on exotic and off season vegetables cultivation by Japanese expert ● Familiarization with some new techniques for improvement of off season and exotic vegetables ● Familiarization with marketing strategy for promotion of exotic and off season vegetables	● Cultivation and management aspects of exotic and off season vegetables ● Experience sharing and introduction of new techniques in exotic and off season vegetables ● Practical techniques for improvement of exotic vegetables (Grafting technique)	● They understood the new techniques of cultivation and management aspects of exotic and off season vegetables, grafting techniques in tomato and capsicum, now they will promote these techniques at their respective sites. ● They were fully satisfied by the training provided by JICA-TCP team

Training on cultivation of tomato, cucumber and capsicum under protected condition to extension staffs of DoA at Farmers' Training Center in Mandi (August 4, 2014)		
Objectives	**Subjects covered**	**Outputs/results**
● To familiarize with the cultivation of tomato, cucumber and capsicum in poly house ● Familiarization with some new techniques for improvement of 3 crops ● Familiarization with insect/pests management in poly house	● Cultivation techniques with hints and tips of tomato, cucumber and capsicum in poly house ● Insect/pest management in poly house ● Improvement of tomato, capsicum and cucumber by grafting ● Multiplication technique of tomato by cutting ● Tips for healthy nursery raising	● They understood practical knowhow to cultivate tomato, cucumber and capsicum in poly house ● They got new techniques for improvement of tomato, cucumber and capsicum by grafting ● They got new technique for multiplication of tomato ● They appreciated the practical training including pruning and training.
Training on exotic and off season vegetable cultivation at Bilaspur (August 6 and 7, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize with cultivation of exotic and off season vegetables ● Experience sharing on exotic and off season vegetables cultivation by Japanese expert ● Familiarization with some new techniques for improvement of off season and exotic vegetables ● Familiarization with marketing strategy for promotion of exotic and off season vegetables	● Cultivation and management aspects of exotic and off season vegetables ● Experience sharing and introduction of new techniques in exotic and off season vegetables ● Practical techniques for improvement of exotic vegetables (Grafting technique)	● They understood the new techniques of cultivation and management aspects of exotic and off season vegetables, grafting techniques in tomato and capsicum, now they will promote these techniques at their respective sites. ● They were fully satisfied by the training provided by JICA-TCP team
Training on exotic and off season vegetable cultivation at Una (August 13 and 14, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize with cultivation of exotic and off season vegetables ● Experience sharing on exotic and off season vegetables cultivation by Japanese expert ● Familiarization with some new techniques for improvement of off season and exotic vegetables ● Familiarization with marketing strategy for promotion of exotic and off season vegetables	● Cultivation and management aspects of exotic and off season vegetables ● Experience sharing and introduction of new techniques in exotic and off season vegetables ● Practical techniques for improvement of exotic vegetables (Grafting technique)	● They understood the new techniques of cultivation and management aspects of exotic and off season vegetables, grafting techniques in tomato and capsicum, now they will promote these techniques at their respective sites. ● They were fully satisfied by the training provided by JICA-TCP team
Harvest, post-harvest and seed preservation in Mandi (November 15, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● Familiarization with the basic techniques for harvest and post-harvest in field level ● Intimation of preservation techniques to keep harvested vegetable fresh ● Familiarization of seed preservation techniques	● Harvesting techniques in the field ● Post-harvest techniques in the field ● Harvesting and Post Harvesting Techniques ● Seed Preservation techniques	● Extension staff understood the right harvesting and post harvesting techniques and they would guide the farmers accordingly

Harvest, post-harvest and seed preservation in Una (November 22, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● Familiarization with the basic techniques for harvest and post-harvest in field level ● Intimation of preservation techniques to keep harvested vegetable fresh ● Familiarization of seed preservation techniques	● Harvesting techniques in the field ● Post-harvest techniques in the field ● Harvesting and Post Harvesting Techniques ● Seed Preservation techniques	● Extension staff understood the right harvesting and post harvesting techniques and they would be able to guide the farmers accordingly
Vegetable promotion at KV school in Hamirpur (November 26, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● Promotion of exotic and indigenous vegetable cultivation and consumption to next generation	● Nutritional importance and medicinal values of exotic and indigenous vegetables for family health ● Procedure of intake of vegetables	● This would motivate the extension staffs, children, their parents and teachers to increase the use of vegetables in their diet ● Extension staffs understood the procedure of this activity and they will be able to utilize these information to promote consumption of vegetables
Exposure visit to Punjab Agriculture University in Ludhiana and nearby area (November 27-December 1, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● Intimation to mechanization including micro irrigation in and out poly-house ● Interaction with advanced farmers ● Familiarization with profitable nursery production ● Familiarization to advanced protected cultivation technique	● Mechanization ● Use of poly-house, net-house, poly-tunnel, mulching and drip irrigation both in protected and open condition ● Use of poly-tunnel for nursery production ● Rotation between paddy crop and onion nursery to produce healthier nursery ● Interaction with farmers for agro-techniques and marketing strategies	● Extension staff understood how to use protection materials for protected cultivation and its effectiveness ● They understood effectiveness of poly-tunnel for nursery production and will be able to promote nursery production in their relevant sites.
Harvest, post-harvest and seed preservation (December 3, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● Familiarization with the basic techniques for harvest and post-harvest in field level ● Intimation of preservation techniques to keep harvested vegetable fresh ● Familiarization of seed preservation techniques	● Harvesting techniques in the field ● Post-harvest techniques in the field ● Harvesting and Post Harvesting Techniques ● Seed Preservation techniques	● Extension staff will be able to know the right harvesting and post harvesting techniques and they can guide the farmers accordingly
Harvest, post-harvest and seed preservation (December 5, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● Familiarization with the basic techniques for harvest and post-harvest in field level ● Intimation of preservation techniques to keep harvested vegetable fresh ● Familiarization of seed preservation techniques	● Harvesting techniques in the field ● Post-harvest techniques in the field ● Harvesting and Post Harvesting Techniques ● Seed Preservation techniques	● Extension staff will be able to know the right harvesting and post harvesting techniques and they can guide the farmers accordingly

Harvest, post-harvest and seed preservation (December 12, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● Familiarization with the basic techniques for harvest and post-harvest in field level ● Intimation of preservation techniques to keep harvested vegetable fresh ● Familiarization of seed preservation techniques	● Harvesting techniques in the field ● Post-harvest techniques in the field ● Harvesting and Post Harvesting Techniques ● Seed Preservation techniques	● Extension staff will be able to know the right harvesting and post harvesting techniques and they can guide the farmers accordingly
Promotion of vegetables (December 12, 2014)		
Objective	**Subjects Covered**	**Outputs/result**
● Promotion of exotic and indigenous vegetable consumption	● Nutritional importance and medicinal values of exotic and indigenous vegetables ● How to intake vegetables ● Consume locally grown vegetables	● This would motivate the extension staff and other people to increase the use of vegetables in their diet ● Extension staff understood how to promote locally produced vegetable and they are expected to do the same type of training in their relevant sites.
Basic skills and knowledge of protected cultivation (January 10, 2015)		
Objectives	**Subjects Covered**	**Outputs/results**
● Familiarization with the basic knowledge for promotion of protected cultivation ● Intimation of new skills to guide farmers	● Introduction to protected cultivation and its efficient use ● Tips and techniques for crop cultivation in protected conditions ($100m^2$) ● Hands-on training for cultivation in poly-house ● Integrated insect-pest and disease management in protected cultivation	● They understood the basic skills and knowledge required prior to start a polyhouse, so now they can guide the farmers well.
Implementation schedule of Crop Diversification Plan in Mandi (April 23, 2015)		
Objectives	**Subjects Covered**	**Outputs/results**
● Training on making a realistic implementation schedule in each project site	● Procedure of making crop schedule ● Introduction on activities to be covered in implementation schedule ● Procedure of implementation of practical schedule in each site	● Extension staff will be able to prepare practical, realistic implementation schedule in the project site to guide farmers properly
Implementation schedule of Crop Diversification Plan in Hamirpur (April 25,2105)		
Objective	**Subjects Covered**	**Outputs/result**
● Training on making a realistic implementation schedule in each project site	● Procedure of making crop schedule ● Introduction on activities to be covered in implementation schedule ● Procedure of implementation of practical schedule in each site	● Extension staff will be able to prepare practical, realistic implementation schedule in the project site to guide farmers properly
Implementation schedule of Crop Diversification Plan in Kangra (April 28, 2015)		
Objective	**Subjects Covered**	**Outputs/result**
● Training on making a realistic implementation schedule in each project site	● Procedure of making crop schedule ● Introduction on activities to be covered in implementation schedule ● Exercise on making realistic, practical implementation schedule in each site ● Presentation	● Extension staffs understood procedure of making practical implementation schedule and they will be able to prepare practical, realistic implementation schedule in the project site to guide farmers properly

Source: JICA TCP Team

(3) Design and Construction

Trainings to core extension officers regarding design & construction were carried out from Phase-1 based on concept of co-working of JICA TCP team and core extension officers. The TCP team was focusing on providing information and knowledge of experience of Lahalri. From Phase-1 stage, the TCP team has started to conduct series of trainings to core extension officers.

Irrigation design engineers of ODA Loan Project had only few year experiences after graduation, so the engineers were learning their techniques and knowledge through actual experiences in the field. In order to know the technical level of core extension officers; it was carried out to carry out the actual on-site visit and the interviews from core extension officers.

Training materials in the field of design and construction were prepared based on the technical problems which the officers actually faced in the site, so that it is easy to understand even for the young engineers with usage of a photograph or simple words. The training materials also revised continuously to match their technical level. PMC consultants also often participated in the trainings and provided their opinion to solve the problems of the working in each PMU.

The outline of the workshop/trainings carried out from Phase-1 to 4 is shown in the following table.

Table 2.4.5 Trainings to Core Extension Officers in Design and Construction

Phase-1		
Training of infrastructure development of Pilot Area (Nov. 2011 to Nov. 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● On the Job Training for Construction Supervision	● This training was implemented by weekly meeting and site visit the under mentioned topics: ✓ Construction management ✓ Condition of contract ✓ Progress control ✓ Quality survey ✓ Safety management	● The counterparts of Pilot Area learned the construction management through weekly meeting with contractor and construction site visit
Workshop on presentation of Irrigation Design of Pilot Area (September 8, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To understand on irrigation Design of pilot area Lahalri as follows i) Outline of the irrigation facilities of pilot area ii)Water Requirement	● This workshop covers the under mentioned topics: i) Outline of the irrigation facilities of pilot area ✓ Map of Lahalri site ✓ Intake & pump house ✓ General features of irrigation facilities ✓ Pipeline system ✓ Design concept of pipeline system ii) Water requirement by pilot area	● The official in-charge of Engineering/ Technical works of TCP and loan project was participate in the workshop, and provide the suggestions and feedback for the effective implementation of the project through their participation.

Training on 1st weekly meeting (kick off) of Construction of Pilot Area (November 11, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To manage regarding progress control in next week ● To confirm of payment procedure	● This weekly meeting covers the under mentioned topics: ✓ payment procedure ✓ payment duration ✓ Over all and weekly construction schedule ✓ Factory inspection ✓ Mobilization schedule and temporary stock yard ✓ Delivery of pump equipment and pipe ✓ Monthly –wise construction schedule in quantity ✓ Detail construction method and temporary work ✓ Procurement schedule for heavy equipment ✓ Delivery schedule for construction plan ✓ Temporary diversion plan ✓ Concrete trail mix test ✓ Water curing ✓ Stock yard and dumping site ✓ Construction monitoring ✓ Format of material for weekly meeting ✓ Format instruction slip ✓ Possible risk	● PMU staff learned to necessary items in kick off meeting
Training on 2nd weekly meeting of Construction of Pilot Area (November 19, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction schedule in this week from contractor ✓ To confirm detail construction schedule in next week from contractor ✓ Approach road and stock yard ✓ Supply of information to contractor of coordinate of distribution tank and regulation tank ✓ Making of Weekly schedule in charge of contractor	● DoA staff learned to indicate detail of site working like stock yard and coordination of facilities. ● Specific dates have been decided for the construction plan of next week due to meeting
Training on 3rd weekly meeting of Construction of Pilot Area (November 26, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction schedule in this week from contractor ✓ To confirm detail construction schedule in next week from contractor ✓ Mobilization and material supplied ✓ Inspection of excavation in intake before laying concrete of foundation ✓ Start of excavation for LRT-1, LRT-2 ✓ Transport of concrete mixer to site ✓ Information of coordinate of pipeline to contractor	● DoA and BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week.

Training on 2nd monthly meeting of Construction of Pilot Area (December 3, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction schedule in this week from contractor ✓ To confirm detail construction schedule in next week from contractor	● DoA and BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week.
Training on 6th weekly meeting of Construction of Pilot Area (December 7, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction schedule in this week from contractor ✓ To confirm detail construction schedule in next week from contractor	● DoA staff checked construction schedule sheet, and confirmed one by one detail plan of next week.
Training on site visit of Construction of Pilot Area (December 21, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● On the Job Training for Construction Supervision and understanding of irrigation facilities	● Place of site visit ✓ Intake and pump house ✓ Regulation tank	● The core-extension officer in PMU learned the actual construction work and the construction management through construction site visit.
Training on 7th weekly meeting of Construction of Pilot Area (December 24, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction schedule in this week from contractor ✓ To confirm detail construction schedule in next week from contractor	● BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week.
Training on site visit of Construction of Pilot Area (January 3, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● On the Job Training for Construction Supervision and understanding of irrigation facilities	● This training was implemented by site visit the under mentioned topics: ✓ Concrete work of sump well ✓ HDPE pipe jointing	● The core-extension officer in PMU learned the construction progress and the construction management through construction site visit.
Training on 8th weekly meeting of Construction of Pilot Area (January 7, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ Survey work for setting out and pipeline alignment ✓ Mobilization of man power ✓ Excavation of intake	● BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week.

Training on 9th weekly meeting of Construction of Pilot Area (January 16, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction progress of 7 facilities in this week from contractor ✓ To confirm detail construction schedule in next week from contractor ✓ Starting of pump house construction	● DPMU and BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week.
Training on 10th weekly meeting of Construction of Pilot Area (January 24, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction progress of 8 facilities in this week from contractor ✓ To confirm detail construction schedule in next week from contractor	● DPMU and BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week.
Training on site visit of Construction of Pilot Area (January 31, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● On the Job Training for Construction Supervision and understanding of irrigation facilities	● This training was implemented by site visit the under mentioned topics: ✓ Excavation checking of retaining wall, outlet chamber, intake ✓ Quality check of Distribution tank	● PMU staff learned the construction progress and the construction management; quality checking, through construction site visit.
Training on 3rd monthly meeting of Construction of Pilot Area (January 31, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This monthly meeting covers the under mentioned topics: ✓ To report of detail construction progress; 8 facilities in this week from contractor ✓ To confirm detail construction schedule in next week from contractor	● DPMU and BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week. ● If there is problem of construction site, contractor is instructed to inform JICA-TCP as soon as possible. ● Implementation agency must solve immediately this problem to do not stop construction.
Training on 12th weekly meeting of Construction of Pilot Area (February 4, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction progress in this week from contractor ✓ To confirm detail construction schedule in next week from contractor ✓ Extension due to rain	● BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week.

Training on 13th weekly meeting of Construction of Pilot Area (February 13, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress in this week ● To manage regarding progress control in next week ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction progress in this week from contractor ✓ To confirm detail construction schedule in next week from contractor ✓ Change of location of some facilities by farmers hindrance ✓ Transport of mules to pass though farmers field	● DPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week ● DPMU staff discussed solution of farmer's land issue with JICA-TCP.
Training on 14th weekly meeting of Construction of Pilot Area (February 18, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction schedule ● To manage regarding progress control. ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction progress in this week from contractor ✓ To confirm detail construction schedule in next week from contractor	● DoA staff checked construction schedule sheet, and confirmed one by one detail plan of next week
Training on 15th weekly meeting of Construction of Pilot Area (February 25, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction schedule ● To manage regarding progress control. ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction progress in this week from contractor ✓ To confirm detail construction schedule in next week from contractor	● DoA and BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week
Training on 4th monthly meeting of Construction of Pilot Area (March 3, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction schedule ● To manage regarding progress control. ● To confirm detail plan of next week	● This monthly meeting covers the under mentioned topics: ✓ To report of detail construction progress in this week from contractor ✓ Steel binding and shuttering ✓ To confirm of delayed work; raising main ✓ Planning of transportation of pump equipment	● DoA and BPMU staff checked construction schedule sheet, and confirmed one by one detail plan of next week
Training on 16th weekly meeting of Construction of Pilot Area (March 17, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction schedule ● To manage regarding progress control. ● To confirm detail plan of next week	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction progress from contractor	● DoA and BPMU staff checked construction schedule sheet, and confirmed next plan of next week
Training on 17th weekly meeting of Construction of Pilot Area (March 24, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction schedule ● To manage regarding progress control.	● This weekly meeting covers the under mentioned topics: ✓ To report of detail construction progress	● DoA and BPMU staff got the knowledge of detail of construction management through weekly meeting.

Training on 5th monthly meeting of Construction of Pilot Area (April 3, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress ● To manage regarding progress control.	● This monthly meeting covers the under mentioned topics: ✓ Specification of retaining wall ✓ Progress of each facilities	● DPMU, BPMU staff got the knowledge of detail of construction management through weekly meeting.
Training on 18th weekly meeting of Construction of Pilot Area (April 7, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress ● To manage regarding progress control.	● This weekly meeting covers the under mentioned topics: ✓ Final completion date ✓ Status for procurement of hydrants ✓ Supply of HDPE dia.125mm	● DPMU, BPMU staff got the knowledge of detail of construction management through weekly meeting.
Training on 20th weekly meeting of Construction of Pilot Area (April 20, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress ● To manage regarding progress control.	● This weekly meeting covers the under mentioned topics: ✓ Monitoring of work ✓ Attendance of person that have authority ✓ Addition of number of labors	● DPMU, BPMU staff got the knowledge of detail of construction management through weekly meeting.
Training on 6th monthly meeting of Construction of Pilot Area (April 30, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To confirm the detail construction progress ● To manage regarding progress control.	● This monthly meeting covers the under mentioned topics: ✓ Completion of the scheme ✓ Raising main test run ✓ Distribution system test	● DPMU, BPMU staff learned to management of next week schedule through weekly meeting.
Training on 21st weekly meeting of Construction of Pilot Area (May 5, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To be shared information of under construction work implemented agency and contractor. ● To manage regarding progress control.	● This weekly meeting covers the under mentioned topics: ✓ Revise quantities ✓ Testing of raising main ✓ Checking of distribution line ✓ Cremation center ✓ Monthly bill	● BPMU staff learned to management of next week schedule through weekly meeting.
Training on 22nd weekly meeting of Construction of Pilot Area (May 16, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To be shared information of under construction work implemented agency and contractor. ● To manage regarding schedule control.	● This weekly meeting covers the under mentioned topics: ✓ Completion date of construction ✓ Joint inspection ✓ Site cleaning ✓ Test report of electric	● BPMU staff learned to management of schedule control through weekly meeting. ● Decided the joint inspection date.

Workshop on presentation of Irrigation Planning & Design, Tender procedure of Pilot Area (June 4, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To make aware the staff of DoA, State PMU and Block PMU's regarding steps taken on planning, designing of irrigation system and the tender procedure flowed by JICA-TCP.	● This workshop covers the under mentioned topics: ✓ Irrigation system planning steps (Site selection, survey methodology) Surveying principles & practices. ✓ Irrigation system designing steps (designing of irrigation system) ✓ Tendering process (preparation of tender document inviting & closing tenders, evaluation and contract award)	● The official in-charge of engineering/ technical works of TCP and loan project participated in the workshop, and provided the suggestions and feedback for the effective implementation of the project through their participation.
Training on meeting of Construction of Pilot Area (June 14, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To share information of construction work with JICA-TCP, BPMU, and GMKVA	● This meeting covers the under mentioned topics: ✓ Review of progress of construction ✓ Kharif cropping calendar ✓ On farm distribution system ✓ The whole irrigation system inspection	● GMKVA understood the current situation of construction work, inspection date, and irrigation facilities will be managed by themselves.
Training on meeting of Construction of Pilot Area (July 9, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To share information of improvement work with JICA-TCP, BPMU, and GMKVA	● This meeting covers the under mentioned topics: ✓ Plaster work of outlet ✓ Outlet coupling ✓ Cover of DT and LRT-1 ✓ Lock of valve	● Detail of the improvement work was explained to GMKVA member from BPMU and JICA-TCP staff. ● GMKVA requested some improvement work.
Phase-2		
Workshop on presentation of Operation & maintenance of MIS & Poly house of Pilot Area (February 21, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To get knowledge as well as skills for proper operation and maintenance of drip & fogger irrigation system and Maintenance of poly house.	● This Training covers the under mentioned topics: ✓ Drip and fogger irrigation system operation and maintenance of drip & fogger irrigation System ✓ practical training of operation and maintenance of micro irrigation system on field ✓ Maintenance of poly house	● Trainees got information for operation and maintenance of micro irrigation system, maintenance of poly house as well as knowledge.

Phase-3		
Training on Auto CAD operations (October 5~7, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To get knowledge as well as enhance their skills of using Auto CAD for the preparation and delivery of 2 dimensional drawings.	● This Training covers the under mentioned topics: ✓ Introduction of Auto CAD ✓ Learning of command ✓ Making drawing of exercises ✓ Resolution of questions in creating a drawing	● Trainees have drawn of the exercises with the Auto CAD actually. ● Through this training PMU/DoA the Engineering staffs was able to create AutoCAD drawings of irrigation structure, navigate the environment, manipulate AutoCAD objects and plot drawings. ● By this course trainees learned the necessary skills for problem solving and enhance their knowledge of additional command on AutoCAD by using shortcut keys.
Training on Survey Instrument ; Total station (November 29~December 1, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To learn by on-the-job trending the techniques for making the topographic drawing required for "Detailed Project reports (DPR)"	● This practical, hands-on course covers the follow as subjects: ✓ Practice of total station in the field ✓ Data downloading & interpretation ✓ Processing of data with LISCAD ✓ Preparation of survey/contour sheet by computer	● The trainees were introduced with LISCAD, a computer software with the help of which the downloaded data from "Total Station" is processed for preparing the contour plan. ● Further the trainees learned to prepare the L- Section & cross sections of the layout of pipelines/field, channels. The trainees also noted down the procedure adopted and commands operated, during the operation of LISCAD, for further uses in their offices
Training on Management of Investigation/ Planning/ Designing/ Construction of Irrigation Project (March 22 ~March 23, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● To acquire the knowledge can be applicable for the planning and implementation of the irrigation project to be constructed under the ODA. ● This course is intended for those engineering professionals who are to prepare "Detail Project Report (DPR)" and consequently involved in construction.	● This Training covers the under mentioned topics: ✓ Procedure for the collection of base data/ instrumental survey work of the selected project. Methods to measure learn water discharge, Calculation of catchment area of the water source ✓ Type of irrigation system & general planed of irrigation work. Preparation of inventory of engineering works to be proposed in the selected project ✓ Calculation of Peak runoff ✓ Design of irrigation facilities ✓ Construction management	● The designing of training wall subject to earth pressure & head wall subject to water pressure was found very useful by every participant. ● Participants understood the importance of velocity check while designing the Main channel & for proposing drop structure. ● Participants were taught the importance of Construction planning & management through PPT, for the completion of the schemes as per schedule & specifications.

Phase-4		
Training on Management of Investigation/ Planning/ Designing/ Construction of Irrigation Project (Hearing at each BPMU; September 15 ~September 25, 2014) (Training; November 15th ~November 16, 2014)training		
Objectives	**Subject Covered**	**Outputs/results**
● This training is intended to target the engineering professionals who are to prepare DPR and are consequently involved in construction activity. ● This theoretical/ practical, hands-on training (Primarily based on major findings of BPMU's) will be covering general planning steps irrigation project.	● Hearings ✓To hear the technical issue and problem in everyday. ✓Based on this result, it is reflected in the training. ● Training ✓Procedure for the collection of base data/ instrumental survey work of the selected project ✓Consensus building and transparency in construction of irrigation facilities ✓Designing of irrigation facilities in pilot area and suggestion by JICA-TCP ✓Construction management in pilot area ✓Gender sensitization ✓Audio and video on techniques of water channel maintenance. ✓Discussion on the training (Q&A)& feedback	● Participants were the engineering staffs of the PMU who are expected to be involved in the process of preparation of DPR's & execution of the schemes. ● In each stage of core extension officers are actually doing (planning, designing, construction management), the specifically issues that their face has been solved. ● Moreover, after the training, including the PMC, to conduct discussions, problems and questions of each other core extension workers have been shared.
Training on AutoCAD 1st Batch (January 31 ~ February 1, 2015		
Objectives	**Subject Covered**	**Outputs/results**
● This training is intended to target those engineering professionals who are the familiar with AutoCAD. ● To get knowledge as well as enhance their skills of using AutoCAD advanced command for the preparation and delivery of 2 dimensional drawings with accuracy & speed.	● Theory on the advanced commands of AutoCAD ● Problem resolving lessons during the exercise on AutoCAD drawings and checking of the drawings prepared by the trainees, pointed out drawbacks & given important tips to the trainees, regarding preparation of improved drawings	● Through this training, the engineering staff would have enhanced their skills by learning additional advance commands on AutoCAD by using shortcut keys. ● By this course trainees learned the necessary skills for problem solving and improved their knowledge on the today's advance technology and enhancing the accuracy, look & speed in their work.
Training on AutoCAD 2nd Batch (February 21 ~ February 22, 2015		
Objectives	**Subject Covered**	**Outputs/results**
● This training is intended to target those engineering professionals who are the beginner with AutoCAD. ● To get knowledge as well as enhance their skills of using AutoCAD commands for the preparation and delivery of 2 dimensional drawings.	● Theory on the basic commands of AutoCAD ● Problem resolving lessons during the exercise on AutoCAD drawings and checking of the drawings prepared by the trainees, pointed out drawbacks & given important tips to the trainees, regarding preparation of drawings.	● Through this course trainees learned the necessary basic skills on AutoCAD operations and thus they can now better their work output in terms of accuracy/quality and time.

Source: JICA TCP Team

(4) Gender

As mentioned above, the TCP prepared a training curriculum for gender and social inclusion in relation with the crop diversification activities. A draft curriculum of gender related issues and activities were prepared based on the experiences of the pilot area. The curriculum emphasizes on the pragmatic use and applicability in the ODA Loan Project reflecting their priority in consideration of their operational structure and capacity. The major activities focused on the SHG promotion with necessary consideration of gender and social inclusion. A training module and materials to be used in the training curriculum of Crop Diversification Project (mainly targeting the ODA Loan Project) have been revised from the one prepared in Phase-2. Additional materials were prepared laying emphasis on teaching materials for the Extension officers refer and utilize in their training of SHGs. Other materials were developed as reference materials for Extension officers to equip with further knowledge and understanding to teach SHG members. Module and materials were compiled in the crop diversification guideline. Gender and social inclusion aspects that have been learnt through pilot project were integrated in each chapter with concerned activities in the guideline.

A series of trainings of the core extension officers on SHG development, gender and social consideration and ToT for community motivators were carried out based on the curriculum and training programs prepared as mentioned above.

It was identified that most of the extension officers who are supposed to handle SHGs and social aspects in the ODA Loan Project are not very familiar with the SHG support and consideration of social issues. In order to enhance their ability and effective work of the extension officers to handle the issue, the workshop style trainings have been organized. At the early stage of the project, the training programs focused on enhancing understanding of overview of the SHG related activities and activity flow as well as planning of their program on the SHGs in line with the ODA Loan Project outline. In the latter stage of the project, the training of Extension officers focused more on practical training in a form of ToT. The issues handled in the trainings were practice of institutional management in SHG related activities, such as accounting, record keeping, inter-loaning, management of group function, as well as technical trainings of SHG income generation activities, which include food processing training for SHG members and microenterprise development.

Training session on consideration of gender and social inclusion were incorporated in trainings of other sectors. The training targeted enhancing mind setting of Extension officers to be sensitive enough on gender related issues and inclusion of disadvantaged people during their extension work.

Considering the situation that the ODA Loan Project employs Community Motivators to support works on the ground, a ToT for the extension officers on Community Motivator was also conducted. The ToT on Community Motivator, as an initial stage, highlighted the expected roles of the community motivators and how the extension officers shall handle and manage the community motivators. The second training session discussed actual required work of Community motivator mainly on SHG related activities. Outline of training to core extension officers in the field of gender and social inclusion are summarized table below.

Table 2.4.6 Outline of Trainings to Core Extension Officers in Gender and Social Inclusion

Training		Phase 1	Phase 2	Phase 3	Phase 4
SHG Support	Planning and management of training		→		
	ToT on SHG institutional management			→	
	ToT on Income generation activities			→	→
Gender and Social inclusion	General concept of gender and social inclusion			→	→
	Gender consideration in Extension work				→
Community Motivator	ToT on works of Community motivator			→	→

Source: JICA TCP Team

The followings summarize the trainings conducted since Phase-1.

Table 2.4.7 Trainings to Core Extension Officers in Gender and Social Inclusion

Phase-1		
Workshop on Experience Sharing of TCP on Institutional Development (December 11, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To share experiences of the TCP on institutional development focusing on the community group function in relation with the crop diversification activities.	● Introduction to the PDCA cycle and planning an activity based on the PDCA cycle ● Sharing field experiences in regard to the institutional development of the farmers' group and SHGs	● The Participants recognized the importance of PDCA, and practiced it while preparing the action plan for a given activity. ● Through the training materials and the references the participants were able to link up the workshop objective with their ongoing activities which resulted in developing better understanding and gaining valuable knowledge in regard to the ODA activities.
Phase-2		
Training on Support and Development of the SHG activities (September 11-12, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To enhance recognition of the roles and responsibility of the extension officers on SHG promotion activities in the project ● To plan and organize their expected roles and works according to the ToR of the Loan project and necessary steps of the SHG development ● To equip the extension officers with necessary skills of training and monitoring SHG activities.	● Review and confirmation of the expected roles of the extension officers on SHG development in the ODA loan project ● Planning and arrangement of the works of extension officers along with the necessary steps of the SHG development ● Works and responsibility of the extension officers on the planned activities ● Preparation of training schedule and action plan (group work) and Presentation	● The extension officers got aware of their expected roles in the SHG promotion and development within the ODA loan project. ● The extension officers are equipped with an idea on how to arrange those roles according to the time schedule of the project. ● The extension officers prepared sample plans of the SHG support programme in their stations ● After the training, the extension officers have conducted trainings of SHG members based on the outline of planned training of ODA loan project, referring to respective parts of the guideline materials for the relevant activities when they conduct trainings.

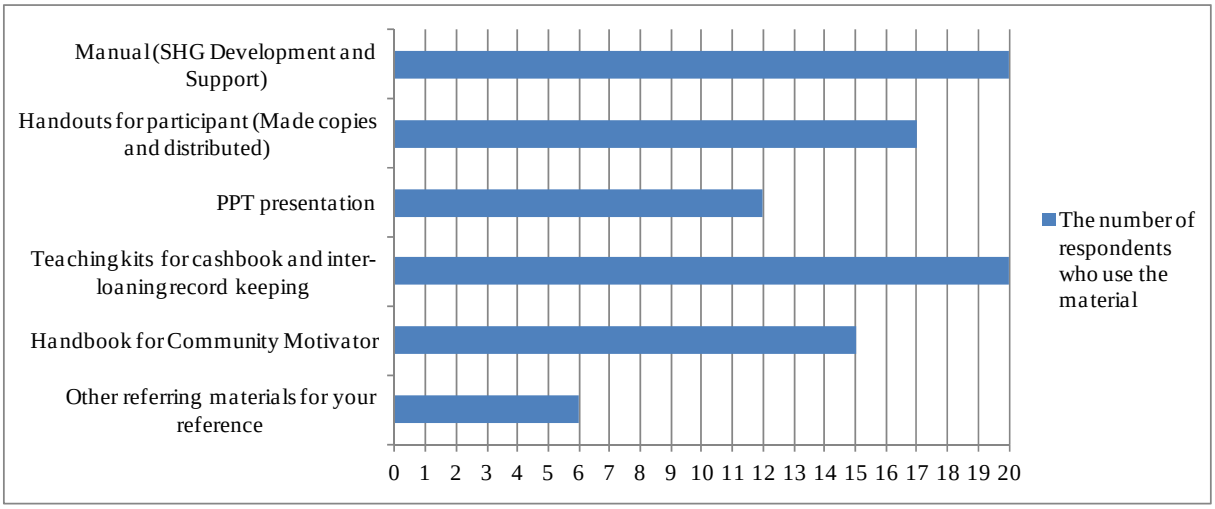
Orientation on Gender and Social Inclusion (September 24, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● Orienting the participants regarding the Gender and Social Inclusion consideration in the ODA loan project.	● Orientation on the Gender ● Gender and Social Inclusion aspect of the project ● Sharing of success story of the gender sensitive project	● Participants have expressed enlightenment on gender and social inclusion concern in project implementation. ● Although it is expected that participants take action with regard to gender and social inclusion, the result of change has not yet been clearly observed.
Training on Roles and works of community motivator (September 24, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To apprise the extension officers about the roles and works of the community motivators and to further equip them in training community motivators as per their specific requirements and scope of work. ● To ensure that the extension officers promote a flexible and adaptable workforce of community motivators equipped to meet the project objective.	● Expected role and works of community motivator ● Roles of community motivators in institution building process ● Community motivators role in enhancing agriculture production and fostering market linkage ● Experience sharing by the TCP Community Motivators	● Many of Community Motivators appointed in each project site of ODA Loan PHCDP refer to the handout for Community Motivator provided through BPMU, which was originally prepared by the TCP. ● One BPMU slightly arranged the provided Community Motivator's handout for use of their Community Motivator. *(the actual training conducted by the BPMU was confirmed in Phase 4)* ● Although the Extension officers understand general concept of responsibility of Extension officers, they have not been clear enough about actual works to be managed by the community motivator. *(the issue was taken up in the later training)*
Training on Support and Development of the SHG activities (2) (February 13, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● To equip the extension officers with appropriate skills and techniques to implement SHG formation and support to function their organization in their respective areas. ● To support the extension officers to take action incorporating the SHG support activities in their overall activity plan	● Review of the SHG related activities in ODA Loan project ● Lecture on SHG formation and tip for sustainability ● How to motivate SHG members to start productive activities ● Practical of Training of SHG on establishing functions of SHG (by-law making, clarification of rules and responsibilities, organization of regular meeting, management of saving and inter-loaning)	● Extension officers of BPMUs have been conducting training to SHG members on Inter-loaning and accounting applying the concepts and technique learnt in the training ● The Extension officers utilized the teaching materials provided and practiced in the training in their training.

Phase-4		
Training on Support and Development of the SHG activities (3) (September 9-10, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● To equip the participants with basic idea and knowledge of micro-enterprise development and business management as income generation activities. ● To identify interventions in micro-enterprise development and business management for concerned SHGs. ● To clarify and providing clues for the difficulties and constraints the Extension Officers are facing in SHG support.	● Review of the progress of SHG related activities in ODA Loan project ● Concept and need of micro-enterprise development ● Basic idea on business management for small scale producers ● Exercise on application of concept and knowledge of micro-enterprise development and business management in SHG support ● Practical training on business management (budgeting, pricing) ● Interactive session on the difficulties and constraints in SHG support tasks	● The extension officers have gained more practical knowledge of success of SHGs ● The participants have cleared their queries in forming SHGs in their duty ● The extension officers are equipped with practical teaching skills of record keeping training to SHG members ● Each BPMU are provided with teaching kits for accounting training and credit management training ● The training module to be refered by the extension officers in their field was revised.
Training on Gender Sensitization of the Engineering Staff of the PMU (November 16, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● Gender sensitization of the engineering staff of the PMU aimed at seeking positive gender related interventions whilst planning and construction of the irrigation infrastructures.	● Concept of gender and gender equality ● Integrating gender related interventions whilst planning, designing and constructing of irrigation infrastructure	● Post gender sensitization session it is expected that the participants understood the concept and purpose of integrating gender related interventions aimed at maximizing the outreach and benefits of the project to all the stakeholders
Training on Support and Development of the SHG activities (4) (March 25, 2015)		
Objectives	**Subject Covered**	**Outputs/results**
● To equip the participants with basic idea and knowledge of organising food processing trainings for SHG income generation activities. ●	● Organisation of Food processing training for SHG income generation activities ● Interactive session with SHG members of Lahalri pilot area (Experience sharing and lessons learnt)	● Experience sharing with SHGs of Lahalri pilot area provided more concrete idea of SHG development to the extension officers. ● The extension officers will be able to refer to respective parts of the guideline materials (SHG Development and support and community motivator's handbook) and food processing booklet while conducting trainings for SHGs and community motivators.
Training on Gender in Extension work (March 26, 2015)		
Objectives	**Subject Covered**	**Outputs/results**
● To identify adequate interventions in agriculture extension work with regard to gender and social inclusion point of view.	● Gender and social inclusion in extension work, (gender and social exclusion related issue in cultivation, water management, and marketing)	● Gender issues in crop diversification activities were analyzed through problem tree analysis ● Possible actions to be taken was discussed among extension officers
Training on Roles and works of community motivator in SHG support (March 26, 2015)		
Objectives	**Subject Covered**	**Outputs/results**
● To clarify and providing clues for the difficulties and constraints in relation to training and field activities of community motivators especially in SHG support.	● Roles of Community Motivator in assisting extension officers in follow-up of field activities (especially with regard to SHG support activities)	● The participants discussed their experiences with community motivators from different BPMU ● Constraints the extension officers face with regard to community motivators were raised and discussed with advice on possible counteraction ● The perticipants were provided with the updated handbook for the community motivators that shall be shared and used by the community motivators

Source: JICA TCP Team

Practices by the extension officers in their sites were followed up in between and after the trainings. At the early stage, trainings conducted by the extension officers were mostly verbal one-way explanation to farmers. After a series of the training for the extension officers with support of the training module and teaching materials, many of the extension officers come to conduct the training for the farmers in participatory way with practical demonstrations. The following describes application of what the extension officers learning thought the trainings in their own training for farmers, which came out as a result of questionnaire to the extension officers who participated in the training.

All of the 20 respondents felt that the guideline information was sufficient for meeting the work output of the SHGs. In regard to the usage of training materials most of the participants mentioned that they sometimes modify the training material as per their need. However most of them felt that they can conduct trainings easily by using these materials and would like to have more such teaching materials. The followings are the utilization and application of the training materials in their own training for farmers.



Source: JICA TCP Team

Figure 2.4.1 Application of Training Materials in the Training by Extension Officers

Gender aspects are important not only from view point of equipping the extension officers with gender sensitive approaches but in terms of gender of the extension officers. In rural area where gender perspective is biased, women farmers may not be comfortable to consult male extension officers. Therefore, appointment and capacity building of female extension officers is also important in consideration of current situation of gender disparity in the field. 12 out of 30 agriculture extension officers in DPMUs and BPMUs in the ODA Loan Project are female, while only 9 out of 73 in engineering staffs. This implies the significant improvement comparing to the figure of DoA officers before the beginning of the project that was, though inferred figure, less than 20 out of 1000 according to the preparatory survey report of the TCP. The following is the summary of extension officers in DPMU and BPMU.

Table 2.4.8 Summary of Extension and Engineering Staff for the HPCDP

Staff for the ODA		Agriculture Extension Staff			Engineering Staff		
S.No	Office	Male	Female	Total	Male	Female	Total
1	SPMU	2		2	4		4
2	DPMU Hamirpur	1	2	3	4	1	5
3	DPMU Palampur	1	2	3	3	2	5
4	DPMU Mandi	1	2	3	3	1	4
5	BPMU Hamirpur	2	2	4	5	2	7
6	BPMU Bilaspur	3		3	6	1	7
7	BPMU Una	2		2	7		7
8	BPMU Mandi	2		2	6	1	7
9	BPMU Sarkaghat	3		3	6	1	7
10	BPMU Dehra		2	2	7		7
11	BPMU Nurpur	2		2	6		6
12	BPMU Baijnath	1	2	3	7		7
Total		20	12	32	64	9	73

* The PD, DPDs, BPMs have not been listed as extension/engineering staff.

*The listing does not include office managers, accountants, computer operators, office attendants and watchman's.

Source: JICA TCP Team

Although it is important to have female extension officers to approach women in the field, female extension officers may face problem in their duty. With deep gender bias, female extension officers might be less respected by male farmers. Therefore, enhancing capacity and confidence of female extension officers is also important. The following shows the participation of PMU extension officers in the above mentioned trainings conducted by the TCP.

Table 2.4.9 Ratio of Female Extension Officers Participated in the Training

	Total accumulated participants	Male	Female	Ratio (Female per 100 male)
Engineering officers	202	173.5	28.5	16.4
Agriculture Extension officers	844	636.5	207.5	32.6

Source: JICA TCP Team

(5) Marketing

Trainings to core extension officers regarding marketing were being carried out from Phase-2 based on concept of co-working of JICA TCP team and core extension officers. The TCP team was focusing not only on just providing information and knowledge, but developing marketing strategy on agricultural product marketing of the ODA Loan Project together with the core extension officers. From Phase-2 stage, the TCP team has started to conduct series of trainings to core extension officers. The outline of the workshop/trainings which were carried out from Phase-2 to 4 is shown in the following table.

Table 2.4.10 Outline of Trainings for Core Extension Officers on Marketing

Subject category		Phase 1	Phase 2	Phase 3	Phase 4
Advanced concept for better marketing	Introduction and motivation of marketing		⇨		
	Calculation of cost and benefit		⇨		
	Marketing channels		⇨		
	Price trends of agro-products		⇨		
	System and convention of APMCs		⇨		
Advanced concept for better marketing	Quality control standards			⇨	
	Organic certification and GAP			⇨	
	Processing and value addition			⇨	

Source: JICA TCP Team

Details of trainings for core extension officers on marketing are shown in the following table.

Table 2.4.11 Trainings to Core Extension Officers in Marketing

Phase-2		
Agricultural Marketing Workshop for Sharing Experiences on TCP Marketing Survey (December 12, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To share information on agricultural marketing with special emphasis on i) crop budgeting ii) grading and packing conventions iii) Price trends of vegetables in the 5 ODA Loan districts	● Crop budgeting ● Grading and packing conventions ● Price trends based average monthly prices in Dusarka APMC ● Useful information about marketing of produce in APMCs ● Marketing information on Distribution Channels, Infrastructure of APMCs, month wise sources of vegetables in respective APMCs, Block wise contribution of vegetable production to respective APMC	● BPMU staff were made aware about Agricultural Marketing
Phase-3		
Training on Market Led Extension (September 12-13, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To learn contemporary marketing issues related to Market-led-extension	● Concept of market-led extension ● Quality control standards in vegetable crops ● Packaging and grading processes in vegetable crops ● Market survey in agriculture ● Existing scenario in Agricultural Marketing and legal framework for Agricultural Marketing ● Primary Processing and Value Addition in Vegetable Crops ● Market Intelligence and Market Information Systems	● PMU and DoA staff were made aware about the role of marketing in extension services and were appraised about the contemporary marketing related topics.
Practice Session on Agricultural Marketing (September 30, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To prepare strategy for marketing of vegetable produce making use of concepts discussed during previous trainings on agricultural marketing.	● The participants were divided into three groups and three scenarios were given to them. Participants worked in groups to device strategy for marketing of vegetables for the given scenario. ● Participants were to formulate a strategy to communicate marketing stagey to the community motivators/core extension officers in the field.	● After brain storming sessions and applying concepts of agricultural marketing, each group prepared marketing strategy. ● Communication strategy to get the marketing plan implemented by the core extension officers was formulated. ● Presentations made by each group followed by discussions.
*Session conducted during “Hands on Training on Protected Cultivation and Post Harvest”		
Agricultural Marketing for Local Markets (November 27, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To share topics of agricultural marketing with extension officers with the objective of sharing this information by the extensions officers with the farmers of Lahalri during hands on training.	● Conventions of grading and packing ● Information regarding selling of produce in APMCs ● Price trends of Vegetables in Dusarka APMC and its use while planning farming operations. ● Cost of production of Vegetables: Methodology	● Information on selected topics shared with the PMU Officers who train farmers on these topics during the next day of training.
*Session conducted during “Hands on training on Winter Season Vegetable Cultivation”		

Marketing for Organic Produces (January 10, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● Share information on trends and practices of marketing of organic products with emphasis on fresh vegetables.	● Organic Markets – international trends ● Organic Markets – domestic trends ● Marketing of organic produce – Case study of HIMOARD in Himachal Pradesh ● Markets for Organic Produce	● Information on marketing of Organic produce and market trends in organic markets were discussed with the participants.
*Session conducted during training on "Organic Certification and Value Addition for Strategic Marketing"		

Phase-4

Sessions on "Marketing Strategy and Panel Discussion for High Value Vegetable Crops" in "Training on Exotic and Off-season Vegetable Cultivation (Mandi District on July 18, 2014) (Kangra District on July 26,2014) (Hamirupur District in July 31, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● Discuss Marketing Strategy for the Marketing of High Value Vegetable Crops	● Potential for growing high value crops (exotic and off-season crops). ● Existing marketing strategies used by farmers in high value vegetable crops ● Role of APMC in promoting high value crops ● Quality, marketing standards and packaging materials used in marketing of high value crops ● Different channels used in distribution of produce from producers to consumers	● Participants learnt about marketing strategies being employed by the farmers ● Participants get to interact with farmers growing exotic /off-season vegetables and learn marketing strategies for these crops.

Training on Exotic and Off-season Vegetable Cultivation Sessions on "Marketing Strategy for High Value Vegetable Crops (at Bilaspur on August 6, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● Discuss Marketing Strategy for the Marketing of High Value Vegetable Crops	● Potential for growing high value crops (exotic and off-season crops). ● Existing marketing strategies used by farmers in high value vegetable crops ● Role of APMC in promoting high value crops ● Quality, marketing standards and packaging materials used in marketing of high value crops ● Different channels used in distribution of produce from producers to consumers	● BPM Bilaspur, DoA Bilaspur staff and Farmers learned about the potential of growing exotic vegetables ● Participants learnt about marketing strategies being employed by the farmers as shared by progressive farmer. ● Participants get to interact with farmer growing exotic /off-season vegetables and learn marketing strategies for these crops.

Training on Exotic and Off-season Vegetable Cultivation Sessions on "Marketing Strategy for High Value Vegetable Crops (at Una on August 14, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● Discuss Marketing Strategy for the Marketing of High Value Vegetable Crops	● Potential for growing high value crops (off-season crops). ● Existing marketing strategies used by farmers in high value vegetable crops ● Role of APMC in promoting high value crops ● Quality, marketing standards and packaging materials used in marketing of high value crops ● Different channels used in distribution of produce from producers to consumers	● BPM Una, DoA Una staff and Farmers learned about the potential of growing exotic vegetables ● Participants learnt about marketing strategies being employed by the farmers as shared by progressive farmer. ● Participants get to interact with resource person from DoA to find out practices in agricultural marketing in APMCs.

Workshop on Techniques of Selection and Packing of Vegetables (December 3, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
To share techniques of selection, packing, and shipping of vegetables for direct marketing to Delhi.	● Harvesting of Vegetable Crops ● Grading and sorting of vegetables ● Packing of vegetables ● Sharing information on use of agrochemicals with the buyers	● BPMU Hamirpur Staff and farmers were made aware about harvesting and post harvest techniques related to shipping of vegetables from Lahalri to Delhi
Dialogue for Marketing of Vegetables (April 8 and 9, 2015) at Chandigarh		
Objectives	**Subject Covered**	**Outputs/results**
(1) To perceive requirement of marketers as well as consumers on vegetables (2) To perceive quality as well as attributes of vegetables, which are required by consumers (3) To get some hints to promote production as well as selling of vegetables	● Promising vegetables / exotic vegetables / Organic vegetables - Quality / Size / Variety / Freshness - Quantity - Seasons - Subjects to be required to producers ● Market strategy for high value vegetables (organic and exotic); - Promising vegetables / varieties - Suitable size / shape / colour / quality / taste by vegetables - Marketing channels to be expected - Essential points for promotion of vegetable selling - Brand, and - Procedure on registration of brand - Organic certificate Procedure of organic certification for farmers' groups	1. Participants got an insight about prevailing demand for exotic and organic vegetables. They also familiarized themselves with the existing quality norms of size, colour, grade, packing and seasonality related to exotic, organic and regular vegetables. 2. Participants observed the operationalization of Apni Mandi and witnessed the direct marketing of high value and regular vegetables. 3. The participants became familiar with strategies of marketing of high value strategic vegetables. They got an overview of establishment of a brand and certification of organic produce.

Source: JICA TCP Team

2.4.2 Trainings to Extension Officers in Sub-pilot Area

(1) Outline of Sub-pilot Area

Sub-pilot areas were defined as 7 Districts that is Chamba, Kinnaur, Kullu, Lahaul-Spiti, Shimla, Sirmaur or Solan out of the Project Area under the ODA Loan Project Area. Through the discussion with DoA, it was decided that the TCP provided technical trainings to extension officers in sub-pilot area based on the experiences under the TCP from Phase-3. These trainings targeting at capacity development of DoA officers in the seven districts which are not included in the ODA Loan Project Area.

Outline of training for extension officers in 7 Districts (Sub-pilot area) are shown in the following table:

Table 2.4.12 Outline of Training and Support for Extension Officers in 7 Districts

Target	Extension officers of 7 Districts (Chamba, Kinnaur, Kullu, Lahaul-Spiti, Shimla, Sirmaur and Solan)
Subjects for training	Priority subjects to be specified in needs assessment workshop
Frequency of training	2 times a year
Venue for training	Palampur, Shimla or other places (depending on training subjects)
Annual activities	Step-1: kick off workshop at the initial stage of the Phases - Clarification of needs and requirement for training activities Step-2: 1st training activity Step-3: 2nd training activity

Source: JICA TCP Team

(2) Subjects of training programs

The needs and requirements for training programs in 7 Districts by each district were confirmed in the needs assessment workshop. Based on the result of the workshop, the TCP team conducted total five trainings in Phases-3 and 4 to extension officers in sub-pilot area. Details of trainings are shown in the following table.

Table 2.4.13 Trainings to Extension Officers in Sub-pilot Area

Phase-3		
Training on Agricultural Marketing (December 12-13, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To learn about contemporary topics of agricultural marketing and market-led-extension.	● Market led-Extension ● Packaging and grading processes in Vegetable Crops ● Marketing Intelligence and Market Information Systems ● Policy and Legal Framework for Agricultural Marketing ● Quality Control Standards in Vegetable Crops ● Primary Processing and Value Addition in Vegetable Crops ● Certification of Organic Produce	● The participants of DoA were made aware about the role of marketing in extension services and were appraised about the contemporary marketing related topics. ● Participants worked in groups and prepared marketing strategies for one cash crop in their respective district.
Training on Participatory Irrigation Management (February 6, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● The main objective of training was capacity development of DoA officers on specific role and activities of WUA through the sharing experience of Lahalri pilot project so that the knowledge can be applicable for the strengthening WUAs under DoA schemes.	● Calculation of Crop Water requirement ● Irrigation scheduling ● Water management by water uses' association ● Water distribution ● Operation of irrigation facilities ● Maintenance of irrigation facilities	● Trainees were taught to calculate Crop Water requirement with FAO software "FAO Crop WAT 8.0", with the local weather parameters & local cropping pattern. ● Trainees were explained the PIM experiences gained in Pilot scheme Lahalri through PPT. ● After each session, short test was conducted. There are 2 purposes of the short test. ● Average answer rate is 69%.
Phase-4		
Preparation of Crop diversification plan, Monitoring & Evaluation (September 19 and 20, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● The Extension Officers of the DoA will be enabled how to prepare Crop Diversification Plan for the areas where irrigation facilities have been created, and how to conduct monitoring and evaluation of the plans prepared.	● The participants were exposed to the Plan-Do-Check-Act (PDCA) cycle and its use for continuous improvement	● They felt satisfied with the Guidelines for the preparation of crop diversification plan and the practical exercises they did to prepare Annual agricultural development and Extension training plan.

Improved techniques of exotic and off-season vegetables to extension staffs in 7 Districts (May 29 and 30, 2015)		
Objectives	**Subject Covered**	**Outputs/results**
● Introduction of present scenario of exotic vegetable cultivation in H.P. and India ● Introduction of new techniques and materials for exotic and off-season vegetables cultivation including cutting and grafting ● Intimation of pre and post-harvest techniques for quality improvement to increase competency ● Familiarization with promotion of exotic vegetables consumption in local market	● Introduction of present scenario of exotic and off season vegetable cultivation in HP and India ● Techniques for improvement of off season and exotic vegetable cultivation ● New techniques of healthy nursery raising ● New techniques for multiplication of vegetables (cutting techniques) ● New techniques for raising of disease resistant seedlings in Solanaceous and cucurbit crops (grafting) ● IPM in protected as well as exotic vegetable cultivation ● Discussion on use of Guidelines for crop diversification in HP ● How to consume exotic vegetables for health purpose	● Participants understood new techniques and materials to improve cultivation of exotic and off season vegetables. ● Participants would be able to explore the possibility of cultivation of exotic and off season to earn more profit through improvement of pre- and post harvest techniques for the farmers of their areas. ● Participants will be able to promote exotic vegetable consumption in local community by making them aware about the nutritional and medicinal value of these vegetables.
Training on Planning, Designing and Construction Management of Irrigation Project {DoA officers in 7 districts} (June 26 and 27, 2015)		
Objectives	**Subjects Covered**	**Outputs/results**
• The object of the training was the Capacity development of DoA officers on infrastructure development by sharing experiences of Lahalri pilot project and helping them to prepare DPRs, in order to apply the learning's from various stages of construction of irrigation facilities.	This training course covers the under mentioned topics: • How to use of TCP Guidelines in the execution of similar other schemes of DoA • Importance & Procedure for the collection of base data/ instrumental survey work of the selected project. and experiences sharing by JICA-TCP • Consensus building and transparency in the construction of irrigation facilities • Designing of irrigation facilities and experiences sharing by JICA-TCP • Construction Management in pilot area and experiences sharing by JICA-TCP	• Post this training, the engineering staff would have developed better understanding on the aspects related to planning, designing and construction management. Further, this training will help the engineering staff in handling the on field constraints which may arise at various stages of construction.

Source: JICA TCP Team

2.5 Activities for Output 4

2.5.1 Farm Household Survey in the Pilot Area

Farm household surveys in the pilot area were conducted three times in 2011, 2013 and 2015. The household survey in 2011 was a baseline survey in order to collect primary data on agricultural, socio-economic and institutional situations of farm households in the Lahalri pilot area.

Before commencement of the baseline survey in August 2011, orientation on implementation of household survey was carried out, while the results obtained from the survey was presented in the workshop in December 2011 as follows:

Table 2.5.1 Trainings of Core Extension Officers on Baseline Survey

Training on Farm Household Survey (August 19 and 20, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● Orientation on implementation of household survey	● Dissemination of TCP ● How to plan and implement farm household survey ● PRA Tools and methodology	● Extension officers of PMU as well as DoA understood the importance and necessity of household survey.
Workshop for fharing the findings of household survey (December 2, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● Dissemination of results obtained from the household survey	● Background of Farm Economic Survey/ Baseline Survey ● Survey coverage and House Hold Profile ● Agricultural Profile ● Livelihood Profile ● Institutions and credit profile ● Gender and Social Inclusion ● Community perception of crop diversification	● Current situation in the pilot area, Lahalri was clarified.

Source: JICA TCP Team

Questionnaires were prepared by JICA TCP team to investigate necessary data. With the questionnaires, interview survey to all 98 households in the Lahalri pilot area was carried out by enumerators under management of JICA TCP. The second survey was carried out in September 2013, in order to collect necessary information to check the outputs obtained from the TCP activates for the mid-term evaluation mission. Questionnaires were simplified based on the questionnaires used in the baseline survey in 2011 to avoid the duplication of the questions. Numbers of farmers for the Lahalri pilot area in 2013 are 98 households. Out of 98 households, 96 households have their lands in the CCA (Cultivable Command Area) in the Lahalri pilot area, while the remaining 2 households are land less farmers, and have rented farm lands in the CCA area. Further third survey was conducted in April/May 2015, in order to confirm some progress of crop diversification as well as impacts of the Project in the pilot area. 93 households have their activities in the CCA (Cultivable Command Area) in the Lahalri pilot area. And around 90% out of the total farm households are members of water users group (KVA) as shown in the following table:

Table 2.5.2 Current Situation of Households in the Lahalri Pilot Area

(1) Total Households related		93 HHs
(2) Member of Water Users Group (KVA)		
Households in the Pilot Area	Male:	13 HHs
	Female:	70 HHs
	Sub-total:	83 HHs
Households outside the Pilot Area		5 HHs
	Total:	88 HHs

Source) Terminal impact survey 2015

The results in 3 surveys are shown as follows:

(1) Land Use

As shown in the following table, results of household survey have some difference, depending on the survey year. Those results are, however, on the same level with the District Revenue Record in 2006/2007, which is reliable record. Therefore gross area of the Pilot Area is fixed to be 28ha, while 24ha in the CCA.

Table 2.5.3 Land Use

Land Use	2011*1		2013*2		2015*3		Revenue Record (2006/2007)*3	
	ha	%	ha	%	ha	%	ha	%
Farm Land	24.1	87	21.5	77	25.8	73	24.2	88
Orchard	0	0	0.0	0	0.0	0	0.0	0
Grass land	3.5	11	5.8	21	8.4	24	0.0	0
Fallow land	0.1	1	0.5	2	0.3	1	0.0	0
Barren land	0.2	1	0.1	0	0.2	1	3.0	11
Others	0	0	0.0	0	0.5	1	0.4	1
Total	27.9	100	27.9	100	35.2	100	27.6	100

*Source: Household Survey, JICA TCP Team (*1: in 2011, *2: in 2013, *3: 2015)*

(2) Sold Quantity of Vegetables in Rabi Season

Transition on sold amount of vegetables during Rabi season in the Pilot Area is shown below.

Table 2.5.4 Sold Quantity of Vegetables in Rabi Season

(Unit: kg)

Crops	2011/12*1	2012/13*2	2014/15*3
1. Cabbage	-	-	450
2. Peas	-	295	80
3. Cauliflower	-	6,580	4,450
4. Tomato	-	50	440
5. Cucumber	-	260	320
6. Potato	-	-	24,890
7. Faba bean	-	-	60
8. Coriander	-	-	350
9. Okra	-	-	40
10. Broccoli	-	-	690
11. Garlic	-	-	40
12. Spinach	-	-	1,345
13. Ginger	-	-	20
14. Fenu Greek	-	-	260
15. Mustard	-	-	300
16. Radish	-	-	4,600
17. Turnip			4,000
18. Fennel			120

*Source: Household Survey, JICA TCP Team (*1: in 2011, *2: in 2013, *3: 2015)*

In the Pilot Area, vegetables are merely cultivated in kitchen garden for their home consumption. After completion of construction of irrigation facilities in November 2012, a part of farmers started vegetable cultivation in fields of the Pilot Area. Cultivated area in the area has increased, resulting in diversification of cultivated crops. Further vegetable farmers in 2012/13 were 10, further vegetable farmers in winter season 2014/15 increased to 30 (see Table 3.2.6).

(3) Sold Quantity of Vegetables in Kharif Season

Transition on sold amount of vegetables during Kharif season in the Pilot Area is shown below.

Table 2.5.5 Sold Quantity of Vegetables in Kharif Season

(Unit: kg)

Crops	2011*1	2013*2	2014*3
1. Bitter gourd		100	140
2. Turmeric			70
3. Okra		1,690	4,340
4. Ginger			1,415
5. Cucumber		780	500
6. Cauliflower			150
7. Long yard bean			40
8. French Bean		70	270
9. Bottle gourd		80	80
10. Coriander			22
11. Tomato			440

*Source: Household Survey, JICA TCP Team (*1: in 2011, *2: in 2013, *3: 2015)*

In 2013, Okra, cucurbits (cucumber, bitter gourds, etc.), which are common vegetables here, were cultivated. Further ginger, turmeric, etc. with less damage by wild animals, have been tried to be cultivated. Farm management in Kharif season could be difficult due to high incidence of damages by pest and disease under monsoon season with higher temperature, compared with Rabi season. Therefore, some farmers have less interest on vegetable cultivation in this season, thus cultivated area would be limited. It was not easy for the farmers to do farm management for vegetable cultivation in this season, thus sold amount of vegetables was also limited. No of vegetable farmers in 2013was 14, while no. of vegetable farmers increase up to 21 in the summer season 2015 (see Table3.2.6).

(4) Income

Average annual income of the farmers in the Pilot Area is shown in the following table.

Table 2.5.6 Annual Income

Source	2011/12*1		2012/13*2		2014/15*3	
	Rupees	%	Rupees	%	Rupees	%
1. Selling Wheat	9,830*4	4	70	0	0	0
2. Selling Maize			570	0	1,290	0
3. Selling Vegetables			990	0	8,830	2
4. Horticulture	0	0	0	0	0	0
5. Labour wage	4,155	2	3,470	1	13,520	4
6. Salaried job	140,908	52	178,530	59	171,570	46
7. Livestock	15,000	5	4,160	1	5,180	2
8. Fishery	0	0	0	0	0	0
9. Forest produce	0	0	0	0	0	0
10. Allied Agricultural Activities	0	0	40	0	930	0
11. Remittances	100	0	120	0	390	0
12. Business / small enterprise	11,490	4	12,370	4	29,870	8
13. Small industry	0	0	860	0	150	0
14. Art and craft	0	0	0	0	0	0
15. Rent	12,700	5	17,140	6	20,700	6
16. Pension	71,160	26	85,130	28	101,570	27
17. Others	6,370	2	2,300	1	19,130	5
Total	271,720	100	305,750	100	373,130	100

*Note: *4: Quantity for home consumption included.*
*Source: Household Survey, JICA TCP Team (*1: in 2011, *2: in 2013, *3: 2015)*

93 households of total farmers are part-time farmers, thus non-farm income is their main income. Irrigation facilities in the Pilot Area were newly constructed in November 2012. Some farmers have conducted vegetable cultivation in the limited area, resulting in increase of farm income.

Further, transition of gross income earned from vegetables is shown in Table 3.2.7. It is reported that gross annual income from vegetables of a vegetable farmer in the first vegetable cropping in the winter season of 2012/13 is around Rs. 5,800, while around Rs. 18,900 in 2014/15, that is boosted by triple.

(5) Expense

Average annual expense of farmers in the Pilot Area is shown in the following table.

Table 2.5.7 Annual Expense

Item	2011/12*1		2012/13*2		2014/15*3	
	Rupees	%	Rupees	%	Rupees	%
1. Food consumption	50,180	33	51,330	33	46,570	19
2. Clothing	8,560	5	8,760	6	12,530	6
3. Fuel	3,260	2	3,870	3	4,240	2
4. Transport	9,600	6	8,690	6	15,320	7
5. Rent	3,830	2	1,980	1	11,280	5
6. Health care	5,640	4	8,900	6	14,270	6
7. Education	25,380	16	22,850	15	34,410	15
8. Festivals / religious activities	4,850	3	3,750	2	3,960	2
9. Social Functions	5,710	4	4,740	3	15,910	7
10. Payment of Interest	11,070	7	13,400	9	6,340	3
11. Electricity	3,110	2	4,090	3	6,590	3
12. Phone	4,400	3	4,580	3	10,540	5
13. Water	960	1	930	1	1,320	1
14. Repair of house	-	-	4,460	3	23,400	10
15. Production cost	-	-	8,330	6	5,020	2
16. House tax	-	-	200	0	1,760	1
17. Other	18,000	12	300	0	14,150	6
Total	154,550	100	151,160	100	227,610	100

*Source: Household Survey, JICA TCP Team (*1: in 2011, *2: in 2013, *3: 2015)*

In the farm household surveys conducted in 2011 and 2013, it was clarified that total annual expenses was approximately Rs.150,000, while Rs.220,000 in 2015. Especially, expenses for rent, social functions, and repair of house in 2015 were remarkably higher than ones in other surveys.

2.5.2 Selection of Pilot Area

One pilot area for construction of irrigation facilities and trials of crop diversification was selected at the beginning of Phase-1. The pilot area was also utilized as a demonstration plot for core extension officers throughout the TCP project period. Concept and objective of pilot area is shown below:

- Model on development/utilization of irrigation facilities and standardization of process for extension of vegetable cultivation,
- Fields for hands-on training for Core Extension Officers and farmers, and
- Demonstration for crop diversification for other ODA Loan sub-projects

The TCP team together with DoA selected pilot area based on three steps. Comparison tables and results of selection in each step are shown in the following section.

1st Step: Selection from 4 Candidate Groups

Table 2.5.8 Selection of Candidate Group

Candidate Groups	Group 1 Existing Irrigation Schemes under RIDF	Group 2 Existing Demo Plots / Fields under Public Organization	Group 3 1st Priority Sub-projects (6 Sites)	Group 4 New Irrigation Schemes
Design & Function of Irrigation	Not applicable for Pilot Area	Not applicable for Pilot Area	Applicable for Pilot Area	Applicable for Pilot Area
Procedure & Process for Implementation	Not applicable for Pilot Area	Not applicable for Pilot Area	Applicable for Pilot Area	Applicable for Pilot Area
Readiness for Training	Available for Training on Farming	Available for Training on Farming	Available through implementation Preliminary design available	Need preparation
Results	Not Selected	Not Selected	Selected	Not Selected

Source: JICA TCP Team

2nd Step: Screening of Suitable Sites from the 1st Priority Sub-projects

Model Type of Irrigation System

Lift Irrigation Systems is preferable in terms of facility design, water management and operation & maintenance, which are applicable to other irrigation system including Flow Irrigation and Shallow Tube Well Irrigation Systems.

New System or Improvement of Existing System

New system is preferable in terms of formalization and standardization of process and steps in implementation.

Location and Accessibility

The location of the pilot area should be easily accessible for coordination with the JICA Loan Project as well as trainings and demonstration.

Table 2.5.9 Screening of Suitable Sites from the 1st Priority Sub-projects

1st Priority Sub-projects	Bakroa (Bilaspur)	Lahalri (Hamirpur)	Majhetli (Kangra)	Mathred (Kangra)	Tikroo (Mandi)	Jankour (Una)
Irrigation System & process	Lift Irrigation System (LIS) New	LIS New	Flow Irrigation System (FIS) Improvement	FIS Improvement	FIS Improvement	Steep Tube Well (STW) New
Location & Accessibility	20 km from Bilapur Nearby NH 88	2.5 km from Hamirpur Nearby NH 88	20 km from Palampur Not nearby NH Road	15 km from Palampur Not nearby NH Road	8 km from Palampur Not nearby NH Road	5 km from Una Not nearby NH Road
Result	Selected	Selected	Not Selected	Not Selected	Not Selected	Not Selected

Source: JICA TCP Team

3rd Step: Selection of Particular Site from the Suitable Sites

Table 2.5.10 Comparative Features of Bakroa and Lahalri

Conditions	Bakroa	Lahalri
- Water Availability	- Lean discharge: 14 lit/sec Design intake: 28 lit/sec No discharge was observed in visit of the JICA Mission in May 2010. - The severe water shortage may disturb training and demonstration for the Model.	- Lean discharge: 32 lit/sec Design intake: 28 lit/sec (the Jamli River side) - River discharge seems to be sufficient.
- Location & Access	- The area is located near the southern end of the target area, and is relatively not convenient for the Pilot Area.	- The location is convenient for the Pilot Area and to coordinate with the Loan Project, since it is the central part of the target area, and is located closer to PMU.
- Other Factors	- There is a disadvantage of long distance from APMC Marketing Yard	- APMC Marketing Yard is adjoining to the Lahalri Site.
- Result		Selected

Source: JICA TCP Team

As a result, Lahalri site in Hamirpur District was selected for the pilot area under the TCP. This result was reported by the TCP to DoA and approved by 1st JCC meeting.

2.5.3 Construction of Irrigation Facilities and Demonstration Plot

(1) Construction of Irrigation Facilities

In the pilot area Lahalri, the construction of irrigation system was completed on November 15, 2012. Its inventory for irrigation faculties is shown in the following table:

Table 2.5.11 Inventory for Irrigation Facilities

No.	Name	Specification	Quantity	Unit
1	**Intake Facilities**			
1-1	Intake	Q=0.185m^3/sec	11.17	m
1-2	Feeder Channel-1	B0.45mXH0.6m, i = 1:300, Wear side	20.21	m
1-3	Spill Way	Q=0.155m^3/sec	1	Place
1-4	Desilting Chamber	Minimum grain size 0.3mm	7.35	m
1-5	Feeder Channel-2	B0.3mXH0.6m, i = 1:300, Sump well side	15.45	m
1-7	Flushing cannel	For cleaning in Desilting Chamber	1	Place
1-8	Sump well	B3.8mXL3.8mXH2.45m	1	Place
1-9	Retaining Wall	For protect of irrigation facilities	1	L.S.
2	**Pumping Facilities**			
2-1	Pump House	B4.0mXL5.0mXH3.0m	1	Building
2-2	Foot valve	Strainer included	2	Nos.
2-2	Saction pipe	Steel pipe，ϕ100mm	2	Nos.
2-3	Pump	Centrifugal Pump,Q=0.014m^3/secX2	2	Nos.
2-4	Motor	18.5kwx2台	2	Nos.
2-5	Check valve	ϕ100mm, Suing type	2	Nos.
2-6	Sluice valve	ϕ100mm	2	Nos.
2-7	Discharge pipe	MS pipe, ϕ200mm, t=6mm	650	m
3	**Distribution Facilities**			
3-1	Pipeline	HDPE,ϕ50mm,ϕ75mm,ϕ90mm,125mm,ϕ140mm	3,400	m
3-2	Distribution Tank	B3.0mXL8.4mXH2.5m	1	Nos.
3-3	Regulation Tank	No.1：B5.55mXL9.0mXH2.5m,No.2：B5.0mXL10.0mXH2.5m	2	Nos.
3-4	Sub Tank		8	Nos.
3-5	Outlet	B1.5mXL1.5mXH1.5m	28	Nos.
3-6	Air valve		3	Nos.
3-7	Blow-off		3	Nos.
4	**Poly House**			
4-1	Lahalri	A=40m^2,Micro Irrigation system	6	Nos.
4-2	KVK Bara	A=252m^2,Micro Irrigation system	1	Nos.
5	**Improvement work**			
5-1	Coupler	For sprinkler system connection of All Sub tank, outlet, hydrant	38	Nos.
5-2	Plaster	For surface protection of All Sub tank, outlet	36	Nos.
5-3	Roof cover	Distribution tank, Regulation tank, For fallen leaves prevention	3	Nos.
5-4	Sluice valve	For operation and maintenance	3	Nos.
5-5	Prevent fall cover	Sub tank, outlet	36	Nos.
5-6	Air valve	RMP, L4, For Water supply capacity improvement	2	Nos.

Source: JICA TCP Team

Series of works of construction of irrigation facilities were implemented by following work schedule.

Table 2.5.12 Work Schedule of Planning, Design and Construction of Irrigation Facilities

No.	Name	Date	Remark
1	**Planning**		
1-1	Agreement with Farmers	Apr.2011～Sep.2011	Jun.2011：Establish of GMKVA Sep.15.2011：No objection certificate
1-2	Topographic survey	Apr.2011～Jun.2011	
2	**Designing**		
2-1	Detail design of facility	Apr.2011～Aug.2011	
2-2	Quantity calculation	Jul.2011～Aug.2011	
2-2	Cost estimate	Jun.2011～Sep.2011	
2-3	Design Review	Jun.2011～Aug.2011	
3	**Tender**		
3-1	Preparation of Tender Document	Sep.2011	
3-2	Notice invited Tender	Sep.12.2011	
3-3	Tender open	Oct.13.2011	
3-4	Tender Evaluation	Oct.14.2011～Oct.20	
3-5	Contract award	Nov.3rd.2011	
4	**Construction**		
4-1	Construction of irrigation facility start	Nov.3rd.2011	During the construction period, settle disputes of farmers of about 90 times.
4-2	Provisional Completion Certificate	Sep.25.2012	Defect Liability period start
4-3	Completion Certificate	Nov.15.2012	
4-4	Pre-Meeting for Handing over with GMKVA	Mar.24.2013	
4-5	Handing over to GMKVA	Apr.11.2013	TCP（JICA）→PMU→GMKVA
4-6	End of Defect Liability period	May.24.2013	8 month
4-7	Construction of Poly Houses	Oct.2012～Jan.2013	Lahalri(6nos), KVK bara(1nos)
4-8	Improvement work	Aug.2012～	Coupler, Plaster,etc.

Source: JICA TCP Team

Layout of irrigation scheme in the Lahalri Pilot area as well as land use map is shown in the following figures.

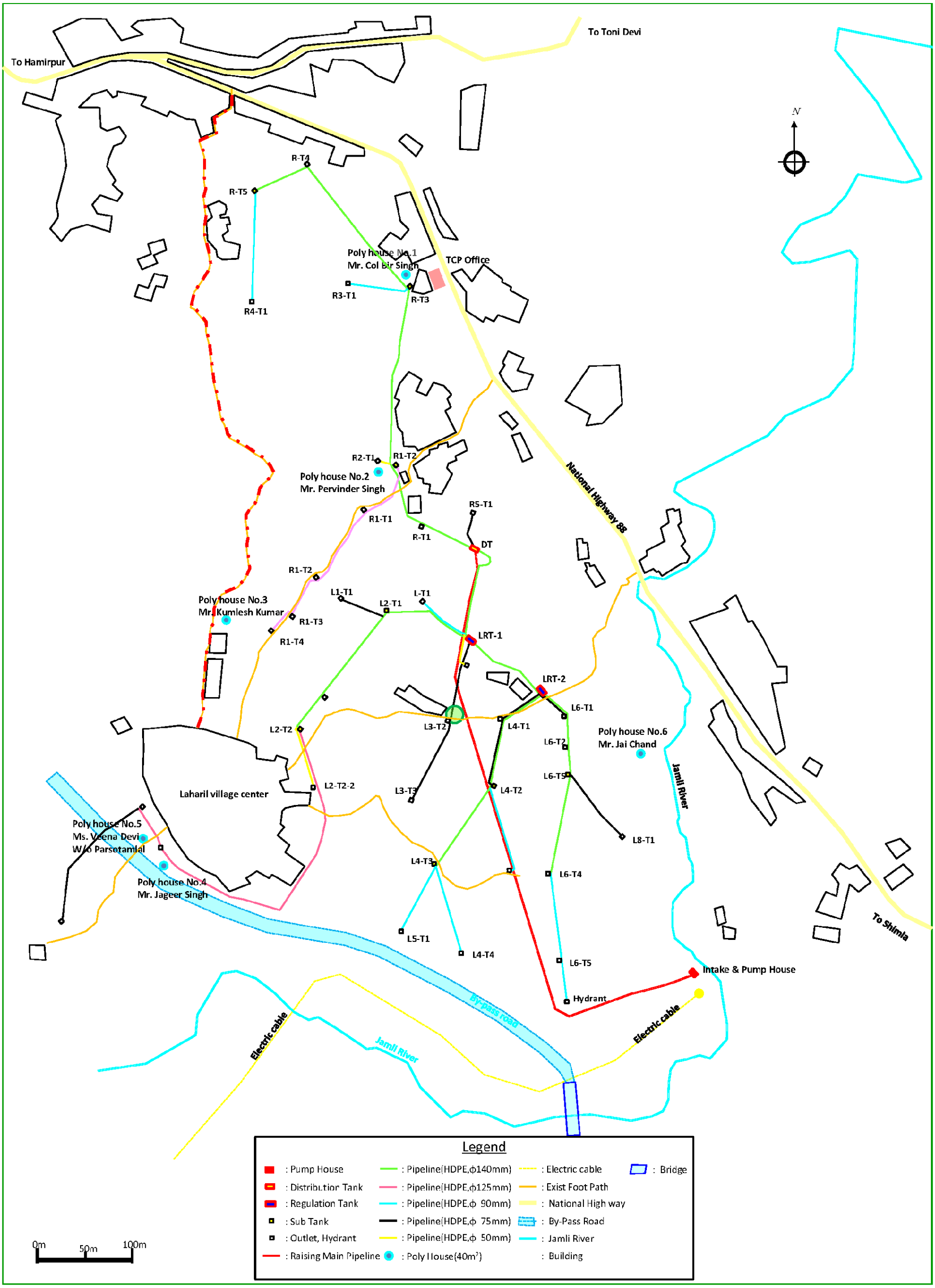


Figure 2.5.1 Layout of Irrigation Scheme in the Pilot Area, Laharli

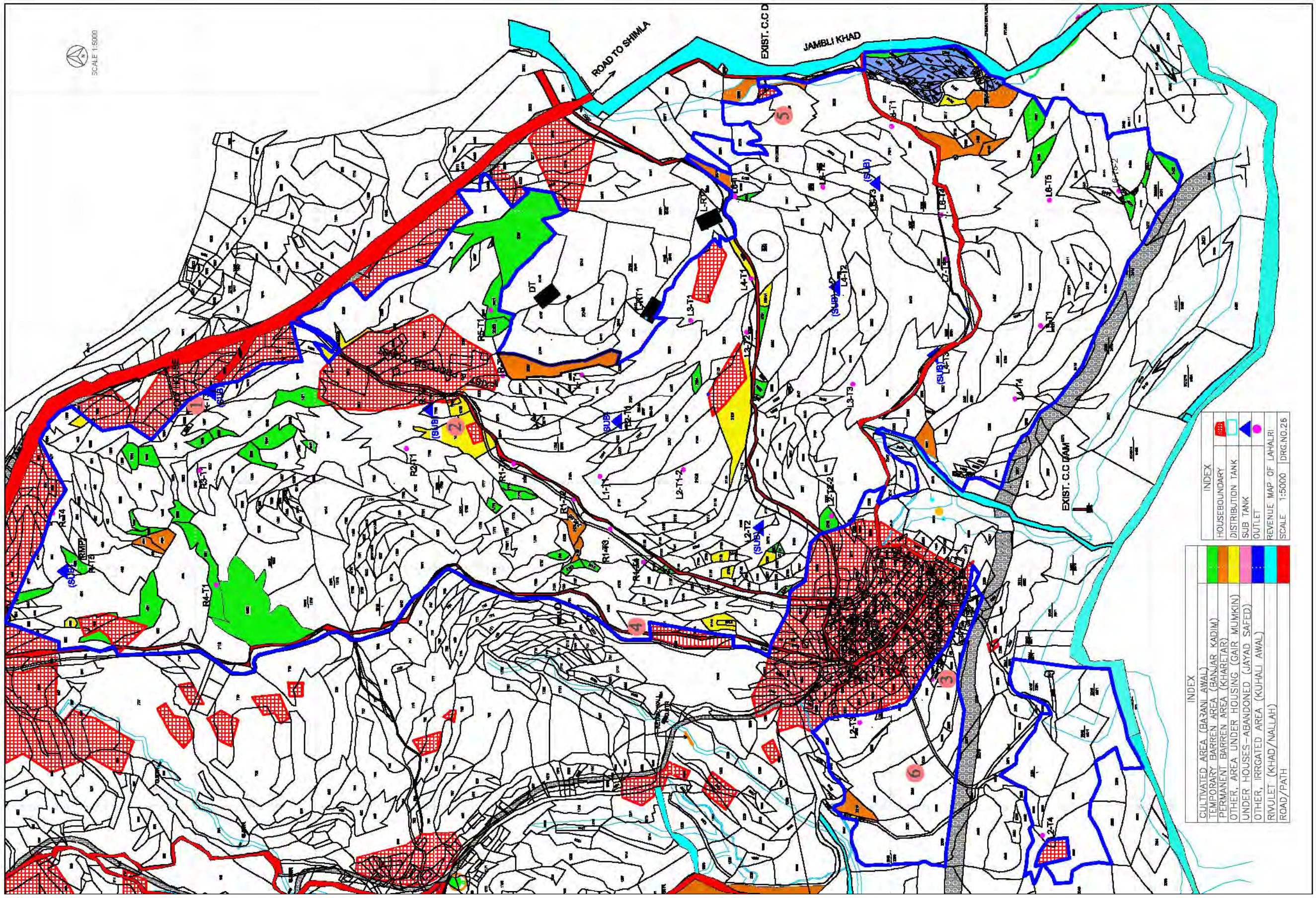


Figure 2.5.2 Land Use Map for the Pilot Area, Lahalri

After the installation of irrigation facilities, some minor improvement works were conducted mainly from the view point of water management. These works are shown in the following table.

Table 2.5.13 Improvement of Irrigation Facilities in the Lahalri Pilot Area

<table>
<tr><th>S/N</th><th>Item</th><th>Reason</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Installation of Top Roof to DT & L-RT1</td><td colspan="2">Through the installation of top roof to Distribution Tank (DT) and Left Regulation Tank (L-RT1), we can prevent debris like leafs falling inside these tanks. As the result, burden of Water Users' Association (WUA) will be largely reduced. Besides, outer walls of DT and L-RT1 are high enough to prevent children to climb. But we can also remove risks of falling of children inside these tanks through the installation of top roof.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>DT before the installation of top roof</td><td>DT after the installation of top roof</td></tr>
<tr><td rowspan="3">2</td><td rowspan="3">Installation of top cover to outlets</td><td colspan="2">Outer walls of outlets are high enough to prevent children to climb. But through the installation of top cover, risk of falling of children inside these tanks will be removed same as DT & L-RT1.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Outlet before installation of top cover</td><td>Outlet after installation of top cover</td></tr>
<tr><td>3</td><td>Installation of control valve to sub-tanks</td><td colspan="2">There are 3 sub-tanks which are connected to lower outlets by pipelines (R-T2: 35m^3, R-T5: 20m^3, L2-T2: 20m^3). When these sub-tanks are filled with water, connected pipelines are also filled with water because these pipelines are directly connected to sub-tanks. Therefore all the water filled inside these sub-tanks will leak to fields if these pipelines are damaged. In that case, crops can be damaged in large area because volumes of these sub-tanks are 35m^3 and 20m^3 respectively. Considering this situation, control valves were installed between sub-tanks and lower pipelines from the view point of water management. Through these control valves, volume of leakage will be reduced largely because water inside tanks can be preserved by closing these valves.</td></tr>
</table>

		 Sub-tank before installation of control valve	 Sub-tank after installation of control valve
4	Installation of cover to chamber of DT, L-RT1 & L-RT2	In Phase-2, lock system was installed to prevent illegal use of water. Regarding butterfly valves, chains and rocks were installed. Regarding sluice valves, sluice wheel can be used as a key because the sluice wheel can be detached. However chains can be cut by cutting tools. And farmers can open sluice valve by using radio pliers. In fact, chains have been cut in about 5 outlets. Moreover there is a report from WUA that somebody took water in the night time. Considering this situation, covers were installed to chamber of DT and RT with large size of locks. Because of these large locks at DT and RT, farmers can get only remaining water inside pipelines if they try to take water illegally at terminal outlets.	
		 Chamber of DT before installation of top cover	 Chamber of RT after installation of top cover

Source: JICA TCP Team

In addition to the improvements of the irrigation facilities, several repair works were conducted mainly for leakage from pipelines. Until March 2013, all the repair works had been carried out by the contractor because of the defect liability period. After the defect liability period, cost of repair works had been paid by JICA TCP as water management trainings. However, most of works for repairing had been gradually sifted to KVA through on the job trainings. All the repair records are shown in the following table.

Table 2.5.14 Repair Works after the Defect Liability Period in the Lahalri Pilot Area

S/N	Date observed	Repair point	Completion date of Repair	Breakdown of the repair cost	Total cost of repair
1	May 24, 2013	✓ Leakage from the pipeline ✓ On L4 line near L4-T1 outlet	Jun. 1, 2013	Fitter: Rs.700 x 2 man-days = Rs.1,400 Labour: Rs.300 x 7 man-days = Rs.2,100 Material: Rs.450	Rs.3,950
2	Jun. 5, 2013	✓ Leakage from the pipeline ✓ On R1 line near R1-T3 outlet ✓ Excavation for runoff water drain by the land owner	Jun. 10, 2014	Fitter: Rs.700 x 2 man-days = Rs.1,400 Labour：Rs.300 x 4 man-days = Rs.1,200 Material: Rs.0	Rs.2,600
3	Jul. 4, 2013	✓ Leakage from the foot valves installed to suction pipes	Sep. 22, 2014	Fitter: Rs.700 x 1 man-day = Rs.700 Material: Rs.600	Rs.1,300
4	Nov. 11, 2013	✓ Leakage from the pipeline ✓ On L2 line near L2-T1 outlet	Nov. 30, 2013	Fitter: Rs.700 x 1 man-day = Rs.700 Labour: Rs.300 x 6 man-days = Rs.1,800 Material: Rs.0	Rs.2,500
5	Nov.24, 2013	✓ Damage of coupling joint between the pump & the motor	Dec. 5, 2013	Material: Rs.200	Rs.200
6	Feb. 29, 2014	✓ Leakage from the pipeline ✓ On L4 line near tee connection of L7 line	Mar. 15, 2014	Fitter: Rs.700 x 2 man-days = Rs.1,400 Labour: Rs.300 x 2 man-days = Rs.600 Material: Rs.250	Rs.2,250
7	Apr. 22, 2014	✓ Leakage from the pipeline ✓ On R-T3 line near R-T3 sub-tank	Apr. 28, 2014	Fitter: Rs.700 x 1 man-day = Rs.700 Labour: Rs.300 x 5 man-days = Rs.1,500 Material: Rs.0	Rs.2,200
8	Mar. 31, 2014	✓ Leakage from the pipeline ✓ On L2 line near L2-T1 sub-tank	Apr. 5, 2014	Fitter: Rs.700 x 1 man-day = Rs.700 Labour: Rs.300 x 4 man-days = Rs.1,200 Material: Rs.444	Rs.2,344
9	Dec. 2, 2014	✓ Leakage from the pipeline ✓ On L6 line near L6-T5 outlet	Dec. 8, 2014	Fitter: Rs.700 x 2 man-days = Rs.1,400 Labour: Rs.350 x 4 man-days = Rs.1,400 Material: Rs.0	Rs.2,800
Total cost					Rs.20,144

Source: JICA TCP Team

(2) Development of Demonstration Plot

Poly houses and micro irrigation system (MIS) were installed mainly for demonstration and training to PMU Extension staff and the farmers. Construction site of the poly houses was discussed in the GMKVA meeting, and GMKVA selected six farmers for poly house demonstration. The TCP team also decided to construct one poly house in KVK Bara for demonstration purpose. Six poly houses of 40 m^2 were constructed in the pilot area and one poly house of 252 m^2 was done in the KVK Bara. Besides, MIS was installed in the six poly houses in the Lahalri pilot area and KVK Bara. Water tanks, water distribution facilities and electricity connection were also provided to all the poly houses. Joint inspections were carried out at each stage along with the farmers (Completed in December 2012) and staffs in charge of KVK Bara in January 2013. 6 farmers were selected as demonstration farmers for poly-house cultivation with voluntary basis.

Demonstration Farm at Lahalri

Demonstration Farm at KVK Bara

(3) Access Farm Road and Collection Center

JICA TCP had duly considered and analyzed the existing situation of the Lahalri pilot area, and the team had concluded that the construction of access farm road and collection center was not feasible in the Lahalri pilot area due to the following reasons.

1) Land Acquisition: The land acquisition needed for the construction of access farm road and collection center is relatively a wider area as compared to the construction of irrigation facilities. In 2011, although the consents were duly received from the farmers before the construction of the irrigation facilities, there were many objections from the farmers even for laying underground pipeline system, especially during the construction of irrigation facilities. Since the pilot area is located in Hamirpur township area, the land value is also relatively high. Therefore, it was almost impossible to obtain the consent from the farmers for the land acquisition required for the construction of the access farm road and the collection center.

2) Existing Conditions: In the preparatory survey, an access farm road was defined as a road which connects the farm land area and main road. In the pilot area, there is already an access road connecting the farm land area to the main road. Therefore, construction of a new access farm road in the pilot area was not necessary. Even in case of widening of existing access road in the pilot area, land acquisition shall be a major problem.

Hence, it was concluded that construction of access farm road in the pilot area was very difficult under JICA TCP.

3) Collection Center: Collection center defined in the ODA loan project has a role of key center in the cluster. In the pilot area, the vegetable cultivation had been just started, and the area was at the initial stage of crop diversification. Thus, a collection center at the stage shall become a superfluous facility for the farmers in the pilot area.

Some persons who operate the collection center including the trading activities are required At the initial stage, there was no operating body and, there was no farmers group in the site. This shall also be a problem after the construction of collection center.

Therefore, JICA TCP concluded that the establishment of farmers group in the pilot area based on farmers demand for group marketing activity and development of linkage with different marketing channels were necessary at the stage compared to the construction of collection center.

In addition, there is an existing marketing yard under APMC, Hamirpur for vegetables and it has a key role for vegetables trading in this area. It was recommended to utilize the existing facilities at the beginning stage compared to construction of new facilities. Based on the interview from APMC, it was understood that the farmers can utilize the existing marketing yard for the sale of vegetables.

The scope of TCP construction work cannot be extended to the area, other than the pilot area. Hence, it was concluded that construction of collection center was not feasible under JICA TCP.

2.5.4 Organization of Farmers Groups and Self Help Groups (SHGs)

(1) Gagan Memorial Krishak Vikas Association (GMKVA)

The activities performed to form the Water Users' Association (WUA) in Lahalri pilot project, and to get it registered under the Himachal Pradesh Societies Registration Act 2006 are summarized in the following table. WUA in the Lahalri pilot project was named Gagan Memorial Krishak Vikas Association (GMKVA).

Table 2.5.15 Activities to Form WUA in Lahalri Pilot Area

Steps	Activities	Responsibility	Time
Awareness campaign regarding JICA TCP Project	● The TCP and the DoA officials of the pilot area held meeting with the farmers and discussed in detail about the JICA TCP Project on crop diversification. ● The farmers were motivated to form the water users association.	TCP Team with the support of DDA Hamirpur, in-charge of the pilot area	April 1, 2011
Formation of farmers association	● General Body (GB) meeting of the farmers to form water users association ● Formation of Gagan Memorial Krishak Vikas Association (GMKVA) ● Election of President, Vice President, Secretary, Treasurer, and Management Committee (MC) members ● Election of advisory committee members ● First meeting of the MC and passing of the resolution regarding the registration of the association under HP societies registration act 2006 ● Approval by the GB of the association for the registration of the association	Execution by the farmers group with some facilitation by TCP team	April 10, 2011
Registration of Farmers Association	● Preparation of the rules and regulations of the association by the MC.	Execution by the farmers group with some facilitation by TCP team	Late April to Early May 2011
	● Non-Objection Certificate (NOC) from the Municipality office, Hamirpur	MC president in support with Community motivator (CM) of TCP	April 29, 2011
	● NOC from the Deputy Director of Agriculture, Hamirpur	MC president in support with CM of TCP	May 3, 2011
	● Discussion on the rules and regulations with DoA officers and PMU officers	TCP Team	Early and mid May 2011
	● Preliminary discussion with core MC office bearers	TCP Team	May 16, 2011
	● Finalization of rules and regulations and approval from the GB and MC of GMKVA	Execution by Management committee and advisory committee, and facilitation by TCP	April 29, 2011
	● Three sets containing Registration form, Rules and Regulations and memorandum of understanding with duly signed by MC members, advisory committee and witnesses from DoA officers ● Preparation of check list	Execution by secretary of the GMKVA, and facilitation by DoA, TCP team	First week of June 2011
	● Affidavit by the president of the association as per the HP societies registration act 2006	Action by GMKVA President, and facilitation by CM of TCP	June 7, 2011
	● Deposition of registration fees Rs. 500 in the block development office. ● Deposition of registration form (three sets) with memorandum of understanding, and all necessary documents in the Block Development office.	The appointed office bearer of GMKVA by the MC and facilitation by TCP team	June 8, 2011
	● Registration certificate from the Sub Divisional Magistrate Hamirpur Office	Receiving by the secretary of the GMKVA	June 21, 2011

Source: JICA TCP Team

Through the activities in Phase-1, WUA was registered in June, 2011 in the pilot project. The basic information of the WUA is show in the following table.

Table 2.5.16 Basic Information of Water Users' Association in Lahalri

Name		Gagan Memorial Krishak Vikas Association (GMKVA)	
Registration Date		June 21, 2011	
Member		88 persons	
Membership fee		INR 50 (one time only)	
Committee	**Management Committee**	11 members	President, vice-president, secretary, treasurer and the other executives are members of Management Committee (MC). Management committee is in charge of management and operation of WUA.
	Advisory Committee	4 members	Advisory Committee (AC) is composed of reliable senior persons. MC members can consult with AC depending on the needs.
	Social Audit Committee	3 members	Social Audit Committee is independently created in-house. Social Audit Committee performs an audit of Cash book kept by the treasurer, and issues a certificate once in a year.
	O&M Sub-committee	6 members	O&M Sub-committee is created under the Management Committee and treats O&M related issues depending on the needs.
	Marketing Sub-committee	6 members	Marketing Sub-committee is created under the Management Committee and treats issues for selling productions depending on the needs.
Meeting structure	**Management Committee meeting**	Bimonthly	Management Committee holds meetings every 2 months and discusses the management and operation of WUA. Example: Water tariff, cleaning the facilities, repairing the facilities
	General Body meeting	Half-yearly	All the member of WUA can participate in General Body meeting. And the General Body meeting was held twice in a year (generally before main cropping seasons). Important matter should be shared and approved by General Body. Example: Water distribution rule, revision of water tariff, mobilization of human resources to cleaning work, promoting irrigation use

Note: These data is as of February, 2014.
Source: JICA TCP Team

In the pilot area, the farming with irrigation facilities started for the first time from November 2012, and the TCP implemented the following field supports so that the GMKVA could manage their activities by themselves.

- Supporting Management Committee (MC) meeting and General Body (GB) meeting
- Supporting operation of Pump Operator (PO) and Water Distribution Coordinator (WDC)
- Supporting proper collection of water tariff and records keeping
- Supporting installation of lock system to all the outlets to prevent illegal use of water
- Supporting operation of sprinkler and hose irrigation to farmers
- Supporting repair of pipeline leakage

These field supports were different from trainings conducted in a specific date & place with budget. However, these field supports were very important and critical to create the sustainable system in irrigation projects. Without these continuous and flexible supports, it was difficult to implant habits of proper activities in WUA. It is strongly recommended to conduct these kinds of field support to WUAs in the ODA Loan Project to promote the sustainable crop diversification.

(2) Self-Help Group (SHG)

In the pilot area of Lahalri village, more than a half of male population of working age between 19 and 60 years are engaged in paid job, while 62% of the female population of the same age group takes on agriculture as their first occupation. The result of the household survey also shows that 88% of the population, whose first occupation is stated as agriculture, is women. As a consequence, it was reconfirmed that it is inevitable to develop capacity of women to promote agriculture related activities. In India, there are existing concept and schemes of support on Self Help Group (SHG) by the government targeting rural women. It was observed to be more acceptable and applicable for the people as well as relevant government officers to apply the existing concept of SHG to promote activities of women, especially in consideration of application to the regarding the ODA Loan Project for crop diversification. Hence it was agreed to develop women's activities based on the SHG concept. However, since Lahalri village belongs to a municipal council area, it has been often left out of those schemes on SHGs that mainly target rural villages. As a consequence, recognition and understanding on the concept and activities of SHG were found limited among the women in Lahalri. Although there were three existing SHGs in Lahalri at the beginning of the project, two of them did not have tangible activities since their formation. Based on this situation, the project took initiative on awareness raising of SHG activities to motivate women to start activities as a group by introducing successful SHG activities of the nearby area familiarizing with possible activities conducted as a group, followed by consecutive discussions with women in the village.

Responding to the above approaches, all the existing SHGs showed interest to start activities with the project support and other interested women formed 2 new groups.

Even though agriculture production activities should not be limited to women, it was judged that group activities among solely by women can be more practicable to start with, considering the opinion of the women who clearly stated that they feel more comfortable to work in groups of women instead of mixed gender groups.

At the beginning of the TCP, people outside commanding area of the irrigation scheme by the project raised objection and complaints as they will not get benefit from the irrigation scheme. The TCP had discussion with the people outside the commanding area and some women came to show their interest to join in the processing activities as well as some agriculture activities even without irrigation facility. Since some of those women are not confident enough and group formation was obstacle for them, the TCP provided all the women, be they group members or not, opportunities of participating in project activities, expecting them to form or join in the groups when they recognize benefit after trials of the activities. After training opportunities and continuous interaction, more people raised their interest on the activities and started joining to the groups.

The groups showed dynamism at their formation stage. In the course of the group establishment and development, one group decided to reform the existing group to start up their physical activities, and another disintegrated the group and joined to other groups, and others experienced change of members. At the end of February 2012, the following groups had engaged in the group activities starting agriculture and processing related activities.

Table 2.5.17 SHGs Formed and Expressed Interest in the Project Activities at the Starting

Name of the group	No. of members	Date of formation	Inter-loaning	Remarks
Bhole Shankar SHG	16	2008	Monthly collection of Rs.50	The group was reformed in Jan 2012
Naman SHG	10	June 2011	Monthly collection of Rs.50	
Lakshmi SHG	10	February 2011		The group has not been operating much, took part in the project activities in Jan 2012, but stopped gathering during Phase 2
Shiv Shakti SHG	16	November 2011	Monthly collection of Rs.100	
Saraswati	8	October 2011	Monthly collection of Rs.100	Decided to disintegrate and some members joined other group

Source: JICA TCP Team

Out of the five SHGs either newly formed or revived in the Phase-1, one group stopped their gathering and another one dismantled consequently some members joined other groups. In Phase-2, the TCP continued support for three SHG groups established in Phase-1, out of which two were revived as they had been defunct while the third one was newly formed through the facilitation of the project. The TCP has supported the activities of the SHGs by providing technical inputs and guidance in regard to formation of the group, establishment of group functions, planning of their activities, and materializing and developing the activities. In Phase-3, the activities of the three on-going groups have been developed in terms of variety, scales, income generation and group stability.

The following table shows summary of the active SHGs as of the end June 2015.

Table 2.5.18 Basic Information of SHGs in Lahalri

SHG	Year of formation	Members	Monthly Savings	Bank Linkage	Total savings*1	Activity
Shiv Shakti	Nov. 2011	18	Rs. 100	June 2012	Rs.,88,000 approx.	Group Farming
Naman (non cca)	Reformed on 11-06-12	12	Rs.100	February 2013	Rs.47,000 approx.	Nursery cultivation
Bhole Shankar	Reformed in January 13	13	Rs. 100	before the TCP started	Rs.58,000 approx.	Food processing

Source: JICA TCP Team

The TCP has assisted the activities from the identification of the suitable activities for the group, planning of the activities, support on the implementation of the activities with introduction of necessary technical knowledge and skills, and management of group including management of monthly contribution, inter-loaning system, organization of meeting, and management of group dynamism. The groups mentioned in the above table have been in operation with high participation in the meetings and activities.

As one of the original function of the SHG, the groups have started inter-loaning activities among the members. After the training and close hands-on instruction, all the SHG has been operating inter-loaning with adequate saving and loaning records. Record keeping has been conducted relatively well in their saving and loan registers. SHG members have been borrowing from the group saving for their emergency incidence such as medical expenditure for serious illness in the family, marriage ceremony of an OBC family, payment for school fees, investment for individual activity such as purchasing sawing machine, purchasing livestock, purchasing daily commodity. This resulted in

improving social standing of the members by improving their life management. The following is the progress of their inter-loaning activities.

Table 2.5.19 Summary of Inter-loaning Activities of SHGs in Lahalri

SHG	Total savings	Number of members who took loan	Total amount disbursed	Interest rate	Repayment rate
Shiv Shakti	Rs.88,000 approx.	3	Rs. 55,000	1%	On-going
Naman (non cca)	Rs.47,000 approx.	5	Rs.41,000	1 %	On-going
Bhole Shankar	Rs.58,000 approx.	5	Rs. 22,000	1 %	On-going

Remark: as of June 2015
Source: JICA TCP Team

Respecting and encouraging initiatives of the groups, technical supports were mostly incorporated in their regular meetings and during their activities. Regular monthly meetings have been conducted by all the three SHGs on certain dates every month with average participation of two-third of the members. The groups have been conducting activities of their choice mainly related to agriculture and allied activities with support by the TCP of technical inputs and facilitation as well as support in form of necessary materials to encourage their trials and develop the activities.

2.5.5 Trainings of Farmers in the Pilot Area

(1) Water Management and O&M

In Phase-1, the TCP team conducted the trainings for farmers in the pilot area mainly in the field of organizing the farmers association including leadership development. Since the construction of irrigation facilities were completed at the end of Phase-1, the TCP team conducted trainings on water distribution, operation of irrigation facilities and maintenance of irrigation facilities in Phase-2. As a result, the water management system/O&M system of the project was established. In Phase-3, trainings were provided to strengthen the sustainability of the water management system. In Phase-4, trainings to farmers were minimized to encourage the independence of WUA. On the other hand, status of activities of WUA was understood every month through monitoring records kept by WUA.

Table 2.5.20 Summary of Trainings for Farmers in the Pilot Area in Water Management and O&M

Training Category		Phase 1	Phase 2	Phase 3	Phase 4
Awareness & institutional development		⇨			
Needs assessment			△		
Exposure visit			△		
Activities of KVA	Water distribution & water tariff		⇨	⇨	
	Operation of irrigation facilities		⇨	⇨	
	Maintenance of irrigation facilities		⇨	⇨	
Strengthening the sustainability	Record keeping & its monitoring	⇨	⇨	⇨	⇨

Source: JICA TCP Team

Details of trainings for farmers in water management and O&M were shown in the following table.

Table 2.5.21 Trainings for Farmers in the Pilot Area in Water Management and O&M

Phase-1		
Street Play (August 21, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To bring awareness to the Local community of Village Lahlari in Distt. Hamirpur H.P. about Technical Cooperation Project and its activities through Street Play (/Kala jatha).	● Outline of irrigation project ● Merit of irrigation project ● Importance of cooperation ● The script for the Kala jatha was prepared by the Contractor in Local Hamirpur Language (‘Pahari’) based on the materials to be provided by the TCP Team	● Participants were motivated to participate in the irrigation project
Workshop on Leadership Development (November 27, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To develop the communication skills among Management Committee (MC) & Advisory Committee (AC) members of GMKVA (Gagan Memorial Krishak Vikas Association). ● To build the capacity of the MC & AC members on problem solving and team building	● Communication (Communication & Listening) ● Problem solving (Problem solving steps & Key elements of problem solving) ● Team building (Team work & Team management)	● The participants were aware of the methods to overcome the barriers of communication. ● The participants understood the tools and techniques of problem solving. ● The participants understood the various aspects which are associated with the effective team work
Workshop on Training Need Assessment on Operation and Maintenance of the Pilot Area in Lahalri (March 14, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To identify the core sector of training / enlisting of training for the Management committee and operation and maintenance subcommittee.	● Basics of the water management practices and components for the operation and maintenance	● The types of trainings required for the sustainable management of irrigation scheme, the following trainings enlisted by the participants. 1. Capacity building on pump operation and irrigation management, water tariff, water distribution, record keeping, conflict management 2. Development of guidelines for appointment of the pump operator, O&M sub-committee on water management (roles and responsibilities), water supply calculation methods 3. Exposure visit of MC, AC and O&M sub-committee, to understand water management methods

Phase-2		
Exposure Visit of Farmers on Water Management and O&M of Irrigation Facilities (September 23, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide GMKVA members an opportunity to learn by visiting the community managed schemes. ● To make GMKVA acquainted with practical knowledge of the water distribution mechanism, collection of water tariff, conflict management, operation and maintenance issues and their solutions.	● Management of Water Users Association ● Construction of irrigation system ● Water management and water distribution system. ● System of collection of water tariff ● Operation and maintenance of the system ● Farming and gender issues of the project ● Field visit of irrigation infrastructure and field area	● The farmers have actively participated in the exposure visit including discussions with KVS (Water Users Association) ● The farmers became acquainted with the water management and operation and maintenance of the irrigation projects visited.
Training on Pump Operation and Water Distribution System (October 5 to 7, 2012) (3 days)		
Objectives	**Subjects Covered**	**Outputs/results**
● To make the GMKVA able to manage the water distribution by themselves by training on the pump operation and water distribution system. ● To test the discharge and the pressure at all the outlets.	● Training of a pump operator and his assistant for pump operation ● Training of farmers on water distribution system regarding operating the valves in the distribution line and their outlets ● Testing on discharge and pressure at all the outlets of the water distribution system	● The pump operator got a good experience on pump operation and trouble shooting. ● Farmers acquired knowledge on the water distribution system. ● The pressure and discharge of each outlet were measured.
General Body Meeting of GMKVA on Rules and Regulations for Water Distribution and Water Management (October 21, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To discuss on the rules and regulations for water distribution and water management system of Lahalri pilot project. ● To get the consensus of the farmers on the water management and water distribution before the rabi cropping season.	● Submitting the demand for the water supply ● Water Tariff ● Operations and maintenance ● Penalties ● Roles and responsibilities of O & M Sub-committee	● The rules and regulations for water management were agreed by GMKVA by ownership of their members with JICA TCP's facilitation in preparation stage ● GMKVA took a decision to abandon monthly payment of Rs.20, apply a water tariff of Rs.70 per hour, and introduce advance payment and penalty system. ● One farmer agreed to manage the distribution tank, and regulation tanks, on voluntary basis, and is designated as Water Distribution Coordinator (WDC).

Training of Water Management, Record Keeping of Water Distribution and Pump Operation (October 30, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To discuss the details of the water distribution system with Water Distribution Coordinator (WDC), active members of MC and O&M sub-committee of GMKVA.	● Irrigation in block system, irrigation schedule ● Record keeping: Irrigation demand and payment record ● Function of DT and Regulation tank (LRT1 & LRT2) ● Operation of outlets inside the blocks ● Pumps operation and it's trouble shooting	● Members of O&M sub-committee understood importance and merits of block rotation. ● Record keeping methods was explained to members of O&M sub-committee. ● Operation of Irrigation facilities was explained to members of O&M sub-committee.
Farmers Training on Irrigation in Rabi Crops (November 7, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To impart the knowledge on importance of irrigation at proper physiological growth stages of major crops to attain the maximum yields	● Training on Cultivation of cereal crops, vegetable crops and fodder production during rabi season: wheat, gram, sarson, toria, onion and garlic. ● Training on water management: making irrigation request to GMKVA as well as importance and benefits of irrigation at the right stages of crops	● The farmers are now aware of the importance of irrigation to attain maximum yields. ● The farmers understood timing of irrigation for wheat and vegetables.
General Body Meeting cum Training on Rules and Regulations of Water Distribution and Water Management in Rabi, 2012 (November 25, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To train the farmers of G GMKVA on the rules and regulations of water distribution and water management of the project so that the GMKVA can manage all the activities of water distribution and water management by themselves.	● Irrigation Schedule ● Merit of block rotation system ● How to request the irrigation water ● Lock system for valves	● The farmers decided on the specific irrigation rule based on the explanation of TCP team. ● Based on the suggestion of Water Distribution Coordinator, water tariff was changed from Rs. 70/hour to Rs.72/hour.
Training on Cleaning of Distribution tank (December 21, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● Importance of cleaning of tanks and outlets for proper functioning of pipeline system ● Methodology of cleaning the Distribution tank	● Instruction of importance of cleaning the tanks and outlets so that there is no damage to the pipeline system. ● Instruction on draining the water, remove the pebbles and stones.	● Participants involved themselves very actively in the cleaning training, and the tanks were cleaned.

Bimonthly meeting of Gagan memorial Krishak Vikas Association (GMKVA) (January 12, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To discuss various current issues related to the effective management of the Project.	● Construction of footway for Mr. Karam Chand house near RT-2 ● Provision of monthly mobile expenses for Water Distribution Coordinator (WDC) & Pump Operator (PO) ● Training on Institutional Development, and maintenance to pump operators ● Training on cleaning of intake, spillway, feeder channel and sump well ● Training on irrigation & water management ● Expansion or increasing the capacity of water reservoir (water storage) ● Exposure visit of community managed irrigation schemes ● Lock system for all butterfly valves ● Dumping of garbage at Jamli river bridge Dugga	● Provision of monthly mobile expenses of Rs.50/- to the pump operator and WDC ● TCP team discussed on the training plan and GMKVA members are interested for training. ● Dumping of garbage was discussed and decided that a compliant will be made to the District Commissioner to ban the dumping at this bridge ● The other issues including T-Joint, concrete footpath to the Pump house
Training on Maintenance of Pump Machinery (January 14 to 18, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To give the training of maintenance of pump machinery to pump operators of GMKVA.	● Greasing in various parts of motor or pump ● Gland parts ● Visual and sound observations and relevant problems ● Problems in NRV ● Problems in Gate valve/ Sluice valve ● Changing of phases ● Other important points regarding to pump operation and maintenance	● Pump operator and his assistant learnt on maintenance of pump machinery. ● They dismantle the machinery by themselves and also did the all work practically.
Training on Cleaning of Water Feeding Structures (January 20, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide the training to GMKVA on cleaning of water feeding structures including spillway, desilting chamber, feeder channel and sump well.	● Cleaning and maintenance of water feeding structures including spillway, desilting chamber, feeder channel, and sump well, and removal of all the accumulated debris, silt, and other foreign materials.	● The GMKVA members participated very actively in the training. They managed to do all the cleaning works by themselves with a creative mind.
Phase-3		
Training on Operation and Maintenance of poly house and its irrigation facilities (September 13, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● The main objective of the training is to train all six farmers who owns poly houses. Through the training, farmers are expected to know operation of drip fogger and maintenance like repair of poly sheet, shade net and side curtain.	● Theoretical discussion on Operation and Maintenance of poly house and its irrigation systems ● Practical training operation and maintenance of poly house ● Operation & maintenance of Drip Irrigation system ● Operation & Maintenance of fogger system	● Participants were aware of the dos and don'ts of poly house and its irrigation system. The farmers were taught practically to rectify the problems of clogging of pipes /foggers. ● They were also advised to keep the door shut immediately after entering the poly house to bar the entry of the insects. They were demonstrated to rectify the small problems arising while opening & closing of doors.

Training on Cleaning of intake site and repairing of foot valve (September 22, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● The main Objective of the training is to make habit and capacity development of Management Committee (MC) and O&M sub-committee of GMKVA for repairing and cleaning of irrigation facilities	● Cleaning of sump well intake site. ● Identification of problem in foot valve ● Repairing of foot valve and training to GMKVA Pump operator. ● Testing of both pump ● Fixed the water level measuring scale in the sump well.	● They managed all the cleaning works by themselves with hard work & self-interest. GMKVA carried out all the cleaning activities in a well-planned manner, and there were sufficient members involved in the cleaning. In future, it is expected that the GMKVA can manage the cleaning of water feeding structures by them.
Training on rules of irrigation and water distribution method in Lahlri pilot project (October 12, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● The main Objective of the training is to enhance the management Committee (MC) and O&M sub-committee of GMKVA.	● Importance of Rules of Water Irrigation ● Principle of Water Distribution ● Rotation Block ● Irrigation Schedule ● Role of Pump Keeper and Water Distribution Coordinator ● Merit of Block Rotation System ● How to request for the irrigation water ● Lock System for valves	● The GMKVA members participated very actively in the training. ● TCP proposed two types of plans for irrigation. Farmers decided Plan 'A' for irrigation, because plan 'A' is useful for vegetable growers. ● After the session, short test was conducted based on the contents of training. For better understand of farmers test was in Hindi and the average rate of correct answer was 79.5 %.
Phase-4		
Training on Operation and Maintenance of Irrigation Facilities (September 21, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● Making the GMKVA understanding about their roles and responsibilities in Operation and maintenance of the irrigation facilities	● Regular inspection of the pumping facilities ● Periodical cleaning of intake, sump well, desilting chamber, open channel and water tanks. ● Repair of pipeline leakage.	● GMKVA members were fully understood their roles and responsibilities for O&M of irrigation facilities. GMKVA members ensured that they will take more responsibilities for managing the O&M part and expanding the activities which associate with that of the project purpose of crop diversification.

Source: JICA TCP Team

Through the trainings and field support, the following system has been established in the pilot area.

1) Water Distribution

- Pilot area is divided into 3 blocks.
- Each block can irrigate 2 days in a week.
- Inside each block, farmer can irrigate based on his/her request.
- Water tariff is paid with irrigation request in advance.
- Block rotation system can flexibly be changed to a simple request system if the demand for water is not so large.

2) Operation of Irrigation Facilities

- A post of Water Distribution Coordinator (WDC) was newly created apart from Pump Operator for coordination of water distribution activities
- WDC manages distribution tank & regulation tanks.
- Operation of WDC is based on the irrigation request of farmers.
- Lock system with chain and lock was installed to terminal outlets.
- The lock system was improved and stronger locks were installed not to terminal outlets but to main tanks.

3) Maintenance of Irrigation Facilities

- Daily inspection is conducted for the pumping facilities by the pump operator.
- Cleaning of tank or the other facilities is basically conducted before every crop season.
- Repair work is managed as soon as possible by the pump operator and the WDC.

4) Management of WUA

- Management Committee holds meetings every 2 months and discusses the management and operation of WUA.
- General body meeting are held twice in a year and approve important matters which is decided by Management Committee.
- Internal audit is conducted by Social Audit Committee and the certificate is issued once in a year.

(2) Vegetable Farming and Post-harvest

Trainings in the field of vegetable farming and post-harvest conducted for farmers in the pilot area are summarized as shown in the following table.

Table 2.5.22 Summary of Trainings for Farmers in the Pilot Area on Vegetable Farming and Post-harvest

Training Category		Phase 1	Phase 2	Phase 3	Phase 4
Awareness campaign		△			
Pre-trial farm	Group formation	△			
	Basic cultivation skills	→			
	Basal manure production	→			
	Farm management	→			
SHG	Nursery production	→			
	Nursery pot production	→			
	Basal manure production	→			
	Food processing	△			
Exposure visit		△ △	△ △	△	
Theoretical and hands-on training	Cultivation techniques		→	→	
	Basal manure production		→	→	
	Post-harvest techniques		→	→	
	Value added cultivation		→	→	
	Farm management		→	→	

In Phase-1, the TCP team conducted practical trainings only for limited number of farmers who had own water source in the pilot area since the construction of irrigation facilities was not completed until the end of Phase-1. The training concentrated on crop cultivation of tomato, brinjal, cucumber and capsicum in kharif season and cauliflower, broccoli, turnip and radish in rabi season. In addition, trainings of Bokashi production and organic liquid fertilizer production were conducted. For SHG members, trainings on bookkeeping and nursery pot sewing were conducted as farming related activities.

Table 2.5.23 Trainings of Farmers and SHG Members in the Pilot Area on Farming and Post-harvest in Phase-1

Phase-1		
Farmers' Support through Field Visits to pre-trial farm on Weekly Basis		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize farmers with farming activities ● To provide farmers hands-on training on skills and techniques of cultivation of vegetables	● Cultivation techniques of vegetables ● Insect-pest and disease control through monitoring ● Nursery production of tomato by cutting ● Cultivation techniques of vegetable under poly-tunnel condition ● On time application of water and fertilizer ● Post-harvesting (collecting, sorting and packing) activities ● How to utilize animal dung for Bokashi production, compost production and liquid fertilizer production	● Farmers could produce vegetables effectively ● Farmers could control insect-pest and disease ● Farmers understood effective application of water and fertilizer ● Farmers could harvest and pack their produce ● Farmers utilized their backyard manure for composting
Exposure Visit on Farming and Post-harvest Activities to Nearby Area of Hamirpur (April 8, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers opportunity to learn advanced agricultural technologies from advanced farmers in Chauki and Marhoon ● To make farmers realize the importance of collective work ● To understand the importance of farm management	● Use of irrigation facilities including sprinklers ● Cropping pattern arrangement to maximize income ● Contract basis farming by labors from outside ● Collective work of post-harvesting (collecting, sorting, storing and shipping)	● The farmers have actively participated in the exposure visit ● Farmers got the information of profitable crops and their management ● Farmers realized the benefit by collective work ● Farmers realized the benefit from contract farming
Awareness Campaign regarding JICA TCP (April 1, 2011)		
Objectives	**Subjects Covered**	**Outcomes/results**
● To familiarize farmers with JICA TCP ● To make them understand the role and works of each component of JICA TCP ● To let farmers know the role of project site as a model for Loan project	● Introduction of JICA TCP ● The role and works implemented by JICA TCP experts ● The importance of pilot project site for Loan project ● Crop diversification	● Farmers understood JICA TCP ● Farmers understood the role and works of JICA TCP ● Farmers showed the interest on cultivation of vegetables ● Farmers understood to make Water user's association.
Formation of Farmer's Group (April 5th week , 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To make small group for training ● To learn how to cultivate vegetables in group including SHG members ● To set pre-trial demonstration farm in each farmer's field	● Group formation ● How to start cultivation of vegetable ● How to set poly-tunnel in their field	● Farmers who could cultivate vegetables by own water sources were identified and listed as voluntary pre-trial farming. ● They started cultivation of vegetables in their field and poly-tunnel.

Hands-on Training on Nursery Bed Preparation and Production (May 2nd week , 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide knowledge and skills for kharif vegetable cultivation	● Varieties of kharif season crop ● Cultivation techniques of each crop ● Insects and disease of kharif crop ● Protected cultivation ● Nursery production in bed	● Farmers understood importance of selection of right varieties of kharif crop ● Farmers were intimated about nursery production in bed. ● Farmers understood the importance of use of fungicide
Hands on Training on Land Preparation and Application of Basal Manure (May 3rd week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To learn how to prepare land before sowing seed ● To learn the type of fertilizers and their application	● How to till the filed ● How to apply basal manure ● How to make bed for cultivation ● How to apply water	● Farmers understood how to prepare land before sowing ● Farmers learnt how to apply basal manure and water
Hands on Training on Poly-tunnel Construction as Water-shed in Rainy Season (June 2nd week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To intimate farmers the skills and knowledge of simple protected cultivation ● To provide information on merits and demerits of protected cultivation	● Varieties of vegetable cultivated in poly-house/poly-tunnel ● Cultivation techniques of each crop ● Water use and application of fertilizer in poly-house/poly-tunnel ● Insects and disease control in poly-house/poly-tunnel ● The reason why farmers need to use water-shed in rainy season	● Farmers learnt suitable varieties for protected cultivation ● Learnt how to cultivate vegetables in poly-house/poly-tunnel
Hands on Training on Preparation of Organic Liquid Fertilizer (June 3rd week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To impart techniques how to make organic liquid fertilizer	● Material preparation ● How to make organic liquid fertilizer ● How to use fermented organic liquid fertilizer	● Farmers understood how to make organic liquid fertilizer at home ● They made organic liquid fertilizer
Hands on Training on Use of Poly-mulch for Water Saving Cultivation (June 3rd week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide enough information on skills and knowledge for water saving cultivation	● Types of mulching ● Use of poly-mulch in poly-tunnel ● Water saving cultivation ● Merits of use of mulch	● Farmers were interested in the use of mulch. ● Farmers learnt how to use poly-mulch in poly-tunnel ● Farmers understood how to save water by using poly-mulch.
Hands on Training on Transplanting of Nursery in the Field (June 4th week, 2011)		
Objectives	**Subjects Covered**	**Outcomes/results**
● To provide skills and techniques how to transplant nursery in the field	● How to take seedling from nursery bed ● Crop distance ● How to apply insecticide and fungicide before transplanting ● How to apply manure before transplanting ● How to transplant each vegetable	● Farmers understood how to transplant nursery in the field ● Farmers transplanted their nursery in their field by themselves.

Theoretical Training on Farm Management (June 4, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To make farmers understand basic skills and knowledge of bookkeeping ● To learn the balance of costs and profits ● To practice record keeping	● Basic bookkeeping ● Items of cost and profit ● Mock training on record keeping of costs and profits in training sheet	● Farmers understood items of costs and profits ● Farmers acquired knowledge of recordkeeping ● Farmers understood how to record costs and profits through mock training.
Hands on Training on Pruning of Tomato, Capsicum and Brinjal (August-September, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers knowledge and techniques of pruning of vegetable	● The needs of pruning for appropriate growth ● How to prune overgrown vegetable plant. ● How to make good shape of each vegetable	● Farmers learnt knowledge and techniques for pruning. ● Farmers conducted pruning in their field and poly-tunnel.
Hands-on Training on Cutting of Tomato (September, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers a new technique of vegetative propagation of tomato	● How to prune side buds. ● What is cutting? ● How to conduct cutting.	● Farmers understood how to conduct cutting. ● Farmers actually conducted cutting in their field.
Hands on Training on Control of Insects and Disease (June- September, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers skills and knowledge of prevention from insects and disease	● How to detect insect and disease ● How to use insecticide ● How to use fungicide ● How to avoid use of agro-chemicals	● Farmers understood how to detect and prevent from insect and disease ● Farmers applied insecticide and fungicide based on their needs
Hands on Training on Harvesting (June-September, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers skills and techniques of harvesting ● To provide the knowledge of seed harvesting	● How to harvest kharif vegetable ● How to harvest seed of kharif vegetable	● Farmers understood how to harvest kharif vegetable ● Farmers conduct harvesting in their filed. ● Farmers tried seed harvesting also.
Hands on Training on Sowing of Rabi Vegetables (August-September, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide practical training in the field for sowing of rabi vegetable	● How to prepare raised bed ● How to apply basal manure ● How to maintain field after sowing including water application	● Farmers understood how to sow the seed of rabi vegetables in the field. ● Farmers tried by themselves to sow seed of rabi vegetables.
Hands on Training on Nursery Preparation in Bed and Pot (August-September, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide training on nursery bed preparation on-site for farmers ● To prepare media mixture for seedling raising in pots	● How to prepare raised bed ● Soil sterilization ● Application of basal manure ● How to prepare media mixture for pot sowing	● Farmers understood how to prepare raised nursery bed ● Farmers and understood how to make media mixture for pot sowing
Hands on Training on Blanching of Cauliflower (November 2nd week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide practical hands-on training on blanching	● The need of blanching for cauliflower ● How to conduct blanching	● Farmers understood the importance of blanching. ● Farmers conducted blanching in 2 methods in their field.

Hands on Training on Harvest and Post-harvest (December 1st week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers how to harvest rabi vegetables ● To provide knowledge and techniques of post-harvest	● How to harvest rabi vegetables ● How to conduct post-harvest activities	● Farmers understood how to harvest rabi vegetable ● Farmers conducted harvest and post-harvest activities.
Hands on Training on Basal manure (Bokashi) Production to SHG (May 3rd week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide SHG members hands-on training for Bokashi production and EM compost production	● How to produce Bokashi ● How to prepare EM compost ● Efficiency of these manures	● They learnt how to produce Bokashi and tried to prepare by themselves ● They learnt how to prepare EM compost and tried to prepare it by themselves
Hands on Training on Organic Liquid Fertilizer Production to SHG (June 3rd week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide SHG members skills and knowledge of organic liquid fertilizer production and application	● Materials and instrument make organic liquid fertilizer ● How to make organic liquid fertilizer ● Application of liquid fertilizer as an additional fertilizer	● SHG members learnt how to make and apply organic liquid fertilizer
Hands on Training on Nursery Pot Production to SHG (August 3rd week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide training on nursery pot production before nursery production	● How to use the material ● Bending and sewing of pot ● Merit of pot sowing	● SHG members understood how to make unwoven cloth pot. ● SHG members produced more than 300 pots for nursery.
Hands on Training on Nursery Production to SHG (September 1st week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide practical hands-on training on pot and nursery bed sowing	● How to sow the seed of rabi vegetables in pot and in bed	● SHG members learnt how to sow the seed and tried sowing by themselves
Hands on Training on Harvesting and Post-harvest to SHG (November 4th week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide SHG members hands-on training for harvesting and post-harvesting.	● How to harvest rabi vegetables ● How to conduct post-harvesting activities	● SHG members understood how to harvest and conduct post-harvest activities of rabi vegetables and tried to conduct by themselves
Hands on Training on Food Processing to SHG (December 3rd week, 2011)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide SHG members hands-on training for simple food processing	● How to produce candy ● How to prepare achal ● How to make juice and jam	● SHG members learnt how to conduct food processing. ● They produced achal, jam and candy by themselves.
Exposure Visit to Palampur University for SHG and Farmers (March 6, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide SHG members and farmers skills and knowledge of food processing and other activities	● Nutritional facts and processing of fruits and vegetables ● Experimental field visit for crop diversification ● New varieties of vegetable	● SHG members learnt how to apply different types of techniques for food processing and how to preserve vegetables and fruits. ● Farmers got new information on vegetables and their cultivation.

Source: JICA TCP Team

The traditional cropping pattern in Lahalri was grain dominant. In addition, most of farmers are not a full-time farmer. As a result, lack of labor hindered conversion from grains to vegetables since vegetable cultivation is labour intensive work. In consideration of such situation, group farming by SHGs and contract farming with labours from outside was promoted.

In Phase-2, most of the trainings were conducted in the pilot area for the convenience of farmers. Some of theoretical trainings were conducted in Palampur University and KVK Bara. Demonstration farms and 6 poly-houses were set. For demonstration farmers, hands-on trainings were conducted at each farmer's field in daily basis.

In Phase-3, trainings were conducted both practical and theoretical ones on the site. In some training, extension officers conducted hands-on training for farmers. Protected cultivation training was conducted in poly-house.

In Phase-4, only two trainings were conducted in Lahalri pilot area on the basis of demand. Beside these trainings, practical trainings were delivered in each farmer's field daily.

Table 2.5.24 Trainings of Farmers in the Pilot Area on Vegetable Farming and Post-harvest from Phase-2 to Phase-4

Phase-2		
Farmers' support through field visits on daily basis		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers hands-on training on skills and techniques of cultivation of vegetables ● To monitor incidence of insects and diseases in the field	● Cultivation techniques of vegetables and cereals ● Insect-pest and disease control through daily monitoring ● On time application of water and fertilizer ● Post-harvesting (collecting, sorting and shipping) activities ● How to utilize animal dung for compost production	● Farmers could produce vegetables effectively ● Farmers could control insect-pest and disease ● Farmers understood effective application of water and fertilizer ● Farmers could harvest and ship produce to local market and Delhi ● Farmers utilized their backyard manure for composting
Exposure Visit on Farming and Post-harvest Activities to nearby area of Hamirpur (November 20, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers opportunity to learn advanced agricultural technologies from progressive farmers in Hamirpur ● To make farmers realize the importance of corporative work ● To make farmers acknowledge integrated farming with animal husbandry	● Use of irrigation facilities including sprinklers ● Cropping pattern arrangement to maximize income ● Contract basis farming by labors from outside ● Corporative work of post-harvesting (collecting, sorting and shipping) ● How to keep animals ● How to utilize animal products ● How to utilize animal dung for compost production	● The farmers have actively participated in the exposure visit ● Farmers got the information of profitable crops ● Farmers realized the benefit by corporative work ● Farmers realized the benefit from contract farming ● The farmers became acquainted with the merit of integrated farming with animal husbandry

Exposure Visit on Farming and Water management Activities to District Kullu (December 7,8 and 9, 2012)		
Objectives	**Subjects Covered**	**Outcomes/result**
● To provide farmers opportunity to learn advanced farming techniques from farmers in Kullu ● To learn profitable nursery production ● To learn cropping pattern for off-season vegetable ● To visit a farmers group for learning collective water management to discuss with farmers in Kullu ● To visit KVK Kullu	● Protected cultivation ● Profitable varieties of vegetable including exotic vegetable such as leaf lettuce and butter lettuce ● Organic farming ● Use of irrigation system ● Nursery production in poly-tunnel ● Off-season vegetable production in poly house ● The importance of water user's association ● Lesson learning from advanced farmers ● Experimental field for organic farming	● Farmers leant lessons from advanced farmers through the visit and discussion. ● SHG group member were interested in nursery production ● Farmers realized profitability of off-season vegetable cultivation ● Farmers actively discussed with advanced farmers. ● Farmers got information of organic farming from experimental field
Exposure Visit on Farming Activities to District Una (March 15 and 16, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide opportunity to learn advanced farming in Una ● To learn how to manage irrigation system for vegetable production ● To learn selection of varieties for profitable production	● Profitable vegetable cultivation ● Water management for maximizing profit from vegetable cultivation ● Importance of crop selection for profitable production ● Visit to see river bed cultivation	● Farmers learnt agricultural techniques in Agro-ecological zone I (lower area) ● Farmers leant how to manage irrigation system ● Farmers learnt how to select varieties to make vegetable farming profitable
Theoretical Training on farm management (September 21, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To make farmers understand basic skills and knowledge of bookkeeping ● To learn the balance of costs and profits ● To practice record keeping	● Basic bookkeeping ● Items of cost and profit ● Record keeping of costs and profits in training sheet	● Farmers understand items of costs and profits ● Farmers acquired knowledge of recordkeeping ● Farmers understood how to record costs and profits through practice.
Theoretical Training on Rabi Season Crop Cultivation (September 29, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide knowledge and skills for rabi crop cultivation ● To intimate protected cultivation through video film presentation ● To learn how to make nursery ● To understand how to produce vermi-compost	● Varieties of rabi season crop ● Cultivation techniques of each crop ● Insects and disease of rabi crop ● Protected cultivation ● Nursery production in bed ● Compost production by use of earth worms	● Farmers understood importance of selection of right varieties of rabi crop ● Farmers were intimated about protected cultivation ● Farmers understood the importance of use of fungicide ● Farmers understood the use of earth worm for compost production
Theoretical Training on water use and fertilizer application (October 9, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To learn adequate water application of each crop ● To learn the type of fertilizers and their application	● Water requirement of each crop ● On time application ● Soil moisture measurement by hand ● Adequate and on-time application of fertilizer to each crop	● Farmers understood how to measure soil moisture by hand ● Farmers learnt the importance of on-time application of fertilizer

Theoretical Training on protected cultivation of vegetables (December 28 and 29, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To intimate farmers the skills and knowledge of protected cultivation ● To provide information on merits and demerits of protected cultivation in agro-ecological zone I ● To produce nursery production in soilless media	● Varieties of vegetable cultivated in poly-house ● Cultivation techniques of each crop ● Water use and fertigation in poly-house ● Insects and disease control in poly-house ● Nursery production in soilless media Practical: How to use micro irrigation system	● Farmers learnt suitable varieties for protected cultivation ● Learnt how to cultivate vegetables in poly-house ● Farmers were interested in soilless media for sound nursery production ● Farmers understood how to handle micro irrigation system
Theoretical Training on Kharif season crop cultivation (January 9 and 10, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide enough information on skills and knowledge for kharif crop cultivation	● Varieties of kharif season crops ● Water use and fertilization ● Insects and disease of kharif crops and their countermeasure ● Productivity of each crop	● Farmers were interested in the most profitable variety of each crop ● Farmers learnt how to grow each crop ● Farmers understood how to control insects and disease of kharif crop
Theoretical Training on organic farming (February 2, 2013)		
Objectives	**Subjects Covered**	**Outcomes/results**
● To provide skills and knowledge necessary for organic farming	● Organic manure and vermi-compost ● Organic insecticide and fungicide ● Integrated pest management by organic way ● Trend of organic farming ● Certification of organic products	● Farmers had information on organic farming ● Farmers were interested in vermi-compost
Theoretical Training on cropping pattern arrangement and Integrated Pest Management (March 28, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers information on cropping pattern arrangement ● To provide farmers skills and knowledge of integrated pest management	● Suitable varieties grown in agro-ecological zone I ● Crop rotation ● Combination of kharif crop and rabi crop ● Combination of vegetables and grains ● Integrated pest management	● Farmers were interested suitable varieties in their farm ● Farmers learnt the importance of crop rotation ● Farmers learnt knowledge and techniques for integrated pest management
Theoretical Training on Farm management, evaluation, monitoring and planning (November 16,17, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers basic skills and knowledge necessary for analyzing the result of harvest and make use of the result for next planning	● Review of basic bookkeeping skills ● Check and analysis of recorded result ● Utilization of the analysis to next year's planning	● Farmers checked their recorded data and evaluate it by themselves. ● Farmers made use of the result of analysis for next year's planning
Theoretical Training on Improvement of food grains (April 1,2, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers skills and knowledge of improvement of grain production	● Suitable varieties of grains ● Land preparation and basal manure ● Application of water and additional fertilizer ● Insects and disease of grains	● Farmers learnt how to improve productivity of grains

Farmer's School on Vegetable Cultivation (November 7, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers opportunity of on-site training by scientists on vegetable cultivation	● Suitable bed making (land preparation) for each vegetable ● Crop distance (Spacing) ● Adequate application of water and fertilizer ● Insects and disease identification by scientists and their counter measure	● Farmers discussed with scientists freely. They were very interested in improved varieties of grains and insect and diseases control ● Farmers learnt skills and techniques directly from scientist ● Farmers requested more information on animal husbandry
Hands-on Training on nursery bed making (September 25, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide practical training on nursery bed making for poly-house farmers and SHG's members	● How to prepare raised bed ● Soil sterilization ● Application of basal manure	● Farmers and SHG's members understood and tried by themselves to make nursery beds.
Hands-on Training on nursery bed preparation and media mixture preparation for cucumber seedlings (September 30, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide training on nursery bed preparation on-site for farmers and SHG members ● To prepare media mixture for cucumber seedling raising in pots	● How to prepare raised bed ● Soil sterilization ● Application of basal manure ● How to prepare media mixture for pot sowing	● Farmers and SHG members understood how to prepare raised nursery bed ● Farmers and SHG members understood how to make media mixture for pot sowing
Hands-on Training on capsicum, cucumber nursery sowing and poly tunnel preparation (October 11-18, 2012)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide practical hands-on training on pot and nursery bed sowing ● To provide basic skills for poly tunnel preparation for early nursery raising	● How to sow the seed of capsicum and cucumber in pot and in bed ● Preparation of poly-tunnel for nursery raising	● Farmers and SHG members learnt and tried sowing by themselves ● Farmers and SHG members understood how to prepare poly-tunnel for nursery by themselves
Hands-on Training on organic manure preparation (February 9, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers and SHG members hands-on training for vermi-compost and vermi-wash production	● How to make vermi-compost ● How to make vermi-wash	● Farmers and SHG members understood how to produce vermi-compost and vermi-wash and tried to prepare by themselves
Hands-on Training on Bokashi and EM compost preparation (February 19, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers and SHG members hands-on training for Bokashi production and EM compost production	● How to produce Bokashi ● How to prepare EM compost ● Efficiency of these manures	● They learnt how to produce Bokashi and tried to prepare by themselves ● They learnt how to prepare EM compost and tried to prepare it by themselves
Hands-on Training on water use and fertilizer application (March 6, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers and SHG members skills and knowledge of timely fertilizer application	● Types of fertilizer and its application as a basal manure and additional fertilizers	● Farmers and SHG members learnt how to apply different types of fertilizer on time

Phase-3		
Farmers' support through field visits on daily basis		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers hands-on training on skills and techniques of cultivation of vegetables ● To monitor incidence of insects and diseases in the field	● Cultivation techniques of vegetables and cereals ● Insect-pest and disease control through daily monitoring ● On time application of water and fertilizer ● Post-harvesting (collecting, sorting and shipping) activities ● How to utilize animal dung for compost production	● Farmers could produce vegetables effectively ● Farmers could control insect-pest and disease ● Farmers understood effective application of water and fertilizer ● Farmers could harvest and ship produce to local market and Delhi ● Farmers utilized their backyard manure for composting
Exposure Visit on Farming and Water management Activities to District Solan (August 9, 10 and 11, 2013)		
Objectives	**Subjects Covered**	**Outputs/ results**
● To provide farmers opportunity to learn advanced farming techniques from farmers in Solan ● To learn profitable nursery production ● To learn inter-cropping for prevention from insects ● To visit a farmers group for learning collective production and marketing ● To discuss with farmers in Solan ● To visit KVK Solan ● To visit Noni University	● Protected cultivation (Poly-house and poly-tunnel) ● Profitable varieties of vegetable such as capsicum, tomato and cherry tomato ● Group farming for mass production and effective marketing ● Nursery production in poly-tunnel ● Off-season vegetable production in poly house ● The importance of collaboration among group ● Lesson learning from advanced farmers ● Experimental field for exotic vegetable	● Farmers leaned lessons from advanced farmers through the visit and discussion. ● SHG group member were interested in nursery production ● Farmers realized profitability of off-season vegetable cultivation ● Farmers actively discussed with advanced farmers. ● Farmers got information of collective work for good marketing strategy
Hands-on Training on Cultivation of Summer Vegetables (August 2, 2013)		
Objectives	**Subjects Covered**	**Outputs/ results**
● To impart farmers an opportunity to get some practical knowledge regarding summer vegetable cultivation ● To familiarize some techniques for summer vegetative propagation of vegetables like tomato ● To interact with extension officers	● Tips and techniques of summer vegetable cultivation like cucurbits, solanaceous, root crops , French beans and okra ● Vegetative propagation of tomato ● Interaction with extension officers	● Farmers understood tips and techniques for summer vegetable cultivation and tried to apply leaned techniques. ● Farmers were fully satisfied with the hands-on training by extension officers
Theoretical and Hands-on Training on Maize Production (August 16, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide practical training on maize cultivation for farmers	● Agro-techniques in maize like varieties, seed rate, fertility management, cultural practices ● Information on nutrient deficiency ● Cropping pattern and mix/inter-cropping with maize ● Hands-on training on application of fertilizer and earthing-up	● Farmers understood the importance of on time application of additional fertilizer and earthing-up.

Hands-on Training on Protected Cultivation and Post-harvest Activities (October 1, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To impart farmers an opportunity to get some practical knowledge regarding protected cultivation ● To familiarize some techniques for grafting of vegetables and use of plastic mulch in vegetable crop ● To interact with extension staffs	● Tips and techniques of protected cultivation ● Post-harvest activities in field level ● Hands-on training on cutting of tomato ● How to prepare media mixture for pot sowing	● Farmers understood basic skills of vegetable cultivation in poly-house ● Farmers understood how to conduct post-harvest activities ● Farmers practiced grafting of tomato and understood how to conduct it. ● Farmers understood how to prepare media mix for pot sowing
Theoretical and Hands-on Training on Winter Season Vegetables (October 6, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize with some new techniques for increasing winter season vegetable production	● Lecture on tips and techniques for winter season vegetable cultivation (Cole crops, root crops and leafy vegetables)	● Farmers understood how to sow the seed of winter vegetables and fertilizer application. ● They did sowing, making nursery and transplanting of seedling in their fields by themselves.
Hands-on Training on Wheat Cultivation (October 12, 2013)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize some new techniques for increasing wheat production like line sowing with seed cum fertilizer drill or by behind the plough, timely application of water and additional fertilizer	● Tips and techniques for cultivation of wheat including preparation of field, sowing techniques and irrigation schedule ● Interaction with farmers	● Farmers understood procedure of sowing and fertilizer application. ● Farmers kept these things in consideration while doing sowing and watering in the field.
Phase-4		
Farmers' support through field visits on daily basis		
Objectives	**Subjects Covered**	**Outputs/results**
● To provide farmers hands-on training on skills and techniques of cultivation of vegetables in each farm ● To guide farmers to monitor incidence of insects and diseases daily basis in the field in order to prevent from those prevalence ● To guide farmers proper time of harvesting, harvesting techniques, post-harvesting techniques and packing techniques for transportation	● Cultivation techniques of vegetables and cereals ● Insect-pest and disease control through daily monitoring ● On time application of water and fertilizer ● Post-harvesting (collecting, sorting, packaging and shipping) activities ● How to utilize animal dung for compost and vermin-compost production ● How to prepare vermin-compost pit	● Farmers could produce vegetables effectively ● Farmers could control insect-pest and disease ● Farmers understood effective application of water and fertilizer ● Farmers could harvest and ship produce to local market and Delhi ● Farmers utilized their backyard manure for composting

Maize cultivation (June 25, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● To impart farmers an opportunity to get some practical knowledge regarding Maize cultivation ● To familiarize with some improved techniques for increasing Maize production	● Agro-techniques in maize like varieties, seed rate, fertility management, water management, cultural practices and etc. ● Information on nutrient deficiency symptoms ● Tips for maize cultivation ● Cropping pattern, mixed cropping with maize and use of maize in intercropping ● Tips for improving maize production at present situation ● Demonstration on line sowing and basal dose application	● Farmers were intimated with the knowhow of cultivation of maize. ● They understood these skills and knowledge so that they would utilize these in their filed.
Training on profitable vegetable cultivation (August 23, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● To familiarize with cultivation of exotic and off season vegetables ● To familiarize with the use of silver and black plastic mulch for the production of exotic vegetables ● Familiarization with seed sowing and transplanting of exotic vegetables	● Cultivation of exotic and off season vegetables ● Promotion of use of exotic vegetables for health improvement ● Demonstration regarding application of silver and black plastic mulch on the beds ● Demonstration of insect net for protection of insects	● Farmers were intimated with the knowhow of cultivation of exotic and off season vegetables ● Farmers got information on use of exotic vegetables for health improvement ● Two farmers tried seed sowing of exotic vegetables. ● Early variety of cauliflower was sown in plug tray and transplanted in the field. ● After germination of exotic vegetable, farmer transplanted it in the field. ● Farmers applied poly mulch in poly houses and open field

Source: JICA TCP Team

(3) Design and construction

In Phase-1, the TCP team arranged some discussion with farmers, in order to share concept of construction, implementation plan with farmers. In Phase-2 stage, based on the curriculum prepared by the TCP, the TCP team started trainings to farmers in pilot area for operation and maintenance of poly house and micro irrigation system by farmers.

Table 2.5.25 Trainings of Farmers in the Pilot Area in Design and Construction

Phase-1		
Training of infrastructure development of Pilot Area (May, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● Discussion for Detail Design of Irrigation Facilities	● This training covers the under mentioned topics: ✓ Flow chart of design ✓ Layout of pipeline ✓ Structural design	● The official in-charge of Engineering/ Technical works of TCP and counterparts of Pilot Area was provided the suggestions and explanations for the implementation plan of the project through their this meeting participation to farmers.
Training of infrastructure development of Pilot Area (June, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● Discussion for Detail Design of Irrigation Facilities & construction	● This training covers the under mentioned topics: ✓ Construction plan	● The official in-charge of Engineering/ Technical works of TCP and counterparts of Pilot Area was provided the suggestions and explanations for the construction plan of the irrigation facilities through their this meeting participation to farmers.
Phase-3		
Workshop on presentation of Operation & maintenance of MIS & Poly house of Pilot Area (February 21, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To get knowledge as well as skills for proper operation and maintenance of drip & fogger irrigation system and Maintenance of poly house.	● This Training covers the under mentioned topics: i) Drip and fogger irrigation system operation and maintenance of drip & fogger irrigation System ii) practical training of operation and maintenance of micro irrigation system on field iii) Maintenance of poly house	● Trainees got information for operation and maintenance of micro irrigation system, maintenance of poly house as well as knowledge.

Source: JICA TCP Team

(4) Gender

i) Gender and social consideration in the project

The household survey in Lahalri, revealed that 17% of households are headed by women where there is no male adult, about 80% of which are widows. The findings show that the sex ratio of population in the pilot site is at 895 females per 1000 males. This is below the national sex ratio of 933 (2001 census) and that of the Hamirpur district (1042 females per 1000 males). Among those populations, 20% of men and 9% of women reside outside the village, mainly for salaried job opportunities. In addition, many of men remaining in village are also engaged in paid jobs. This means, more women are taking care of and are occupied in agriculture, livestock rearing and household keeping. In terms of literacy, it was found in the survey that literacy among adults at Lahalri is 92%. Males have high literacy of 98% while female literacy is at 86%. This difference is due to much lower female literacy in the age group 40-60 and above 60 years. In the age group between 40 and 60, 93% of females are literate while 99% for males. The elderly population that lies in the age group above 60 years is the least literate with female literacy of 22% while that of male is almost 90%. Analyzing landholdings of the households, landholdings of female headed households are much less that of male headed. 73% of female headed household have less than 0.25ha, while 55% for male headed. Only 7% of female headed household have more than 0.5ha while that of male headed is 17%. There is also huge difference in household income between male headed and female headed households. Average annual household income of female headed household in CCA area of Lahalri is INR.172,966, while that of male headed is INR.283,022. The TCP, taking this situation into consideration, several approaches have been taken through the project activities to minimize disadvantages and negative effects of gender gap and to increase gender equality.

Gender consideration has been integrated in individual trainings of farmers. Involvement of female farmers was assured by different arrangement for women through female community motivators, considering time of the training that is more suitable for women. Women in male headed household and female headed household face different difficulties. For example, women from male headed household often face difficulty in getting permission for participating social activities, while women of female headed household have less time as they are occupied in acquiring income to take care of their families. Those needs were taken into consideration when trainings are organized. In addition to the special consideration in training arrangement, an awareness meeting was conducted in the village, inviting both women and men. The details of the training are as shown in Table 2.5.28. Trainings have been conducted with maximum involvement of women who are major actors of many of the activities. Participation of women has been high as shown in the following table, while the ratio of the men and women in each training differs depending on the activity.

Table 2.5.26 Gender Ratio of Participants in Trainings

Trainings	Total accumulated participants	Male	Female	Ratio (women per 100 men)
Engineering	71	64	7	11
Water management	291	228	63	28
Farming	464	244	220	90
Marketing	56	31	25	81
SHG activities	210	5	205	4,100
Total	1092	572	520	91

Source: JICA TCP Team

ii) SHG activities

One of the focus areas in regard to gender and social inclusion is formation of SHG activities and ensuring their self-sustainability. Objectives of SHG components in the crop diversification in the project can be summarized as follows;

- To encourage women and vulnerable group of people to be involved in the economic activity not merely being agriculture workforce.
- To increase income of women (enable women to have cash that can be used with their own decision) and vulnerable group of people.
- To empower women, who are the major actor of the agriculture, and vulnerable group of people by equipping them with management skills through group activities
- To encourage processing of vegetables that have lower value in market as their own (such as slightly damaged ones, wrongly shaped ones, and excess or over-produced ones) to be sold with higher value.
- To enhance organizational skills of farmers.
- To increase productivity of concerned activities by taking advantage of working as a group by sharing works making easier to produce and market.

In consideration of the above mentioned objectives, SHG activities were supported in the project.

Major supports provided from the project are as follows:

- Institutional development trainings to enhance organizational skills and support collective works, such as group work management, account and book keeping, and leadership development
- Productive activity support to empower women and vulnerable people by equipping with skills: Technical trainings on the farming, nursery preparation, food processing.
- Marketing support to support income generation with their activities

The following figure indicates the development stage and project intervention in each stage along with the timeline.

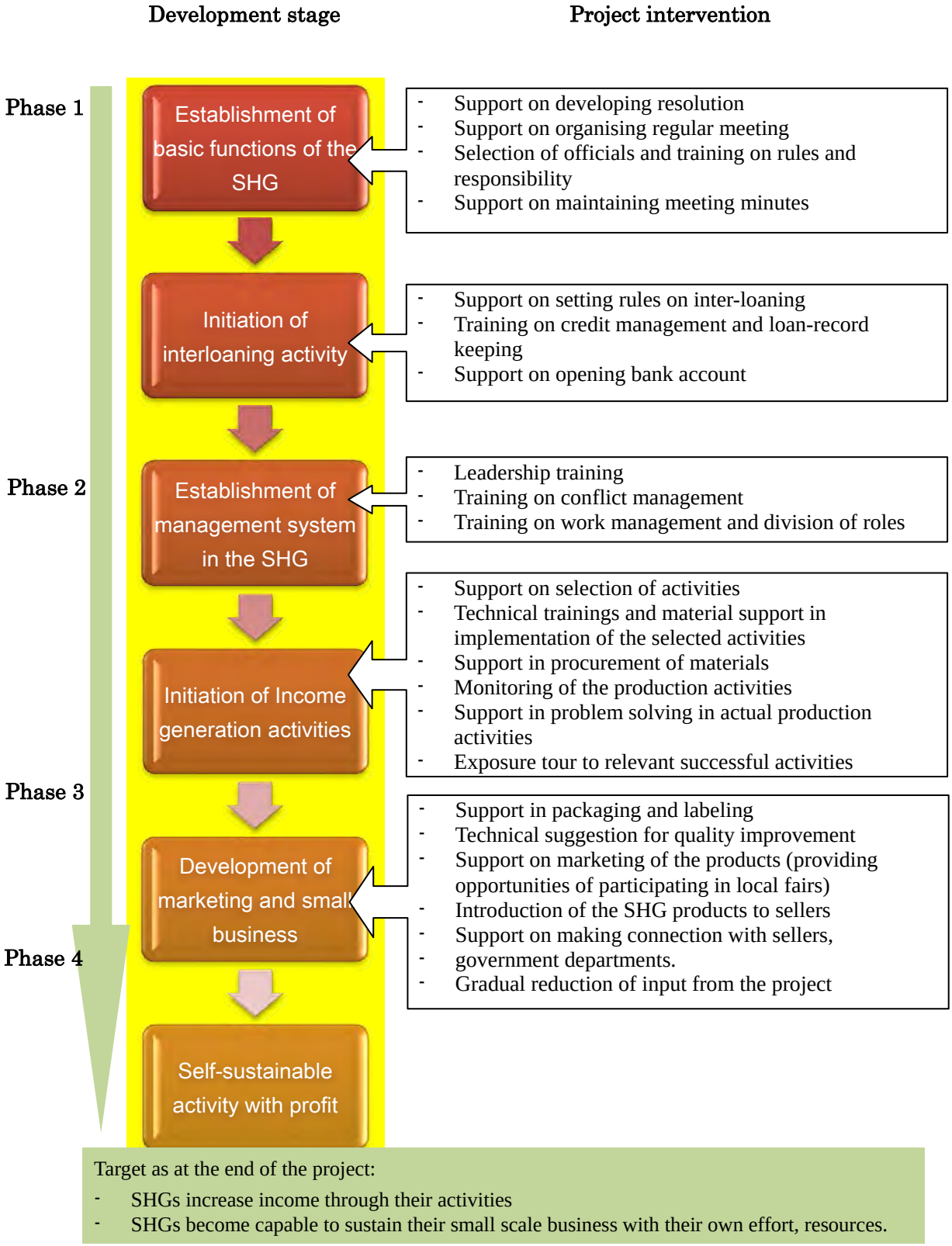
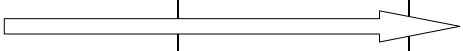
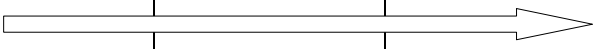
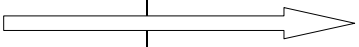
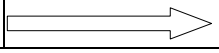


Figure 2.5.3 Process taken in SHG Development Support

Accordingly, the TCP analyzed their needs on technical support and provided them with trainings required at each stage. The trainings for the SHGs were conducted both for the capacity building of the group and its members along with the development of the activities. The trainings were conducted in forms of lecture type training, on-site practical training and exposure visit. Training materials were prepared and shared with DoA and PMU officers for their reference.

From Phase 3, support on the SHGs shifted from generating activities to develop and sustain the activities. This shift caused change of focus in supports from skill development training to follow-up and technical advice on their on-going activities. Most of the technical advices and input were made during their daily activities, instead of taking a form of collective trainings. In Phase 4, although a few technical trainings were organized based on additional needs of the SHG, the project intervention has focused on hands-on advice during their practice. As SHGs have become more stable with their production, the project started supporting micro-business management in the later phases. Trainings such as business plan making, cost-profit calculation were conducted to SHG members, in addition to the record keeping of their products and sales SHG have been maintaining from the starting of their production.

Table 2.5.27 Summary of Training for SHGs

Training program		Phase 1	Phase 2	Phase 3	Phase 4
SHG function and management	Organized training				
	Practical follow-up				
Technical production trainings					
Income generation and micro business management					
Gender sentitization trainings					

Source: JICA TCP Team

The trainings implemented from Phase 1 to Phase 4 are shown in the following table.

Table 2.5.28 Training of Farmers in the Pilot Area in Gender, Social Inclusion and Institutional Development

Phase 1		
Introduction of SHG Activities and Nursery Pot Making Training (July 28, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To motivate the SHGs to take on income generating activities ● To provide technical skill in nursery pot making.	● Interest raising through AV aids ● Nursery pot making training	● The SHG members show keen interest for the group activity and got a general idea how they can increase their income through these activities. ● The members got trained in nursery pot making(cloth)
Orientation on the Project and the SHG Activates (September 12, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● Orienting the concerned stakeholders (specially the SHG members) about the project and its objective	● Orientation and the scope of SHG activities	● 3 existing SHGs showed keen interest to align with the TCP, having got aware of the project activities.

Awareness Raising on SHG Activates (September 16, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members aware of the potential activities which they could undertake.	● Awareness raising on SHG activities	● The SHG members got apprised about the potential SHG activities that they could undertake in Lahalri.
Awareness Raising on SHG Activates and Group Formation (October 11, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members aware of the potential activities and the benefits of working in a group	● Awareness raising on SHG activities and group formation	● The SHG members got apprised about the potential SHG activities and the interested/motivated member's plans to form a SHG group to undertake income generating activities.
Group Formation and Support in Selection of Groups Representatives (October 13, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To form new group and to orient the members on the purpose of the project ● Providing facilitation and guidance to the group members at the formation stage.	● Formation of group and selection of its representatives ● Framing of rules and regulations of the group ● Orientation of the SHG members	● 2 new groups are formed ● The members select their groups representatives and frame rules and regulations for the group ● The SHGs decide on collecting a sum of Rs.100/ member for SHGs monthly savings ● The SHG members gets an idea of the project support and purpose
Training on Book Keeping for Naman SHG (November 1, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members aware of the benefit of Book Keeping ● To train the SHG members on book keeping	● Training on Book Keeping ● Passing of resolution for aligning of the group with the TCP activities.	● The group member's gets trained in Book keeping ● The group passes a resolution for aligning with the TCP supported activities.
Monitoring of Book Keeping for Interloaning Purpose – Shiv Shakti SHG (December 5, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members aware of the benefit of Book Keeping and the ways of monitoring it.	● Benefits of Book Keeping and its monitoring	● The group member's understood the benefit of book keeping and they got a general idea on how to maintain an interloaning book/register.
Training on Leadership for Bhole Shankar SHG (December 10, 2011)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members aware of the importance of leadership in the group. ● To apprise the members about the roles and responsibilities of the leaders within the SHG	● Importance of SHG Leadership ● Roles and Responsibilities of the SHG leaders.	● The group members understand the importance of active and effective leadership in SHGs. ● The SHG members are now aware of the roles and responsibilities of president, treasurer, secretary and the members.
Training on Food Processing (December 14, 2011)		
Objectives	**Subject covered**	**Output/results**
● To make the SHGs aware of the benefits associated with food processing ● To provide technical skills to SHG members on Food Processing ● Exposure to the cultivation activities	● Lecture on balanced diet ● Training in food processing ● Exposure on nursery bed and poly house cultivation	● The SHG members understand the concept of balanced diet which the can implement in their home. ● SHG members practiced on chutney and squash making learnt in the training ● The members gets motivated to cultivate vegetables and to process them for income generation and own consumption.

Training on Maintenance of Saving and Proceeding Register for Shiv Shakti SHG (January 5, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To equip the SHG members with the skills and necessary know how on maintenance of saving and proceeding register.	● Orientation on importance of maintenance of saving and proceeding register ● Tips on maintenance of the savings and proceeding registers	● The SHG members learn how to fill in entries in the savings and proceedings registers. ● The group started recording, started with close support from the community motivators and have continue maintaining as per May 2015.
Trainings on Maintenance of Saving and Proceeding register for Saraswati SHG (January 5, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To equip the SHG members with the skills and necessary know how on maintenance of saving and proceeding register.	● Orientation on importance of maintenance of saving and proceeding register ● Tips on maintenance of the savings and proceeding registers	● The SHG members learnt how to fill in entries in the savings and proceedings registers. ● However, the group was disintegrated later
Training on leadership roles and framing of SHG rules and regulations for Naman SHG (February 9, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members familiar with the leadership and its roles ● To frame SHG rules and regulations	● Orientation on importance of SHG Leadership ● Framing roles and responsibilities of the SHG leaders and members. ● Rules and regulations for the SHG	● The SHG discussed and formed their own set of rules and regulations
Training on framing of Rules and Regulations for the Bhole Shankar SHG (February 10, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members aware of the importance of rules and regulations ● To frame SHG rules and regulations	● Orientation on importance of SHG rules and regulations ● Framing Rules and regulations for the SHG	● The SHG discussed and formed their own set of rules and regulations
Exposure visit to Palampur University for Women Groups from Lahalri (March 6, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To align and motivate the SHG members for the activities related to the TCP. ● To encourage women in the project area to start agriculture and post harvest related activities ● To encourage the SHG members to vitalize group activities and to get general idea to various aspects of farming.	● Visiting facilities of food processing ● Lecture on PHT and nutritional improvement ● Visiting the vegetable farm facilities ● Lecture on potential and opportunities of vegetable farming ● Lecture on extension activities and facilities for farmers ● Visit to museum of the university	● The group gets an idea on the food processing opportunities and tips on maintenance of nutrition in processed food ● The women group gets updated on the new innovations and techniques which has come up in regard to the agricultural practices ● The group is encouraged to undertake farming and food processing related activities
Phase 2		
Planning Workshop for Group farming for Shiv Shakti SHG (September 5, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To share the idea with SHG ● To confirm their objectives on the activity. ● To make implementation plan of the activity	● Planning the group farming activity ● Needs assessment for the group's activity	● The SHG members show keen interest for the group farming activity and plan to do it. ● The members agree to lease out 2 Kanal of land for the activity ● The members plan to cultivate cauliflower(1 Kanal) and broccoli(1 Kanal)

Planning Workshop on Nursery Cultivation and Training on Record Keeping for Inter-Loaning for Naman SHG (September 7, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● Seeking possibility of conducting nursery making as SHG group activity ● Monitoring ledger / record maintenance and introducing the loaning format.	● Planning Nursery cultivation activity for the SHG ● Introduction of the loaning format for SHG	● The group members agree to take up nursery cultivation (onion and cauliflower) as its activity and finalize the land for the same. ● A new loaning worksheet is introduced to the group ● The group is regularly maintaining its register and is practicing inter-loaning
Training in Mulberry Leaf Processing for Bhole Shankar SHG (September 27, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To introduce some possible processed product from mulberry leaves. ● To make aware of the benefit of mulberry ● To open up eyes of the members to seek for innovative food processing activity for income generation.	● Introduction of mulberry based product like tea and mulberry powder ● Benefit of mulberry in health and economic value	● The SHG members got introduced to the mulberry processing with knowledge about the benefits of mulberry ● The members prepared mulberry tea at home and shares it with the TCP ● The group plans to undertake mulberry processing as its income generating activity in the coming season ● The group continue producing and marketing mulberry tea as per May 2015
Work Management and Accounting Training for Shiv Shakti SHG (October 5, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To make aware of needs of work management in relation to group farming. ● To come up with a plan for work management. ● Introducing accounting worksheet for the SHG members	● Sharing and discussing the work management options in relation to group farming activity. ● Works to be done in regard to the group farming ● Importance and how to maintain cashbook	● The group members started arranging division of work, recording of work participation that is reflected in profit share. ● The group formed sub-group for some activities ● The group members started recording their expense for the activities
Work Management, Budgeting and Accounting Training for Naman SHG (October 9, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To come up with a plan for work management considering work sharing among the members ● To raise understanding of budgeting and accounting worksheet to the group members	● Sharing and discussing work management in regard to nursery cultivation ● Works to be done regarding nursery cultivation activity for kitchen garden and commercial purpose. ● Importance and how to maintain cashbook	● The group members gets familiar with the work options in regard to their nursery cultivation activity ● The members started practice of budget making with help of the project.
Training on Accounting of the Bhole Shankar SHG (October 10, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To raise understanding of budgeting and accounting worksheet to the group members	● Importance and how to maintain cashbook	● Accounting record has not been kept so far by the time of reporting. ● The group started taking record of loaning in addition to the collection of monthly contribution

Training on Nursery Bed Making for Shiv Shakti SHG (October 30, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To equip the SHG members with the skills and necessary knowledge of nursery bed preparation and establish group work atmosphere through the practice.	● Preparation of nursery beds of cauliflower and broccoli ● Technical trainings on measurement and setting of nursery, land and soil preparation of the nursery, and pest management for nursery preparation	● The group members learn how to prepare beds for nursery and how to treat the soil prior to sowing. ● It was a learning experience for the group and through this exercise the group realized that the work becomes easy, interesting and less time consuming if all work in tandem to achieve the given objective.
Training on Nursery Bed Making for Naman SHG (October 31, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To equip the SHG members with the skills and necessary knowledge of nursery bed preparation for group farming activity and establish group work atmosphere through the practice.	● Preparation of nursery beds of cauliflower and onion ● Technical trainings on measurement and setting of nursery, land and soil preparation of the nursery, and pest management for nursery preparation	● The group members learn how to prepare beds for nursery and how to treat the soil prior to sowing. ● It was a learning experience for the group and through this exercise the group realized about the group working culture of sharing and helping each other. ● The group continue preparing bursary bed for their income generation activities as at May 2015
Training on Nursery Sowing and Pest Management Training for Shiv Shakti SHG (November 5, 2012)		
Objectives	**Subjects covered**	**Outputs/results**
● To enhance understanding of nursery management options available and how they can be integrated in the present activity. ● To identify limitations to current management method. ● To use monitoring techniques effectively with relevant monitoring equipment	● Sowing of nursery seeds (cauliflower and broccoli) in the beds ● Identifying pests of nursery and introducing the control measures for them. ● Action plan and evaluation for the activity	● The group members learned about sowing techniques through practices. ● The group members gain clearer idea to identify the pests and diseases and chemicals to control them. ● By discussing the groups activity for the month the members in hindsight knows what they are supposed to do and thus enabling them to divide the tasks among themselves.
Training on Nursery Sowing and Pest Management for Naman SHG(November 7, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members familiar with the nursery management practices ● To familiarize the members with relevant monitoring equipment, including hand lenses, etc. ● Establish a plan for pest management for future activities including nursery cultivation.	● Sowing of nursery seeds (cauliflower and onion) in the beds ● Identifying pests of nursery and the control measures. ● Discussing the group's activity for this month. ● Action plan and evaluation for the activity.	● The group members gained new techniques of sowing the nursery seedlings ● The members realised the ways to identify the pests and diseases and chemicals to control them. ● The group continue nursery sawing as their income generation activities as at May 2015
Training on Disease and Pest Management for Cauliflower and Broccoli for Shiv Shakti SHG (December 5, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
To make the SHG members identify the various pests and diseases which can harm their crop and to apprise them of the remedial measures which can be implemented to control them. To establish a plan for pest and disease management for future activities Preparation for the future activity of the group	● Basic knowledge on pests and disease common for cauliflower, broccoli and onion w and control measures for them. ● Monitoring groups growth as an institution ● Discussing the activity for the future	● The SHG members get trained in identifying pests and diseases of the crops that they are planning to cultivate ● The group cultivated and harvested those vegetables handling problems of disease and pest and other damages

Training in Food Processing for Bhole Shankar SHG (December 6, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To introduce and improve skills of preparation of Papad and Bari. ● To enhance understanding on the multiple technologies used in the preservation and packaging of processed food. ● To improve motivation and flexibility of the group members through skill acquirement	● Nutritious benefit of the ingredients ● Practical session in preparation of Papad and Bari along with discussing value addition, preservation, packaging and marketing.	● Few of the group members have individually started practicing food processing (post processing training) and one of the members is selling chutney for income generating purpose. ● By May 2015, the group continued food processing activities and developed further on their product
Training on Disease and Pest Management for Cauliflower and Onion for Naman SHG (December 18, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members identify the various pests and diseases which can harm their crop and to apprise them of the remedial measures which can be implemented to control them. ● Preparation for the future activity of the group	● Basic knowledge on identifying pests of cauliflower, broccoli and onion and control measures for them. ● Discussing the activity for the future	● The SHG members realized how to identify pests and diseases of the crops ● The group managed to harvest seedlings even though they faced disease damage for some parts. ● The group improved management after several practice.
Training on Problem Solving and Conflict Management for Naman SHG (January 3, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To describe the different types of conflict individuals may confront. ● To describe the different problem/conflict handling styles	● Think through a conflict case study ● Sharing an idea on how to manage conflict	● The group members learnt how lack of understanding about differing needs can result in distance, arguments and break-ups especially, in workplace conflicts where differing needs are often at the heart of bitter disputes, about the different conflict situations arising within the group along with the ways to tackle these conflict situations.
Training on Problem Solving and Conflict Management for Shiv Shakti SHG (January 5, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To review the general steps for effective decision making and to identify the barriers to effective decision making ● To describe the different types of conflict individuals may confront. ● To describe the different problem/conflict handling styles	● Think through a conflict case study ● Sharing an Idea on how to manage conflict	● The discussion initiated during the training to resolve conflict helped to expand the group member's awareness of the given conflict situation and it should give them an insight into how they can achieve their own goals without undermining those of other members. ● Through this training the SHG members were able to develop an understanding on how creative problem solving, decision making and team building can improve relationship amongst the members.
Training on Problem Solving and Conflict Management for Bhole Shankar SHG (January 10, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To review the general steps for effective conflict management and to identify the barriers for the same ● To describe the different types of conflict individuals may confront	● Think through a conflict case study ● Sharing an idea on how to manage conflict	● By learning the necessary skills for problem solving and conflict resolution, SHG members can keep their personal and professional relationships strong and growing which would be beneficial for the group and its activity

Training on Developing Business Mind for the Naman SHG(March 5, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To motivate the SHG members to develop their group into a microenterprise ● To make the members aware of the various considerations which need to be taken into account prior to commencing of any activity for income generation purpose. ● To clarify further activities for future business	● Interest and motivation raising through AV aids ● Preparing Business mind through lecture method ● Discussing activity for this month ● Action plan and evaluation for the future	● The group members showed keen interest in the documentary shown to them and they were motivated to think of an activity which would ensure optimum use of natural resources and earning income through it. ● The SHG members got first hand information of what needs to be done prior to starting an income generating activity ● It is expected that the group will adhere to the points discussed during the business mind training prior to starting any kind of income generating activity.
Training on Developing Business Mind for Shiv Shakti SHG (March 6, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To motivate the SHG members to develop their group into a microenterprise ● To apprise the SHG members of the various considerations which need to be taken into account prior to commencement of an income generating activity. ● To discuss the ongoing activities of the group ● To clarify further activities for future business	● Interest and motivation raising through AV aids ● Preparing Business mind through lecture method ● Discussing the future activity of the SHG ● Action plan and evaluation for the future	● The group members were motivated to start some activity which was new and which could provide them good monetary income ● The members came to know of the practices which need to be followed prior to starting of a new business ● The SHG members are thinking of using broccoli leaf powder as a source of value addition to the processed food products like papad and bari. ● By learning the necessary skills for problem solving and conflict resolution, SHG members can keep their personal and professional relationships strong and growing which would be beneficial for the group and its activity
Phase 3		
Training on Leadership Development (for all the 3 SHGs in Lahalri) (January 8, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members understand the importance to assign specific responsibilities to officials. ● Make the SHG members understand what they should look into (traits and roles of good leaders) when selecting leaders or office bearers for their group. ● Build up a leadership potential amongst the participants to groom them for group business	● Theoretical explanation on the kind of leadership along with understanding the roles and traits associated with SHG leaders. ● Understanding leadership roles through a experience sharing or the problems faced by the SHG members during the course of activity ● Experience sharing between groups	● It is expected that post training the SHG members and other representatives of the group will have a certain idea on the need of having a dynamic, active and trustworthy leaders. They will have more clarity on the roles and traits of these leaders and will have an insight how they can support their leader and contribute to the group's purpose.
Training on Preparation of Business Plan for Nursery Preparation Activity of Naman SHG (February 3, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members aware of the various components which they need to consider prior to commencing their nursery preparation /any income generation activity. ● Enhancing skills and capacity of the SHG members to ensure sustainability of their group. ● Sharing, learning's and planning for the future activities of the group business	● Sharing of experiences from the past activity along with discussion of lessons learnt ● Preparation of business plan for the group's nursery preparation activity that include cost-profit analysis and activity scheduling	● The group members have clearer idea on the cost calculation and expected income from their nursery preparation activity. ● The groups are able to follow their plan by having clearer idea on allocation of their activities in a certain timeframe. ● The group have been preparing business plan in each season of production with help of the project.

Training on Preparation of Business Plan for Cultivation Activity of Shiv Shakti SHG (February 5, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members aware of the various components which they need to consider prior to commencing their cultivation /any income generation activity. ● Enhancing skills and capacity of the SHG members to ensure sustainability of their group. ● Sharing, learning's and planning for the future activities of the group business	● Sharing of experiences from the past activity along with discussion of lessons learnt ● Preparation of business plan for the group's cultivation activity that include cost-profit analysis and activity scheduling	● The group members have clearer idea on the cost calculation and expected income from their cultivation activities. ● The groups are able to follow their plan by having clearer idea on allocation of their activities in a certain timeframe. ● The group have been preparing business plan in each season of production with help of the project.
Training on Preparation of Business Plan for Food Processing Activity of Bhole Shankar SHG (February 11, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● To make the SHG members aware of the various components which they need to consider prior to commencing food processing /any income generation activity. ● Enhancing skills and capacity of the SHG members to ensure sustainability of their group. ● Sharing, learning's and planning for the future activities of the group business	● Sharing of experiences from the past activity along with discussion of lessons learnt ● Preparation of business plan for the group's food processing activity that include cost-profit analysis and activity scheduling	● The group members have clearer idea on the cost calculation and expected income from their food processing activities. ● The groups are able to follow their plan by having clearer idea on allocation of their activities in a certain timeframe. ● The group have been preparing business plan in each season of production with help of the project.
Phase 4		
GMKVA Workshop (September 21, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● GMKVA sensitization on gender: making the members understand that the peoples capacity, ability, responsibilities should not be determined by sex/gender; as they have different capabilities, which in turn are largely defined by the opportunity they get	● Gender Sensitization of the GMKVA and its Applicability	● It is expected that post this session, the participants will be more motivated and will start believing that through sustained efforts and logical planning a difference can be made in changing the mindset/perception of the society which is still deeply engulfed in its traditional beliefs and culture.
Training on food processing for Bhole Shankar SHG (February 6, 2015)		
Objectives	**Subject Covered**	**Outputs/results**
● Recognize and identify basic steps/concepts related to preparation of pickle, jam and candy. ● Understand the ways of maintaining the nutrition worth of the processed food by use of multiple technologies. ● Develop an insight on value addition, packaging and marketing of the processed food products	● Discussing the purpose and products for the training. ● Practical session in preparation of mix veg. pickle, along with discussing value addition, preservation, packaging and its marketing. ● Practical session in preparation of jam and papaya chutney along with discussing value addition, preservation, p ● Discussing way forward and closing.	● It is expected that post this training, the participants would have learnt the preparation process for preparation of pickle, jam and chutney. ● The SHG members will now be preparing products which are hygienic, have higher nutrition worth and have a longer shelf life. ● The SHG members will prepare and perfect the recipes learned during the training at their homes (with some value additions) before going for bulk production and marketing.

Source: JICA TCP Team

(5) Marketing

From Phase-2 Stage, based on the curriculum prepared by the TCP, the TCP team started trainings to farmers in pilot area for developing agricultural marketing knowledge of farmers.

Trainings conducted for farmers in the field of marketing are summarized in the following table.

Table 2.5.29 Outline of Trainings for Farmers in Marketing

Subject category		Phase 1	Phase 2	Phase 3	Phase 4
Basic information of marketing	Introduction and motivation of marketing		⇨		
	Calculation of cost and benefit		⇨		
	Marketing channels		⇨		
	Price trends of agro-products		⇨		
	System and convention of APMCs		⇨		
Advanced concept for better marketing	Quality control standards			⇨	
	Organic produces			⇨	
	Processing and value addition			⇨	

Trainings in marketing sector conducted from Phase-2 to Phase 4 are shown in the following table.

Table 2.5.30 Trainings of Farmers in the Pilot Area in Marketing

Phase-2		
Agricultural Marketing Workshop for the farmers of Lahalri (December 4, 2012)		
Objectives	**Subject Covered**	**Outputs/results**
● To share information on agricultural marketing with special emphasis on i) crop budgeting ii) grading and packing conventions iii) Price trends of vegetables in Dusarka APMC	● Crop budgeting ● Grading and packing conventions ● Price trends based average monthly prices in Dusarka APMC ● Useful information about marketing of produce in APMCs	● About the importance of crop budgeting while undertaking commercial farming of vegetables. ● Farmers were informed about the prevalent conventions of grading and packing in APMCs that result in getting better prices ● Price trend were shared with farmers to create awareness about the seasonality in production of vegetables. ● Farmers made aware about HP Agricultural & Horticultural Produce Marketing (development and regulation) Act, 2005 on information that a farmer should know when he goes to sell his product in market.
Training on Marketing (Grading/packing) of Vegetables to Farmers and SHG members (February 22, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To build capacity of farmers and SHG members in marketing of vegetables.	● Discussion on prevailing prices and marketing strategy of the farmers and SHG members ● Demonstration on harvesting, grading and packing	● Farmers learned good practices of harvesting, grading and packing in Cauliflower

Phase-3		
Training on post-harvest management and marketing of vegetable crops (November 28, 2013)		
Objectives	**Subject Covered**	**Outputs/results**
● To demonstrate and discuss on harvesting and post-harvest management of vegetable crops	● Demonstration on harvesting and post-harvest storage of Elephant foot yam was given to the farmers ● Issues related to packaging and sorting of vegetables for local markets ● Group marketing of vegetables ● Farmers' experiences on topics related to marketing of vegetables	● Farmers were informed about post-harvest storage of elephant foot yam which is a new crop for the farmers. ● Farmers discussed about the practical issues related to marketing of vegetables like group marketing, sorting and packing of produce for selling to the market.
Phase-4		
Farmers' Visit to Organic Fair and Food Festival (June 15, 2014)		
Objectives	**Subject Covered**	**Outputs/results**
● To interact directly with farmer groups practicing organic farming, service providers including certification agencies and input providers for organic farming (companies manufacturing bio-pesticides, bio-manures etc.) ● Farmers get an opportunity to meet the buyers and sellers of organic produce. ● Farmers learn about difference in quality of organic products, demand and marketing procedures by interacting with farmer-groups presently undertaking organic farming.	● Marketing of organic produce ● Participatory Guarantee Systems ● Organic farming practices ● Certification process for organic farming	● Farmers interacted with the farmer groups practicing organic farming. The opportunities in organic farming and the challenges that farmers face were discussed. ● Farmers discussed about the marketing procedures, collected information on buyers and retailers of organic produce. ● Farmers got to know about new products by different companies that can be used during organic farming.
GMKVA Workshop (September 21, 2014)		
Objectives	**Subjects Covered**	**Outputs/results**
● To discuss topics on record keeping, cost of production and price setting of vegetables produced by the farmers. ● Sharing information on marketing of exotic vegetables with the farmers so that farmers are in a position to set up marketing linkages before the crop is ready for harvest	● Record keeping for documenting expenditure involved and benefits. ● Calculation of cost of production ● Price Setting for vegetable crops ● Information on marketing of exotic vegetables in Chandigarh.	● The concepts record keeping were revisited and improvements in the existing practices of record keeping were shared. ● Information on calculating the cost of production by using information of daily record keeping was shared with the participants. Analyzing this information to make its use in decision making was shared with the participants. ● Information on setting the price was shared with farmers. Value method, cost of production and market price methods may be used by farmers for setting price of products. ● Shared information for marketing of exotic vegetable crops in APMC and to retailer in Chandigarh.

Source: JICA TCP Team

2.6 Other Activities under the TCP

2.6.1 Mid-term Evaluation

The joint mid-term evaluation of the Technical Cooperation Project for Crop Diversification in Himachal Pradesh was conducted from October 18 to 29, 2013 by the joint evaluation team which consists of both Japanese and Indian side. Objectives of the evaluation is

1. To verify the accomplishments of the Project compared to those planned;
2. To identify obstacles and/or facilitating factors that have affected the implementation process;
3. To analyze the Project in terms of the five evaluation criteria (i.e. Relevance, Effectiveness, Efficiency, Impact and Sustainability); and
4. To make recommendations on the Project regarding the measures to be taken for the remaining period.

The results of mid-term evaluation were compiled in the evaluation report, and submitted to JCC on October 10, 2013. Based on the evaluation result, PDM was revised as Ver.1 as of Oct. 2013 as shown in Attachment-2. Results of the mid-term evaluation are shown in the following box,

Summary of Evaluation Results based on 5 evaluation criteria

(1) Relevance; Still Relevant

The Overall Goal and the Project Purpose are still relevant with the needs of India and Target Groups (i.e. Core Extension Officers). They are still consistent with the national development plan of India (i.e. 12th Five Year Plan and the Annual Plan of DOA in State of Himachal Pradesh (2013)) as well as Official Development Assistance (ODA) policies of Japan. Japanese technical advantage has been confirmed.

(2) Effectiveness; Yet to be proven despite some achievements made

Although training system development (Output 2) and training for Core Extension Officers (Output 3) and a model development in Pilot Site of Laharlr (Output 4) are steadily making progress, the sign of achieving the Project Purpose ('establishing promotion mechanism for crop diversification in DOA') is yet to be observed at the time of the Mid-term Review.

It is due to the fact that formulation of annual crop diversification plans and its monitoring for sub-projects is the responsibility of PMU applying the method developed by the TCP. For the part of irrigation scheme development, which the The ODA Loan Project is responsible for, the implementation of 210 sub-projects is facing 1 year delay.

(3) Efficiency; Moderate

Some Outputs have been achieved so that the TCP is on the right track. However, full achievement of expected Outputs requires DOA/PMU's efforts of applying some of the TCP's methods and model (in particular formulation of annual crop diversification plan under activity 1-3, and conducting hands-on training for core extension officers in 5 districts under output 3). Therefore the prospect of achieving all the expected Outputs is difficult to be judged at this stage.

(4) Impact; Overall Goal is yet to be achieved. No other unforeseen positive& negative impact observed yet.

The Overall Goal is yet to be achieved. In addition, the target figure for the indicator should be clearly identified in order to assess the level of achievement.

(5) Sustainability; Institutional and technical sustainability is unclear. Policy supports are to be sustained.

Policy Aspect

Crop diversification highlighted in HP agriculture policy.

Institutional aspect

DOA/PMU is a central part of absorbing the experiences, conducting training & replication of Model for crop diversification developed.

Technical aspect

Although trainings were provided to CEOs, sustainable system of developing trainer from PMU staff (DOA staff) may be put in place.

Recommendations

Institutional aspect

1. A mechanism for facilitating the interaction and technical transfer between PMU, DPMU, BPMU with the TCP
   - Sharing the best practices
   - Monthly meetings of PMUs with the TCP for more intensive sharing
2. Formulating to Monitoring mechanism by PDCA for crop diversification plan at sub-projects
3. Identification of trainers among CEOs from DOA staff in the PMUs.
4. Assignment of more CEOs to needed places
5. Community Motivators should be capable

For the TCP (TCP Experts and PMU)

1. Contents of the Crop Diversification Model
2. SHGs to develop a simple business plan
3. Training for simple storage technology of vegetable
4. Assistance to DPR preparation
5. Modification of PDM according to the reality

For PMU/DOA

1. Flexible training schedule for farmers
2. DPR contents: training plan and crop diversification plan (CDP)

2.6.2 Terminal Evaluation

The joint terminal evaluation of the Technical Cooperation Project for Crop Diversification in Himachal Pradesh was conducted from June 26 to July 10, 2015 by the evaluation team which consists of both Japanese and Indian side. Objectives of the evaluation is

1. To review and confirm the achievement and implementation process of the TCP;
2. To evaluate the TCP in terms of five evaluation criteria, namely relevance, effectiveness, efficiency, impact and sustainability, based on The Project Design Matrix (PDM);
3. To evaluate changes in external conditions;
4. To reach the conclusion on whether it is appropriate to complete the TCP;
5. To make recommendations for further improvement of the TCP to stakeholders; and
6. To draw lessons that can be applicable to other similar ongoing and future projects of JICA

The results of terminal evaluation were compiled in the evaluation report, and submitted to JCC on July 8, 2015. The report of the joint terminal evaluation on the Project for Crop Diversification in Himachal Pradesh is attached in Attachment-6. Based on the evaluation result, PDM was revised as Ver.3 as of Jul. 2015 as shown in Attachment-2. Results of the terminal evaluation are shown in the following box,

Summary of Evaluation Results based on 5 evaluation criteria

(1) Relevance; High

The TCP remains highly relevant in terms of the policies of the national and state government, policy directions of GOJ and the needs of the C/P agencies

(2) Effectiveness; High

Effectiveness is secured at the satisfactory level at the time of terminal evaluation, thanks to the efforts made by the TCP jointly with PMU especially after the commencement of the construction of irrigation facilities.

(3) Efficiency; Moderate

A number of activities have been carried out and the outputs are being produced as mostly planned. In addition, the interview

surveys reveal that overall satisfaction towards inputs such as human resources, trainings and the provided equipment is high. However, the delay in commencement of infrastructure development under the ODA Loan Project partially affects the efficiency. The TCP will terminate before the ODA Loan Project becomes fully in progress. In other words, if the sub-projects have been completed in time, then the TCP could have provided technical supports to more CEOs working in such sub-projects. *(4) Impact; High* The Overall Goal remains achievable thanks to the efforts being made by both the TCP and the ODA Loan Project. From now on, CEOs with enhanced extension skill start replicating crop diversification activities, i.e. formulation CDP, providing trainings on farmers, etc. at all the sub-project sites by referring the Guidelines. Thus, the path to the Overall Goal is set out. *(5) Sustainability; Moderate* The sustainability is being enhanced thanks to the joint endeavor of TCP and PMU/DOA. Sustainability especially in terms of organizational and institutional aspect will be further firmly secured by taking up the recommendations of this terminal evaluation by the TCP, PMU/DOA.
Recommendations
1. Notification of the Guidelines to all 12 DDA and Block-level offices 2. Dissemination of the leanings and experiences of the TCP within DOA 3. Annotation to PDM (Refer to PDM ver. 3 as attached) 4. Further JICA's cooperation

2.6.3 Dissemination of the TCP Activities to Other Institutes or Organizations

(1) Palampur Agriculture University

Grafting and cutting techniques on vegetable crops were new techniques in Himachal Pradesh and even in India. Grafting techniques are very effective to improve soil derived diseases and insects tolerances such as bacterial wilt and nematode. These two are very serious problem in poly-house in Himachal Pradesh.

One scientist (Dr. Pardeep Kumar) in Palampur Agriculture University has started experiments of grafting of vegetable crops since 2012. However survival rate of grafted plants was very low (10-15%) until that time (July, 2013). The scientists requested the technical support from the TCP. We gave physical and technical support to them in July, 2013.

- Material support: supporting tools for grafting such as 500 grafting clips and 1000 grafting tubes.
- Technical support: advice of pre-requisites for grafting and how to take care after grafting (healing chamber, hardening etc.),

After this advice, survival rate of grafted plants was drastically increased to 95-100%. He ordered grafting clips to local company and got cheaper clips from local market. We also introduced cutting of vegetables for vegetative multiplication of hybrid varieties. He has started experiments on tomato, capsicum and cucumber. They were fully successful. His achievement resulted in a big scheme funded by central government to produce grafted nursery by grafting machine for farmers even though it was not set still now. As of now, he has submitted thesis on grafting of tomato and capsicum. The effect of grafting to tomato was shown in following table. Use of rootstock brought out good quantity and quality.

Table 2.6.1 Effect of Rootstocks on Growth, Yield and Quality Parameters of Tomato

Treatment	Number of fruits/plant	Fruit yield/plant (kg)	Plant height	Ascorbic acid (mg/100g)	TSS (%)	Pericarp thickness
Hawaii 7996 + Avtar	28.33	1.70	190.66	23.97	5.30	3.10
Hawaii 7998 + Avtar	30.66	1.84	193.66	26.86	5.70	3.43
VI047335 +Avtar	33.0	2.00	198.66	30.00	5.96	4.06
VI034845 +Avtar	35.66	2.14	205.66	31.20	6.23	4.16
VI45276 +Avtar	31.33	1.88	193.33	29.53	5.90	3.83
Palam Pink +Avtar	27.66	1.66	188.00	28.86	5.83	3.76
Palam Pride +Avtar	25.66	1.54	190.33	28.00	5.80	3.56
Cotrol- Non grafted	17.33	1.04	184.33	21.43	4.87	2.93

Source: Dr. Pardeep Kumar, Plampur Agriculture University

Not only information on grafting and cutting was provided but they were also made aware of a new technique of nursery raising by using coarse sand as the growing media. We shared our experience of raising nursery in sand from Lahalri. In nursery raising for poly-house crop, use of soilless media is standard specification. However it is difficult to get these materials in Himachal Pradesh. So they have looked for substitute for this soilless media. In case of coarse sand, it is easily available in Himachal Pradesh and is easy to sterilize and even reusable. In addition, seedlings grown in coarse sand is very healthy because they have short inter-nods and thick stem. They are very much exiting to this concept and they assured us that they will soon start nursery production in sand in their farm.

(2) KVK Bara

KVKs (Krishi Vigyan Kendras) are a front-line agricultural extension center financed by the *Indian* Council of Agricultural Research (ICAR). KVK gives special emphasis on training and education of farmers, entrepreneurs, farm women, rural youth, financial institutions extension functionaries as well as voluntary organizations.

JICA TCP supported KVK Bara to demonstrate new materials and techniques not only for Extension staffs in PMU and farmers in Lahalri but also for visiting farmers from different areas of Himachal Pradesh and scientists. Provided materials and techniques are shown in following table.

Table 2.6.2 Provided Materials and Techniques

Concept, information or techniques	Objective	Contents
Grafting	Improve disease tolerance	Grafting of tomato, cucumber and capsicum
Cutting	Vegetative propagation	Cutting of tomato
Use of poly-mulch	Reduce weeding and use of water	Application of black and white, silver and white mulch in and out of poly-house
Use of insect net	Protection from insect	Application of insect net (cheese cloth)
Use of floating row cover sheet	Protection from frost injury, promotion of germination and protection from insect attack	Application of floating row cover sheet in and out of poly-house
Use of poly-tunnels in poly-house	Protection from frost injury and promotion of early growth in winter	Application of multi-layers poly-tunnel
Use of water tube	Increase of temperature in winter	Introduction of use of water bottle or water duct. Water absorb heat from sunshine in daytime and release heat at night
Cultivation of musk melon	New crop in Himachal Pradesh	Introduction of cultivation of musk melon in poly-house as a cash crop
Hands-on training	Introduction of teaching method	Introduction of more practical training through experience
Pictorial manuals	Introduction of teaching materials	Introduction of visualized teaching materials to promote understanding

Source: JICA TCP Team

(3) Mission of Turkish Government

The ODA Loan Project and TCP introduced the crop diversification activities under the projects to study mission of Turkish Government in November 11 and 12, 2015. Turkish government is implementing a similar project for crop diversification currently. Turkish government dispatched the mission to inspect the projects for crop diversification in H.P. The TCP guided them to visit the pilot site and discussed with them regarding implementation of crop diversification activities.

2.6.4 Public Relations (PR) Activities

Public awareness of the project on crop diversification is crucial for the successful implementation of the pilot project and expansion of crop diversification in the JICA Loan Project. To promote awareness, public relations (PR) activity was carried out by the TCP team using the materials listed in the following table.

Table 2.6.3 Summary of PR Activity in Phase-2

Type	Language	Numbers	Target	Distribution
Brochure	English	2,500 copies	Government officers, extension/research institutes, and other stakeholders	Posting to the organizations, Distributing at fairs.
	Hindi	1,500 copies	Farmers and the general public	
Website	English	-	The general public	Hosted on jica.go.jp
Pen, notepad and file	-	500 each	Participants of the trainings	Used at TCP trainings
Banner	Hindi	2 banners	Participants of the trainings	Used at TCP trainings

Source: JICA TCP Team

Table 2.6.4 Summary of PR Activity in Phase-3

Type	Language	Numbers	Target	Distribution
Introduction of the project in festival	-	-	Local people in the pilot area	Hamir Utsav (Hamirpur local fair) on Oct. 27 to 29, 2013
3D model of pilot area	-	1	Indian stakeholders	Exhibited in festival and kept in counterpart's office
Website	Japanese	-	Japanese taxpayers and stakeholders	Hosted on jica.go.jp
Calendars for 2014	Hindi	1,000 copies	Indian stakeholders	Distributed by hand

Source: JICA TCP Team

Table 2.6.5 Summary of PR Activity in Phase-4

Type	Language	Numbers	Target	Distribution
Introduction of the project in festival	-	-	Local people in the pilot area	Hamir Utsav (Hamirpur local fair) on November 10 to 12, 2014
Website	Japanese	-	Japanese taxpayers and stakeholders	Hosted on jica.go.jp
Document holder	Hindi	1,000 copies	Indian stakeholders	Distributed by hand
Calendars for 2015	Hindi	1,000 copies	Indian stakeholders	Distributed by hand
Diary with Agriculture information	Hindi	500 copies	Farmers in the Sub-project area in the ODA Loan Project	Distributed by hand

Source: JICA TCP Team

2.6.5 Overseas Training in Japan for Core Extension Officers

(1) Outline of Overseas Training

Overseas training in Japan has been carried out under the Technical Cooperation Project for Crop Diversification in Himachal Pradesh for 12 days period from 29 June to 10 July 2014. Target officers for the overseas training were selected from DoA and PMU, the counterpart agencies based on the discussion with DoA. As a result of selection, eight officers from MoA (Central Government of India), DoA and PMU were dispatched to the overseas training in Japan. List of the officers are shown in the following table.

Table 2.6.6 List of Officers Dispatched to the Overseas Training in Japan

No.	Name	Agency/Position
1	Mr. Ram Adhin Singh PATEL	Assistant Commissioner, Department of Agriculture and Cooperation/Natural Resource Management, Ministry of Agriculture (MoA)
2	Mr. Som Raj KALIA	Joint Director, Department of Agriculture (DoA)
3	Mr. Ashwani Kumar BHARDWAJ	Divisional Engineer, Soil Conservation Division, Department of Agriculture (DoA)
4	Mr. Pradeep BEHL	Deputy Project Director, State Project Management Unit (SPMU)
5	Mr. Prem Lal SHARMA	Block Project Manager, Block Project Management Unit (BPMU), Bilaspur
6	Mr. Rattan Chand BHARDWAJ	Block Project Manager, Block Project Management Unit (BPMU), Sarkaghat
7	Mr. Bharat Raj SOOD	District Project Manager, District Project Management Unit (DPMU), Palampur
8	Mr. Navneet Kumar SOOD	Subject Matter Specialist (SMS), District Project Management Unit (DPMU), Palampur

Source: JICA TCP Team
Note: Agency and position as of July 2014

(2) Objective of Overseas Training

Main objective of the overseas training is to overview Japanese agriculture system and techniques and apply the experiences for smooth implementation of the ODA Loan Project. The TCP team coordinated and arranged the overseas training based on necessary technical fields of the ODA Loan Project. Five themes of Japanese technology and experiences were included in the training as shown below.

1) Decision making of agriculture policy and system of research and extension of agricultural technology in Japan (Extension field)
2) Current situation of cultivation, post-harvest and processing techniques and functions of agriculture cooperatives in Japan (Vegetable cultivation and post-harvest field)
3) System of development of irrigation facilities and operation/maintenance by farmers group/LID in Japan (Water management field)
4) Support for women's group activities in Japan (Gender field)
5) Agriculture marketing system in Japan (Marketing field)

Relationship between the ODA Loan Project and the overseas training is summarized in the following figure.

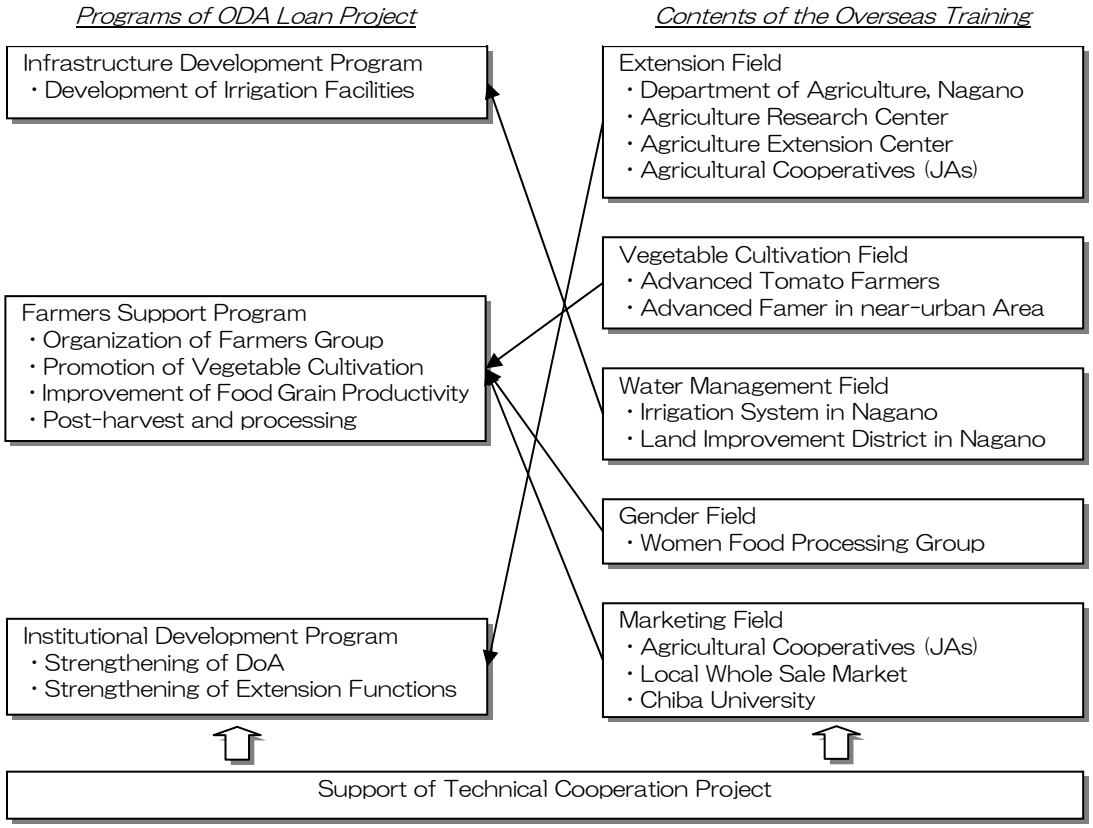


Figure 2.6.1 Relationship between the ODA Loan Project and the Overseas Training

(3) Training contents

The TCP team considered climatic condition and similarity of agriculture product for selection of Nagano Prefecture as main place to visit in the overseas training. The TCP team also planned to visit Chiba Prefecture as an example of agriculture in Sub-urban area. Places and training contents of the overseas training are summarized table below.

Table 2.6.7 Training Curriculum of Overseas Training in Japan

No.	Place	Training Contents
	Nagano Pref.	
1	Vegetable and Flower Research Center, Nagano Pref.	- Research and development activities in the field of vegetable and flower cultivation - Field visit of research center
2	Matsumoto Agricultural Extension Center, Nagano Pref.	- System of agricultural extension activities in Japan - Exchange information and discussion with extension officers of Nagano Pref.
3	Nomura Farm, Ltd. (Advanced Farmer)	- Vegetable cultivation, post-harvest and processing technique at farmer level - Visit tomato cultivation in poly house
4	Yazawa Food Processing Factory (Women's Group)	- Small scale food processing activities by women's group
5	Chushin-daira Federation of Land Improvement District (FLID)	- Development of national irrigation scheme (Chushin-daira Irrigation Scheme) - Visit headwork site of the irrigation scheme (Azusaga-wa barrage)
6	Chushin-daira Right bank Land Improvement District (LID)	- Operation and maintenance works by LID - Visit field level irrigation facilities
7	JA (Agricultural Cooperative) Seba	- System and role of JA - Visit pre-cooling facilities of Lettuce
8	JA (Agricultural Cooperative) Shiojiri-shi	- System of agro-product distribution and marketing system by JA - Visit farmers market
9	Department of Agriculture, government of Nagano Pref. (Courtesy call to Director of Agriculture)	- Advice from Director of Agriculture, Nagano Pref. for agriculture development of H.P.
	Chiba Pref.	
10	Ishii Farm (Advanced Farmer)	- Current situation of agriculture in sub-urban area - Visit tomato cultivation in poly house - Visit farmers restaurant
11	Matsudo Nambu Wholesale market	- Role of wholesale market in Japan - Visit market facilities
12	Chiba University, Prof.Sakurai	- Lecture of agriculture marketing in Japan and other countries - Discussion of improvement of marketing system in H.P.

Source: JICA TCP Team

(4) Training Schedule

Before starting the overseas training, orientation workshop was organized on June 7, 2014 by the TCP team with participation with all of the officers who would visit Japan. The overseas training was carried out without any problem by coordination of the TCP team. Actual itinerary of the overseas training is shown below.

Table 2.6.8 Itinerary of the Overseas Training in Japan

No.	Date	Day		Time	Activity	Stay
1	28-Jun	S	AM			in Flight
			PM		Flight from Delhi to Narita	
2	29-Jun	S	AM		Arrival at Narita Move from Narita to JICA Tokyo	Tokyo International Center, JICA
			PM			
3	30-Jun	M	AM	9:30-11:30	Orientation in JICA Tokyo Center	Matsumoto City
			PM	14:30-17:30	Move from Tokyo to Matsumoto, Nagano Pref.	
4	1-Jul	T	AM	10:00-11:00 11:00-13:00	Move to Shiojiri Michinoeki Osakada Park	Matsumoto City
			PM	13:30-15:30 16:00-16:30	Agriculture Research Center Move to Matsumoto	
5	2-Jul	W	AM	9:15-9:30 9:30-11:30	Move to Extension Center Agriculture Extension Center in Matsumoto	Matsumoto City
			PM	13:30-15:00 15:30-17:00 17:00-17:30	Vegetable farmers (Mr.Nomura) Woman's Group (Yazawa Processing Factory) Move to Matsumoto	
6	3-Jul	T	AM	9:15-9:30 9:30-12:00	Move to Matsumoto Pref. Office Chusindaira Irrigation scheme	Matsumoto City
			PM	13:30-16:00 16:00-17:00	Japan Agricultural Cooperatives (JA) Seba Move to Matsumoto	
7	4-Jul	F	AM	9:00-10:00 10:00-12:00	Move to Shiojiri JA Shiojirishi	Tokyo International Center, JICA
			PM	15:00-15:30 16:00-19:00	Courtesy call to DoA, Nagano Pref. Move from Nagano to Tokyo	
8	5-Jul	S	AM		Report Preparation	Tokyo International Center, JICA
			PM		Report Preparation	
9	6-Jul	S	AM		Free	Tokyo International Center, JICA
			PM		Free	
10	7-Jul	M	AM	9:00-10:30 10:30-14:00	Move to Chiba Vegetable farmer (Mr.Ishii, sub-urban area)	Tokyo International Center, JICA
			PM	14:00-15:00	Move to Tokyo	
11	8-Jul	T	AM	9:00-10:00 10:00-12:00	Move to Chiba Local Wholesale Market (Matsudo Nambu Market)	Tokyo International Center, JICA
			PM	14:00-16:00 16:00-17:00	Chiba University Move to Tokyo	
12	9-Jul	W	AM	9:00-10:00 10:00-12:00	Move to Yotsuya, Tokyo (by Subway) Courtesy call to JICA	Tokyo International Center, JICA
			PM	13:00-15:00 15:00-16:00	Visit to NK Move to Tokyo (by Subway)	
13	10-Jul	T	AM	7:00-9:00	Move to Narita Airport Flight from Tokyo to Delhi	Delhi
			PM		Arrive at Delhi	
14	11-Jul	F	AM		Courtesy call to JICA India Office	
			PM			

CHAPTER 3 PROJECT OUTPUTS AND OUTCOME

3.1 Project Design Matrix

The purpose of the TCP is to establish the promotion mechanism for crop diversification in the HP State, in order to support the implementation of the ODA Loan Project. The overall goal, project purpose, outputs and verifiable indicators are described in Project Design Matrix, PDM (refer Attachment-2). Outputs and Outcomes with their indicators are summarized in the following table.

Table 3.1.1 Outcome and Outputs with Relevant Indicators

(1) Outcome

Outcome	Objectively Verifiable Indicators
Project Purpose (Target at the end of the Project) The promotion mechanism for crop diversification is established in DOA Himachal Pradesh.	Extension activities based on the Crop Diversification Model are expanded in 5 districts.

Source) Attachment-2: Project Design Matrix

(2) Outputs

Outputs	Objectively Verifiable Indicators
1. DOA[*1]'s capacity to plan and implement crop diversification is strengthened.	1-1 Implementation guideline for crop diversification is prepared 1-2 Annual PDCA cycle of crop diversification functions in DOA[*1] (i.e. Annual Plan on crop diversification is formulated, monitored and evaluated.)
2. Training system to promote crop diversification is developed	2-1 Training curriculum and materials are developed after revision in each subject.
3. The extension skill of the core extension officers is improved.	3-1 80% of the core extension officers can conduct farmers' training by themselves on the various technologies. 3-2 50% of the core extension officers can launch extension activities in the areas they cover.
4. Crop diversification model is developed and practiced in the Pilot area	4-1 30% of the farmers/20% of CCA in the pilot area undertake vegetable cultivation. 4-2 30% of farmers in the pilot area can increase their income by the Project. 4-3 SHGs in the pilot area can increase their income by their group activities. 4-4 Irrigation facilities in the pilot area are properly maintained by farmers

*Note) *1 The target group is the core extension officers of PMU*
Source) Attachment-2: Project Design Matrix

This chapter describes achievements at the end of the TCP for each output and outcome. Monitoring results of vegetable cultivation, water management and SHG activities in the pilot area are also shown in detail.

3.2 Achievement of Outputs

3.2.1 Output-1: Strengthening DOA's Capacity for Planning and Implementation of Crop Diversification

The TCP was fully supporting PMU of the ODA Loan Project as one of the main targets of technical transfer in order to strengthen their capacity for planning and implementation of Crop Diversification. The TCP provided necessary support for formulation of Crop Diversification Plan (CDP) with PDCA cycle concept. We also prepared the Guidelines for Crop Diversification based on the experiences of pilot activities. At the end of the TCP, the final version of Guidelines (Ver. 3) was distributed to all of SPMU, DPMUs, and BPMUs, also to the Offices of Deputy Director of Agriculture (DDA) in each district and utilized for the daily activities of them. Fifty four (54) CDPs have been prepared in the sub-project area of the ODA Loan Project. They are implementing extension activities for crop diversification according to the CDPs. The following sections describe the result of output-1 in detail.

(1) Preparation of Guideline for Crop Diversification

The Guidelines consist of two parts, Part I which discusses implementation processes, training curriculum for farmers and lessons learned in the six crop diversification themes, i.e. (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing, and further Part II which contains practical information for CEOs to provide farmers with extension services such as technical information on each subject, training curriculum, training materials, lessons learned in the pilot area, etc.

First version of the Guidelines was drafted by the TCP experts in August 2014. After that, the second version which incorporated all the feedbacks from CEOs was drawn up in February 2015. The Guidelines were updated, considering the monthly feedback from CEOs based on their practical usage, and thus the final version of the Guidelines were prepared in September 2015. The TCP also had the workshop for disseminating the Guideline in the same month. Currently the Guideline has been used widely by 119 officials in PMU, both extension and engineering staffs, for their practical works (Indicator 1-1). It is also expected that the officers of DoA in each district refer the guidelines. Uses of the Guideline in PMU are shown in the following table.

Table 3.2.1 Target Users of the Guidelines

Office	Technical Staff of PMU								
	Extension Staff			Engineering Staff			Total		
	DoA*1	OS*2	Sub total	DoA	OS*2	Sub total	DoA	OS*2	Sub total
1. SPMU	3	1	4	3	2	5	6	3	9
2. DPMU Hamirpur	2	2	4	1	4	5	3	6	9
2.1 BPMU Hamirpur	3	2	5	3	4	7	6	6	12
2.2 BPMU Bilaspur	2	2	4	2	5	7	4	7	11
2.3 BPMU Una	1	2	3	1	6	7	2	8	10
3. DPMU Mandi	2	2	4	1	3	4	3	5	8
3.1 BPMU Mandi	1	2	3	2	5	7	3	7	10
3.2 BPMU Sarkaghat	2	2	4	1	6	7	3	8	11
4. DPMU Palampur	2	2	4	1	4	5	3	6	9
4.1 BPMU Dehra	1	2	3	2	5	7	3	7	10
4.2 BPMU Nurpur	1	2	3	1	5	6	2	7	9
4.3 BPMU Baijinath	2	2	4	2	5	7	4	7	11
Total	22	23	45	20	54	74	42	77	119

*Note)*1:DoA: Staff deployed from DoA, Himachal Pradesh, *2:OS: Staff outsourced*
Source: Documents of PMU (as of June 2015)

(2) Preparation of Crop Diversification Plan (CDP)

Crop Diversification Plan (CDP) should be prepared for each sub-project of the ODA Loan Project. The purpose of CDP is to implement proper extension services and monitor progress of crop diversification in certain sub-project area of the ODA Loan Project based on the PDCA cycle concept This CDP consists of Agricultural Development Plan (ADP) and Extension Training Plan (ETP). Implementation Schedule to ensure implementation of CDP is also annexed to CDP. The TCP provided the trainings for understanding concept of PDCA cycle and workshops for preparation of CDPs (35 times in total in all BPMU offices) for developing capacity of the core extension officers for planning and implementation of extension activities. As a result, at the end of the TCP, the CDPs have been already formulated in 54 sub-project sites of the ODA Loan Project. The core extension officers are expanding the extension services based on the CDPs (Indicator 1-2)[1].

3.2.2 Output-2: Development of Training System on Promotion of Crop Diversification

The TCP understands that "Training System" consists of training curriculums, materials and guide for instruction necessary for the core extension officers when they provide technical training to farmers. The TCP developed training curriculum and materials in four themes for crop diversification, i) water management/O&M, ii) vegetable farming/post harvest, iii) Gender and iv) Marketing by incorporating lessons learned in the pilot area (Lahalri), and reviewing some existing training materials (indicator 2-1) used in universities, Farmers' Training Centre (FTC), Krishi Vigyan Kendra (KVK), State Agricultural Management and Extension Training Institute (SAMETI). Developed curriculum, materials and guide for instruction were entirely compiled in the PART-II of the Guidelines. The core extension officers are now providing trainings for farmers with reference of the training curriculum and materials developed by the TCP.

3.2.3 Output-3: Improvement of Extension Skill of Core Extension Officers

The TCP conducted series of trainings to the core extension officers for capacity development of them in six crop diversification themes i.e. (i) agricultural extension, (ii) Infrastructure Development, (iii) water management and O&M, (iv) vegetable farming and post-harvest, (v) Self Help Group (SHG) Development, and (vi) agricultural marketing. Total number of trainings and participants is 12 times with 264 participants in Phase-2, 23 times with 499 participants in Phase-3, and 38 times with 464 participants in Phase-4 respectively. Through these trainings, the capacity of them was developed enough for implementing extension activities. In June 2015, the TCP carried out the interview survey to assess the skill of the core extension officers. 29 core extension officers out of 30, who are carrying out the extension activities in the field were surveyed, because one core extension officer joined in PMU recently and thus not included in the survey.

[1] As of September 2015, construction of irrigation facilities was completed in 32 sub-project sites, and is in progress in 101 sub-project sites. As for the remaining 77 sub-projects, preparation of DPR is in progress.

Extension activities are carried out by CEOs in the field listed in the table below.

Table 3.2.2 CEOs in the Extension Field of PMU

Office	Subject Matter Specialist (SMS)	Agriculture Development Officer (ADO)	Agriculture Expert (AE)	Agriculture Extension Officer (AEO)	Agriculture Officer (AO)	Total
1. District PMU Hamirpur	1		1		1	3
1.1 Block PMU Hamirpur		1	1	1	1	4
1.2 Block PMU Bilaspur		1	1		1	3
1.3 Block PMU Una			1		1	2
2. District PMU Mandi	1		1		1	3
2.1 Block PMU Mandi			1		1	2
2.2 Block PMU Sarkaghat		1	1		1	3
3. District PMU Palampur	1		1		1	3
3.1 Block PMU Dehra			1		1	2
3.2 Block PMU Nurpur			1		1	2
3.3 Block PMU Baijinath		1	1		1	3
Total	3	4	11	1	11	30

Source: PMU, June 2015

(1) Trainings to Farmers

The TCP had interview survey to confirm the current situation of trainings to farmers by the core extension officers about the following points:

(i) Implementation of needs Assessment,
(ii) Clarification of objectives,
(iii) Preparation of Action Plan (AP) before the training implementation,
(iv) Preparation of Training Report (TR) after the training implementation,
(v) Sharing information to other officers, and
(vi) Improvement of training quality based on feedback from Farmers.

We also confirmed (vii) frequency of field visit each sub-project by the core extension officers as an indicator of proper extension activity. The results are shown the table below:

Table 3.2.3 Current Situation on Training Skills of CEOs

(i) Needs Assessment

	Always	Sometimes	Never
No. of Respondents	16	13	0
Proportion	55%	45%	-

(ii) Clarification of objectives

	Always	Sometimes	Never
No. of Respondents	29	0	0
Proportion	100%	-	-

(iii) Preparation of AP

	Always	Sometimes	Never
No. of Respondents	16	11	2
Proportion	55%	38%	7%

Continued to next page

(iv) Preparation of TR

	Always	Sometimes	Never
No. of Respondents	25	3	1
Proportion	86%	10%	4%

(v) Sharing information

	Always	Sometimes	Never
No. of Respondents	23	6	0
Proportion	79%	21%	0

(vi) Feedback from Farmers

	Always	Sometimes	Never
No. of Respondents	16	13	0
Proportion	55%	45%	-

(vii) Visiting Farmers

	Once a week	Once a fortnight	Once a month	Rarely
No. of Respondents	3	9	10	4
Proportion	11%	35%	39%	15%

Source) Interview by TCP, June 2015

The survey results revealed that all of the core extension officers have started to provide technical trainings to farmers and more than half of them are able to properly plan, implement and report the trainings (Indicator 3-1). 45% of them are visiting farmers once a fortnight or more for carry out extension activities other than trainings.

(2) Planning of Extension Activities

The following table shows the interview results about extension skills of the core extension officers especially for planning of extension activities in certain sub-project area of the ODA Loan Project.

Table 3.2.4 Current Situation on Extension Skills of CEOs

(i) Preparation of Agricultural Development Plan (ADP)

	Always	Sometimes	Never
No. of Respondents	21	2	3
Proportion	81%	8%	11%

(ii) Preparation of Extension Training Plan (ETP)

	Always	Sometimes	Never
No. of Respondents	22	4	-
Proportion	85%	15%	-

(iii) Preparation of Implementation Schedule

	Always	Sometimes	Never
No. of Respondents	13	8	5
Proportion	50%	31%	19%

(iv) Instruction on Monitoring

	Yes	Not all	Never
No. of Respondents	23	3	-
Proportion	88%	12%	-

Source) Interview by TCP, June 2015

Through the interview survey of the core extension officers, it was revealed that 81% and 85% out of 26 core extension officers formulated ADP and ETP respectively (Indicator 3-2). Preparation of ADP and ETP is the key step of the extension activities in a certain sub-project area. This means more than

80% of the core extension officers have launched the extension activities.

(3) New Skills of the Core Extension Officers

The TCP introduced various new materials, techniques and new varieties to the core extension officers for improvement of their extension skills. The new materials introduced to farmers are in the following table.

Table 3.2.5 Introduction of New Materials, Techniques and Crops / Varieties

i) New Materials

New Materials introduced to Farmers	Purpose of Usage
Black and white mulch	Reduction of weed and retaining of soil moisture
Silver mulch	Reduction of weed, insects and retaining of soil moisture and early maturity
Black mulch	Reduction of weed and retaining of soil moisture
Insect shield net	Protection from insects and frost injury
Poly-tunnel	Early and healthy nursery production
Walk-in poly tunnel	Protection from rain in Kharif season and from coldness in Rabi season
Poly-house	Cultivation of poly-house crops such as Tomato, Cucumber and Capsicum
Net house	Protection from insects and high heat
Cucumber net	Support for vine type vegetables
UV shield shade net	Reduction of heat in hot summer (From April to June)
Decomposable pot	Easy and no damage transplanting
Floating cover sheet	To promote early seed germination, protection from frost injury and from animal attack
Grafting clips and tubes	To support grafted part for easy attachment

ii) New Techniques

Name of Techniques Introduced to Farmers	Purpose of Usage
Cutting of tomato / capsicum / cucumber / brinjal	Vegetative multiplication of good variety
Grafting of cucurbit family and solanaceous family	Improvement of disease tolerance
Blanching of cauliflower	Protection from frost injury and improvement of quality
Pruning of okra leaves	Improvement of nutrition distribution
Rejuvenation pruning of brinjal and capsicum	Rejuvenation of plant body and re-starting of new harvest
Line sowing of maize	Improvement of yield and easiness of additional fertilizer application, earthing up and weeding
Line sowing of wheat	Improvement of yield and easiness of additional fertilizer application, hoeing and weeding
Line sowing of peas	Improvement of yield and easiness of additional fertilizer application, earthing up and weeding
Healthy nursery production	Improvement of survival rate of nursery and for good health of seedlings
Earthing up and water application of potato	Improvement of quantity and quality, avoidance from toxic greenly potato
Inter-cropping of maize and peas	Improvement of yield
Inter-cropping of wheat and peas	Improvement of yield
Bokashi and organic liquid fertilizer production	Production of organic fertilizer by themselves
Fertilizer schedule and rate	On time and effective application of fertilizer
Safe use of chemicals	Effective and safe use of chemicals
IPM (Pheromone trap: Palam trap)	Safe vegetable production (Protection from fruit fly)
IPM (Pheromone trap: Brinjal-shoot and fruit borer trap)	Safe vegetable production (Protection from shoot and fruit borer)
IPM (Sticky trap)	Safe vegetable production (Protection from aphid, white fly and other insects in and outside of poly-house)
IPM (Neem cake and Trichoderma)	Safe vegetable production (Reduction of number of nematode)
Photo collection of insects and diseases	Earlier detection of insects and diseases and preparation of check sheet

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iii) New Crops / Varieties

Name of Crop/ Varieties introduced to Farmers	Purpose of Use
Elephant foot yam (NDA-9)	Quality improvement (No pungency)
Garlic (GHC-1)	Big size garlic to sell high rate
Red cabbage	High value vegetable
Savoy cabbage	High value vegetable
Brussels Sprout	High value vegetable
Color cauliflower (Orange)	High value vegetable
Color cauliflower (Lime green)	High value vegetable
Color cauliflower (Pink)	High value vegetable
Color cauliflower (Purple)	High value vegetable
Romanesco cauliflower	High value vegetable
Red leaf lettuce	High value vegetable
Yellow leaf lettuce	High value vegetable
Cherry tomato	High value vegetable
Basil	High value vegetable
Parsley	High value vegetable
Snap Peas	High value vegetable
Swiss Chard	High value vegetable
Broccoli	High value vegetable

Source: JICA TCP

3.2.4 Output-4: Development and Implementation of Crop Diversification Model in the Pilot Area

The TCP was promoting crop diversification in the pilot area, Lahalri, Hamirpur District through development of the irrigation facilities/demonstration farm and training/guide to farmers during the project period. The most important purpose of these activities is to accumulate technical experiences and lessons learned. The TCP have struggled to clarify technical problem during construction and O&M of irrigation facilities, to consider applicable cultivation techniques, to seek proper instructional method to farmers etc. The experiences in the pilot area was formalized as "Crop Diversification Motel" of a systemized knowledge consisting of (i) process of six crop diversification themes[2], (ii) techniques in each theme and (iii) lessons learned from the pilot activities, and CDM was indeed developed through the pilot activities, and it is also articulated in the Guidelines. The activities in the pilot area were beneficial for achievement of the project purpose in this regard.

Actual progress of crop diversification in the pilot area is not very remarkable due to the site location near urban area, low population of full-time farmers etc. However, a certain level of crop diversification was achieved. The result of activities in the pilot area is discussed in the following section.

(1) Vegetable Cultivation

Construction of irrigation facility in the pilot site was completed in November 2012, and vegetable cultivation has started since Rabi 2012/13. Number of farmers who started vegetable cultivation is in the upward trend both in Rabi and Kharif. Although as for vegetable-cultivated area, the figure of Kharif 2015 fell below that of Kharif 2014, this is because cereals are major crops cultivated in Kharif in this area. The result shows upward trends in Rabi both in terms of number of farmers and in terms of vegetable-cultivated areas and 30 farmers (30%) cultivated vegetables in 4.88 ha (20%) (Indicator 4-1) in Rabi 2014/15.

[2] Six crop diversification themes are (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing.

Table 3.2.6 No. of Farmers and Area for Vegetable Cultivation

		2012/13 Rabi	2013 Kharif	2013/14 Rabi	2014 Kharif	2014/15 Rabi	2015 Kharif
Farmers who started veg cultivation*1	Nos	10	14	19	19	28	21
	%	10	14	19	19	28	23
Vegetable cultivated area in CCA*2	ha	0.64	1.36	3.17	2.78	4.88	2.47
	%	3	6	13	12	20	10

*(Note) *1 : Number of farming households in the pilot site is 99 from 2012 to 2014, and 93 in 2015.*
**2 : CCA is 24ha according to the district cadastral survey 2006/07*
Source: JICA TCP

(2) Farming Income

As seen in the table below, the farmers (HHs) who started vegetable cultivation increased their income through selling vegetable (Indicator 4-2). In Rabi 2014/15, vegetable cultivation increased in the farmers' income of Rs. 22,400 in average.

Table 3.2.7 Number of Vegetable Farmers and Their Average Income from Vegetable Cultivation

	2012 Kharif	2012/13 Rabi	2014 Kharif	2014/15 Rabi
Vegetable Farmers(HHs)	0	10	19	30
Vegetable Income (Rs./HH)	0	5,800	11,400	18,900

Source: JICA TCP

(3) SHGs in the Pilot Area to Increase Their Income

In the first year, five SHGs, including existing SHGs, started working with the TCP. Two SHGs stopped working due to lack of interests. So, the following table shows the current situation of the existing three SHGs. Three SHGs have achieved increase in their income through group activities (Indicator 4-3).

Table 3.2.8 Activities of SHGs

SHG	Year of formation	Nos.	Activities	Income from activities mentioned in the left column
Shiv Shakti	Nov. 2011	18	Group farming of vegetables such as cauliflower, cabbage, broccoli, okura etc.	Rs.37,190 (Rs.20,712)
Naman*	June** 2012	12	Nursery raising of cauliflower, onion, broccoli, etc.	Rs.47,340 (Rs.30,440)
Bhole Shankar	Jan.** 2012	15	Food processing such as Bahri, Barumichuri、Mulberry leaf and powder	Rs.38,310 (Rs.27,755)

Note:: Naman is a SHG outside of CCA. **: Year of re-formation. -Bracketed figures are figures without project supports.*
Source: JICA TCP

(4) Water Management and O&M

Construction of irrigation facilities in Lahalri was completed on 15 November 2012, and handed over to Water Users Association named GMKVA on 11 April 2013. The TCP fully supported GMKVA for establishments, registration, water management and operation & maintenance. At the end of the TCP, GMKVA follows the water distribution rule which they established, collect water charges properly, carry out maintenance and cleaning works periodically. Thus, it is concluded that GMKVA maintains the irrigation facilities properly (Indicator 4-4).

3.3 Achievement of Project Purpose (Outcome)

The TCP defined "Crop Diversification Model (CDM)" as a systemized knowledge consisting of (i) process of six crop diversification themes[3], (ii) techniques in each six theme, and (iii) lessons learned from the pilot activities. Meanwhile "Mechanism for Crop Diversification (MCD)" is defined as mechanism consisting of five components, i.e. three components of CDM mentioned above plus (iv) human resources and (v) institutions, as shown in the following Figure.

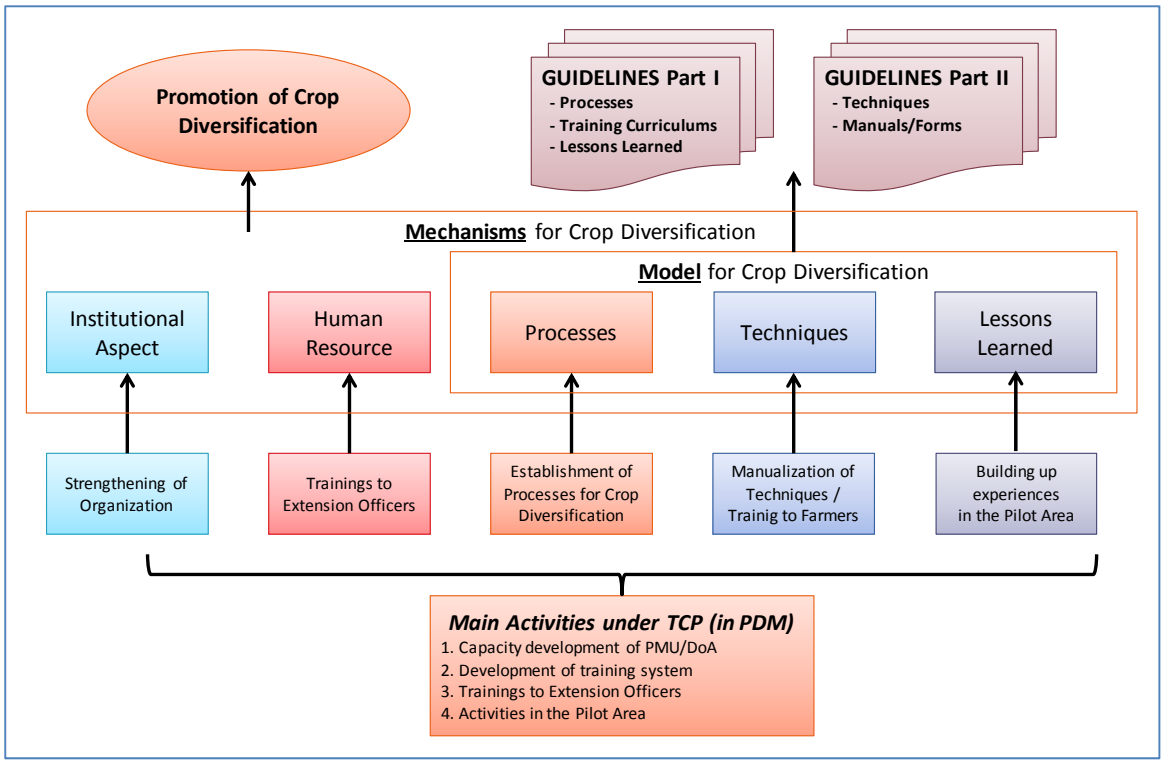


Figure 3.3.1 Conceptual Framework of MCD and CDM

As described in Chapter 2, the TCP carried out a series of activities for promotion of crop diversification during Phase-1 to 4. Processes, techniques and lessons learned from the pilot activities as "Crop Diversification Model" were complied into "the Guidelines" to be utilized by the core extension officers of PMU. The TCP also had technical trainings which include both theoretical and practical to the core extension officers to develop human resource for promotion of crop diversification.

Based on the definition of "model" and "mechanism" above, it is concluded that the project purpose, "The promotion mechanism for crop diversification is established in DOA Himachal Pradesh", has been achieved at the end of the TCP because of the following reason,

1. Crop Diversification Plans (CDPs) have already been prepared in 54 sub-projects of the ODA Loan Project. The core extension officers in these sub-projects started to provide "extension services" based on the CDPs;

[3] 6 crop diversification themes are (i) agricultural extension, (ii) Infrastructure Development , (iii) water management and O&M, (iv) vegetable farming and post-harvest, (v) Self Help Group (SHG) Development, and (vi) agricultural marketing.

2. “Crop Diversification Model” has been developed and formalized as the Guidelines including the Training Curriculum and Training Materials. The Guidelines have been shared and utilized by PMU officers when they provide extension services;

3. Core extension officers of PMU are now capable enough to provide extension services to the farmers through the trainings conducted by the TCP. Therefore, development of human resources necessary for promotion of crop diversification has been achieved; and

4. PMU, which is implementing the ODA Loan Project, functions well to promote crop diversification in H.P. in the institutional aspect.

3.4 Monitoring Results of Activities in the Pilot Area

This section shows the monitoring result of activities including vegetable cultivation, marketing, water management and SHG as additional information of output of the TCP.

3.4.1 Vegetable Cultivation

(1) Vegetable Cultivation Area

Vegetable cultivation in the Pilot area started from Rabi season in 2012-13 in the Pilot area under irrigated condition. The results of expansion of area and diversification of crops/varieties are below.

Table 3.4.1 Cultivated Area in the Pilot Area by Cropping Seasons

(i) Rabi 2012/13 (Unit: m^2)

Crops	Open Fields			Poly House	Total
	Villagers	Contract Farmers	Sub-Total		
Cauliflower	2,000	-	2,000	-	2,000
Peas	400	-	400	-	400
Chickpea	1,600	-	1,600	-	1,600
Garlic	200	-	200	-	200
Onion	200	-	200	-	200
Radish	400	-	400	-	400
Total area	4,800	-	4,800	-	4,800

Source: JICA TCP Team

(ii) Kharif 2013 (Unit: m^2)

Crops	Open Fields			Poly House	Total
	Villagers	Contract Farmers	Sub-Total		
Bottle Gourd	1,000	2,350	3,350	-	3,350
Bitter Gourd	470	2,100	2,570	-	2,570
Cucumber	500	1,150	1,650	-	1,650
Brinjal	80	1,000	1,080	-	1,080
Okra	1,000	2,000	3,000	-	3,000
Tomato	100	0	100	-	100
Soyabean	800	800	1,600	-	1,600
Polyhouse (Tomato)	120	0	120	-	120
Polyhouse (cucumber)	120	0	120	-	120
Total area	4,190	9,400	13,590	-	13,590

Source: JICA TCP Team

(iii) Rabi 2013/14 (Unit: m^2)

Crops	Open Fields			Poly House	Total
	Villagers	Contract Farmers	Sub-Total		
Cauliflower	2,300	6,200	8,500	-	8,500
Brocooli	350	2,600	2,950	-	2,950
Coriander	500	1,400	1,900	-	1,900
Spinach	600	2,000	2,600	-	2,600
Fennel	350	1,600	1,950	40	1,990
Fenugreek	200	1,200	1,400	-	1,400
Turnip	300	1,200	1,500	-	1,500
Radish	300	1,000	1,300	-	1,300
Garlic	300	0	300	-	300
Pea	800	1,600	2,400	-	2,400
Potato	3,400	3,200	6,600	-	6,600
Chinese Sarson	50	0	50	-	50
Tomato	-	-	-	120	120
Cucumber	-	-	-	40	40
French Bean	-	-	-	40	40
Total	9,450	22,000	-	240	31,690

Source: JICA TCP Team

(iv) Kharif 2014 (Unit: m^2)

Crops	Open Fields			Poly House	Total
	Villagers	Contract Farmers	Sub-Total		
Tomato	120	200	320	60	380
Brinjal	20	600	620	-	620
Capsicum	160	100	260	-	260
French Beans	100	400	500	140	640
Long Yard Bean	1,000	100	1,100	-	1,100
Okra	5,430	2,200	7,630	100	7,730
Bottle Gourd	650	2,000	2,650	-	2,650
Bitter Gourd	750	1,600	2,350	-	2,350
Snake Gourd	0	100	100	-	100
Sponge Gourd	0	200	200	-	200
Squash	20	0	20	-	20
Cherry Tomato	20	0	20	-	20
Cucumber	600	1,000	1,600	310	1,910
Elephant Foot Yam	100	200	300	-	300
Ginger	7,200	1,600	8,800	-	8,800
Pumpkin	0	600	600	-	600
Soyabean	50	0	50	-	50
Coriander				80	80
Total area	16,220	10,900	27,120	690	27,810

Source: JICA TCP Team

(v) Rabi 2014/15 (Unit: m^2)

Crops	Open Fields			Poly House	Total
	Villagers	Contract Farmers	Sub-Total		
Cauliflower	3,400	2,400	5,800	-	5,800
Broccoli	620	800	1,420	-	1,420
Cabbage	670	800	1,470	-	1,470
Faba bean	450	200	650	-	650
Radish	1,330	800	2,130	-	2,130
Turnip	860	400	1,260	-	1,260
Potato	20,350	5,200	25,550	-	25,550
Spinach	1,040	400	1,440	-	1,440
Coriander	540	400	940	-	940
Fenu greek	470	200	670	-	670
Peas	900	0	900	-	900
Garlic	1,080	20	1,100	-	1,100
Turmeric	440	0	440	-	440
Ginger	3,450	200	3,650	-	3,650
Mustard	570	0	570	-	570
Fennel	450	200	650	-	650
Tomato				190	190
Cucumber				90	90
Total area	36,620	12,020	48,640	280	48,920

Source: JICA TCP Team

(vi) Kharif 2015 (Unit: m^2)

Crops	Open Fields			Poly House	Total
	Villagers	Contract Farmers	Sub-Total		
Okra	5,520	3,200	8,720	30	8,750
Bottle Gourd	370	1,800	2,170	-	2,170
Bitter Gourd	230	1,100	1,330	-	1,330
Pumpkin	40	800	840	-	840
Cucumber	590	2,600	3,190	180	3,370
French bean	110	0	110	-	110
Sponge Gourd	0	600	600	-	600
Spinach	0	100	100	-	100
Coriander	0	250	250	60	310
Colocasia	120	0	120	-	120
Turmeric	300	0	300	-	300
Ginger	3,000	1,600	4,600	-	4,600
Long yard beans	250	200	450	-	450
Radish	0	800	800	-	800
Capsicum	0	200	200	-	200
Water Melon	0	400	400	-	400
Snake Gourd	0	150	150	-	150
Tomato	-	-	-	90	90
Total area	10,530	13,800	24,330	360	24,690

Source: JICA TCP Team

During Phase-1, irrigation was not available therefore only voluntary farmers and SHG members participated in the training of cultivation of vegetables and grew vegetables in their kitchen gardens.

During Phase-2, trainings to all farmers and demonstration farms started in Rabi season (2012-2013). Total area was 4,800 m². 6 crops were introduced.

During Phase-3, total area in Kharif season (2013) was expanded to 13,590m^2 and 9 crops/varieties were cultivated. In Rabi season (2013-2014), total area was 31,690m^2 and 15 crops/varieties were cultivated.

During Phase-4, total area in Kharif season (2014) reached to 27,810m^2. The reduction in area from Rabi season was because of farmer's avoidance from insect attacks. Total area in Rabi season (2014-2015) was again expanded to 48,920m^2. 18 crops/varieties were cultivated and 16 exotic vegetables were introduced. Kharif season in 2015, total area is 24,690m^2. The reason of decrease from last Rabi season was caused by unseasonal heavy rain in April. Even though some farmers had sown the seed of Potato, Ginger and Okra in March and April, mortality rate was high so they gave up cultivation of vegetables. During this season 19 crops/varieties were cultivated.

(2) Sales of Vegetables

Farmers have mainly sold vegetable produces near their fields, though they have brought them into wholesale market at Hamirpur. Meanwhile farmers have used some produces for home consumption. Further some farmers in the Pilot area have conducted small business that is a direct selling of vegetable s to consumers in Delhi since November 2013. This business has been done in the trial basis. Initially farmers needed all technical supports to the following activities:

(i) how to communicate with consumers in Delhi,

(ii) how to select quality produce and pack them,

(iii) how to decide a selling price, and

(iv) how to ship produces to Delhi

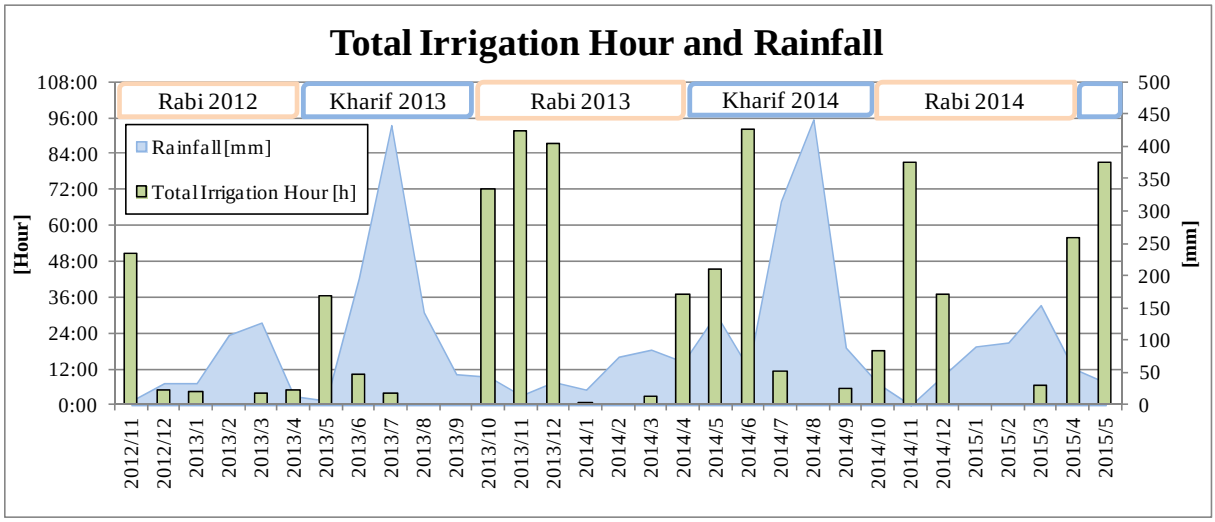
As a result of on-the-job training, farmers have certain capability to sustain activities by themselves, and thus have felt much more confident on direct selling business. Shipping of vegetables to Delhi was in total 34 times with Rs. 150,000 sales 2013 onward.

3.4.2 Water Use and O&M System

(1) Irrigation Status in the Pilot Area Lahalri

In Hamirpur, Rabi season is from end of October to end of April. And Kharif season is from June to mid October. Irrigation use of Kharif season is generally less than Rabi season because Kharif season includes rainy season, which is from mid June to mid September. In November 2012, irrigation water became available in the pilot area Lahalri. The status of irrigation water use in the pilot area is summarized in this section.

The total irrigation hour and rainfall for each month are shown in the following figure.



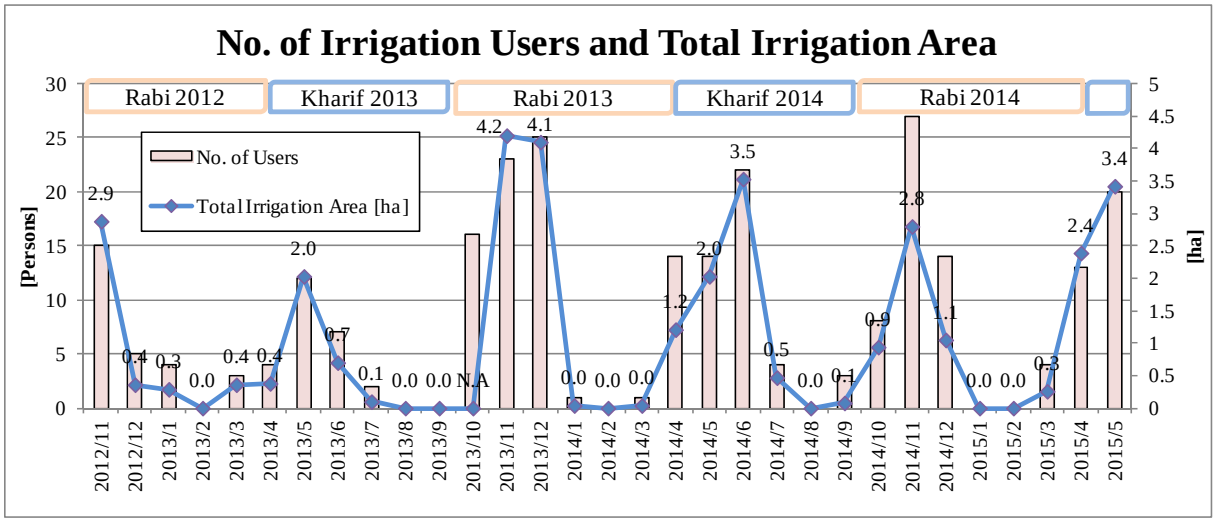
Source: GMKVA record (Irrigation hour) and Tehsil Office (Rainfall)

Figure 3.4.1 Total Irrigation Hour and Rainfall

Summary of the figure is shown in the followings.

- ✓ Total irrigation hour increased more than 2 times from 1st Rabi (2012) to 2nd Rabi (2013) and from 1st Kharif (2013) to 2nd Kharif (2014).
- ✓ However, total irrigation hour has decreased form 2nd Rabi (2013) to 3rd Rabi (2014).

Number of irrigation user and total area of irrigation are shown in the following figure.



Source: GMKVA record

Figure 3.4.2 Number of Irrigation Users and Irrigated Area

Summary of the figure is shown in the followings.

- ✓ No. of Irrigation users and total irrigation area also increased largely from 1st Rabi to 2nd Rabi and from 1st Kharif to 2nd Kharif respectively.
- ✓ However, total irrigation area have decreased from 2nd Rabi to 3rd Rabi although the no. of

irrigation users has reached 27 persons in Nov., 2014.

In conclusion, it was found that irrigation use in Lahalri pilot area increased largely from the 1st year to the 2nd year although it became stagnant in the 3rd year.

Decrease of irrigation use in the 3rd year is from the large decrease of irrigation users for wheat although irrigation users for vegetable have steadily increased as shown in the following table. In Rabi 2014, many farmers have selected late-sown wheat and timely rain has come in Mid December. Therefore, they didn't need to use irrigation water for wheat. And the reason to shift the timing for sowing wheat was no rainfall from 15th of Oct. to 13th of Dec in 2014.

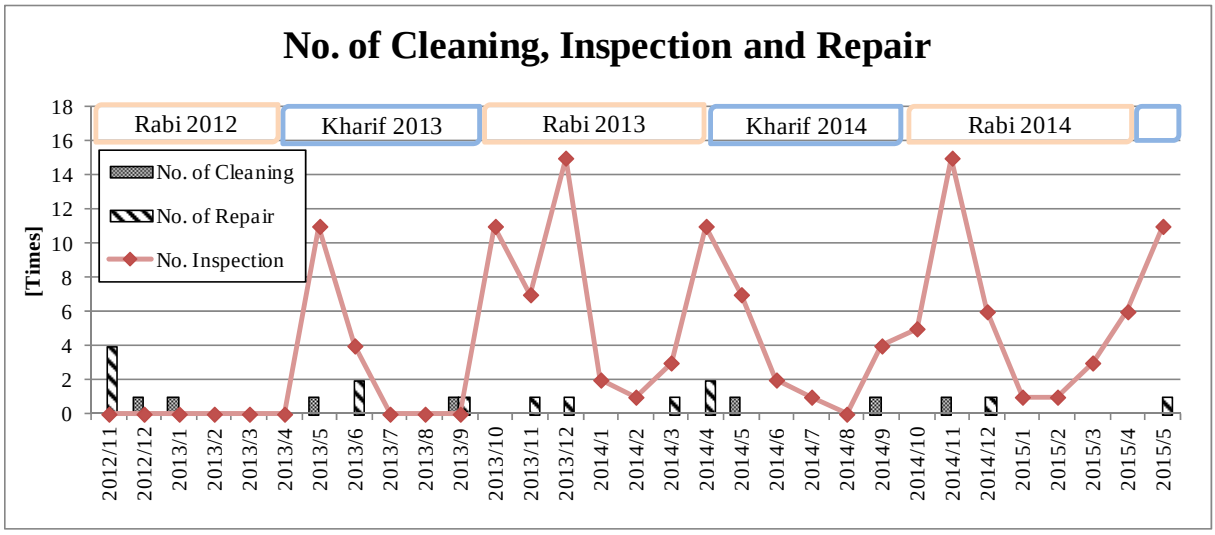
Table 3.4.2 Transition of No. of Irrigation Users in Rabi seasons

	Rabi 2012	Rabi 2013	Rabi 2014
No. of total users in each season for wheat irrigation	14	18	7
No. of total users in each season for vegetable irrigation	11	20	31

Source: GMKVA record

(2) Maintenance Status of Irrigation Facilities in the Pilot area Lahalri

Maintenance activities consist of i) cleaning of irrigation facilities, ii) inspection of irrigation facilities and iii) repair of irrigation facilities. All these activities are important in terms of securing the sustainability of irrigation project. The TCP has guided GMKVA to conduct cleaning works for irrigation facilities twice in a year (before each cropping season) and to conduct additional cleaning depending on the situation. Regarding inspection of the irrigation facilities, on the job training (field support) was provided to the Pump Operator with Hindi record format of daily inspection. When the irrigation facilities were damaged, the cost for repair was paid by the TCP as repair trainings. However, most of works except for the payment have been gradually sifted to GMKVA through the on the job trainings. Numbers of cleaning, inspection and repair are shown in the following figure.



Source: GMKVA record

Figure 3.4.3 Numbers of Cleaning, Inspection and Repair of Irrigation Facilities

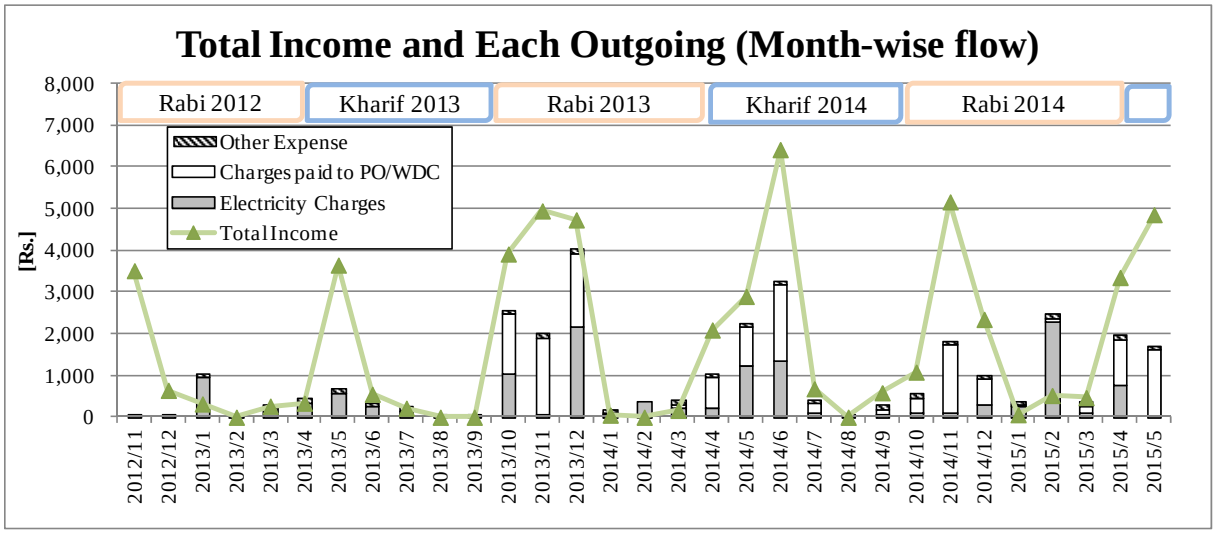
Summary of the figure is shown in the followings.

- ✓ Cleaning of irrigation facilities (water tanks or intake area) have been conducted more than twice in a year.
- ✓ Inspection of pumping facilities has been done by Pump Operator in daily pace.
- ✓ There are 4 times of repair works of pipeline leakage in November 2012. But these repair works were conducted by a contractor (Jain Irrigation) because of the defect liability period.
- ✓ After handing over of the irrigation facilities (April 2013), repair works were conducted 4 times in a year on average.
- ✓ Most of repair works were repair of leakage from the pipeline

(3) Financial Status of Water Users' Association (WUA) in the Pilot area Lahalri

The financial status of WUA after starting of irrigation is summarized in this section. The major expenditure of WUA is electricity cost for irrigation facilities. Moreover, Management Committee (MC) of WUA decided to pay small fees to Pump Operator (PO) and Water Distribution Coordinator (WDC) at Rs. 10 per irrigation hour from October 2013 though PO and WDC had worked voluntarily ever before. On the other hand, the main income of WUA is water tariff which the farmers pay when they use irrigation water. WUA had decided that the amount of water tariff was Rs. 60 per hour based on the proposal by the TCP. After that, WUA revised the tariff by themselves from Rs. 60 to Rs. 72 (January 2013), to Rs. 54 (July 2013) and again to Rs. 60 (May 2014).

Monthly outgoings and incomings are shown in the following figure.



Source: GMKVA record

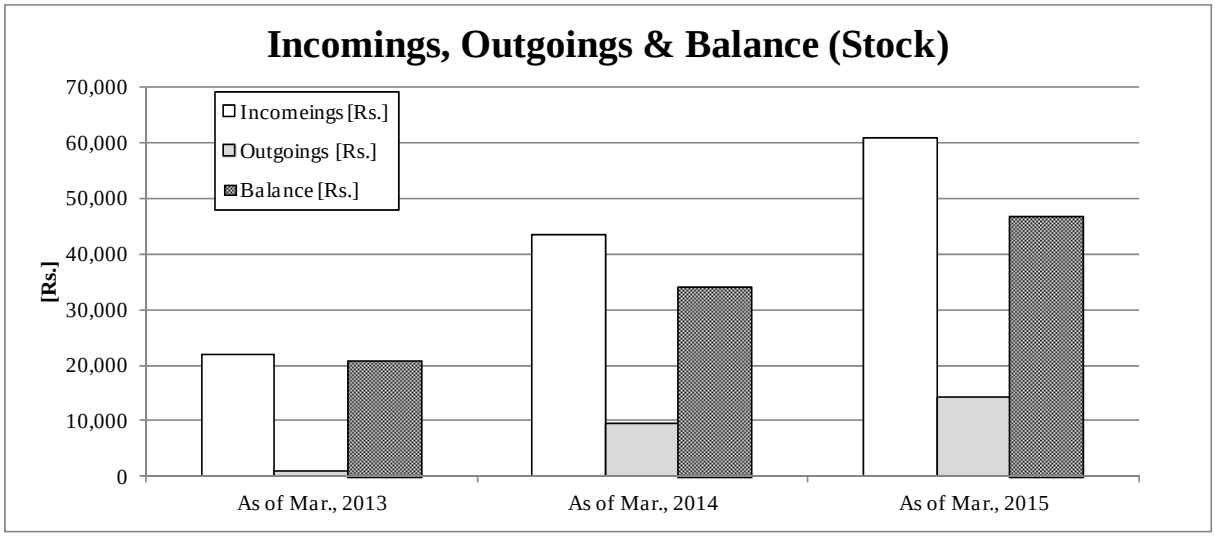
Note: Electricity cost is not considered in the monthly electricity bill until meter check. That is to say, if officer of electricity board does not come to check it, the charge is imposed in the bill after meter check at a time. For example, electricity cost of Nov., 2012 was imposed not in the bill of Nov. but in the bill of Jan. 2013.

Figure 3.4.4 Total Income and Outgoings in Each Month

Summary of the figure is shown in the followings.

- ✓ After October 2013, total outgoings doubled because WUA had introduced fees to Pump Operator and Water Distribution Coordinator.
- ✓ However, monthly income doubles outgoings, and the difference becomes savings.

Stock of the income, outgoings and the balance are shown in the following figure.



Source: GMKVA record

Figure 3.4.5 Total Income, Outgoings and Balance (Stock)

Summary of the figure is shown in the followings.

- ✓ Incomings of WUA have increased about Rs. 20 thousands every year.
- ✓ Increment of outgoings is smaller than that of incomings, and therefore, the balance (= saving of WUA) has increased over the past three years.
- ✓ As we mentioned before, all the cost of repair were paid by the TCP as repair trainings and the total cost of repair was Rs. 20,144 (Refer to "2.5.3 Construction of Irrigation Facilities and Demonstration Plo**t**").
- ✓ If GMKVA paid all the cost of repair, the balance would stay in black although the balance would decrease from Rs. 46,643 to Rs. 26,499 as of March, 2015.

3.4.3 SHG Activities

The following is the progress of the activities by each SHG.

(1) Shiv Shakti SHG

Shiv Shakti SHG chose group farming as their production activity and has been working with the variety of vegetables since the 2nd phase. Although there are several SHGs that state they are conducting group farming, most are operated individually, as it is more complicate to work as a group in cultivation activities. Therefore, farming activity as a group is relatively rare and new concept for the SHG in Himachal. Considering this situation, the TCP supported in management of the activities as a group, such as division of roles, work management and conflict management.

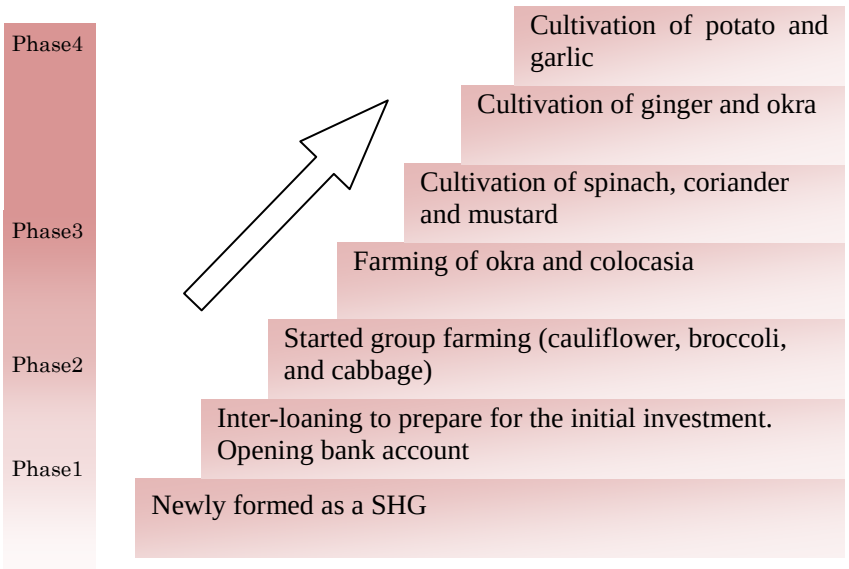
Even though they have faced several difficulties throughout the activities, which include technical difficulty of farming as well as constraints in management, the group has carried on with their group farming activity. After the broccoli, cauliflower and cabbage cultivation in winter season (Rabi season) in 2012, they have decided to cultivate okura and colocasia in summer season (Karif season) of 2013. For the maximum use of their field, they have cultivated leaf vegetables during Karif and the following rabi season. Another reason of changing the variety of the vegetable was that they faced several difficulties in cultivation of broccolis and cauliflowers. In Phase 4, the group cultivated okura judging from the profitability of the product they experienced in the previous year. In addition, they chose ginger, potato and garlic cultivation that has advantage in menace damage. The below table shows the summary of their cultivation activities.

Table 3.4.3 Outline of Farming Practices Conducted by Shiv Shakti SHG

Vegetable	Activity	2012			2013												2014												2015				
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Cauliflower & cabbage	Seedling making																																
	Cultivation																																
	Harvesting & marketing																																
Broccoli	Seedling making																																
	Cultivation																																
	Harvesting & marketing																																
Colocasia	Cultivation																																
	Harvesting & marketing																																
Okura	Cultivation																																
	Harvesting & marketing																																
Leaf vegetables	Cultivation																																
	Harvesting & marketing																																
Ginger	Cultivation																																
	Harvesting & marketing																																
Potato	Cultivation																																
	Harvesting & marketing																																
Garlic	Cultivation																																
	Harvesting & marketing																																

Source: JICA TCP Team

The following figure illustrates the development of group farming activities of Shiv shakti SHG since starting of the project.



1,250m^2	Rs.7,203
950m^2	Rs. 1,255
320m^2	Rs.5,510
700m^2	Rs.6,079
800m^2	Rs.664
-	-
-	-
Cultivation Area (m^2)	Profit

Source: JICA TCP Team

Figure 3.4.6 Development of Shiv Shakti SHG (as of May 25, 2015)

The TCP supported not only farming techniques but also strengthening group management throughout their activities. From the second cultivation season, reviewing the lessons learnt from the activities conducted in the previous season, the SHG members discussed to choose suitable vegetables for their cultivation in consideration of their land, water availability, climate, influence of wild animals and insects, and market potentials with support and consultation of the project experts. The TCP facilitated their planning, preparation of the activities, monitoring process and marketing. The SHG members divided themselves as per work required in the field and recorded their attendance and contribution in the work to divide their profit according to their contribution to the work.

Their produces have been mostly sold locally in village, and some were sold in Hamirpur APMC(Agriculture Produce Marketing Committee, Dosarka) market. Local sales were done mainly through advance order from villagers while they are cultivating. Sales to the wholesale market are done mainly through their husband or male neighbors in Laharli. This arrangement was made largely because the quantity of their harvest has not been large enough to market at a bulk in the market after selling for advance orders, as well as the social environment that women are not expected to go to the wholesale market to sell their produce. In order to enhance their marketing capacity, the TCP encouraged the SHG members to study on the market price to sell with adequate price. The TCP facilitated and supported them in putting up exhibits at the local fair (Hamir Utsav)[4] in Hamirpur to provide them relevant exposure on the marketing aspects of vegetables. Having tried cultivating several different varieties of vegetables, the project supported management of cultivation as profit making. Cost-profit calculation was taught and prepared before planning the coming season cultivation activities. Simple business plan was introduced to plan for their activities.

Since Rabi season of year 2014, the group members decided to cultivate in subgroups due to distance

4 : held on October 27 to 29, 2013

to cultivation field of the group and divergence of interest on the cultivation, as well as to make management easier. The following summarize the cultivation activities of Shiv Shakti SHG during project period.

Table 3.4.4 Summary of Production by Shiv Shakti SHG

Rabi 2012			
Variety of vegetables	Cauliflower	Broccoli	Cabbage
Date of sowing	22-12-2012	20-12-2012	22-12-2012
Cultivated area (m^2)	400	160	240
Production (kg)	134	15	190
Production cost (Rs.)	2,054	316	648
Gross income (Rs.)	1342	440	1900
Net profit (Rs.)	-712	124	1252
Karif 2013			
Variety of vegetables	Okra		Colocasia
Date of sowing	17-6-2013		20-05-2013
Cultivated area (m^2)	300		400
Production (kg)	253		136
Production cost (Rs.)	1495		2436.5
Gross income (Rs.)	5915		4095
Net profit (Rs.)	4420		1658.5
Between Rabi 2013-2-14			
Variety of vegetables	Spinach	Coriander	Mustard
Date of sowing	16-10-2013	23-10-2013	23-10-2-13
Cultivated area (m^2)	150	150	20
Production (kg)	174	132	97
Production cost (Rs.)	244	319	41.5
Gross income (Rs.)	1,740	3,405	970
Net profit (Rs.)	1,496	3,086	928.5
Kharif 2014			
Variety of vegetables	Ginger		Okra
Date of sowing	22-05-2014		12-04-2014
Cultivated area (m^2)	600		350
Production (kg)	96		192
Production cost (Rs.)	7,398.5		1,346
Gross income (Rs.)	5,700		4,300
Net profit (Rs.)	-1698.5		2,954
Rabi 2014- 15			
Variety of vegetables	Potato		Garlic
Date of sowing	14-10-2014		20-10-2014
Cultivated area (m^2)	1,000		250
Production (kg)	244		156
Production cost (Rs.)	4,742		2,975
Gross income (Rs.)	2,440		12,480
Net profit (Rs.)	-2,302		9,505
Kharif 2015			
Variety of vegetables	Okra		
Date of sowing	25-03-2015		
Cultivated area (m^2)	1,150		
Production (kg)	On going		
Production cost (Rs.)			
Gross income (Rs.)			
Net profit (Rs.)			

**The activities for Kharif 2015 is on-going and the mentioned figures are as on 25th May, 2015*
Source: JICA TCP Team

(2) Naman SHG

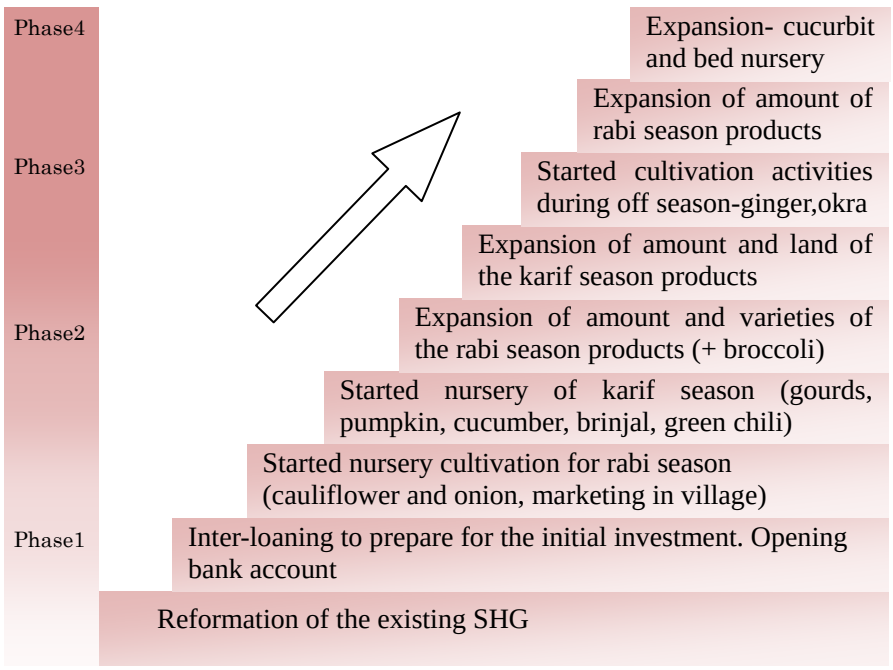
The group mostly consists of members who come from non-CCA area of the irrigation scheme and 5 of the members belong to OBC families. The TCP, to ensure inclusion of these members, supported and provided technical guidance in regard to their choice of activities. Considering less landholdings by the members and that their lands are not covered by the irrigation scheme, nursery cultivation activity has been taken as their best option that requires less land and water. As this activity was new to the group at the beginning, the group members decided to cultivate nursery on a small scale to learn and thereafter to develop for commercial selling. In the year 2013, the group started cultivating nursery of cauliflowers and onion to transplant them in their kitchen gardens, with remaining distributed to neighbors. In the following season, the group grew cucurbits seedlings for the commercial marketing purpose targeting the upcoming Kharif season. Through their activity in Phase-2, they have recognized that seedling preparation is suitable and profitable for their group. During Phase-3 period, they have expanded their area and scale of nursery cultivation. Learning from the previous experience of market demands, they decided the variety and amount of seedling they are going to prepare. In Phase 4, recognizing profit from seedling raising, the group started preparing business plan, with help of the project, calculating cost-profit and sparing their profit for the expense of the following activity to encourage sustaining their activity. In addition to the seedling raising, Naman SHG opted to start group farming of ginger in 2014 in a field rented for the group. Through facilitation of the project, the group has been developing and expanding their activities. The following table shows the outline of their production activities.

Table 3.4.5 Outline of Seedling Preparation Practices Conducted by Naman SHG

Items	Activity	2012			2013												2014												2015				
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Cauliflower & broccoli	Seedling making																																
	Harvesting & marketing																																
Onion	Seedling making																																
	Harvesting & marketing																																
Cucurbits	Seedling making																																
(Cucumber, pumpkin, bitter gourd, bottole gourd)	Harvesting & marketing																																
Brinjal	Seedling making																																
	Harvesting & marketing																																
Chili	Seedling making																																
	Harvesting & marketing																																
Tomato	Seedling making																																
	Harvesting & marketing																																
Okura	Cultivation																																
	Harvesting & marketing																																
Ginger	Cultivation																																
	Harvesting & marketing																																

Source: JICA TCP Team

The following figure illustrates the development of Naman SHG with their seedling raising and farming activities since starting of the project.



1300 pots & 2 beds	Rs. 6,677
13 beds	Rs. 7,341
500m^2	Rs.4,443
5 beds	Rs.4,570
5 beds	Rs.3,085
3 beds	Rs.4,587
3 beds	Rs.560
-	-
-	-
No. of beds (incld.pots) /cultivation area	Profit

Source: JICA TCP Team

Figure 3.4.7 Development of Naman SHG (as of May 25, 2015)

Once they decided to expand their production, issue of marketing raised. In relation with the supply of the seedling in market, SHG members sometimes faced difficulty in marketing their products. With support of the community motivator's facilitation, they have tried several possibility of marketing that includes participating in local fairs, visiting periodical market places of nearby villages, and selling to retail shops of seeds and seedlings, in addition to local advance order. Exposure to the market through participating, exhibiting and marketing their produces in local fair like Hamir Utsav helped the SHG in developing their insight for framing better marketing strategies (packaging, labeling, etc.) aimed at product improvement, better work management and increasing overall revenue of the group.

The following is the summary of the nursery cultivation activity:

Table 3.4.6 Summary of Production by Naman SHG

Rabi 2012					
Variety of Nursery	Cauliflower			Onion	
Cultivated area (m^2)	3			6	
Production (kg)	700(no)			2 (kg)	
Production cost (Rs.)	170			90	
Gross income (Rs.)	Kitchen Garden Cultivation			Kitchen garden Cultivation	
Net profit (Rs.)					
Kharif 2013					
Variety of Nursery	Gourd	Pumpkin	Cucumber	Brinjal	Green chilly
Cultivated area (m^2)/ no. of pots	700	100	620	$1\,^1/_2$	$1\,^1/_2$
Production (nos)	522	80	400	445	255
Production cost (Rs.)	1107	72	685	83	66
Gross income (Rs.)	3,245	435	2,220	445	255
Net profit (Rs.)	2,138	363	1,535	362	189
Kharif 2013 (1. early variety)					
Variety of Nursery	Cauliflower (Plug tray)			Cauliflower (Nursery bed)	
Cultivated area (m^2)/ no. of pots	9			2	
Production (nos)	797			1005 approx.	
Production cost (Rs.)	423			346	
Gross income (Rs.)	797			1005	
Net profit (Rs.)	374			659	
Rabi 2013 (2. late variety)					
Variety of Nursery	Cauliflower	Broccoli		Onion	Flowers
Cultivated area (m^2)	6	3		30	3
Production (nos)/(kg)	1800	950		31(kg) (4kg for kitchen garden cultivation)	485
Production cost (Rs.)	825	412.5		1,342.5	312
Gross income (Rs.)	1,440	760		2430	885
Net profit (Rs.)	615	347.5		1,087.5	573
Kharif 2014						
Variety of Nursery	Gourd	Cucumber	Pumpkin	Brinjal	Green Chilli	Tomato
Cultivated area (m^2)/ no. of pots	950	300	50	$6m^2$	$3m^2$	$3m^2$
Production (nos)	325	125	20	146 (Bundles*)	55 (Bundles)	89 (Bundles)
Production cost (Rs.)	2,043	368	32	360	425	375
Gross income (Rs.)	3250	1250	200	1460	550	890
Net profit (Rs.)	1207	882	168	1100	125	515
Kharif 2014						
Variety of vegetables	Ginger			Okra		
Date of sowing	27-05-2014			22-06-2014		
Cultivated area (m^2)	400			100		
Production (kg)	164			21		
Production cost (Rs.)	5772.3			150.72		
Gross income (Rs.)	9,840			525		
Net profit (Rs.)	4,067.7			374.28		

Kharif 2014					
Variety of Nursery	Cauliflower	Cabbage	Broccoli	Flower	Onion
Cultivated area (m^2)/ no. of pots	6	3	3	3	24
Production (nos)	2500-2700	1500-1600	1300-1400	400-450	8 beds
Production cost (Rs.)	734.4	367.2	517.2	160.24	2,340
Gross income (Rs.)	2,080	1,200	1,040	900	6,240.1
Net profit (Rs.)	1,346	833	522.8	739.762	3,899.9

Rabi 2014-Kharif 2015					
Variety of Nursery	Gourd	Cucumber	Green Chilli	Brinjal	Tomato
Cultivated area (m^2)/ no. of pots	1,100	300	3	2	1
Production (nos)	935	235	1200 – 1300	600- 650	200 -225
Production cost (Rs.)	1,563	183	275	305	87
Gross income (Rs.)	5,985	1,470	1,000	500	135
Net profit (Rs.)	4,423	1,232	725	195	48

**One bundle contains about 12-14 seedlings*
Source: JICA TCP Team

(3) Bhole Shankar SHG(16 members)

Bhola Shankar group is a non homogenous group comprised of members who are vulnerable with relatively low income in Lahalri and 2 of the members are physically handicapped. Although the group was formed 8 years ago, the group due to internal inconsistency and lack of practical activity had gone defunct. The group was revived through the activities conducted with the TCP. The members have opted for food processing related activities. Although they have selected food processing as their main activity, they have also engaged in farming activities during rain season since 2014, as the most of the processed food are dehydrated products that require good whether condition. The following is the summary of their activity experience.

Table 3.4.7 Outline of Food Processing Practices Conducted by Bhola Shankar SHG

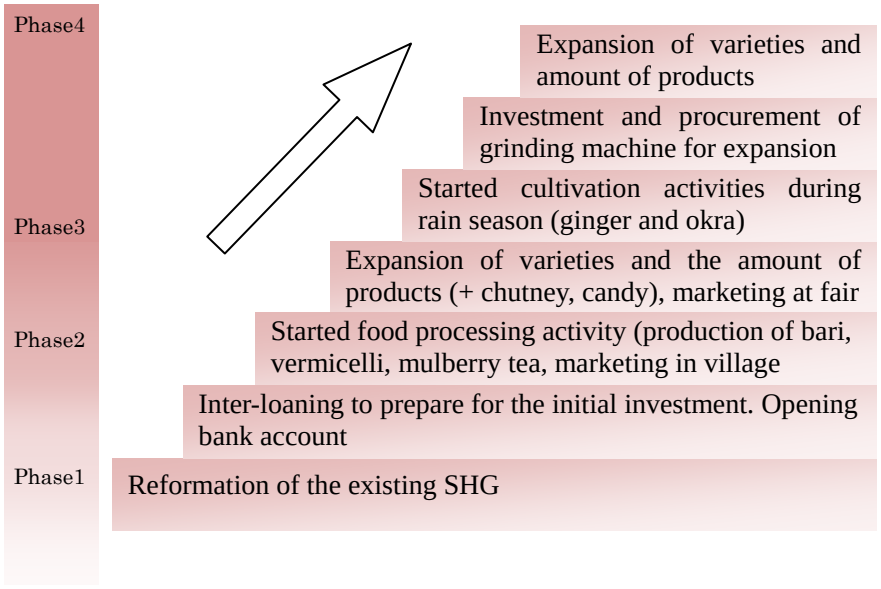
Items	Activity	2012			2013												2014												2015				
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Bari and Velmichelli	Preparation																																
	Marketing																																
Mulberry tea and powder	Preparation																																
	Marketing																																
Chatney and candy	Preparation																																
	Marketing																																
Shira	Preparation																																
	Marketing																																
Ginger	Cultivation																																
	Harvesting & marketing																																
Okura	Cultivation																																
	Harvesting & marketing																																

Source: JICA TCP Team

The TCP have organized trainings in food processing such as chutney making, mulberry leaf processing, and papad and bari making for the group members. At the beginning, the group was selling to neighbors as trial productions. They have gradually expanded their production and started selling at local fairs. TCP facilitated the participation of the group in the Hamir Utsav (urban area) and Bilaspur Fair (rural area) to provide them firsthand marketing experience and in dealing with potential customers. After the experience of participating in such fairs the SHG members learnt needs of processed food products in the area. The group members have divided themselves into sub groups in

preparation of their products to counter the non homogenous nature of the group.

The following describe the development of the activities of Bhola Shankar SHG.



7 types	Rs.14,530
-	-
500m^2	Rs.4,802
6 types	Rs.8,774
3 types	Rs.1,516
-	-
-	-
Variety of products /cultivation area	Profit

Source: JICA TCP Team

Figure 3.4.8 Development of Bhole Shankar SHG (as of May 25, 2015)

The main objective of this activity in relation with crop diversification is to promote food processing with specific focus on value addition using the farm produce and other natural resources available in the area. In Phase 3, they have produced some innovative value added products improving nutritious value by adding vegetables and fruits in dehydrated products, such as papaya bari, vermicelli with carrot, and mulberry bari. Although the project supported with materials during trial and initial marketing period, SHG became self-sustainable procuring the ingredient by themselves with their sales. In order to expand their production, the SHG also invested for machinery, a grinder which costs about Rs. 8,000, by collecting money among the members, with support of the attached motor from the project.

At the beginning, the members have chosen their product with their own interests. By learning from the market demands, they came to produce products with higher needs. Through fairs and local marketing, the members realized which products have higher demands and which is more profitable calculating the cost and profits.

The following is the summary of the food processing activity:

Table 3.4.8 Summary of Production by Bhole Shankar SHG

In Phase-2				
Products	Bari	Vermicelli	Mulberry tea /powder	Total
Production (kg)	19.5	15.5	2.2	
Selling price (per kg)	160	60	250	
Production cost	2,220	626	75	2,921
Gross income	2,965	930	545	4,440
Net profit	741	304	470	1,516

In Phase-3*								
Products	Bari	Vermicelli	Mulberry tea /powder	Porridge	Other Products (soft toys)	Chutney	Candy	Total
Production (kg)	44	16	4.5	2	9	17	6	
Selling price (per kg)	160- 180	60	350 & 800	50		130	200	
Production cost	5,025	500	40	8	-	490	438	6,501
Gross income	7,640	960	2,425	100	540	2,210	1,400	15,275
Net profit	2,615	460	2,385	92	540	1,720	962	8,774

In Phase-4								
Products	Bari	Vermicelli	Mulberry tea	Gujiya	Cera	Chutney	Candy	Total
Production (kg)	28	19	30	220	46	3	7	
Selling price (per kg)	175-200	60	500 & 800 (ongoing)	5 per pack	120	200	200	
Production cost	3,535	738	300	463	1,600	353.5	440	7429
Gross income	5,260	1,140	6,940	1,100	5,520	600	1,400	21,960
Net profit	1,725	402	6,640	637	3,920	246.5	960	14,530.5

Phase 4 (Kharif 2014 vegetable cultivation)		
Variety of vegetables	Ginger	Okra
Date of sowing	24-05-2014	28-05-2014
Cultivated area (m^2)	400	100
Production (kg)	171	19
Production cost (Rs.)	5802.3	180.72
Gross income (Rs.)	10,260	525
Net profit (Rs.)	4,457.7	344.28

** The above mentioned figures are as on May, 2015*

Source: JICA TCP Team

CHAPTER 4 LESSONS LEARNED

4.1 Essential Points regarding Promotion of Crop Diversification

(1) Linkage of Planning and Monitoring

The TCP proposed formulation of Crop Diversification Plan (CDP) to be required for each sub-project of JICA ODA Loan project. Consequently, the ODA Loan Project has planned the CDP for each sub-project. This CDP consists of Agricultural Development Plan (ADP), which shows roadmap for promotion of crop diversification in the sub-project area, while Extension Training Plan (ETP) for implementation of extension and training activities for farmers in order to surely bring crop diversification. Consequently crop production plan for each cropping season is clarified and further extension and training activities for each sub-project are being also planned, resulting in smooth crop production.

Outputs to be obtained from extension and training activities in each sub-project of JICA ODA loan project are directly linked to agricultural production. Therefore, it is indispensible to confirm cultivated area and production as well as situation of operation and maintenance of sub-project, in order to evaluate impact of extension and training activities. Namely this confirmation is defined as monitoring, and one Community Motivator is employed to conduct this monitoring activity in each sub-project. This community motivator is selected out of farmers in each sub-project area as supporting staff of extension officer.

Results obtained from monitoring are utilized as follows:

- In case production in each cropping season is not commensurate with the target, its cause should be clarified, and solved for the following season.
- In case skills as well as information to be disseminated are not sufficiently adopted, its reason should be checked, and any countermeasures be taken.
- If some skills or information is not followed by farmers, the relevant training programs or activities should be cancelled.

It is required that CDP should be reviewed annually. Surrounding environment of agricultural sector is generally changeable, hence farmers' intentions to cultivation is easily influenced. Therefore it is required that current agricultural situation should be carefully reviewed, and its results be reflected in the plan.

(2) Improvement of Communication

In order to implement the project smoothly and effectively, it is indispensible that CEOs' awareness of their activities should be increased, and their information as well as experience on activities be shared,. In case of the JICA ODA Loan project, targeted 210 sub-projects are scattered in 5 Districts, therefore information sharing in and among PMU offices is of high importance. So creation of proper system for

smooth implementation of disclosure as well as sharing of information is required. Components for disclosure and sharing of information are shown as follows:

- Daily work record : Preparation of daily work record by CEOs
- Weekly meeting : Weekly meeting by DPMUs and BPMUs
  : Sharing weekly work progress and schedule for next week
  : Sharing record of meeting
- Sharing work outputs / outcomes :Sharing training materials, reports, etc. among offices

Currently, progress on construction work as well as financial issues are shared in monthly review meeting of the PMU. Further it is required that information and data on extension and training activities be shared among extension staff of the PMU.

(3) Selection of Pilot Area

Lahalri pilot area was selected, considering various aspects which include not only engineering aspects but also location as a pilot area, access to market and interest of villagers for farming. Recently, with the advance of urbanization, situation of Lahalri area has changed abruptly, as a number of full-time farmers has reduced and further young generation is been moving away from agriculture these days. Considering such situation, it is proposed that “need for farming” should be given higher priority in terms of site selection.

It is understood that this height of “need for farming” should meet certain condition on interest of farmers to participate actively in the project. However it is not realistic to directly measure their interest on farming. So it is proposed to confirm certain degree of their eligibility for selection of sub-project areas by checking the following items before construction stage.

- Ratio of full-time farmers and part-time farmers
- Establishment of water users’ association
- Contribution of membership fee
- Consent on work activities as well as role of group members in terms of operation and maintenance of irrigation facilities, group work, collection of water tariff, etc.

4.2 Water Management and O&M of Irrigation Facilities

In DoA, there is no technical support to Water Users’ Association (WUA=KVA) to be conducted by extension officers after construction of irrigation facilities. As a result, it is revealed that operation & maintenance of irrigation facilities is not properly conducted by WUA/KVA in some cases.

The TCP tried to develop common understanding of importance on O&M by WUA through trainings of CEOs. As a result, importance of operation and maintenance system has been strongly recognized in the ODA Loan Project. The ODA Loan Project will be completed in March 2018, and all responsibilities would be transferred to DoA, H.P. Considering this situation, it is really proposed that

system for sustainable support to operation and maintenance of irrigation facilities by water users group be set up in DoA, H.P.

4.3 Vegetable Farming and Post-harvest

(1) Significance of Hands-on Training

It is understood that not only knowledge and information but presence and extent of experience on farming practice become the difference between success and failure of extension activities. JICA TCP conducted not only theoretical training but also hands-on training for core extension officers, and earned certain recognition from CEOs. It is proposed that extension system including hands-on training should be more adopted in the future training programs of DoA.

(2) Providing Extension Service according to Characteristics of the said Sub-project

Extension officers should clarify skills required for famers need through discussion with farmers, not from officers themselves. Namely it is necessary to reflect the voice on the ground to extension services. It is necessary to disseminate certain skills to be required for farmers, after catching farmers' needs, features of target areas with major concerns, etc. Accordingly, extension service should not be uniformed in JICA ODA Loan project, but the separate service should be provided, according to the specific characteristics of sub-projects.

(3) Suitable Crops in Suitable Cropping Season

The basics of cultivation are to grow suitable crops during the period of the suitable cropping season. As a result, it is expected that improvement of quality as well as yield will be realized. To perform this practice, it is important to prepare implementation schedule in terms of purchase and application of farm inputs (fertilizers, agro-chemicals, etc.), farming practices, irrigation, harvesting, etc., and to record daily farming practices. It is important to implement extension activities, using the implementation schedule.

(4) Improvement of Yield as the Fastest Way to improve Quality.

Vegetable cultivation in the Pilot area is still developing. In other words, it is expected that yield will be furthermore improved. Causes of low yield are various, such as (i) cultivation is not conducted in proper timing, (ii) quality seeds or seedlings are not adopted, (iii)application of fertilizer is not sufficient, (iv) plant protection measures are not sufficient, etc. The multiple influences of these causes have greatly affected the yields. Further effort on improvement of low yield is expected to involve reliable upgrading of quality of produces.

4.4 Gender / Social Inclusion / Institutional Development

(1) Gender and social inclusion in crop diversification project

Beliefs on gender bias have been developed not only in men but also in women. Especially elderly women have strong commitment on traditional gender roles and restrict activities of younger women from behaving out of tradition. Merely gender sensitization through workshop cannot change behavior and deeply rooted community perspectives. Through the SHG activities it was experienced that development of activities of women can improve recognition and acceptance of social activities of women. When activities of women are recognized by the society, men also take them positively and show interest on them. (e.g. being introduced in the news paper articles in the case of Lahalri). On the other hand, there is a risk that men try to intervene when they see profits from the activities. It was observed that husbands of some SHG core members propose to take up the SHG activity as family business. Since the SHG activities and income through the activities are income that women can use with their own decision, it is important to keep the activity for income of women.

Though it has been recognized by the society that women play important role in agriculture, even then it has not led to the gender equality. Recognition of importance of women in agriculture work can sometimes increase burden on women. This point has not been well understood and recognition of the work of women is sometimes intentionally misused. As project interventions, it shall be recommended to create opportunities of equal participation of men and women in trainings and meetings. Recognizing that some women may be left behind in the mixed group opportunities, follow-up and additional support shall be provided for women. Side support such as encouragement and empowerment of women through SHG activities can gradually make women participate in the decision making in the mixed group.

Special arrangements in farming groups, such as minimum number of women in the core committees, specific support to women groups, allocation of female extension officers, reduce gender gap, or positive discrimination to encourage women or the disadvantaged are effective triggers of reducing gender discrimination. However, whether those arrangements can bring change or not, highly depends on facilitation of the extension officers. For example, even if the minimum number of women in the positions is defined, women may not be able to participate in the discussion with men unless the facilitators pay attention and facilitate women to participate.

An ideal intervention of gender and social consideration in crop diversification practices may not make short-term impact clear but extension officers in charge with sensitive attitudes on this issue should take necessary approach in their daily duty. Notably, repeated sensitization shall be necessary for those who have not been familiar with this issue. However, in the cases where extension officers cannot afford to spare time for further deliberation and the issues are taken as additional concerns, least attention shall be paid on gender and social inclusion. It is suggested to mainstream gender and social consideration with specified related duties and targets, so that extension officers can follow

within their duty and capacity. Physical arrangement such as support on women groups defined as a scheme can increase opportunities for women to participate, to acquire skills, to share information among women, and to access and approach external support and schemes.

Regarding social inclusion in consideration of status of lower caste, it cannot be generalized that people belonging to the lower caste are disadvantaged. Due to preferential treatment policy for the SC/ST people, some ST/SC households have much higher income than average general caste households do. In Lahalri, OBC families are relatively disadvantaged. Meanwhile, prejudice still prevails inside people. Women from OBC families are not in the SHG consisting of relatively well-off families in Lahalri. Situation should not be judged merely based on economic and physical status but be assessed through observation of social structure, especially where there is a minority of disadvantaged people.

(2) Significance of SHG Activities Support in Crop Diversification

SHG activities can play different roles in crop diversification project from different point of view. It is not merely income generation activities or promotion of small enterprise but has several other significances. Some advantages are due to a nature of small common interest group, and others emphasize gender point of view when SHGs focus on women. Based on the experiences and observation in the project, roles and contributions of SHG in crop diversification project can be summarized as follows.

- Collective works can function better in a small common interest group rather than village level organization. SHG activities, taken as activities of common interest groups, are easier to be managed with neighbourhood relationship or friendships. Especially in agriculture activities that are based on individual properties are difficult to be managed in a larger coverage.

- Women (or applicable to some men in some place) who do not have much access to information and knowledge, SHG is a good platform to share information, learning together as training opportunities can be provided to recognized groups. Even though there is not much advantage to work together in a common field, learning opportunities from each other together with support from projects or extension officers that cannot reach each member count for improvement of cultivation and other related activities. Group can work as entry point for available support and schemes. Many schemes target the groups rather than individuals. A SHG can function as a recipient of support or participating body for the schemes. It is more beneficial for those who do not have access to schemes and support as individuals.

- From gender point of view, capacity of women can be developed through group working. Capacity development of women is significant in any other activities including crop diversification. Promotion of SHG activities have high potential of enhancing capacity of women members.

4.5 Design and Construction

(1) Standard Concept for Designing and Construction Management

Before the commencement of design and construction work in the pilot area, the TCP decided "standard concept for design and construction management". The concept defined technical issues to be decided which are not mentioned in the specifications. The examples of the concepts are shown below:

<Design>

- Reinforcement depending on canal size,
- Thickness of the structure for covering of the reinforcement bar,
- Minimum quantities of the reinforcement bar
- Thickness of the pipe
- Slope of the excavation
- Design for the maintenance

Inspection

Recording by photographs

<Construction Management >

- Curing Period
- How to use of the vibrator
- Concrete strength inspection
- Recording and timing of the progress inspection

In case of the TCP, the concepts decided before starting the work were disseminated to all stakeholders. Design and construction management based on the concepts ensured uniformed qualities of the irrigation structures. In case of the ODA Loan Project, it is not easy to generalize concepts due to a number of irrigation schemes. In a point of view for ensuring qualities of structure, works based on standard concepts for design and construction are important.

(2) Process Control in Construction

The construction period and the quality of the irrigation facilities in the pilot area were assured by process control. Process control is the method for assuring the construction period and the quality by sufficient confirmation at each step. The trainings about construction management for PMU were carried out based on consideration of process control.

Progress meeting

The construction management of the ODA Loan Project is also expected to be carried out by the concept of process control in order to achieve better quality and completion within the construction period. For the success of the process control, photographs record, minutes of construction meeting and management of the documents are very important.

4.6 Marketing

(1) Understanding of Needs of Marketing Stakeholders

Through the exchange of information with the stakeholders under the TCP activities, it was recognized the needs of stakeholders of marketing such as consumers, traders, retailers etc. are wide and various. For example, each consumer has different needs even for the same vegetable in size, maturity, part etc. It is important to understand their need and to produce the vegetables as per requirement. The farmers of the pilot area opened a small stall for vegetable sales on the road side. The stall had good sales because the farmers sold fresh vegetable just from the farm. At the same time, they were also able to get the information of local consumers' demand directly through sales activities in the stall and to produce the vegetables as per need of buyers.

The vegetables of H.P. are recognized as off season vegetable in consuming area such as Delhi, Punjab etc. and especially in summer season. It is also understood that the vegetables produced in H.P. are safe with less chemicals. It is necessary to take advantages of vegetables of H.P. for further promotion of marketing.

(2) Collaborative Activities without Group

It was understood through the pilot activities that permanent group activities for marketing are not practicable because of conflicts of interest especially for distribution of profits. However, the farmers were able to work together temporarily for procuring of agricultural input, hiring transportation for vegetables etc. It shall be effective and practicable to work together for marketing – if not as permanent group- for reducing workload and cost when they share their interest.

(3) Gradual Approach for Marketing Support

The farmers in the pilot area had various interests to vegetable cultivation and marketing. The TCP applied gradual approach for marketing support, such as 1) providing basic and essential knowledge for all farmers, 2) providing advanced knowledge for experienced farmers and 3) practicable marketing support for advanced farmers. Marketing activities are directly linked to commercial activities, thus it is effective and important, not providing uniform support, to provide gradual and prioritized support based on farmers' interest, knowledge and techniques.

(4) Better Linkage between Government and Private Sectors

The main stakeholders of agricultural marketing as a commercial activity are basically private sectors including individuals and companies. Also in Japan, the government sector have been providing *support* for private sector in agricultural marketing such as development of institution, marketing infrastructure development, providing information, branding, subsidy etc. The private sector continues to play an important role in marketing activities in H.P. thus the government sector should consider how to effectively support private sector. In order to tackle this issue, it should also be considered how to make better linkage between government and private sectors.

CHAPTER 5 RECOMMENDATIONS

5.1 Promotion of Crop Diversification in H.P.

As described in the previous chapters, the TCP has contributed to establishing the mechanism for crop diversification in H.P. by strengthening of DoA/PMU, developing human resources, preparing systemized guidelines, etc. For further promotion of crop diversification, especially after completion of the ODA Loan Project, the following issues shall be considered carefully.

(1) Establishment of Extension System after Completion of the ODA Loan Project

Construction works of the ODA Loan Project are supposed to be completed in March 2017, and after a certain period of time, extension activities by PMU will be handed over to extension officers of DoA. DoA is planning to employ more than 150 new persons as extension officers to post them in the project area. After completion of the TCP, it is necessary to establish a system to develop the capacity of these new extension officers by DoA and also the trained extension officers by the TCP, for implementation and continuation of proper extension activities in the project area.

(2) Strengthening Water Management and O&M

It is important for irrigation facilities to be maintained adequately by water users for longer life with proper functions. Since number of irrigation facilities of the ODA Loan Project will be completed after the completion of the TCP, many issues for water management may rise up. In addition to the experiences of the TCP, it is important to accumulate the experiences and problems of water management from the ODA Loan Project and to consider and develop better operation and maintenance system. It is expected that the DoA/PMU continues to support farmers on water management and O&M of the infrastructure created.

(3) Strengthening of Marketing and Branding Activities

By the efforts of DoA and the ODA Loan Project, the production of vegetable in H.P. is increasing. In order to achieve the ultimate goal of increasing farmers' income by crop diversification, marketing aspect of vegetables is also essential such as branding, differentiating, strengthening of connection with market sector and so on. It is recommended to consider promotional activities of marketing of vegetables by DoA linked with private sector and also to establish support system of marketing to farmers/private sector.

(4) Utilization of the Guidelines

The guidelines for crop diversification was developed by the TCP and shared with PMU/DoA. The guidelines shall be utilized by DoA/PMU and updated based on further experiences through activities for crop diversification. The TCP expects that DoA/PMU will continuously develop better guideline by themselves in the future.

5.2 Second Stage of JICA Technical Cooperation Project

For further promotion of crop diversification in the State, 1) Establishment of extension system after the ODA Loan Project, 2) Strengthening of water management system and 3) Marketing activities shall be essential. To tackle these issues, the state government and DoA officially requested the government of Japan to implement second stage of JICA Technical Cooperation Project. To ensure sustainability of crop diversification activities after completion of the ODA Loan Project, implementation of second stage of JICA TCP is reasonable, relevant and highly needed. Second stage of JICA TCP could contribute to increase farmers' income by crop diversification. Therefore, it is strongly expected that the government of Japan and JICA will select and commence second stage of Technical Cooperation Project as early as possible. The following figure shows the draft implementation structures of second stage of JICA TCP:

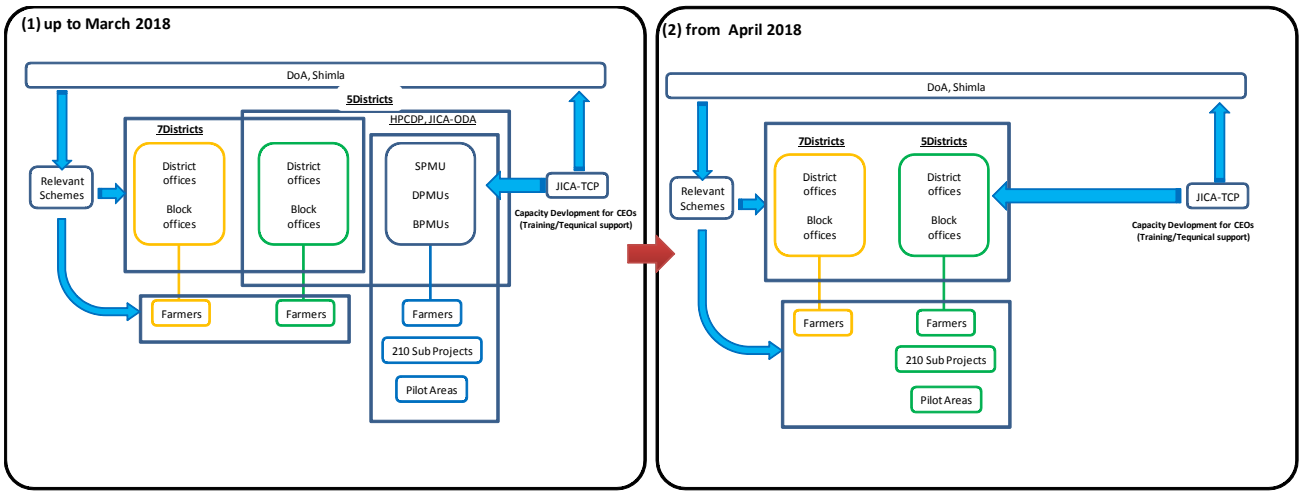


Figure 5.2.1 Draft Project Implementation Structure in Second Stage of JICA TCP

5.3 Expansion of the Experiences of H.P. to Other Areas/Projects

(1) Advantage of Coordination between ODA Loan Project and TCP

The TCP has been implemented in close coordination with PMU of the ODA Loan Project. One of the reasons of successful implementation of the TCP might be that such project implementation structure functioned well. The number of this type of project with JICA fund is still less even including the other countries. It is expected that JICA positively formulate this type of project for better quality and outcome of projects.

(2) Expansion of the Experiences to other similar areas in India

The experiences of the State of H.P. through implementation of the ODA Loan Project must be beneficial for other similar areas in India when they implement JICA or other project in these areas. It is expected that mutual exchange of information and even human resources between H.P. state and other similar area will increase for better project implementation.

Attachment-1
Record of Discussion

RECORD OF DISCUSSIONS BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY AND
AUTHORITIES CONCERNED OF THE GOVERNMENT OF INDIA
ON JAPANESE TECHNICAL COOPERATION
PROJECT FOR CROP DIVERSIFICATION IN HIMACHAL PRADESH

Japan International Cooperation Agency (hereinafter referred to as "JICA"), through its Chief Representative of India Office, and the authorities concerned of the Government of India (hereinafter referred to as "GoI") through the State Government of Himachal Pradesh (hereinafter referred to as "GoHP") had series of discussions with respect to desirable measures to be taken by JICA and GoI through GoHP for successful implementation of the above mentioned Project.

As a result of the discussions, JICA and Indian authorities concerned agreed on the matters referred to in the document attached hereto.

New Delhi, India, 1st October, 2010

Mr. Shinichi Yamanaka
Chief Representative
JICA India Office
Japan International Cooperation Agency

Mr. Ram Subhag Singh
Secretary (Agriculture)
Government of Himachal Pradesh

Witness:

Mr. Surendra Kumar Bagde
Director (Japan)
Department of Economic Affairs
Ministry of Finance,
Government of India

Mr. E.K.Majhi
Joint Secretary (Natural Resource Management)
Department of Agriculture and Cooperation,
Ministry of Agriculture
Government of India

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN JICA AND GOI

1. GoI through the GoHP will implement the Technical Cooperation Project for "Crop Diversification in Himachal Pradesh" (hereinafter referred to as "the Project") in cooperation with JICA.

2. The Project will be implemented in accordance with the Master Plan which is given in Annex I.

II. MEASURES TO BE TAKEN BY JICA

In accordance with the laws and regulations in force in Japan, JICA will take, at its own expense, the following measures according to the normal procedures under the Colombo Plan Technical Cooperation Scheme.

1. DISPATCH OF JAPANESE EXPERTS
   JICA will provide the services of the Japanese experts as listed in Annex II.

2. PROVISION OF MACHINERY AND EQUIPMENT
   JICA will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in Annex III. The Equipment will become the property of GoI upon being delivered C.I.F. (cost, insurance and freight) to the Indian authorities concerned at the ports and/or airports of disembarkation.

3. TRAINING OF INDIAN PERSONNEL IN JAPAN
   JICA will receive the Indian personnel connected with the Project for technical training in Japan, if necessary.

III. MEASURES TO BE TAKEN BY THE GOI

1. GoI through GoHP will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through full and active involvement in the Project by all related authorities, beneficiary groups and institutions.

2. GoI will ensure that the technologies and knowledge acquired by the Indian nationals as a result of Japanese technical cooperation will contribute to the economic and social development of India.

3. GoI through the Department of Economic Affairs (hereinafter referred to as "DEA") will grant in India privileges, exemptions and benefits to the Japanese experts referred to in II-1 above and their families, which are no less favorable than those accorded to experts of third countries working in India under the Colombo Plan Technical Cooperation Scheme.

4. GoI through GoHP will ensure that the Equipment referred to in II-2 above will be utilized effectively for the implementation of the Project in consultation with the Japanese experts referred to in Annex II.

5. GoI will take necessary measures through GoHP to ensure that the knowledge and experience acquired by the Indian personnel from technical training in Japan will be utilized effectively in the implementation of the Project.

6. In accordance with the laws and regulations in force in India, the GoI through GoHP will take necessary measures to provide at its own expense:

   (1) Services of the Indian counterpart personnel and administrative personnel as listed in Annex IV;

   (2) Land, buildings and facilities as listed in Annex V;

(3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided by JICA under II-2 above;

7. In accordance with the laws and regulations in force in India, GoI through GoHP will take necessary measures to meet:

(1) Expenses necessary for transportation within India of the Equipment referred to in II-2 above as well as for the installation, operation and maintenance thereof;

(2) GoI through DEA will take necessary measures for customs duties, internal taxes and any other charges, imposed in India on the Equipment referred to in II-2 above; and

(3) Running expenses necessary for the implementation of the Project.

IV. ADMINISTRATION OF THE PROJECT

1. Director, Department of Agriculture (hereinafter referred to as "DoA"), the Government of Himachal Pradesh, as the Project Director, will bear overall responsibility for the administration and implementation of the Project.

2. Additional/Joint Director, DoA, the Government of Himachal Pradesh, as the Project Manager, will be responsible for the managerial and technical matters of the Project and could be a Project Director of a Yen Loan Project named as Himachal Pradesh Crop Diversification Promotion Project under appraisal process by the Government of Japan.

3. The Japanese Chief Advisor will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.

4. The Japanese experts will provide necessary technical guidance and advice to the Indian counterpart personnel on technical matters pertaining to the implementation of the Project.

5. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee (hereinafter referred to as "JCC") will be established whose functions and composition are described in Annex VI.

V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by JICA and the Indian authorities concerned, at the middle and during the last six months of the cooperation term in order to examine the level of achievement.

VI. CLAIMS AGAINST JAPANESE EXPERTS

GoI through GoHP undertakes to bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in India except for those arising from the willful misconduct or gross negligence of the Japanese experts.[1].

VII. MUTUAL CONSULTATION

There will be mutual consultation between JICA and GoI through GoHP on any major issues arising from, or in connection with this Attached Document.

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[1] For this, JICA experts shall have to provide prior intimation to the MOA, DEA, and the Project Director about their arrivals, movement out of Himachal Pradesh and out of the Country,

VIII. MEASURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

For the purpose of promoting support for the Project among the people of India, GoI through GoHP will take appropriate measures to make the Project widely known to the people of India.

IX. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be 5 years from the arrival date of first JICA Expert in Himachal Pradesh.

LIST OF ANNEXTURES

ANNEX I

MASTER PLAN

1. Project Title: Technical Cooperation Project for "Crop Diversification in Himachal Pradesh"

2. Frame Work of the Project

(1) Objective

Overall Goal: Crop diversification is promoted in the target area.

Project Purpose: The promotion mechanism for crop diversification is established in DOA of Himachal Pradesh.

(2) Outputs

1) DoA's capacity to plan and implement crop diversification is strengthened.
2) Training system to promote crop diversification is developed.
3) Core extension officers for crop diversification are trained.
4) Crop diversification model is established through activities in the Pilot area and Sub-Pilot Area.

(3) Activities

1-1. Conduct baseline survey

1-2. Review existing plan on crop diversification and study, how the pilot project should be.

1-3. Conduct Plan-Do-Check-Action training on crop diversification

1-4. Formulate annual plan on crop diversification

1-5. Develop Crop Diversification Guideline based on the lesson learned from Crop Diversification model practiced in the Pilot Area and Sub-Pilot Area

2-1. Formulate annual plan on extension training

2-2. Review the existing training curriculum and materials on the extension

2-3. Develop training curriculum and materials on the extension of crop diversification

2-4. Revise curriculum and materials incorporating feedback from the Pilot Project

3-1. Conduct hands-on training to core extension officers assigned to the pilot area and highlighted 5 districts (Kangra, Una, Hamirpur, Bilaspur and Mandi) on:

- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Infrastructure development/operation and maintenance

3-2. Conduct trainings to extension officers in Sub-Pilot Areas[2]

4-1. Selection of a pilot area to be approved by JCC.

4-2. Construct irrigation facilities and prepare demonstration plot in the pilot area.

4-3. Organize farmers groups and Self-help groups

4-4. Conduct trainings to farmers on:

- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Operation and maintenance of Agricultural Infrastructure facilities

4-5. To provide technical advise for the extension officers to conduct farmers' trainings in Sub-Pilot Area on:

- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Operation and maintenance of Agricultural Infrastructure facilities

(4) Project Site

State of Himachal Pradesh

[2] The Government of Himachal Pradesh will establish Sub-Pilot Areas by its own budget in Chamba, Kinnaur, Kullu, Lahaul-Spiti, Shimla, Sirmaur or Solan.

ANNEX II

LIST OF JAPANESE EXPERTS

1. Chief Advisor / Agriculture Extension
2. Water Management / Operation and Maintenance
3. Crop Cultivation / Post Harvest
4. Training / Project Coordination
5. Gender / Social Inclusion
6. Design & Construction Management

ANNEX III

LIST OF MACHINERY AND EQUIPMENT

Machinery and equipment necessary for the effective implementation of the Project will be provided within the budget allocated for the Project.

ANNEX IV

LIST OF INDIAN COUNTERPARTS AND ADMINISTRATIVE PERSONEL

1. Counterpart Personnel

(1) Project Director

Director, DoA

(2) Project Manager

Additional/ Joint Director, DOA

(3) Other Staffs in DoA

Superintending Engineer, DoA

Assistant Soil Conservation Officer, DoA

Subject Matter Specialist, DoA

(4) Staff in charge of Activities in Pilot Area

Below mentioned officers in Block Office where Pilot Area will be

Subject Matter Specialist,

Sub Divisional Soil Conservation Officer

Junior Engineer/ ADO Soil Conservation

ANNEX V

LIST OF LAND, BUILDINGS AND FACILITIES

1. Land, buildings and facilities necessary for implementation of the Project.
2. Rooms and space necessary for installation and storage of equipment envisaged for implementation of the Project.
3. Office space and necessary facilities for the Japanese experts and related staff members.
4. Other facilities mutually agreed upon as necessary.

ANNEX VI

JOINT COORDINATING COMMITTEE

The Joint Coordination Committee (JCC) composed of those members as listed below shall meet at least once a year and when needed.

1. Function

(1) To authorize annual work plan of operation in accordance with this framework and the Record of Discussions (R/D) between GoI and JICA.
(2) To review overall progress of the technical cooperation program in accordance with this frame work and the R/D.
(3) To review measures taken by JICA
(4) To review measures taken by GoI.
(5) To examine and endorse the Joint Evaluation report during the project.
(6) To give recommendations to both GoI and JICA for the smooth and successful implementation of the project.

2. Composition

(1) Chairperson:
Principal Secretary/ Secretary (Agriculture), The Government of Himachal Pradesh

(2) Members:
1) Indian Side:
- Director of DoA, The Government of Himachal Pradesh as a Project Director
- Additional/Joint Director of DoA, The Government of Himachal Pradesh as a Project Manager.
- Superintendent Engineer, DoA, The Government of Himachal Pradesh
- Director of State Agricultural Management and Extension Training Institute, The Government of Himachal Pradesh
- Managing Director of State Agricultural Marketing Board, The Government of Himachal Pradesh.
- Director Extension of State Agriculture University

- Project Director of Agricultural Technology Management Agency (ATMA) of Pilot Area, The Government of Himachal Pradesh.
- Representative of Department of Agriculture and Cooperation, Ministry of Agriculture, GoI
- Representatives from any other State Departments/Institutions as decided by the Chairperson

2) Japanese Side:

- Team Leader of Japanese expert team.
- Representative of Project Management Consultant for JICA ODA Loan Project.
- Representatives, JICA India Office

Notes:

1. Officials of the Embassy of Japan in India may attend the JCC meetings as observers, as and when required.
2. Persons who are nominated by the chairperson may attend the JCC meetings as observers, as and when required.

Attachment-2

Project Design Matrix

Ver.0 As of March 2010
Ver.1 As of October 2013
Ver.2 As of July 2015

Project Name: Technical Cooperation Project for Crop Diversification in Himachal Pradesh | Duration: 5 years | Ver.00
Target Area: State of Himachal Pradesh | Target Group: Core Extension Officers of DOA | Date: March, 2010

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal: (Target at 5 years after end of the Project) Crop diversification is promoted in the target area based on the advantageous climate conditions	(After 5 years of completion of the project) (1) **% of total cultivated land in the target area is diversified to the vegetable.	(1) Agricultural census by DOA/ Other reports	
Project Purpose: (Target at the end of the Project) The promotion mechanism for crop diversification is established in DOA Himachal Pradesh	(1) Extension activities based on the Crop Diversification Model are expanded in 5 districts	(1)Monitoring survey carried out by the Project	-Proposed ODA Loan Project is implemented on schedule -RIDF project is continued on the same scale -No severe decline in agriculture production price
Outputs: 1. DOA's capacity to plan and implement crop diversification is strengthened. 2. Training system to promote crop diversification is developed. 3. Core extension officers for crop diversification are trained. 4. Crop diversification Model is developed and practiced in the Pilot area.	(1)-1 Implementation guideline for crop diversification is prepared. (1)-2 Annual PDCA cycle of crop diversification functions in DOA (i.e. Annual plan on crop diversification is formulated, monitored and evaluated.) (2)-1 Training curriculum is prepared for each subject (group organization, vegetable cultivation, farm management, irrigation and water management, etc) (2)-2 Training materials are developed in each subject. (3)-1 80% of trained extension officers can conduct farmers' training by themselves on the various technologies. (3)-2 50% of trained extension officers can launch extension activities in the areas they cover. (4)-1 80% of the farmers in the pilot area increase their vegetable production. (4)-2 80% of farmers in the pilot area can decide the cropping pattern by themselves with market information. (4)-3 80% of farmers in the pilot area can increase their income by crop diversification. (4)-4 SHG in the pilot area can increase their income by their group activities. (4)-5 Irrigation facilities in the pilot area are properly maintained by farmers.	(1)-1 Check the output (1)-2 Monitoring survey carried out by the Project (2)-1 Check the output (2)-2 Check the output (3)-1 Monitoring survey carried out by the Project (3)-2 do – (4)-1 do - (4)-2 do - (4)-3 do - (4)-4 do - (4)-5 do -	- No severe decline of the state government budget on the agriculture development and support - No severe decline in agriculture production price

Note: The "core extension officers" include SMS, ADO, AEO, SDSCO, AE, JE. .
Gender and social inclusion should be considered in every activity as well as measured byobjectively verifiable indicators.

Activities	Inputs	
1-1 Conduct baseline survey 1-2 Review existing plan on crop diversification in DOA 1-3 Conduct Plan-Do-Check-Action training on crop diversification 1-4 Formulation of annual plan on crop diversification 1-5 Conduct monitoring and evaluation of annual plan 2-1 Formulate annual plan on extension training 2-2 Review the existing training curriculum and materials on extension 2-3 Develop training curriculum and materials on extension of crop diversification 2-4 Revise curriculum and materials incorporating feedback from the Pilot Area 3-1 Conduct hands-on training for core extension officers assigned to the pilot area: • Group formation • Crop cultivation • Farm management • Post harvest/processing • Marketing • Infrastructure development/operation and maintenance 3-2 Provide lectures and hands-on trainings for core extension officers to be in charge of ODA Loan Project: • Group formation • Crop cultivation • Farm management • Post harvest/processing • Marketing • Infrastructure development/operation and maintenance 3-3 Conduct trainings for core extension officers in Sub-Pilot Areas (without infrastructure development) 4-1 Selection of a pilot area to be approved by JCC. 4-2 Organize farmers groups and Self-help groups 4-3 Construct irrigation facilities and prepare demonstration plot in the pilot area. 4-4 Conduct trainings for farmers on: • Group formation • Crop cultivation • Farm management • Post harvest/processing • Marketing • Infrastructure development/operation and maintenance	<Japanese Side> <Japanese Side> 1) Experts - Project Management / Agriculture Extension - Water Management / Operation and Maintenance - Crop Cultivation / Post Harvest - Training / Project Coordination - Gender / Social Inclusion - Design & Construction Management 2) Training for beneficiaries and Himachal Pradesh C/Ps 3) Cost for project office management (personnel, equipment, and consumables) 4) Cost for construction of pilot area and preparation of demonstration plot 5) Equipments for project management, if necessary <Himachal Pradesh Side> 1) Counterparts (from Shimla Headquarter to field level) 2) Necessary transport and other expenditures for counterparts 3) Project office at Shimla and site 4) Sharing of project office running expenses 5) Tax exemption measures, etc. <Abbreviation> DOA: Department of Agriculture, Government of Himachal Pradesh SMS: Subject Matter Specialist ADO: Agricultural Development Officer AEO: Agricultural Extension Officer SDSCO: Sub-divisional Soil Conservation Officer AE: Assistant Engineer JE; Junior Engineer	No disaster is occurred (drought / flood) - No policy change in the Agriculture **Pre-conditions** - There is a need on the agriculture development in the state - There is the budget to bear the counterpart budget for project implementation in the State

Note: The "core extension officers" include SMS, ADO, AEO, SDSCO, AE, JE. .
Gender and social inclusion should be considered in every activity as well as measured by objectively verifiable indicators.

Modified PDM (PDM ver.1)

Project Name : Technical Cooperation Project for Crop Diversification in Himachal Pradesh | Duration: 5 years | Ver. 01
Target Area: State of Himachal Pradesh | Target Group: Core Extension Officers | Date: Oct. 2013

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal (Target at 5 years after the end of the Project) Crop diversification is promoted in the target area based on the advantageous climate conditions	(After 5 years of completion of the project) (1) 20% of total cultivated land in the target area is diversified to the vegetable	(1) Agricultural census by DOA / Other reports	
Project Purpose (Target at the end of the Project) The promotion mechanism for crop diversification is established in DOA Himachal Pradesh.	(1) Extension activities based on the Crop Diversification Model are expanded in 5 districts.	(1) Monitoring survey carried out by the Project	- RIDF project is continued on the same scale - No severe decline in agriculture production price
Outputs 1. DOA[*1]'s capacity to plan and implement crop diversification is strengthened. 2. Training system to promote crop diversification is developed. 3. The extension skill of the core extension officers is improved. 4. Crop diversification model is developed and practiced in the Pilot area.	(1)-1 Implementation guideline for crop diversification is prepared. (1)-2 Annual PDCA cycle of crop diversification functions in DOA[*1]. (i.e. Annual Plan on crop diversification is formulated, monitored and evaluated.) (2)-1 Training curriculum and materials are developed after revision in each subject. (3)-1 80% of the core extension officers can conduct farmers' training by themselves on the various technologies. (3)-2 50% of the core extension officers can launch extension activities in the areas they cover. (4)-1 30% of the farmers/20% of CCA in the pilot area undertake vegetable cultivation. (4)-2 30% of farmers in the pilot area can increase their income by the Project. (4)-3 SHGs in the pilot area can increase their income by their group activities. (4)-4 Irrigation facilities in the pilot area are properly maintained by farmers	(1)-1 Check the output (1)-2 Monitoring survey carried out by the Project (2)-1 Check the output (3)-1 Monitoring survey carried out by the Project (3)-2 - do - (4)-1 - do – (4)-2 - do – (4)-3 - do – (4)-4 - do –	- No severe decline of the state government budget on the agriculture development and support - No severe decline in agriculture production price

Modified PDM (PDM ver.1)

Activities

1-1. Review the existing plan on crop diversification and study, how the pilot project should be.
1-2. Conduct Plan-Do-Check-Act training on crop diversification
1-3. Facilitation in the preparation of annual plan on crop diversification
1-4. Develop Crop Diversification Guideline based on the lesson learned from crop diversification model practiced in the Pilot Area and Sub-pilot Area

2-1. Formulate annual plan on extension training
2-2. Review the existing training curriculum and materials on extension
2-3. Develop training curriculum and materials on extension of crop diversification
2-4. Revise curriculum and materials incorporating feedback from the Pilot Project

3-1. Conduct hands-on training to core extension officers assigned to the pilot area and highlited 5 districts (Kangra, Una, Hamirpur, Bilaspur and Mandi) on:
- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Infrastructure development/operation and maintenance

3-2. Conduct trainings for extension officers in Sub-Pilot Areas (Government of Himachal Pradesh will establish Sub-Pilot Areas by its own budget)

4-1. Conduct baseline survey
4-2. Selection of a pilot area to be approved by JCC
4-3. Construct irrigation facilities and prepare demonstration plot in the pilot area.
4-4. Organize farmers groups and Self-help groups
4-5. Conduct trainings for farmers on:
- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Operation and maintenance

Inputs

<Japanese Side>
1) Experts
- Chief Advisor / Agriculture Extension
- Water Management / Operation and Maintenance
- Crop Cultivation / Post Harvest
- Training / Project Coordination
- Gender / Social Inclusion
- Design & Construction Management

2) Training for beneficiaries and Himachal Pradesh C/Ps
3) Cost for project office management (personnel, equipment, and consumables)
4) Cost for construction of pilot area and preparation of demonstration plot
5) Equipments for project management, if necessary

<Himachal Pradesh Side>
1) Counterparts (from Shimla Headquarter to field level)
2) Necessary transport and other expenditures for counterparts
3) Project office at Shimla and site
4) Sharing of project office running expenses
5) Tax exemption measures, etc.

<Abbreviation>

DOA: Department of Agriculture, Government of Himachal Pradesh
PMU: Project Management Unit
DPMU: District Project Management Unit
BPMU: Block Project Management Unit
TCP: Technical Cooperation Project
CCA: Cultivable/Culturable Command Area
SHG: Self Help Group

- Proposed ODA Loan Project is implemented on schedule
- No disaster is occurred (drought / flood)
- No policy change in the agriculture

Pre-conditions

- There is a need on the agriculture development in the state
- There is the budget to bear the counterpart budget for project implementation in the State

Gender and social inclusion should be considered in every activity as well as measured by objectively verifiable indicators
*1 The Target group will be the core extension officers of PMU staff

ANNEX 2: Project Design Matrix (PDM)

Project Name : Technical Cooperation Project for Crop Diversification in Himachal Pradesh | Duration: 5 years | Ver. 02
Target Area: State of Himachal Pradesh | Target Group: Core Extension Officers | Date: July. 2015

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal (Target at 5 years after the end of the Project) Crop diversification is promoted in the target area based on the advantageous climate conditions	(After 5 years of completion of the project) (1) 20% of total cultivated land in the target area is diversified to the vegetable	(1) Agricultural census by DOA / Other reports	
Project Purpose (Target at the end of the Project) The promotion mechanism for crop diversification is established in DOA Himachal Pradesh.	(1) Extension activities based on the Crop Diversification Model are expanded in 5 districts. (Rephrased as "Extension activities based on the Guidelines which capture the essence of CDM are expanded in five districts.")	(1) Monitoring survey carried out by the Project	- RIDF project is continued on the same scale - No severe decline in agriculture production price
Outputs 1. DOA[*1]'s capacity to plan and implement crop diversification is strengthened. 2. Training system to promote crop diversification is developed. 3. The extension skill of the core extension officers is improved. 4. Crop diversification model is developed and practiced in the Pilot area.	(1)-1 Implementation guideline for crop diversification is prepared. (1)-2 Annual PDCA cycle of crop diversification functions in DOA[*1]. (i.e. Annual Plan on crop diversification is formulated, monitored and evaluated.) (2)-1 Training curriculum and materials are developed after revision in each subject. (3)-1 80% of the core extension officers can conduct farmers' training by themselves on the various technologies. (3)-2 50% of the core extension officers can launch extension activities in the areas they cover. (4)-1 30% of the farmers/20% of CCA in the pilot area undertake vegetable cultivation. (4)-2 30% of farmers in the pilot area can increase their income by the Project. (4)-3 SHGs in the pilot area can increase their income by their group activities. (4)-4 Irrigation facilities in the pilot area are properly maintained by farmers	(1)-1 Check the output (1)-2 Monitoring survey carried out by the Project (2)-1 Check the output (3)-1 Monitoring survey carried out by the Project (3)-2 - do - (4)-1 - do – (4)-2 - do – (4)-3 - do – (4)-4 - do –	- No severe decline of the state government budget on the agriculture development and support - No severe decline in agriculture production price

ANNEX 2: Project Design Matrix (PDM)

<table>
<tr>
<td><u>Activities</u>
1-1. Review the existing plan on crop diversification and study, how the pilot project should be.
1-2. Conduct Plan-Do-Check-Act training on crop diversification
1-3. Facilitation in the preparation of annual plan on crop diversification
1-4. Develop Crop Diversification Guideline based on the lesson learned from crop diversification model practiced in the Pilot Area and Sub-pilot Area

2-1. Formulate annual plan on extension training
2-2. Review the existing training curriculum and materials on extension
2-3. Develop training curriculum and materials on extension of crop diversification
2-4. Revise curriculum and materials incorporating feedback from the Pilot Project

3-1. Conduct hands-on training to core extension officers assigned to the pilot area and highlited 5 districts (Kangra, Una, Hamirpur, Bilaspur and Mandi) on:
・ Group formation
・ Crop cultivation
・ Farm management
・ Post harvest/processing
・ Marketing
・ Infrastructure development/operation and maintenance
3-2. Conduct trainings for extension officers in Sub-Pilot Areas (Government of Himachal Pradesh will establish Sub-Pilot Areas by its own budget)

4-1. Conduct baseline survey
4-2. Selection of a pilot area to be approved by JCC
4-3. Construct irrigation facilities and prepare demonstration plot in the pilot area.
4-4. Organize farmers groups and Self-help groups
4-5. Conduct trainings for farmers on:
・ Group formation
・ Crop cultivation
・ Farm management
・ Post harvest/processing
・ Marketing
・ Operation and maintenance</td>
<td><u>Inputs</u>

<Japanese Side>
1) Experts
- Chief Advisor / Agriculture Extension
- Water Management / Operation and Maintenance
- Crop Cultivation / Post Harvest
- Training / Project Coordination
- Gender / Social Inclusion
- Design & Construction Management

2) Training for beneficiaries and Himachal Pradesh C/Ps
3) Cost for project office management (personnel, equipment, and consumables)
4) Cost for construction of pilot area and preparation of demonstration plot
5) Equipments for project management, if necessary

<Himachal Pradesh Side>
1) Counterparts (from Shimla Headquarter to field level)
2) Necessary transport and other expenditures for counterparts
3) Project office at Shimla and site
4) Sharing of project office running expenses
5) Tax exemption measures, etc.

<Abbreviation>

DOA: Department of Agriculture, Government of Himachal Pradesh
PMU: Project Management Unit
DPMU: District Project Management Unit
BPMU: Block Project Management Unit
TCP: Technical Cooperation Project
CCA: Cultivable/Culturable Command Area
SHG: Self Help Group</td>
<td>- Proposed ODA Loan Project is implemented on schedule
- No disaster is occurred (drought / flood)
- No policy change in the agriculture

<u>Pre-conditions</u>
- There is a need on the agriculture development in the state
- There is the budget to bear the counterpart budget for project implementation in the State</td>
</tr>
</table>

Gender and social inclusion should be considered in every activity as well as measured by objectively verifiable indicators

*1 The Target group will be the core extension officers of PMU staffs

Attachment-3
Plan of Operation
(Actual Result As of October 2015)

Plan of Operation (Actual Result)

Year	2011	2012	2013	2014	2015
Phase	Phase-1	Phase-2	Phase-3	Phase-4	
Month	J F M A M J J A S O N D (1–12)	J F M A M J J A S O N D (13–24)	J F M A M J J A S O N D (25–36)	J F M A M J J A S O N D (37–48)	J F M A M J J A S O N D (49–60)

Staff assignment (months marked "=")

No.	Field	Months
1	Project Management / Agricultural Extension	3–9, 11, 12, 14, 16, 19–23, 25, 26, 28–31, 33, 34, 36, 38–42, 44, 45, 47, 48, 50, 51, 54, 55, 57, 58
2	Water Management / Operation & Maintenance	3, 4, 7, 8, 10, 11, 19, 20, 22–24, 26, 27, 30, 31, 33, 34, 36, 38, 39, 42, 43, 46, 47, 51, 52, 55, 56
3	Vegetable Cultivation / Post Harvest	4, 5, 7, 8, 11, 13, 20, 21, 24, 25, 27, 31–33, 37, 39, 43, 44, 47, 48, 51, 52, 55, 56
4	Training / Project Coordination	3, 4, 14, 15, 19, 23, 24, 27, 28, 31, 34, 35, 38, 41, 43, 46, 47, 49, 50, 54, 55, 57, 58
5	Gender / Social Inclusion	6, 11, 20, 21, 23, 33, 37, 38, 45, 49, 50, 54, 55
6	Design & Construction Management	4–11, 14–16, 20, 23, 24, 33, 34, 38, 39, 42, 43, 46, 47, 50, 51, 54, 55

1	2	3	4	5	6	Activity	Original Plan (=) months	Actual (*) months
						1. DOA's capacity to plan and implement crop diversification is strengthened		
*						1-1. Review existing plan on crop diversification and study, how the pilot project should be.	1–4	3–5, 25–27
*						1-2. Conduct Plan-Do-Check-Action training on crop diversification	7, 8, 20, 21, 31, 32, 49, 50	16, 24, 33, 34
*						1-3. Facilitation in the preparation of annual plan on crop diversification	14, 15, 26, 27, 38, 39, 50, 51	13, 14, 25, 26, 38, 39, 49–51
*	+	+	+	+	+	1-4. Develop Crop Diversification Guideline based on the lesson learned from Crop Diversification model practiced in the Pilot Area and Sub-Pilot Area	28–60	34–57
						2. Training system to promote crop diversification is developed		
*			+			2-1. Formulate annual plan on extension training	14, 15, 26, 27, 38, 39, 50, 51	19, 20, 29, 30, 39, 40
*	+	+	+	+	+	2-2. Review the existing training curriculum and materials on the extension	4–7	4–14
*	+	+	+	+	+	2-3. Develop training curriculum and materials on the extension of crop diversification	8–12	12–45
*	+	+	+	+	+	2-4. Revise curriculum and materials incorporating feedback from the Pilot Project	16–18, 28–30, 43–45, 53–55	46–57
						3. The extension skill of the core extension officers are improved		
*	+	+	+	+	+	3-1. Conduct hands-on training to core extension officers assigned to the pilot area and highlighted 5 districts (Kangra, Una, Hamirpur, Bilaspur and Mandi)	9, 10, 16, 17, 22–24, 29, 30, 32, 34–36, 40, 41, 46–49	6–15, 20–28, 30–40, 42–53, 55, 57
*	+	+	+	+	+	3-2. Conduct trainings to extension officers in Sub-Pilot Areas	30, 32, 34–36, 40, 41, 46–49	36, 39, 45, 53
						4. Crop Diversification Model is developed and practiced in the Pilot Area		
*	+		+			4-1. Conduct baseline survey	1–3, 29–31, 56–58	6–15, 33, 34, 53, 54
*	+	+		+	+	4-2. Selection of a pilot area to be approved by JCC.	1, 2	3–6
						4-3. Construct irrigation facilities and prepare demonstration plot in the pilot area.		
	+				*	(1) Preparation of detailed design and tender document	4, 5	5–11
					*	(2) Tendering, selection of contractor and contract award	6–8	11, 12
					*	(3) Construction and supervision	9–15	12–17
	+				*	(4) Traial operation and handing over	16–27	19–28
		+			*	(5) Preparation of demonstration plot	16–18	19–24
	*			+		4-4. Organize farmers groups and Self-help groups	6–27	4–9
*	+	+	+	+	+	4-5. Conduct trainings to farmers	6–39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59	6–15, 20–28, 30–40, 42–54
						0. Activities related to Project Management		
*	+	+	+	+	+	0-1. Preparation of the Reports		▲ WP1 (9), PR1 (17), WP2 (19), PR2 (28), WP3 (30), PR3 (40), WP4 (41), PC/R (58)
*	+	+	+	+	+	0-2. Organize JCC meetings		▲ 1st JCC (6), 2nd JCC (17), 3rd JCC (20), 4th JCC (27), 5th JCC (30), 6th JCC (34), 7th JCC (41), 8th JCC (54), 9th JCC (58)
*	+	+	+	+	+	0-3. Joint Evaluation		Mid-term Evaluation (33, 34), Terminal Evaluation (54)

Legend
* Main person in charge
\+ Responsible for the part of specialty

= Original Plan   * Revised Plan on June 2015
* Actual

Attachment-4
Minutes of Meeting of 7th Joint Coordination Committee

Himachal Pradesh Agriculture Development Society
Crop Diversification Promotion Project Hamirpur (H.P.)
218 Aastha Kanwal Complex, Hamirpur, District Hamirpur-177001 (HP)
Phone: +91-1972-218150, Fax No: +91-1972223059, E-mail:- pmucdp-hp@nic.in

No. Agr. Hmr PMU(F)10-03/2011-~~878~~/8771 Dated:- 30.06.2014.

To

1) The Additional Chief Secretary (Agri.)
   to the Govt. of Himachal Pradesh Cum
   Chairman Executive Committee,
   HPADS, Shimla-2.
2) The Director of Agriculture,
   Himachal Pradesh Shimla-5.
3) Additional Commissioner, Dept. of Agriculture & Co-operation,
   NRM Division , Ministry of Agriculture1-2 B Sastari Bhawan ,
   New Delhi.
4) Chief Representative,
   JICA India office 2nd floor, Dr. Gopal Dass Bhawan 28 Bara
   Khamba Road, New Dehli 110001
5) The Managing Director,
   H.P. State Agriculture Marketing Board Kalini , Shimla-2.
6) Director Extension CSK HPKV,
   Palampur District Kangra (H.P.)
7) Director of State Agricultural,
   Management & Extension Training Institute, Mashobra-Shimla-1
8) Chief Adviser,
   TCP Near PNB Bank Dosarka Hamirpur,
   Distt. Hamirpur (H.P.).
9) Team Leader PMC- HPCDP- JICA-ODA-Hamirpur (H.P.)

Subject:- **Proceeding of the 7th meeting of Joint Co-ordination Committee of (JCC) held on 18-06-2014.**

Sir,

Enclosed pleased find herewith proceeding of the 7th Meeting of Joint Co-ordination Committee (JCC) under Technical Co-operation Project for Crop Diversification in Himachal Pradesh held on 18-06-2014 at 12:00 Noon under the Chairmanship of Sh. Deepak Sanan Additional Chief Secretary(Agri.), to Govt. of Himachal Pradesh Shimla-2 for information and necessary action please.

Yours faithfully,

Project Director,
HPCDP JICA-ODA Hamirpur,
Distt. Hamirpur (H.P.)

Proceedings of the 7th meeting of Joint Coordination Committee (JCC) under Technical Cooperation Project on Crop Diversification held under the Chairmanship of Sh. Deepak Sanan, Additional Chief Secretary (Agriculture) to the Govt. of H.P. Shimla-2, on 18th of June, 2014 at 12 noon in the Committee Room of H.P. Secretariat, Shimla-2.

List of participants is given at **Annexure-I.**

At the outset, the Director of Agriculture, welcomed the Chairman, representative JICA India Office and the other members of the Joint Coordination Committee (JCC) and apprised the house that in this meeting the progress report of JICA -Technical cooperation Project Phase-3 and work plan for phase-4 shall be discussed for approval. Thereafter, Mr. Ishizaki, Chief Advisor, JICA-TCP, was asked to make a presentation on the agenda items.

Agenda Item 1: Confirmation of minutes of 5th JCC meeting held on 11th July, 2013:

The Chief Advisor, JICA-TCP informed that the minutes of 5th JCC meeting held on 11th July 2013 were circulated amongst all the members on 23.07. 2013, and as no comments were received from any member, hence the minutes were confirmed as such. However, the Action Taken Report on the decisions taken during 5th meeting of JCC held on 11.07.2013was reviewed as under:

(i) Overseas Training in Japan:

The Chief Advisor, JICA-TCP informed that JICA has arranged budget for overseas training of officers from PMU and DoA in Japan w.e.f. 29th of June 2014 to 10th of July 2014 and the preparatory work is in progress. The Director of Agriculture informed that some queries were raised by the Department of Economic Affairs, Government of India and the comments on the same have been submitted. Mr. Subroto Talukdar, JICA India office informed that they are in touch with the DEA on this issue and clearance from DEA is expected very shortly.

(ii) Involvement of resource persons from Outside the State Universities as trainers:

The Director of Agriculture suggested that JICA-TCP should invite good resource persons from outside the state also in addition to HPKV, Palampur and University of Horticulture and Forestry, Nauni for imparting training to the officers of DOA and PMU. The Chief Advisor, JICA-TCP, assured that during Phase-4, efforts shall be made to arrange resource persons from outside the state also.

Agenda Item No.2: Confirmation of minutes of 6th JCC meeting held on 30.10.2013:

The minutes of 6th JCC meeting held on 30.10.2013 were circulated to all the members and as no comments were received from any member, hence the same were confirmed as such.

Project Director
HP Crop Diversification Project
JICA-DOA Loan, Hamirpur (H.P.)-177001

Action taken report on the decisions taken during 6th JCC meeting held on 30.10.13:

(i) Preparation of the guidelines for promotion of crop diversification:

The Chief Advisor, JICA-TCP informed that draft guidelines for crop diversification have been prepared and shall be sent to the PMU for their comments during the month of July, 2014. After detailed discussion on this issue, the Director of Agriculture suggested that JICA-TCP should send the draft guidelines to the Project Director, HPCDP, ODA by early July 2014 so that PMU can circulate the same to its field officers and obtain the comments /suggestions. After receiving feed back from the field offices, a joint workshop of PMU,PMC, DoA and TCP be arranged before 31st of July, 2014 to discuss the comments. Thereafter, the guidelines be finalized by 7th of August 2014 for implementation in the field. He further suggested that these guidelines be reviewed periodically and if any change is required that may be incorporated from time to time.

(ii) Monitoring and up-grading performance of Community Motivators:

The Director of Agriculture informed that though the role and responsibilities of community motivators have already been defined however, on the basis of experience of JICA-TCP in the pilot site some measurable output indicators to know the performance of Motivators are required to be fixed . He suggested that PMU, PMC should join hands with JICA-TCP to develop performance indicators and the task be completed at the earliest.The Addl. Chief Secretary (Agri.) desired that the Director of Agriculture should monitor the progress at regular interval and get these finalized at the earliest. It is expected that the indicators should be proposed latest by September,2014 so that these can be used by the ODA project.

(iii) Strengthening of activities of SHGs:

The Chief Advisor, JICA-TCP informed that at the Pilot site , three SHGs have been formed and these are involved in agriculture related activities at very small scale. During Phase-4, it is planned to further motivate these SHGs to expand their activities step by step. The Chairman suggested that JICA-TCP should chalk out their programs in such a way that the skills of SHGs should be up graded so that by taking up more activities, they become economically viable. Progress on strengthening of activities of SHGs be also monitored regularly .

(iv) Storage facilities

The Chief Advisor, JICA-TCP informed that some information related to Zero Energy Cool Chamber was collected from the HPKV, Palampur and adjoining areas but the farmers are not using them due to less produce and the same were found as non functional. In spite of this, the cost estimates of a cool chamber measuring 1.5 x 2.0 mt has been prepared which comes around Rs. 50,000 per unit. The cost appears to be on higher side compared to the benefit to the farmer. However, he informed that during Phase-4 on trial basis, efforts shall be made to create such facilities in pilot area if the farmers are interested for the same.

Project Director
HP Crop Diversification Project
JICA-ODA Loan, Hamirpur (H.P.)-177001

Agenda Item No.3: Review of progress of Phase-3 activities of the JICA-TCP:

The Chief Advisor, JICA-TCP gave detailed power point presentation of the progress of work (activity-wise) taken up during the Phase-3 which was approved by the house. The copy of the same is attached at **Annexure-2.**

Agenda Item No.4: Presentation and approval of the work plan of Phase-4 to be implemented during the year 2014-15:

The Chief Advisor, JICA-TCP, gave detailed power point presentation of different activities to be taken up during the Phase-4 and the same was approved by the house. The copy of which is attached at **Annexure-3.**

During discussion, stress was laid on the following issues:

- The Chairman desired that some mechanism should be worked out so as to judge the impact of trainings on the trainees and how these learnings have been used by the farmers in the fields. He suggested that measurable indicators be fixed to check the adoption rate in the fields.
- The Chairman desired that the impact of different project interventions on the farmers be gauged by comparing the situation before the start of the scheme and after completion of scheme.
- The constraints experienced in the pilot area like shortage of labour, man power ,less interest by farmers , marketing etc. need to be pointed out, and thus measures to overcome these problems should be documented for use in ODA project.
- The Chairman pointed out that contract farming with outsiders is being practiced in the State however, the possibilities of such farming by local farmers does not appear to occur possibly because farmers in villages don't prefer to lease out their farm lands to other famers of the same village because of the HP Tenancy and Land Reforms Act. He suggested that PMU with PMC should look into the ways to encourage contract farming among the local farmers so that the land of absentee farmers and others can be utilized well. They should propose some model that care of lessor concerns and which can be taken up with the Government for issue of appropriate guidelines .
- The Director of Agriculture pointed out that the TCP is going to be wound up in December 2015, while the ODA loan project shall continue till the year of 2018. Most of the construction works shall be completed after 2015 and after that extension activities are to be carried out. In the period from 2016 to 2018, he suggested that possibility for extension of Technical Cooperation Project till at least 2017 be explored. After discussion with JICA personnel, it was desired that proposal in this behalf be submitted by the Government of Himachal Pradesh to JICA through Ministry of Agriculture for having a second phase of this project.
- The chairman suggested that proposal with regard to storage facilities, preferably group storage needs to be explored and there is necessity to educate the farmers about the proper use of cold storages After discussion, it was decided that under ODA project, a committee be constituted wherein officers from PMU, PMC & Marketing Board be nominated which will

Project Director
HP Crop Diversification Project
JICA-ODA Loan, Hamirpur (H.P.) 177001

study all aspects and submit its report for consideration. Some funds from ODA Loan project savings can be re-allocated for marketing and post harvest infrastructure at the time of Mid term Evaluation of the project.

The Chairman in his concluding remarks specially thanked the representatives of JICA India for participating in the meeting and sharing their valuable suggestions. He desired that necessary efforts be made to achieve the activities proposed in the Work Plan to be implemented during 2014-15. Furthermore, he appreciated the work done by JICA-TCP and suggested that JICA-TCP should continue to extend technical guidance and support to the ODA Loan Project and DOA as and when required till the conclusion of TCP. He also asked for a monthly review of the TCP activities at the level of Director of Agriculture who is also the Project Director of Technical Co-operation Project.

The meeting ended with a vote of thanks from and to the Chairman.

Project Director
HP Crop Diversification Project
JICA-ODA Loan, Hamirpur (H.P.)-177001

Annexure-I

List of participants

Name of the meeting: 7th Meeting of Joint Coordination Committee (JCC) under Technical Cooperation Project (TCP for Crop Diversification in Himachal Pradesh.

Place: Committee Room, H.P. Secretariat, Govt. of Himachal Pradesh Shimla-2.

Date: 18.06.2014 Time: 12 noon

No.	Name	Position/Designation an organization/Institution/Agency
1.	Sh. Deepak Sanan	Additional Chief Secreary (Agri.) to the Govt. of H.P.
2.	Dr. J.C.Rana	Director of Agriculture, Govt. of H.P.
3.	MR. Hiroshi Yoshida	Representative, JICA India office, New Delhi
4.	Mr. Subrotu Talakudar	JICA India Office, New Delhi
5.	Dr. H.S.Baweja	Managing Director, H.P. Marketing Board, Shimla-5.
6.	Dr. Yogeshwer Mahajan	Project Director, HP CDP, JICA-ODA, Hamirpur
7.	Dr. Tarseem Kumar	Director, SAMETI, Mashobra, Shimla
8.	Dr. Jagjit Kumar Sharma	SMS, SPMU, Hamirpur
9.	Dr. Suresh Sharma	SMS, DOA, Shimla
10.	Sh. M.L.Gupta	PMC, Hamirpur
11.	Dr. D.P.Singh	Vegetable Expert, PMC, Hamirpur
12.	Shg. Ajay Kumar	PMC, Hamirpur
13.	Mr .Ishizaki	JICA-TCP
14.	Mr. Shimizu	JICA-TCP
15.	Mr. Fukuda	JICA-TCP
16.	Dr. R.K.Sharma	JICA-TCP, Hamirpur

Project Director
HP Crop Diversification Project
JICA-ODA Loan, Hamirpur (H.P.)-177001

Attachment-5
Minutes of Meeting of 8th Joint Coordination Committee

Himachal Pradesh Agriculture Development Society
Crop Diversification Promotion Project Hamirpur (H.P.)
218 Aastha Kanwal Complex, Hamirpur, District Hamirpur-177001 (HP)
Phone: +91-1972-218150, Fax No: +91-1972223059, E-mail:- pmucdp-hp@nic.in

No. Agr. Hmr PMU(F)10-03/2011-1207 Dated:- 22 JUL 2015

To

1) The Additional Chief Secretary (Agri.)
   to the Govt. of Himachal-Pradesh Cum
   Chairman Executive Committee,
   HPADS, Shimla-2.
2) The Director of Agriculture,
   Himachal Pradesh Shimla-5.
3) Additional Commissioner, Dept. of Agriculture & Co-operation,
   NRM Division , Ministry of Agriculture1-2 B Sastari Bhawan ,
   New Delhi.
4) Chief Representative,
   JICA India office 2nd floor, Dr. Gopal Dass Bhawan 28 Bara
   Khamba Road, New Dehli 110001
5) The Managing Director,
   H.P. State Agriculture Marketing Board Kalini , Shimla-2.
6) Director Extension CSK HPKV,
   Palampur District Kangra (H.P.)
7) Director of State Agricultural,
   Management & Extension Training Institute, Mashobra-Shimla-1
8) Chief Adviser,
   TCP Near PNB Bank Dosarka Hamirpur,
   Distt. Hamirpur (H.P.).
9) Team Leader PMC- HPCDP- JICA-ODA-Hamirpur (H.P.)

Subject:- **Proceeding of the 8th meeting of Joint Co-ordination Committee of (JCC) held on 8th July,2015**

Sir.

Enclosed pleased find herewith proceeding of the 8th Meeting of Joint Co-ordination Committee (JCC) under Technical Co-operation Project for Crop Diversification in Himachal Pradesh held on 8th July-2015 at 12:15 Noon under the Chairpersonship of Mrs. Upma Chaudhry Additional Chief Secretary(Agri.). to Govt. of Himachal Pradesh Shimla-2 for information and necessary action please.

Yours faithfully,

Project Director,
HPCDP JICA-ODA Hamirpur,
Distt. Hamirpur (H.P.)

Minutes of Meeting of 8th JCC on Terminal Evaluation of Technical Cooperation Programme for Crop Diversification in H.P. held under the Chairpersonship of Mrs. Upma Chaudhry, Additional Chief Secretary (Agri.) to the Govt. of H.P. on 8th July, 2015 at 12.15 PM in the H.P. Secretariat, Shimla-2.

The list of participants is attached at Annexure "1".

At the outset, the Director of Agriculture, H.P. welcomed the participants. He especially welcomed Mr. Tomohide Ichiguchi. Senior Representative. JICA India Office. Delhi, and his team for attending this meeting. The Director of Agriculture informed that basically this meeting has been convened to apprise the Joint Coordination Committee of TCP about the outcome of Terminal Evaluation of Technical Co-operation Project (TCP). The Terminal Evaluation Team was here w.e.f. 27th June, 2015 to 8th July, 2015. The Team has conducted the visit to the Pilot area in Lahalri constructed by JICA-TCP, and two sub-projects under ODA – Loan viz. Panjali (Hamirpur) and Kahali (Bilaspur) constructed by PMU. The Team interacted with members of KVAs as well as SHGs of these sub projects. They also had meetings with SPMU and Core Extension Officers (CEOs) to receive feedback about the TCP activities from them. He explained that in this meeting, the Terminal Evaluation Report shall be presented by the evaluation team for approval by the JCC. He informed the house that the JICA-TCP after completion of its 5 years shall be closed by 31st October, 2015 and before that another JCC meeting shall be convened for final approval of the project report.

Mr. Ichiguchi, Senior Representative, JICA-India in his opening remarks informed that with the full support from JICA-TCP, PMU and DOA, the Team was able to complete its report very effectively. He expressed that Team has critically examined all the aspects for proper evaluation of different activities taken up under the project as envisaged in the RoD. The Team has evaluated the achievements on five criteria viz. relevance, effectiveness, efficiency, impact and sustainability. Further the conclusion/ recommendations and lessons learnt have also been given by the Team in its evaluation report. The appraisal of the report revealed that the JICA-TCP has achieved the goal in all respect and the performance of TCP is very good. He expressed that sustainability of the project is required to be ensured.

Mr. Akihiro Kimura, team member from JICA-India, informed that first, Ms. Oishi shall give detailed presentation on methodology adopted for terminal evaluation, and later the conclusion/ recommendations/ lessons learnt shall be highlighted by him. Thereafter, Ms. Oishi gave presentation on the methodology adopted for evaluation as well as the results of the evaluation.

Presentation by Ms. Misa Oishi, Terminal Evaluation Team Consultant

Ms. Misa Oishi informed that she along with two Indian members viz. Mr. Pradhan Chand Bhatt and Mr. B.R. Takhi conducted the evaluation. Ms. Oishi further informed that for evaluation, she worked on five evaluation criteria viz. relevance, effectiveness, efficiency, impact and sustainability. She gave detailed presentation on each criteria. The copy of her presentation is attached at **Annexure-2**. The detailed report submitted by the Mission is attached at Annexure-3

Presentation by Mr. Akihiro Kimura, Representative JICA-India:

Mr. Akihiro Kimura gave detailed presentation on the conclusion, recommendations and lessons learnt from the TCP activities taken up by the JICA-TCP during operation period and the same is attached at the end of **Annexure-2.**

The Chairperson expressed that the Terminal Evaluation Team has covered almost all the criteria for evaluation of JICA-TCP activities taken up during the operation period. She showed satisfaction on the achievement of goals envisaged under JICA-TCP. She stated that some suggestions have already been made by the Director of Agriculture and the report shall be very effective for further adoption of recommendations by PMU in their sub-projects. The sustainability is very important and needs to be further ensured so that the sub-project should really become an asset to the farming community to follow crop diversification. She informed that issue for further extension i.e. Phase-II of TCP has been taken up with JICA through Ministry of Agriculture, Govt. of India, DEA and it has already been supported by Government of India and sent to Embassy of Japan for consideration. She requested the Senior Representative JICA India to take up this matter with Japanese authorities so that TCP Phase-II can be started in succession to the termination of present TCP.

Mr. Ichiguchi stated that JICA-TCP has done well and has achieved the targets envisaged in the RoD. All the aspects as required to be taken up by JICA-TCP have been successfully implemented. Regarding further extension of TCP Phase-II, he informed that they are convinced with the need and will definitely follow up with Japanese authorities so that PMU could get continuous support from TCP experts for the promotion of sustainable crop diversification in the remaining sub projects which are about 181 in No. JICA would require certain clarification which may be replied soon after getting the same. He expressed satisfaction by knowing that the ODA project is also working in quite positive directions.

The Director of Agriculture appreciated the recommendations made by the Terminal Evaluation Mission and expressed to ensure operational sustainability of this project. In ODA sub projects this aspect is required to be taken care of. He informed that under ODA project, about 29 sub projects have been completed and in the next 3-4 years the construction shall be completed in many other sub projects and to promote crop diversification in all these sub projects, support from TCP is very much required.

He further stated that he has no hesitation to say that the staff of PMU, PMC and TCP efficiently tackled all problems confronted while executing the sub projects. If there was any dispute, the same was settled promptly. He appreciated the coordination between PMU and TCP as the TCP has given good support to PMU. He desired that the TCP should be given further extension (second phase) and speedy action be taken at all levels for launching second phase of TCP in continuation with the present phase as already explained by the Chairperson. He assured that DOA will provide full support by providing Extension Officers at block level for implementation of the second phase of TCP so as to achieve the goal within the prescribed time limit. He emphasized the need for improving productivity as well as developing a good marketing mechanism of vegetables, which are likely to be

produced in these sub projects so that farmers could get remunerative prices for their produce. He further stated that good cooperation has been received from TCP. and we expect that same tempo shall continue in the future also. He expressed that this is the model project for hilly States and seeing the success of this project, other States of India shall come forward for adoption of this model for crop diversification.

The report submitted by Terminal Evaluation Mission Annexure -3 was **approved by the house and was signed by the Mr. Tomohide Ichiguchi, Senior Representative, JICA-India and Dr. J.C Rana, Director of Agriculture, H.P. on behalf of Department of Agriculture, Government of Himachal Pradesh in the presence of Additional Chief Secretary (Agriculture)-cum-Chairperson of Joint Coordination Committee (JCC).**

At the end, the Director of Agriculture thanked the Japanese Delegates and other members and expressed that JICA India shall take appropriate immediate steps for extension of TCP Phase-II from the year 2016-2020, so as to avoid gap in the on-going activities.

The meeting ended with a vote of thanks to and from the Chairperson.

ANNEXURE-1

LIST OF PARTICIPANTS

Name or purpose: 8th JCC /JICA Terminal Evaluation Mission meeting under the Chairpersonship of Addl. Chief Secretary (Agri.) to the Govt. of H.P. Shimla-2.

Date: 8th July, 2015 Venue: Committee Room Armsdale Secretariat, Shimla-2.

S.N	Name	Position/Designation & Organization/ Institution/Agency
1	Ms. Upma Chaudhry	Addl.Chief Secretary (Agri.) to the Govt. of H.P.Shimla-2.
2	Mr. Tomohide Ichiguchi	Deputy Chief Representative, JICA India Office, Delhi
3	Mr. Akihiro Kimura	Representative, JICA India Office, Delhi
4	Mr. Subroto Talukdar	JICA India Office, Delhli
5	Ms. Misa Oishi	JICA Evaluation Team
6	Dr. J.C.Rana	Director of Agriculture, H.P., Shimla
7	Mr. Ishizaki Yoshiyuki	JICA-TCP, Hamirpur
8	Mr. Shimizu Keisuke	JICA-TCP, Hamirpur
9	Mr. Fukuda Akihiro	JICA-TCP, Hamirpur
10	Mr. Pradhan Chand	Sr.S.M.S. Dhramsala (Member Terminal Evaluation Team)
11	Mr. B.R. Takhi	Vice Principal, SAMETI,Mashobra (Member Terminal Evaluation Team
12	Mr. Jagdish Thakur	Project Director, HP CDP, Hamirpur
13	Mr. Pawan Thakur	Senior Marketing Officer (Marketing Board)
14	Mr. Dinesh K. Shrestta	Team Leader, PMC/HPCDP
15	Dr. Suresh Sharma	SMS, Counterpart, TCP, DOA, Shimla
16	Dr. Jagjit Kumar Sharma	SMS, SPMU, HP CDO, JICA-ODA
17	Dr. Sameer Sharma	Agril. Information Officer, DOA, Shimla

Attachment-6

Report of the Joint Terminal Evaluation on the Project for Crop Diversification in Himachal Pradesh

Joint Terminal Evaluation Report

for

the Technical Cooperation Project for Crop Diversification in Himachal Pradesh (TCP)

8 July, 2015

CONTENTS

Abbreviations

ADA	Additional Director Agricultural
ADO	Agricultural Development Officer
ADP	Agricultural Development Plan
AE	Assistant Engineer
AEO	Agricultural Extension Officer
BPMU	Block Project Management Unit
CCA	Culturable/Cultivable Command Area
CEO	Core Extension Officer
CDP	Crop Diversification Plan
CDM	Crop Diversification Model
DDA, DD	Deputy Director of Agriculture
DDAO	Deputy Director of Agriculture Office
DOA	Department of Agriculture of Himachal Pradesh State
DPMU	District Project Management Unit
ETP	Extension Training Plan
FTC	Farmers Training Centre
GoHP	Government of Himachal Pradesh
GoI	Government of India
GoJ	Government of Japan
HP	Himachal Pradesh
HPCDPP	Himachal Pradesh Crop Diversification Promotion Project
IP	Implementation Plan
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
LIS	Lift Irrigation Scheme
M/M, MM	Man Month or Minutes of Meeting
MCD	Mechanism for Crop Diversification
O&M	Operation and Maintenance
OBC	Other Backward Caste
ODA	Official Development Assistance by Government
PDCA	Plan – Do – Check – Act
PDM	Project Design Matrxi
PO	Plan of Operation
PMU	Project Management Unit
SAMETI	State Agricultural Management and Extension Training Institute
SC / ST	Scheduled Caste / Scheduled Tribe
SHG	Self-help Group
SMS	Subject Matter Specialist
SPMU	State Project Management Unit
TCP	Technical Cooperation Project
WUA	Water Users' Association

Local Words

Crore	10 Million (10,000,000)
GMKVA	Gagan Memorial Krishak Vikas Association
Kanal	Unit of Area, Approximately 400 m^2
Kharif	Southwest monsoon cropping season (June to September)
KVK	Krishi Vigyan Kendras (Agriculture Science Centers)
KVA	Krishak Vikaas Association (Water Users' Association / Farmers' Group)
Lakh, Lac	100 Thousand (100,000)
Nallah	Small River and Stream (Seasonal and Perennial)
Rabi	Winter cropping season (October to May)
RKVY	Rashtriya Krishi Vikas Yojana

USD 1.0 = JPY 122.74, INR 1.0 = JPY 1.927

(as of July 2015)

USD = United States of America Dollar, JPY = Japanese Yen, INR = Indian Rupee

Chapter 1 OUTLINE OF THE TERMINAL EVALUATION

1.1. Background of the Terminal Evaluation

Himachal Pradesh is a hilly state located at the foot of the Western Himalayas, with an area of 556.7 million hectare, and a population of approximately 6 million people. Nearly 70% of the working population in the State is engaged in agriculture, and most of them are marginal and small landholders with an area of less than 2.0 ha. Also, only about 18% of the cultivable area is irrigated, and therefore a majority of farmers remain engaged in traditional cultivation of food grains. On the other hand, the State has a considerable potential for vegetable cultivation, with an advantage of cool climate as well as the geographical proximity to the large cities such as Delhi. Thus, in order to improve livelihood of farmers in rural area, it is important to increase productivity of the existing cultivable areas, through shifting from self-subsistence food grain cultivation to diversified agriculture, by adopting cash crop such as vegetables. For crop diversification, it is imperative to overcome the major constraint, a shortage of irrigated land.

Under such circumstances, "The Study on Diversified Agriculture for Enhanced Farm Income in the State of Himachal Pradesh (January 2007 to March 2009)" was conducted and the master plan on rural development through diversified agriculture is formulated based on the agricultural characteristics of each region and its needs In line with the master plan, by considering both the importance of infrastructure development and human resource development, Government of Himachal Pradesh requested the Government of Japan for an ODA-loan project focusing on infrastructure development as well as this technical cooperation project, The Technical Cooperation Project for Crop Diversification in Himachal Pradesh (hereinafter referred to as TCP) focusing on developing a crop diversification model and enhancing capacity of agricultural officers. TCP started in March 2011 and plans to terminate in March 2016. The mid-term evaluation was carried out in October 2013.

This time, about six months prior to the completion of TCP, a terminal evaluation is conducted to evaluate whether TCP has achieved its expected outputs and project purpose and make recommendations for the remaining project period. Like the mid-term evaluation, the terminal evaluation was also carried out by a joint evaluation team consisted of both Indian and Japanese members. The result of the terminal evaluation is utilized to draw the conclusion on whether it is appropriate to complete the project or necessary to extend follow-up cooperation, and draw lessons to be applicable to other similar projects of JICA.

1.2. Objectives of the Terminal Evaluation

The specific objectives of the Terminal Evaluation are outlined as follows:

(1) to review and confirm the achievement and implementation process of TCP

(2) to evaluate TCP in terms of five evaluation criteria, namely relevance, effectiveness, efficiency, impact and sustainability, based on The Project Design Matrix (PDM)

(3) to evaluate changes in external conditions

(4) to reach the conclusion on whether it is appropriate to complete TCP

(5) to make recommendations for further improvement of TCP to stakeholders

(6) to draw lessons that can be applicable to other similar ongoing and future projects of JICA

1.3. Members of the Terminal Evaluation Team

The terminal evaluation team (hereinafter referred to as the Team) consists of the following members.

1.3.1. Indian Team

(1) Mr. B.R. Takhi

Vice Principal, State Agricultural Management and Extension Training Institute (SAMETI)

(2) Mr. P.C. Bhatt

Senior Subject Matter Specialist, Addl. Director of Agriculture Office (ADAO), Dharamshala

1.3.2. Japanese Team

(1) Mr. T. Ichiguchi (Leader)

Senior Representative, JICA India Office, JICA

(2) Mr. A. Kimura (Cooperation planning I)

Representative, JICA India Office, JICA

(3) Mr. S. Talukdar (Cooperation planning II)

Lead Development Specialist, JICA India Office

(4) Ms. Misa Oishi (Evaluation analysis)

Consultant, Overseas Operations Department, Kokusai Kogyo Co., Ltd.

1.4. Schedule of the Terminal Evaluation

Day	Date	Activities
28-Jun	Sun	am: Site visit (TCP Pilot Site: Lahalri) pm: Interview with Farmers Group in Lahalri
29-Jun	Mon	am: Meeting with TCP Experts pm: Interview with SPMU and DPMU Hamirpur
30-Jun	Tue	am: Site visit (ODA Loan Site 1: Panjhli Village) pm: Interview with Farmers Group & BPM Officers
1-Jul	Wed	am: Site visit (ODA Loan Site 2: Kahali Village) pm: Interview with Farmers Group & BPM Officers Site to Shimla (3 Hours)
2-Jul	Thu	am: Report Preparation pm: Internal Meeting Meeting with Director
3-Jul	Fri	11:00: Kick-off meeting with Director, counterpart members, and Indian side evaluation team pm: Move to Hamirpur (4 hours)
4-Jul	Sat	am: Site visit (TCP Pilot Site: Lahalri) pm: Interview with Farmers Group in Lahalri Meeting with PMU
5-Jul	Sun	am: Preparation of draft final evaluation report pm: Move to Shimla (4 hours)
6-Jul	Mon	am: Preparing draft final evaluation report pm: Sharing the report with India side members (evaluation team and PMU)
7-Jul	Tue	11:00: Presentation of evaluation method and preliminary result to India side evaluation team and Counter Part Members pm: MM discussion and finalizing MM and evaluation report
8-Jul	Wed	11:00: 8th JCC meeting, signing of MM (time confirmed) pm: Move from Shimla to Chandigarh (4 hours)

1.5. Methodology of the Terminal Evaluation

TCP was reviewed based on the Project Design Matrix (PDM), which is a summary table of TCP. The PDM was revised and approved by the relevant authorities at the time of mid-term review. The terminal evaluation was carried out based on this revised PDM.

1.5.1. Procedure of the terminal evaluation

At first, the Team formulated the evaluation grid which identified the specific evaluation points and the data collection methods. For the data and information, the Team applied various methods such as the

interviews based on the questionnaire, the group discussions and the observation of the project site and the provided equipment in use. The Team analyzed and evaluated TCP in terms of the achievement level of the project, the implementation process, and five evaluation criteria such as Relevance, Effectiveness, Efficiency, Impact and Sustainability. Finally, the Team made the recommendations based on the result of the terminal evaluation.

1.5.2. Points for the terminal evaluation

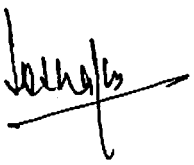
Achievement level and Implementation Process of TCP

The achievement levels in terms of Inputs, Activities, Outputs, and Project Purpose were assessed in comparison with the revised PDM and Plan of Operation (PO) and the actual progress of TCP. The implementation process of TCP was also confirmed from the various viewpoints such as monitoring and communication.

Evaluation Criteria

In addition to verification of achievement level and implementation process of TCP, the terminal evaluation assesses TCP from the following five evaluation criteria.

(1) Relevance:	An overall assessment of whether the project purpose and overall goal are in line with policy of both sides and with partner country's needs
(2) Effectiveness:	A measure of whether the project purpose has been achieved. This is then a question to the degree to which the outputs contribute towards achieving the intended project purpose.
(3) Efficiency:	A measure of the production of outputs of TCP in relation to the total resource inputs
(4) Impact:	The positive and negative changes, produced directly and indirectly as the result of TCP
(5) Sustainability:	An overall assessment of the extent to which the positive changes achieved by TCP can be expected to last after the completion



Chapter 2 OUTLINE OF TCP

The expected Overall Goal, Project Purpose and Outputs written in the PDM are as follows:

Overall Goal:

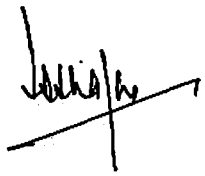
Crop diversification is promoted in the target area based on the advantageous climate conditions.

Project Purpose:

The promotion mechanism for crop diversification is established in DOA of Himachal Pradesh.

Outputs:

1) DOA's capacity to plan and implement crop diversification in strengthened.
2) Training system to promote crop diversification is developed.
3) The extension skill of the core extension officers is improved.
4) Crop diversification model is developed and practiced in the pilot area.



Chapter 3 ACHIEVEMENT AND IMPLEMENTATION PROCESS

3.1. Inputs

3.1.1. Inputs from the Japanese side

The details regarding main inputs provided by JICA are shown below.

(1) Dispatch of JICA experts

The following numbers of experts were dispatched and assigned. For details, please refer to the Annex 4.

- Eight (8) experts for the 1st Phase (from March 2011 to May 2012)
- Nine (9) experts for the 2nd Phase (from June 2012 to April 2013)
- Eight (8) experts for the 3rd Phase (from May 2013 to April 2014)
- Six (6) experts for the 4th Phase (from May 2014 to December 2015 (planned))

(2) Overseas Training

Eight (8) persons underwent the training organized by TCP from 29 June 2014 to 10 July 2014, as seen in the Annex 5.

(3) Provision of equipment

The provided equipment by TCP is detailed in Annex 6.

3.1.2. Inputs from the Indian side

The Indian side has allocated necessary budget and assigned enough counterpart personnel for the smooth implementation of TCP. In addition, office space with utility services has been provided in Directorate of Agriculture, Shimla.

3.2. Achievement of TCP

3.2.1. Overall Goal

"Crop diversification is promoted in the target area based on the advantageous climate conditions."

Currently TCP is making progress to assure a path towards the overall goal as seen below. Provided that

the recommendations made as a result of the terminal evaluation are seriously taken, the prospect of achievement will be further enhanced.

Indicator 1: Twenty percent (20%) of total cultivated land in the target area is diversified to the vegetable.

In the target area, CCA will surely expand up to certain extent because of 210 irrigation facilities under ODA-loan "Himachal Pradesh Crop Diversification Promotion Project (HPCDPP)", and therefore crop diversification is expected to be further promoted through "the promotion mechanism for crop diversification" during the project period. Thus, the path to the Overall Goal is set out.

However, despite the fact that the adoption process is slower in agricultural sector, Project Management Unit (PMU) exists only till March 2018. Some DOA officers who are currently working in PMU are likely to work in promotion of crop diversification in the target area even after March 2018. However, many staff of PMU are outsourced for the project period, and also DOA officers are transferable as so do many other officials in public sector. Thus, it is advisable for TCP and DOA to take up the recommendations made by the Team seriously to further enhance the prospect of achieving the Overall Goal.

3.2.2. Project Purpose

"The promotion mechanism for crop diversification is established in DOA of Himachal Pradesh (HP)."

The Project Purpose is achieved thanks to the following TCP's major outputs.

- TCP formulated "Guidelines for Crop Diversification in Himachal Pradesh (hereinafter referred to as The Guidelines) based on both experiences of the pilot site, Lahalri and their expertise. The Guidelines consist of two parts, Part I which discusses technical aspects in the six crop diversification themes, i.e. (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing, and Part II which contains practical information for Core Extension Officers (CEOs) to provide farmers with extension services such as procedure of training, technical information on each subject, training curriculum, training materials, etc. In fact, CEOs have started providing extension services by referring and utilizing the Guidelines (second version).

- TCP has made tremendous efforts to enhance the capacity of CEOs primarily through provision of training. By now, more than 70 training sessions were conducted by TCP and nearly 1,500 persons in total participated in them. Such efforts to enhance CEOs' capacity resulted in the fact that currently more than 88.5% of CEOs formulated Agricultural Development Plan (ADP) in a participatory manner and all of them formulated Extension Training Plan (ETP) by using the knowledge obtained at training as well as by referring the Guidelines. (Note: Crop Diversification (CDP) consists of ADP and ETP.)
- The outcome of TCP is designed to be replicated in the sub-project sites of HPCDPP. In fact, CEOs with improved extension skills have initiated extension activities at advanced sub-project sites. They are planned to replicate such extension activities by referring the Guidelines at all the 210 sub-project sites of HPCDPP in the five districts.

The achievement level of the Project Purpose is also verified from its indicator as seen below.

Indicator 1: Extension activities based on the Crop Diversification Model are expanded in five districts. Rephrased as "Extension activities based on the Guidelines which capture the essence of CDM are expanded in five districts."

As depicted in the figure below, TCP defines "Crop Diversification Model (CDM)" as a systemized knowledge consisting of (i) process of six crop diversification themes[1], (ii) techniques in each six theme and (iii) lessons learned from the pilot activities, and details of CDM is described in "Guidelines for Crop Diversification in Himachal Pradesh (hereinafter referred to as The Guidelines). TCP also defines "Mechanism for Crop Diversification (MCD)" as a mechanism consisting of five components, i.e. three components of CDM plus (iv) human resources and (v) institutions. By employing these definitions, the indicator can be rephrased as "Extension Activities based on the Guidelines which capture the essence of CDM are expanded in five districts."

[1] The six crop diversification themes, i.e. (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing,

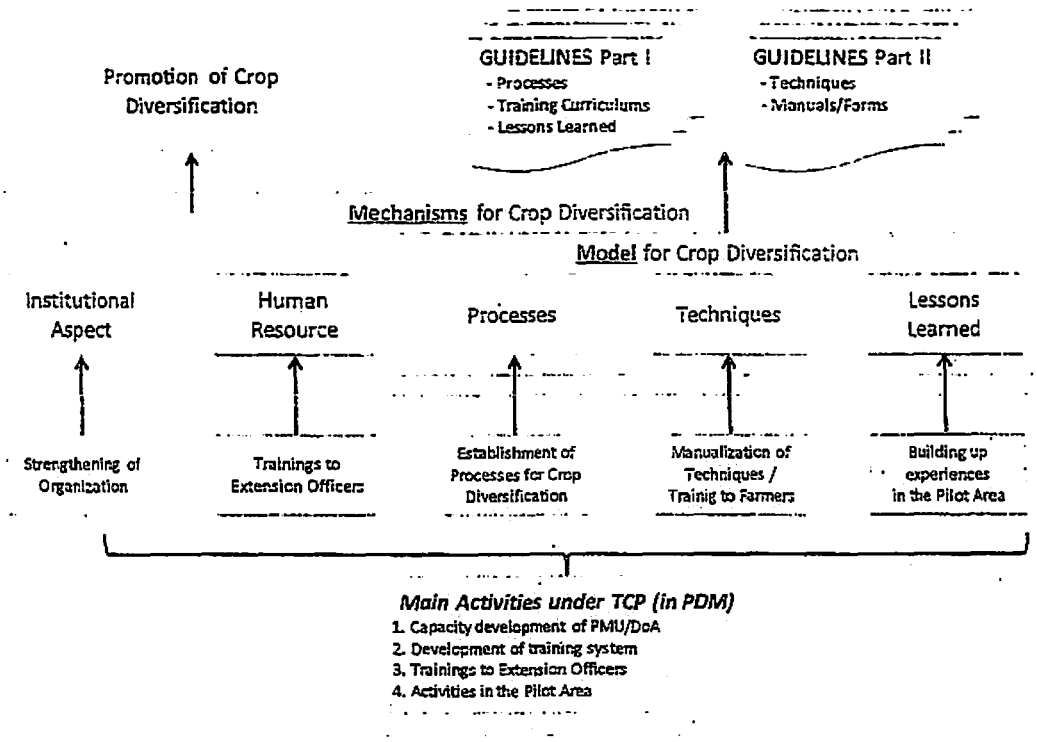


Figure1: Conceptual Framework of MCD and CDM

At the commencement of extension activities, first of all, extension officers need to prepare Crop Diversification Plan (CDP) consisting of Agricultural Development Plan (ADP) and Extension Training Plan (ETP) by referring the Guidelines which capture all the aspects of CDM, and then will start providing extension services. Here, please note that extension activities are defined as follows solely for evaluation purpose.

(i) Extension activities (preparatory phase) : formation of farmers' associations/ formulation of CDP jointly with farmers

(ii) Extension activities (main phase): provision of extension services to farmers based on CDP

Interview survey to the core extension officers (CEOs) conducted by TCP just before this terminal evaluation reveals that 88.5% and 100% of CEOs formulated ADP and ETP respectively[2], and therefore most of the CEOs started extension activities in the preparatory phase. As for extension activities in the main phase, it was initiated in first sub-project site only in Kharif 2015 due to the delay in

[2] There are 30 CEOs as seen in Table 2. and the interview survey covers 29 out of 30 CEOs who has been working in PMU. (One CEO recently joined PMU.) Out of 29 CEOs, 3 are now not in a role to formulate CDP. Thus. the parameter of these percentages is not 29 but 26.

commencement of infrastructure development under HPCDPP[3]. Thus extension activities in the main phase have just started.

As just mentioned, it is true that extension activities in the main phase have just started. However, as for fourth component of MCD, human resources, TCP endeavors to improve CEO's capacity as one of mandates of TCP. (Note: Output 3 is "The extension skill of the core extension officers is improved."). As for the fifth component, institution, PMU is functioning as expected to promote crop diversification in the target area through HPCDPP. Thus it can be concluded that "The promotion mechanism for crop diversification in the target area is established in DOA of Himachal Pradesh (HP)".

3.2.3. Outputs

Output 1. "DOA's capacity to plan and implement crop diversification is strengthened."

Indicator 1-1: Implementation guideline for crop diversification is prepared.

Indicator 1-2: Annual PDCA cycle of crop diversification is formulated, monitored and evaluated. (Note: Annual plan on crop diversification is formulated, monitored and evaluated.)

Currently, Output 1 is being achieved as seen below. In fact, based on the Guidelines, most CEOs formulated CDPs, annual plans of crop diversification, in a participatory manner at 33 sub-project sites, but they have not yet in a position to monitor and evaluate based on PDCA at the time of terminal evaluation. Since the first cycle of crop season, Kharif 2015, ends at around September 2015, CEOs will start monitoring and evaluation as per trained at the training session provided by TCP. Thus CDP will be formulated, monitored and evaluated based on PDCA before the end of TCP and thus Output 1 will be produced.

As for indicator 1-1, the Guidelines are in the process of finalization. The target users of the Guidelines are shown in the table below. As for indicator 1-2, 33 CDPs were formulated based on PDCA concept in 33 sub-projects of HPCDPP, but as just mentioned crop diversification based on CDP was promoted only since Kharif 2015 due to the delay in commencement of infrastructure development, and therefore it is not yet in a position to conduct monitoring and evaluation based on PDCA. Once the first crop season ends, CEOs will start monitoring and evaluation by refereeing the Guidelines.

[3] Under HPCDPP, 210 sub-projects are planned to be carried out. In each sub-project, a irrigation facilities is to be constructed in order to increase irrigated land suitable for crop diversification.

Table1 : Target Users of the Guidelines

Office	Technical Staff of PMU								
	Extension Staff			Engineering Staff			Total		
	DOA	Out-source	Sub-total	DOA	Out-source	Sub-total	DOA	Out-source	Sub-total
1. SPMU	3	1	4	3	2	5	6	3	9
2. DPMU Hamirpur	2	2	4	1	4	5	3	6	9
1.1 BPMU Hamirpur	3	2	5	3	4	7	6	6	12
1.2 BPMU Bilaspur	2	2	4	2	5	7	4	7	11
1.3 BPMU Una	1	2	3	1	6	7	2	8	10
3. DPMU Mandi	2	2	4	1	3	4	3	5	8
2.1 BPMU Mandi	1	2	3	2	5	7	3	7	10
2.2 BPMU Sarkaghat	2	2	4	1	6	7	3	8	11
4. DPMU Palampur	2	2	4	1	4	5	3	6	9
3.1 BPMU Dehra	1	2	3	2	5	7	3	7	10
3.2 BPMU Nurpur	1	2	3	1	5	6	2	7	9
3.3 BPMU Baijinath	2	2	4	2	5	7	4	7	11
Total	22	23	45	20	54	74	42	77	119

(Source) Documents of PMU (as of June 2015)

Output 2. "Training system to promote crop diversification is developed."

Indicator 2-1: Training curriculum and materials are developed after revision in each subject.

Output 2 is satisfactorily produced as seen below.

By interpreting "training system" as "system of extension services provision by CEOs to farmers", TCP have developed training curriculum and materials through (i) reviewing all the existing training materials used in universities, Farmers' Training Centre (FTC), Krishi Vigyan Kendra(KVK), State Agricultural Management and Extension Training Institute (SAMETI) and (ii) incorporating lessons learned in the pilot area, Lahalri. Developed curriculum and materials are all compiled in the part II of the Guidelines, and the Guidelines (2nd edition) have been circulated to all relevant offices (1 SPMU, 3 DPMU and 8 BPMU). Training curriculum and materials compiled in the Guidelines are currently in use by the advanced sub-projects, and therefore it can be concluded that the output 2 is produced.

Output 3. "The extension skill of the core extension officers is improved."

Indicator 3-1: Eighty percent (80%) of the core extension officers (CEOs) can conduct famers' training by themselves on the various technologies.

Indicator 3-2: Fifty percent (50%) of the core extension officers can launch extension activities in the areas they cover.

Output 3 is also satisfactory achieved as seen below.

As for indicator 3-1, all the CEOs started conducting farmers' training by themselves although for the limited subjects. Since the irrigation facilities are completed in only 29 sub-projects out of 210, most of the farmers' training is regarding formation of KVA and etc. which are suitable to conduct even before the availability of irrigated water. As for indicator 3-2, 88.5% and 100% of CEOs formulated ADP and ETP respectively and therefore it is clear well over 50% of CEO indeed launched extension activities in the areas they cover.

Table 2 : CEOs of PMU

Offices	CEOs		
	DOA	Out-source	Total
1. DPMU Hamirpur	2	1	3
1.1 BPMU Hamirpur	2	2	4
1.2 BPMU Bilaspur	1	2	3
1.3 BPMU Una	0	2	2
2. DPMU Mandi	1	2	3
2.1 BPMU Mandi	0	2	2
2.2 BPMU Sarkaghat	1	2	3
3. DPMU Palampur	1	2	3
3.1 BPMU Dehra	0	2	2
3.2 BPMU Nurpur	0	2	2
3.3 BPMU Baijinath	1	2	3
Total	9	21	30

(Source) Documents of PMU (as of June 2015)

Output 4. "Crop diversification model is developed and practiced in the Pilot area."

Indicator 4-1: Thirty percent (30%) of the farmers or 20% of CCA in the pilot area undertake vegetable cultivation.

Indicator 4-2: Thirty percent (30%) of farmers in the pilot area can increase their income by the Project.

Indicator 4-3: SHGs in the pilot area can increase their income by their group activities.

Indicator 4-4: Irrigation facilities in the pilot area are properly maintained by farmers.

Output 4 is satisfactory produced as seen below.

As previously noted, TCP defines "Crop Diversification Model (CDM)" as a systemized knowledge

consisting of (i) process of six crop diversification themes[5], (ii) techniques in each six theme and (iii) lessons learned from the pilot activities, and CDM was indeed developed through the pilot activities, and it is also articulated in the Guidelines.

In addition, four indicators show the positive results. As for indicator 4-1, vegetable cultivation has started since Rabi 2012/13 after the completion of irrigation facility in November 2012, and number of farmers who started vegetable cultivation is in the upward trend both in Rabi and Kharif. As for indicator 4-2, the income of farmers who started vegetable cultivation (30% of all the farmers in the area) is increased. As for 4-3, 3SHGs increased their incomes by their group activities, such as group farming, food processing and nursery rising. Also, despite the fact that the support from TCP is gradually reduced, they continue their group activities and their capacity to sustain activities is being increased. As for indicator 4-4, through the supports from TCP, KVA called Gagan Memorial Krishak Vikas Association (GMKVA) was officially formed and the irrigation facility constructed by TCP was handed over to GMKVA in April 2013. GMKVA established the mechanism of operation such as appointing a pump operator and a water distribution coordinator and defining their duties and carried out water distribution as per planned. GMKVA also started maintenance activities such as minor repairs and cleanings. Irrigation facility in the site is indeed well maintained. By considering all these, it can be said that the achievement level of output 4 is by and large satisfactory.

3.2.4. Implementation Process

No critical issues were observed in the implementation process. At the topmost level, the joint coordinating committee (JCC) meetings chaired by the Additional Chief Secretary of Agriculture and participated by DOA officials were held seven times by now to supervise the overall progress of TCP. In addition to the formal communication at the JCC level, other formal meetings such as C/P meetings and monthly project management committee meetings were held regularity and the progress and the concerned issues were shared among TCP and HPCDPP. Basically TCP experts and DOA officials of PMU communicated formally as well as informally and well shared information. Thus, as already noted, no critical issues were observed in implementation process.

[5] Six crop diversification themes are (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing.

Chapter 4 EVALUATION BY FIVE CRITERIA

4.1. Relevance (High)

The Team concluded that TCP remains highly relevant in terms of the policies of the national and state government, policy directions of GOJ and the needs of the C/P agencies, as detailed below.

The 12th Five Year Plan (2012-2017) pointed out the enhancement of productivity is one of the priorities issues in agricultural sector. Also, the Five Year Plan (2012-2017) of Himachal Pradesh highlights 7 issues as objectives in agricultural sector during this five-year-plan period, and they include increase of production and productivity and diversification for higher farm income. Thus TCP is consistent with both the national and state development policies in agricultural sector.

Rolling Plan for Project Planning for India (June 2011) prepared by the Ministry of Foreign Affairs in Japan identifies several priority areas, and one of them is "support for poverty alleviation". It says that (1) to enhance productivity (2) to develop agricultural infrastructure and (3) to generate employment opportunity in rural area are focused issues under the priority area of "support for poverty alleviation", and TCP which contributes all three aspects is considered as an important project.

Main C/P, PMU, is promoting crop diversification in the target 5 districts. Under HPCDPP, PMU is responsible for construction of irrigation facilities, organizing farmers, formulating CDP and providing extension services to farmers in 210 sub-project sites in line with CDP. TCP provides CEOs of PMU with opportunities to develop their capacities, i.e. both on and off-site training. With CEOs who improved their capacity, PMU could implement HPCDPP smoothly. The project's components are highly needed by PMU.

4.2. Effectiveness (High)

The Team concluded that effectiveness is secured at the satisfactory level at the time of terminal evaluation, thanks to the efforts made by TCP jointly with PMU especially after the commencement of the construction of irrigation facilities.

TCP consists of four outputs, i.e. Output 1 which aims to strengthen DOA's capacity to formulate and implement crop diversification plan in the five target districts. Currently, based on the Guidelines, most CEOs have actually formulated CDPs at 33 sub-project sites. They have not yet monitored and evaluated

based on PDCA at the time of terminal evaluation, though. However, since the first cycle of crop season, Kharif 2015, ends at around September 2015, CEOs will start monitoring and evaluation as per trained at the training session provided by TCP. Thus CDP will be formulated, monitored and evaluated based on PDCA before the end of TCP. Both Output 2 and Output 3 which contribute to capacity development of extension officers are successfully produced through developing training system and in fact imparting training sessions to enhance CEOs' skill to promote crop diversification. Lastly, Output 4 which aims to develop a model by capturing all the experiences at the pilot site is also produced through intensive activities of TCP experts at the pilot site. Since the both achievement levels of the Project Purpose and the four outputs are considered satisfactory, TCP is highly effective.

4.3. Efficiency (Moderate)

A number of activities have been carried out and the outputs are being produced as mostly planned. In addition, the interview surveys reveal that overall satisfaction towards inputs such as human resources, trainings and the provided equipment is high. However,

Human Resources (TCP experts and C/P)

By considering the effective implementation of CDP in collaboration with HPCDPP, the experts who are specialized in 6 areas which are thematically important for crop diversification in HP, i.e. (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing have been dispatched. From the interview with several technical staff of PMU, the main target of technological transfer, it became clear that they considered their expertise and duration of stay are appropriate and also they think that TCP's supports as essential for smooth implementation of their duties (implementation of HPCDPP). Thus inputs form TCP, number of experts and their expertise can be concluded as appropriate. (As for the assignment of experts and their expertise, please see the annex of the Evaluation Report.)

Adequate numbers of C/Ps with appropriate technological background were assigned. As previously noted, the target of technological transfer of TCP is more than 100 technical staff of PMU, and most of them have either experience or knowledge, sometimes both, in agriculture, and therefore they have basic foundation to absorb and utilize technical knowledge and transferred technology.

Training in Japan

Eight members of PMU who are DOA officials participated in training in Japan from 29 June 2014 to 10

July 2014 as per annexed to the Evaluation Report. The training course covered five important themes namely, agricultural extension, vegetable farming and post-harvest, water management and O&M of irrigation facilities, gender and marketing. Geographically, they have visited Nagano prefecture whose climate is similar to HP and Chiba prefecture where peri-urban agriculture flourishes.

During the terminal evaluation, the evaluation team interviewed two out of eight. They listed up what they have seen in Japan, i.e. farming technologies in each prefecture, activities of JA, activities of women's cooperatives, agricultural-related business activities initiated by farmers. They said what they have seen in Japan enabled them to delineate a future vision of HP's agricultural development.

Equipment

The biggest physical input of TCP is irrigation facility, and this input is essential for every activity in the pilot site, Lahalri, and therefore highly utilized. In addition, equipment input by TCP, office equipment such as computer, printer, etc., is in full use now.

Lastly, the delay in commencement of infrastructure development under HPCDPP partially affects the efficiency. TCP will terminate before HPCDPP becomes fully in progress. In other words, if the sub-projects have been completed in time, then TCP could have provided technical supports to more CEOs working in such sub-projects. Thus, the overall efficiency of TCP is moderate.

4.4. Impact (High)

The Team can conclude that the Overall Goal remains achievable thanks to the efforts being made by both TCP and HPCDPP, as seen below.

In the target area, CCA will surely expand up to certain extent because of 210 irrigation facilities under HPCDPP. From now on, CEOs with enhanced extension skill start replicating crop diversification activities, i.e. formulation CDP, providing trainings on farmers, etc. at all the sub-project sites by referring the Guidelines. Thus, the path to the Overall Goal is set out.

In addition, the following positive impacts are observed by the Team.

- Through the training provided to extension officers of 7 non-HPCDPP districts, some transferred technology is likely to be used even beyond the target areas.
- When introducing farming technology, TCP did introduce a very new technology to Himachal

Pradesh, i.e. grafting. For example, a farmer in Lahalri who tried out grafting technology received a "Best Farmers Award" from the state government and the prize was awarded from the Governor.

- The same technology was highly appreciated by the Agricultural University of HP. With the government's financial assistance, the University imported two semi-automatic grafting machines and started research on grafting.
- In Lahalri as well as the sub-pilot sites the evaluation team visited, farmers confirmed that fodder crop was raised even during dry season thanks to the irrigation, and the availability of fodder throughout the year rise their income through increment of milk production.

4.5. Sustainability (Moderate)

The Team concluded that the sustainability is being enhanced thanks to the joint endeavor of TCP and PMU/DOA as seen below. Sustainability especially in terms of organizational and institutional aspect will be further firmly secured by taking up the recommendations of this terminal evaluation by TCP, PMU/DOA.

Organizational and institutional aspect

Main C/Ps of TCP are technical staff of PMU, an organization established to implement HPCDPP. Some of those who are currently working in PMU, especially those who are seconded from DOA, are expected to continue their extension activities at the target areas. Moreover, TCP and PMU jointly endeavor to secure sustainability as follows:

i) Regarding the Guidelines, a major output of TCP, TCP starts discussing acknowledgement of the Guidelines with DOA and also plans to invite five DDA for the explanatory workshop at the time of releasing the final version of the Guidelines.

ii) Along with the progress of HPDCP, PMU starts developing a channel to communication with DDAO in the target area. For example, PMU officers attended a monthly meeting of DDAO Hamirpur to inform the progress of HPCDPP in Hamirpur District, and request DDA to send his extension officers to the sub-project sites to share the experience of HPDCPP.

iii) PMU officially appointed Master Trainers as per recommendation of the mid-term evaluation. Currently eight BPMs and eight AEOs and three DPM are appointed as master trainers officially. All of them are seconded from DOA.

iv) DOA committed to hire 150 persons mainly as extension officers; Many of CEOs who are outsourced are likely to apply for the posts. Once they are hired, they are likely to internalize what they have learned from TCP into DOA.

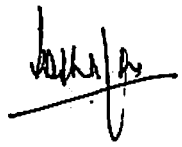
As seen above, serious efforts were made and are to be made by DOA, PMU and TCP, and in fact it helps tremendously to secure sustainability of TCP.

Financial aspect

DOA is a state nodal agency to promote agricultural development. Moreover, promotion of crop diversification is a key area of their activities, and therefore DOA is highly likely to secure budget to continue promoting crop diversification. As mentioned earlier, DOA committed to hire 150 new graduates. This self-evidently shows that DOA is likely to secure enough budgets (incl. personnel expenses).

Technical aspect

As stated in the section of "Efficiency", varieties of activities, i.e. infrastructure development construction of irrigation facilities, formation of KVA and SHGs, demonstration activities with progressive farmers, etc. were carried out at the pilot site, Lahalri. Based on experiences of the pilot site, TCP team conducted training activities which are highly practical and needed at the ground-level and enhanced capacity of CEOs. Currently, they are actively working, i.e. formulating CDP, etc., in sub-project sites of HPCDPP.



Chapter 5 CONCLUSIONS

5.1. Results of Terminal Evaluation

DOA, HP and JICA's collaboration started way back in 2007, when "The Study on Diversified Agriculture for Enhanced Farm Income in the State of Himachal Pradesh (January 2007 to March 2009)" was inaugurated. This long-term professional relationship created rapport and mutual trust. Under such a favorable atmosphere, TCP has been implemented since March 2011 for the period of five years with the Project Purpose to establish the promotion mechanism for crop diversification in DOA in five target districts of HP.

The major achievements of TCP until the time of Terminal Evaluation include, but are not limited to, the following:

- TCP formulated The Guidelines based on both experiences of the pilot site, Lahalri and their own expertize. In fact, currently CEOs use the Guidelines (second version) to provide extension services in some advanced sub-project sites. Once the final version of the Guideline is released in September, and once HPCDPP becomes fully in progress, the Guidelines will be utilized to promote crop diversification in more sites.
- TCP has made tremendous efforts to enhance the capacity of CEOs primarily through provision of training. For, example, most of CEOs have already formulated ADP and ETP by using the knowledge obtained at training as well as by referring the Guidelines.
- The outcome of TCP is designed to be replicated in the sub-project sites of HPCDPP. In fact, CEOs with improved extension skills have initiated extension activities at advanced sub-project sites. They are planned to replicate such extension activities by referring the Guidelines at all the 210 sub-project sites of HPCDPP in the five districts..

It is observed that the Indian C/Ps, primarily the technical staff of PMU, have been making efforts to collaborate with TCP since the early stage of the project. It is also worth mentioning that most of the recommendations made at the time of Mid-term Review have been carried out and produced positive impacts.

Considering the above circumstances, the Team is of the opinion that TCP has been progressing well and the Project Purpose will be fully achieved with continued efforts of the people concerned. In conclusion, the Team therefore suggests that TCP be terminated as planned.

5.2. Recommendations and Actions to be taken

1. Notification of the Guidelines to all 12 DDAOs and Block-level offices

The Guidelines for Crop Diversification in Himachal Pradesh (The Guidelines) will be finalized soon in September 2015. The Team recommends Director of Agriculture shall approve and distribute the Guidelines to all DDAOs and Block-level offices under each DDAO with recommendation to make full use of the Guidelines in order to widely share the learnings of TCP.

2. Dissemination of the leanings and experiences of TCP within DOA

Distributing the Guidelines to DDAOs is not enough but the importance of the Guidelines shall be well understood by DDA. The Team recommends DOA shall assign core extension officers trained under TCP to each district and block-level for transferring technologies and knowledge through core extension officers, especially through Master Trainers, at the both district and block-level after dissolution of PMU in March 2018, and their activities shall be properly monitored by DDA.

3. Annotation to PDM

TCP defines "Crop Diversification Model (CDM)" as a systemized knowledge consisting of (i) process of six crop diversification themes, (ii) techniques in each six theme and (iii) lessons learned from the pilot activities, and details of CDM is described in The Guidelines. However, there are still discrepancies in understanding on CDM among the relevant officials due to the ambiguity of the word "model", and therefore the Team recommend to rephrase the indicator of the Project Purpose as "Extension Activities based on the Guidelines which capture the essence of CDM are expanded in five districts." This point is annotated as seen in the Annex III of the Evaluation Report.

4. Further JICA's cooperation

TCP has focused on production side of crop diversification. Once vegetable cultivation gain momentum successfully, both production itself and marketable surplus will increase, and therefore it becomes necessary to strengthen marketing and sales supports to farmers. By considering these issues, further JICA's cooperation on this matter must be effective and necessary. In addition, further JICA's cooperation to production may be effective to ensure quality expansion of extension activities based on the Guideline and actual crop diversification by farmers in the five districts.

5.3. Lessons Learned

1. Effective collaboration between ODA-loan project and technical cooperation project

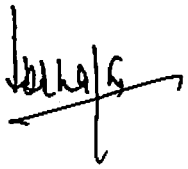
The design that the outcome of TCP is extended to and utilized in the sub-project sites of an ODA-loan project is well-functioning to achieve a concrete common goal "to promote crop diversification in the sub-pilot sites of the Loan" for PMU officers and TCP experts.

2. Selection of pilot sites

The pilot site of TCP, Lahalri, was selected based mainly on applicability of irrigation technology. In Lahalri, many farmers are part-time and not many farmers are interested in labor-intensive vegetable cultivation. For selection of pilot sites, it is highly advisable to look at not only technological side but also non-technological side such as motivation of farmers, activeness of village leaders, activeness of group activities.

3. Number of pilot sites

Single pilot site, Lahalri, was selected under TCP. As noted in "Selection of pilot sites", Lahalri has rather unique features and therefore the TCP team has faced difficulties in generalizing what they have learned in the pilot site. As many pilot sites as possible should have been established instead of the single site to develop crop diversification model as the variety of experiences and lessons learned in different conditions of different pilot sites could create more enhanced and diffusive model.



Annex 1: Project Design Matrix (PDM)

Project Name : Technical Cooperation Project for Crop Diversification in Himachal Pradesh | Duration: 5 years | Ver. 01
Target Area: State of Himachal Pradesh | Target Group: Core Extension Officers | Date: Oct. 2013

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal (Target at 5 years after the end of the Project) Crop diversification is promoted in the target area based on the advantageous climate conditions	(After 5 years of completion of the project) (1) 20% of total cultivated land in the target area is diversified to the vegetable	(1) Agricultural census by DOA / Other reports	
Project Purpose (Target at the end of the Project) The promotion mechanism for crop diversification is established in DOA Himachal Pradesh.	(1) Extension activities based on the Crop Diversification Model are expanded in 5 districts.	(1) Monitoring survey carried out by the Project	- RIDF project is continued on the same scale - No severe decline in agriculture production price
Outputs 1. DOA*1's capacity to plan and implement crop diversification is strengthened.	(1)-1 Implementation guideline for crop diversification is prepared. (1)-2 Annual PDCA cycle of crop diversification functions in DOA*1. (i.e. Annual Plan on crop diversification is formulated, monitored and evaluated.)	(1)-1 Check the output (1)-2 Monitoring survey carried out by the Project	- No severe decline of the state government budget on the agriculture development and support - No severe decline in agriculture production price
2. Training system to promote crop diversification is developed.	(2)-1 Training curriculum and materials are developed after revision in each subject.	(2)-1 Check the output	
3. The extension skill of the core extension officers is improved.	(3)-1 80% of the core extension officers can conduct farmers' training by themselves on the various technologies. (3)-2 50% of the core extension officers can launch extension activities in the areas they cover.	(3)-1 Monitoring survey carried out by the Project (3)-2 - do -	
4. Crop diversification model is developed and practiced in the Pilot area.	(4)-1 30% of the farmers/20% of CCA in the pilot area undertake vegetable cultivation. (4)-2 30% of farmers in the pilot area can increase their income by the Project. (4)-3 SHGs in the pilot area can increase their income by their group activities. (4)-4 Irrigation facilities in the pilot area are properly maintained by farmers	(4)-1 - do - (4)-2 - do - (4)-3 - do - (4)-4 - do -	

Annex 1: Project Design Matrix (PDM)

Activities

1-1. Review the existing plan on crop diversification and study, how the pilot project should be.
1-2. Conduct Plan-Do-Check-Act training on crop diversification
1-3. Facilitation in the preparation of annual plan on crop diversification
1-4. Develop Crop Diversification Guideline based on the lesson learned from crop diversification model practiced in the Pilot Area and Sub-pilot Area

2-1. Formulate annual plan on extension training
2-2. Review the existing training curriculum and materials on extension
2-3. Develop training curriculum and materials on extension of crop diversification
2-4. Revise curriculum and materials incorporating feedback from the Pilot Project

3-1. Conduct hands-on training to core extension officers assigned to the pilot area and highlited 5 districts (Kangra, Una, Hamirpur, Bilaspur and Mandi) on:
- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Infrastructure development/operation and maintenance

3-2. Conduct trainings for extension officers in Sub-Pilot Areas (Government of Himachal Pradesh will establish Sub-Pilot Areas by its own budget)

4-1. Conduct baseline survey
4-2. Selection of a pilot area to be approved by JCC
4-3. Construct irrigation facilities and prepare demonstration plot in the pilot area.
4-4. Organize farmers groups and Self-help groups
4-5. Conduct trainings for farmers on:
- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Operation and maintenance

Inputs

<Japanese Side>
1) Experts
- Chief Advisor / Agriculture Extension
- Water Management / Operation and Maintenance
- Crop Cultivation / Post Harvest
- Training / Project Coordination
- Gender / Social Inclusion
- Design & Construction Management

2) Training for beneficiaries and Himachal Pradesh C/Ps
3) Cost for project office management (personnel, equipment, and consumables)
4) Cost for construction of pilot area and preparation of demonstration plot
5) Equipments for project management, if necessary

<Himachal Pradesh Side>
1) Counterparts (from Shimla Headquarter to field level)
2) Necessary transport and other expenditures for counterparts
3) Project office at Shimla and site
4) Sharing of project office running expenses
5) Tax exemption measures, etc.

<Abbreviation>

DOA: Department of Agriculture, Government of Himachal Pradesh
PMU: Project Management Unit
DPMU: District Project Management Unit
BPMU: Block Project Management Unit
TCP: Technical Cooperation Project
CCA: Cultivable/Culturable Command Area
SHG: Self Help Group

- Proposed ODA Loan Project is implemented on schedule
- No disaster is occurred (drought / flood)
- No policy change in the agriculture

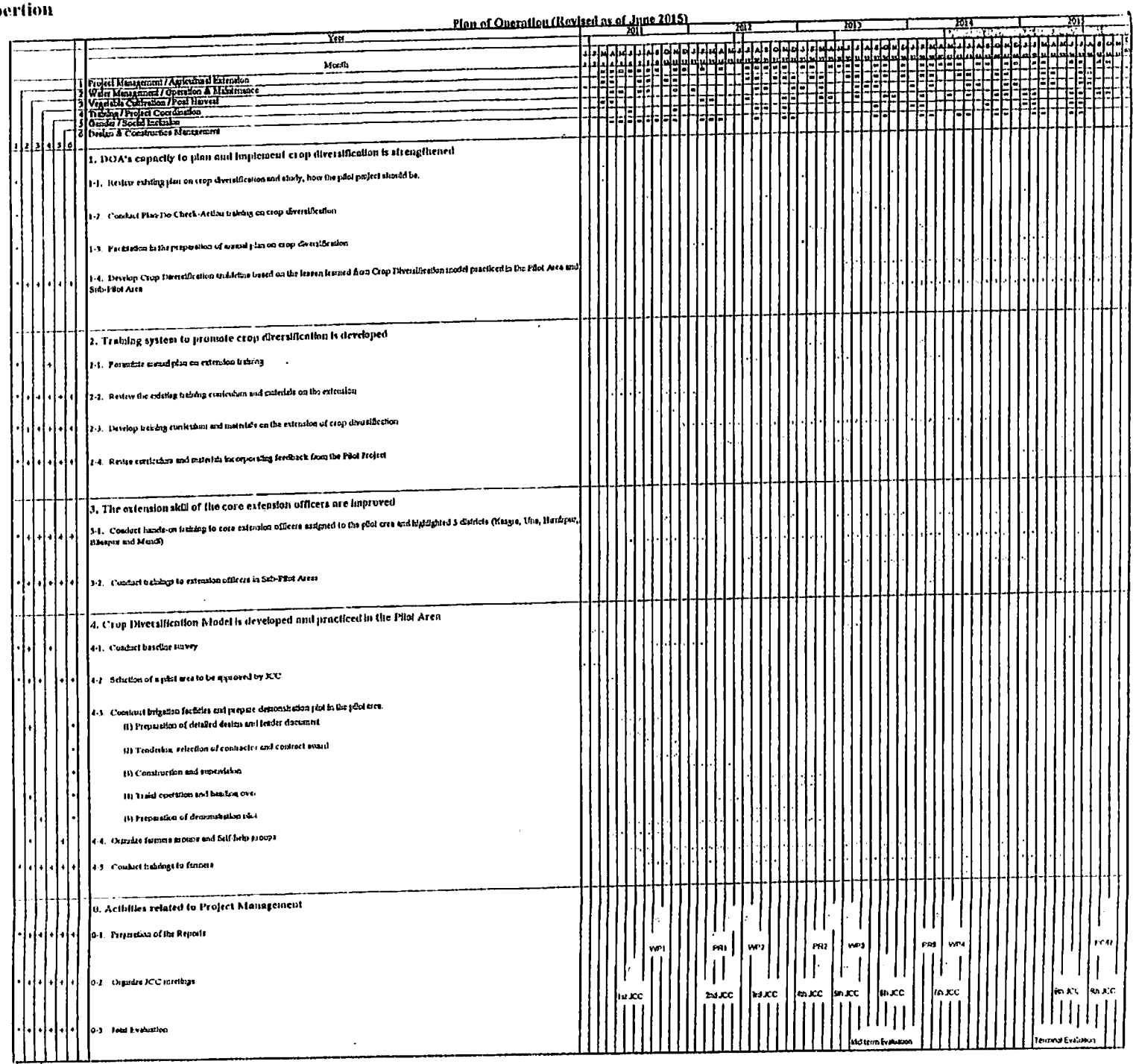
Pre-conditions

- There is a need on the agriculture development in the state
- There is the budget to bear the counterpart budget for project implementation in the State

Gender and social inclusion should be considered in every activity as well as measured by objectively verifiable indicators
*1 The Target group will be the core extension officers of PMU staffs

Annex 2: Plan of Operation

Plan of Operation (Revised as of June 2015)



Legend
* Main person in charge
› Responsible for the part of specialty

Original Plan
Actual
Revised Plan on June 2015

Annex 3: Evaluation Grid (Results)

India **Terminal Evaluation of the Technical Cooperation Project for Crop Diversification in Himachal Pradesh** 2015.07.08

	Evaluation Questions		Result
	Questions	**Sub-questions (indicators)**	
Verification of performance	**Achievement of Overall Goal** Crop diversification is promoted in the target area based on the advantageous climate conditions.	1. Twenty percent (20%) of total cultivated land in the target area is diversified to the vegetable.	In the target area, CCA will surely expand up to certain extent because of 210 irrigation facilities under ODA-loan "Himachal Pradesh Crop Diversification Promotion Project (HPCDPP)", and therefore crop diversification is expected to be further promoted through "the promotion mechanism for crop diversification" developed by this Technical Cooperation Project (TCP) during the project period. Thus, the path to the Overall Goal is set out. However, despite the fact that the adoption process is slower in agricultural sector PMU, an institution, which is one of five components of "Mechanism for Crop Diversification" (as detailed later), exists only till the end of HPCDPP, March 2018. Some DOA officers who are currently working in PMU are likely to work in promotion of crop diversification in the target area even after March 2018. However, many staff of PMU are outsourced for the project period, and also DOA officers are transferable as so do many other officials in public sector. Thus, it is advisable to discuss how to achieve the overall goal at this occasion of the terminal evaluation.
	Achievement of Project Purpose The promotion mechanism for crop diversification is established in DOA of Himachal Pradesh (HP).	1. Extension activities based on the Crop Diversification Model are expanded in five districts (Note: The indicator can be rephrased as "Extension activities based on the Guidelines which capture the essence of CDM are expanded in five districts.")	TCP defines "Crop Diversification Model (CDM)" as a systemized knowledge consisting of (i) process of six crop diversification themes, (ii) techniques in each six theme and (iii) lessons learned from the pilot activities, and details of CDM is described in "Guidelines for Crop Diversification in Himachal Pradesh (The Guidelines). TCP also defines "Mechanism for Crop Diversification (MCD)" as mechanism consisting of five components, i.e. three components of CDM plus (iv) human resources and (v) institutions. By employing these definitions, the indicator can be rephrased as "Extension Activities based on the Guidelines which capture the essence of CDM are expanded in five districts." At the commencement of extension activities, first of all, extension officers need to prepare Crop Diversification Plan (CDP) consisting of Agricultural Development Plan (ADP) and Extension Training Plan (ETP) by referring the Guidelines which capture all the aspects of CDM, and then will start providing extension services. Also, as detailed in later, solely for evaluation purpose, extension activities are defined as follows.

			(i) Extension activities (preparatory phase) : formation of farmers' associations/ formulation of CDP jointly with farmers (ii) Extension activities (main phase): provision of extension services to farmers based on CDP Interview survey to the core extension officers (CEOs) conducted by TCP just before this terminal evaluation reveals that 88.5% and 100% of CEOs formulated ADP and ETP respectively, and therefore most of the CEOs started extension activities in the preparatory phase. As for extension activities in the main phase, it was initiated in first sub-project site only in Kharif 2015 due to the delay in commencement of infrastructure development under HPCDPP. Thus extension activities in the main phase have just started. As mentioned above, it is true that extension activities in the main phase have just started. However, as for fourth component of MCD, human resources, TCP endeavors to improve CEO's capacity as one of mandates of TCP. (Note: Output 3 is "The extension skill of the core extension officers is improved."). As for the fifth component, institution, PMU is functioning well to promote crop diversification in the target area through HPCDPP. Thus it can be concluded that "The promotion mechanism for crop diversification in the target area is established in DOA of Himachal Pradesh (HP)". (Note: There is a concern how to ensure the sustainability after March 2018 since PMU is a non-permanent institution established solely to implement HPCDPP till March 2018. This will be discussed separately later.
	Achievement of Outputs 1. DOA's capacity to plan and implement crop diversification is strengthened.		As for indicator 1-1, the Guidelines are in the process of finalization. As for indicator 1-2, 33 CDP were formulated based on PDCA concept in 33 sub-projects of HPCDPP, but due to the delay in commencement of infrastructure development, crop diversification based on CDP was promoted only since Kharif 2015, and therefore it is not yet in a position to conduct monitoring and evaluation based on PDCA. However, TCP provided series of training which include monitoring and evaluation techniques based on PDCA, and therefore it is likely that all the sub-projects will be planed and implemented in accordance with PDCA. It is worth noting here that also the output question "DOA's capacity", it is logical and important first to focus on "DOA's capacity in the five target districts" since the project purpose and the overall goal

1－1
Implementation guideline for crop diversification is prepared.

aim at the target area. Staff of PMU, the target of technological transfer under TCP, consists of DOA officials and outsourced persons, and their capacity to plan and implement crop diversification is indeed being strengthened.

The Guidelines consist of two parts, Part I which discusses technical aspects in the six crop diversification themes, i.e. (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing, and Part II which contains practical information for CEOs to provide farmers with extension services such as procedure of training, technical information on each subject, training curriculum, training materials, lessons learned in the TCP pilot site, etc.

The Guidelines (second version) are currently in use by CEOs in the selected sub-pilot site of HPCDPP. Then, it is soon to be used widely in all the sub-pilot sites by more than 100 officials in PMU. In addition, the Guidelines are prepared by considering the applicability beyond the sub-project sites, and therefore it can be widely used in other areas once the Guidelines are officially acknowledged by DOA.

Table1 : Target Users of the Guidelines

Office	Technical Staff of PMU								
	Extension Staff			Engineering Staff			Total		
	DOA	Out-source	Sub-total	DOA	Out-source	Sub-total	DOA	Out-source	Sub-total
1. SPMU	3	1	4	3	2	5	6	3	9
2. DPMU Hamirpur	2	2	4	1	4	5	3	6	9
1.1 BPMU Hamirpur	3	2	5	3	4	7	6	6	12
1.2 BPMU Bilaspur	2	2	4	2	5	7	4	7	11
1.3 BPMU Una	1	2	3	1	6	7	2	8	10
3. DPMU Mandi	2	2	4	1	3	4	3	5	8
2.1 BPMU Mandi	1	2	3	2	5	7	3	7	10
2.2 BPMU Sarkaghat	2	2	4	1	6	7	3	8	11
4. DPMU Palampur	2	2	4	1	4	5	3	6	9
3.1 BPMU Dehra	1	2	3	2	5	7	3	7	10
3.2 BPMU Nurpur	1	2	3	1	5	6	2	7	9
3.3 BPMU Baijinath	2	2	4	2	5	7	4	7	11
Total	22	23	45	20	54	74	42	77	119

			(Source) Documents of PMU (as of June 2015) First version of the Guidelines is drafted by TCP experts in August 2014. After that, the second version which incorporated all the feedbacks from CEOs was drawn up in February 2015. Currently this second version of the Guidelines is in use by CEOs in the field. After revising the second version based on the feedbacks from CEOs once again, the final version is going to be presented in September 2015.
		1－2 Annual PDCA cycle of crop diversification is formulated, monitored and evaluated. (Note: Annual plan on crop diversification is formulated, monitored and evaluated.)	Annual plan of crop diversification is called Crop Diversification Plan (CDP) which consists of Agricultural Development Plan (ADP) and Extension Training Plan (ETP). In response to the recent request from PMU, the needs of Implementation Plan (IP) to ensure implementation of CDP is discussed and shared by both PMU and CTP, and IP is now annexed to CDP. As seen in the annex of the evaluation report, TCP provided substantial amount of training on formation of ADP, ETP and IP as well as on PDCA. As of May 2015, construction of irrigation facilities was completed in 29 sub-project sites, and is in progress in 34 sub-project sites. Also, it is just started in 30 sub-project sites. CDP is already formulated for 33 sub-projects. (Please note that some of the sub-project sites with completed irrigation have not formulated CDP yet, while others where the construction is ongoing have already prepared CDP in order to be ready for crop diversification right after the completion of the construction.) By considering the fact that CEOs have undergone enough training on PDCA and CDP formulation, and in fact 33 CDP has been formulated in 33 sub-projects, crop diversification plan, CDP, is actually formulated based on PDCA. However, as mentioned previously, crop diversification based on CDP was promoted only since Kharif 2015, and therefore CEOs are not yet in a position to conduct monitoring and evaluation based on PDCA.

Annex 3: Evaluation Grid (Results)

2. Training system to promote crop diversification is developed.	2 – 1 Training curriculum and materials are developed after revision in each subject.	TCP have developed training curriculum and materials by interpreting "training system" as "system of extension services provision by CEOs to farmers". Developed curriculum and materials are all compiled in the part II of the Guidelines, and the Guidelines (2nd edition) have been circulated to all relevant offices (1 SPMU, 3 DPMU and 8 BPMU). Training curriculum and materials compiled in the Guidelines are currently in use by the advanced sub-projects, and therefore it can be concluded that the output 2 is produced. TCP developed training curriculum and materials by (i) reviewing all the existing training materials used in universities, Farmers' Training Centre (FTC), Krishi Vigyan Kendra(KVK), State Agricultural Management and Extension Training Institute (SAMETI) and (ii) incorporating lessons learned in the pilot area (Lahaul).
3. The extension skill of the core extension officers is improved.	3 – 1 Eighty percent (80%) of the core extension officers can conduct famers' training by themselves on the various technologies.	As for indicator 3-1, all the CEOs started conducting farmers' training by themselves although for the limited subjects. As for indicator 3-2, it is clear that the extension activities in the preparatory phase are initiated. In addition, CEOs are trained on various technologies through TCP and enhanced their capacity to conduct farmers' training. Thus the extension skill of CEOs is indeed improved. Extension activities in the field are carried out CEOs listed in the table below. Table 2 : CEOs of PMU

Offices	CEOs		
	DOA	Out-source	Total
1. DPMU Hamirpur	2	1	3
1.1 BPMU Hamirpur	2	2	4
1.2 BPMU Bilaspur	1	2	3
1.3 BPMU Una	0	2	2
2. DPMU Mandi	1	2	3
2.1 BPMU Mandi	0	2	2
2.2 BPMU Sarkaghat	1	2	3
3. DPMU Palampur	1	2	3
3.1 BPMU Dehra	0	2	2
3.2 BPMU Nurpur	0	2	2
3.3 BPMU Baijinath	1	2	3
Total	9	21	30

(Source) Documents of PMU (as of June 2015)

TCP has provided 29 CEOs with various training sessions as well as on-site training opportunities as listed in the annex of the evaluation report in both (i) technical side such as infrastructure development, water management, O&M of irrigation facilities, farming techniques and (ii) non-technical side such as PDCA cycle and institutional development of KVAs and SHGs in order to enable them to conduct farmers training by themselves. (One CEO is recently joined in PMU, thus not included in the above discussion.)

Interview survey to the 29 CEOs conducted by TCP just before this terminal evaluation reveals that all of them have started farmers training by themselves. Since the irrigation facilities are completed in only 29 sub-projects out of 210, most of the farmers' training is regarding formation of KVA and etc. which are suitable to conduct even before the availability of irrigated water. However, it is also known from the interview to PMU that in some sub-pilot sites, the farmers' training on vegetable farming has been conducted in response to the farmers' requests.

【Sub-project H-1002 (LIS) Panjahli Village】
On 30th June 2015, the evaluation team visited Panjahli village where the irrigation facility was completed in February 2013, and vegetable cultivation has been started since Rabi 2014. Number of benefited households are 31 and all of them are member of KVA. As much as 20 out of 31 benefitted households have started vegetable cultivation. Water user fee is Rs.40 per hour for KVA members and Rs.60 per hour for non-members. All the KVA members also pays Rs.20 monthly and collected amount is saved as Institutional Development Fund of KVA, which will be used for O&M.

The evaluation team interviewed CEOs who are in charge of this sub-project site, and also checked the CDP (draft). CEOs are now preparing ADP and ETP through participatory consultation with farmers. Since the irrigation facilities was completed here, training on institutional development of KVA and SHG as well as O&M of the irrigation facilities were conducted by CEOs.

【Sub-project G-1011 (LIS) Kahali Village】
On 1st July 2015, the evaluation team visited Kahali village where the irrigation facility was completed in January 2015, and vegetable cultivation has been started since Kharif 2015. Number of benefited households are 21 and all of them are member of KVA. Since crop diversification is just

			started in this season, currently 1.48 ha out of 15.65 ha of CCA is converted to vegetable cultivation. It is approximately 1% but the figure is in fact more than the planned in CDP for this Kharif 2015. (The evaluation team received a copy of CDP.) Water user fee is Rs.100 per hour. Currently more than Rs.50,000 are saved in KVA's account which will be used for O&M. At this sub-project site, the evaluation team interacted with KVA members and SHG members to see how farmers' training provided by CEOs are accepted by villagers, and if training was considered as practical and useful for them. The answers from KVA members and SHG members are very positive, and it became known that many benefited households are now ready for crop diversification along with individual crop diversification plan since they are confident enough for successful crop diversification thanks to water and knowledge. (CDP is a compilation of crop diversification plans of individual famers.)
		3－2 Fifty percent (50%) of the core extension officers can launch extension activities in the areas they cover.	As previously noted, solely for evaluation purpose, extension activities are defined as follows. (i) Extension activities (preparatory phase) : formation of farmers' associations/ formulation of CDP jointly with farmers (ii) Extension activities (main phase): provision of extension services to farmers based on CDP Interview survey to CEOs conducted by TCP just before this terminal evaluation reveals that 88.5% and 100% of CEOs formulated ADP and ETP respectively, and therefore most of the CEOs started extension activities in the preparatory phase. As for extension activities in the main phase, it was initiated in first sub-project site only in Kharif 2015 due to the delay in commencement of infrastructure development under HPCDPP. Thus extension activities in the main phase have just started in one sub-project site.

	4. Crop diversification model is developed and practiced in the Pilot area.		As previously noted, TCP defines "Crop Diversification Model (CDM)" as a systemized knowledge consisting of (i) process of six crop diversification themes, (ii) techniques in each six theme and (iii) lessons learned from the pilot activities, and CDM was indeed developed through the pilot activities, and it is also articulated in the Guidelines. (Note: Six crop diversification themes are (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing.) In addition, four indicators show the positive results, and therefore it can be said that the achievement level of output 4 is acceptable.
		4-1 Thirty percent (30%) of the farmers or 20% of CCA in the pilot area undertake vegetable cultivation.	Construction of irrigation facility in the pilot site was completed in November 2012, and vegetable cultivation has started since Rabi 2012/13. Number of farmers who started vegetable cultivation is in the upward trend both in Rabi and Kharif. Although as for vegetable-cultivated area, the figure of Kharif 2015 fell below that of Kharif 2015, this is because cereals are major crop cultivated in Kharif in this area. Thus, by looking at the upward trends in Rabi both in terms of number of farmers and in terms of vegtable-cultivated areas, it can be said this indicator is basically met.

Table 3: Farmers who started vegetable cultivation and vegetable cultivated area.

		Target	2012/13 Rabi	2013 Kharif	2013/14 Rabi	2014 Kharif	2014/15 Rabi	2015 Kharif
Farmers who started veg cultivation*1	Nos	-	10	14	19	19	30	21
	%	30%	10	14	19	19	30	23
Vegetable cultivated area in CCA*2	ha	-	0.64	1.36	3.17	2.78	4.88	2.47
	%	20%	3	6	13	12	20	10

(Note) *1 : Number of farming households in the pilot site is 99 from 2012 to 2014, and 93 in 2015.
*2 : CCA is 24ha according to the district cadastral survey 2006/07

4-2
Thirty percent (30%) of farmers in the pilot area can increase their income by the Project.

As seen the table below, the farmers (households) who started vegetable cultivation increased their income tremendously through selling vegetable.

Table 4:Number of vegetable farmers and their average income from vegetable cultivation

	2012 Kharif	2012/13 Rabi	2014 Kharif	2014/15 Rabi
Vegetable Farmers(HHs)	0	10	19	30
Vegetable Income (Rs./HH)	0	5,800	11,700	18,900

(Source) : JICA TCP

4-3
SHGs in the pilot area can increase their income by their group activities.

In the first year, five SHGs, including existing SHGs, started working with TCP. Two SHGs stopped working due to lack of interests. So, during the terminal evaluation (28 June 2015), the evaluation team interacted with three SHGs who continues income generating activities as seen in the table below.

Table 5: Activities of SHGs

SHG	Year of formation	Nos.	Activities	Income from activities mentioned in the left column
Shiv Shakti	2011 Nov.	18	Group farming of vegetables such as cauliflower, cabbage, broccoli, okura etc.	Rs.37,190 (Rs.20,712)
Naman*	2012 June**	12	Nursery raising of cauliflower, onion, broccoli, etc.	Rs.47,340 (Rs.30,440)
Bhole Shankar	2012 Jan.**	15	Food processing such as Bahri, Barumichuri, Mulberry leaf and powder	Rs.38,310 (Rs.27,755)

(Note1) *Naman is a SHG outside of CCA.**Year of re-formation.
(Note2) Bracketed figures are figures without project supports.
(Source) Progress Report -4th Phase- of TCP, Interaction with SHG members

During the interaction, members of SHGs confirmed that the training received under TCP covers wide topics such as institutional capacity development and techniques of food processing, nursery raising,

			etc. Thanks to the training, they said that now they gained SGH management skill as well as technical knowledge. Some even said they are now financially more independent. Support from TCP is gradually reduced and their capacity to sustain activities is being increased. Also, as seen above, they gained substantial income, thus this indicator is well met.
		4-4 Irrigation facilities in the pilot area are properly maintained by farmers.	Irrigation facilities constructed under TCP in Lahalri was completed on 15 November 2012 and handed over to KVA on 11 April 2013. Even after completion of the construction, a few small-scale improvements, i.e. roofing of distribution tanks, covering hydrants, etc., have been made. TCP supports establishments of KVA through the following steps. i) Conducted awareness camp on spot jointly by PMU and TCP to explain the outline of the pilot project and importance of establishing KVA and expected functions of KVA. ii) Organized farmers meetings attended by TCP experts. Farmers group named Gagan Memorial Krishak Vikas Association (GMKVA) was formally established and office bearers such as the president, the vice president, the secretary, etc. were elected. iii) Formulated KVA by-laws by the management committee of KVA and registered as an official society at the Sub Divisional Magistrate Hamirpur Office Outline of GMKVA is as follows as of June 2015. Table 6: Outline of GMKVA (Source) Progress Report -4th Phase- of TCP, Interaction with KVA members On 28 June 2015, the evaluation team interacted with GMKVA members to find out their roles and duties in the pilot project.

Name	Gagan Memorial Krishak Vikas Association (GMKVA)
Registration Date	21 June 2011
Member	88 (registration fee Rs.50)
Management Committee	11
Advisory Committee	4
Social-audit committee	3
O&M sub committee	6
Marketing sub-committee	6

			• GMKVA employs two members; one works as a pump operator and one does as a water distribution coordinator. • Farmers who want to use irrigation water first access to the water distribution coordinator and pay Rs. 100 as an advance. The water distribution coordinator checks if there is enough water in the storage tank. If not, he calls to the pump operator to pump up water. Then he distributes water by opening up appropriate bulbs of pipelines to deliver water to the requested farmer. • Water charge is Rs. 60 per hour, and the water distribution coordinator is in charge of collecting fees. • Operational records are kept by both the pump operator and the water distribution coordinator in an appropriate manner (Records were checked by the evaluation team members.) • Members of O&M sub-committee have conducted cleaning of storage tank seven times and minor repairs 11 times. • GMKVA has now acquired ability to mediate disputes among farmers. Once the construction started, complaints and requests such as "Why are you excavating my land? Why not others?" or "We want a hydrant in our land." etc. were raised. Those conflicts of interests are now solved through KVA. TCP provided farmers enough training on water distribution, O&M of irrigation facilities in order to secure sustainability of GMKVA, and in fact the current O&M status is good enough. Thus this indicator is safely met.
Verification of implementation process	**Implementation status of activities** Implementation status	Were activities implemented as planned?	At individual activity level, both construction of irrigation facilities and setting-up of 6 poly houses were delayed a few months. However, these delays do not affect the progress of TCP as a whole. On the other hand, the delay in HPCDPP affects TCP. Originally the outcome of TCP is supposed to spread to many sub-project sites of HPCDPP, but due to the delay in HPCDPP, the actual application of TCP outcome was limited to several sub-projects.
	Implementation status of monitoring	Has monitoring been carried out?	Based on RD, JCC chaired by Principle Secretary/ Secretary (Agriculture), Gov't of HP was formed and several JCC meetings were organized as seen in the table below.
		Is monitoring mechanism appropriated?	

		Are responsibilities shared clearly among relevant organizations?	Table 7: List of JCC Meetings (Source) MM of JCC meetings JCC is a formal institution bound by RD. In addition to JCC, C/P meetings were regularly held before every JCC to substantially discuss the important issues which plan to be presented at JCC. Furthermore at the project-level, TCP experts attend a monthly meeting called project management committee meeting. The meeting is participated by DOA officials, i.e. the director of DOA, PMU and PMC, and TCP experts shared information with them officially. In addition, the interview to PMU officials revealed that TCP experts and DOA officials of PMU well communicate and share information. Thus implementation status of monitoring can be said as appropriate.
	Relationship between Indian C/Ps and Japanese experts	Status of communication	As mentioned in the section of "Implementation status of monitoring", Indian C/P and TCP experts communicates well both formally and informally. Status of communication is good enough.
		Appropriateness of selected C/Ps	Main C/Ps of TCP are technical staff of PMU, an organization established to implement HPCDPP, and not both DOA officers and PMU officers as expected in the planning phase of TCP. Currently more than 100 technical staff is working in PUM and the size of C/Ps seems enough. Technical staff of PMU consists of extension officers to promote crop diversification and engineering

Times	Date	Main points discussed
1st	30 June 2011	• Shared basic information of TCP
2nd	6 Feb. 2012	• Reviewed the progress of TCP • Discussed crop diversification plan in the pilot site
3rd	18 Aug. 2012	• Reviewed the progress of TCP • Reviewed the progress of construction work • Confirming the importance of farmers association for O&M
4th	8 April 2013	• Reviewed the progress of TCP
5th	11 July 2013	• Reviewed the progress of TCP • Approved the work plan of TCP
6th	30 Oct. 2013	• Shared the result of the mid-term review of TCP
7th	18 June 2014	• Discussed training in Japan • Followed up the issues discussed in the previous JCC, i.e. SHGs activities, etc.

			staff to supervise construction of irrigation faculties. Some of them who are seconded from DOA have substantial experience in extension and infrastructure development. Thus the selected C/Ps can be said as appropriate. Since the both Project Purpose and the Overall Goal focuses on the five target districts, technical staff of PMU is indeed an appropriate C/Ps. However, by considering the fact that two-third of technical staff of PMU is outsourced and PMU exists only till March 2018, the discussion in terms of sustainability is necessary in the latter part.
		Project management (e.g. Ways to handle challenges and problems)	Basically TCP handles challenges and problems through a series of discussion with C/Ps both officially and unofficially. Moreover, the progress of TCP is regularly presented at the time of JCC and major issues shall be discussed and approved at JCC level.
		Change in C/Ps' attitude (Independence and activeness)	From the discussion with the management-level official of PMU who are seconded from DOA, it became clear that they have been serious to utilize the outcome of TCP by knowing it helps them to accelerate sub-projects of HPCDPP. Important suggestions such as the process improvement of CDP formulation, etc. were raised, too. Also, based on the needs at the field-level, PMU recently requested TCP to conduct new training on preparation of IP which aims to ensure implementation of CDP. They were serious and became more serious after the commencement of infrastructure development under HPCDPP.
	Involvement of beneficiaries	Change in involvement and commitment of C/Ps (DOA, SPMU, DPMU, BPMU)	Director of Agriculture is a Project Director of TCP, and he supervises the overall progress of TCP. As just mentioned, from the discussion with the management-level official of PMU who are seconded from DOA, it became clear that they are serious to utilize the outcome of TCP by realizing it help them to accelerate sub-projects of HPCDPP.
		Change in involvement and commitment of farmers	Out of 93 households in Lahalri who are benefitted from the irrigation facility of TCP, 88 households joined GMKVA. (Those who did not join in GMKVA, 5 households, are basically ones with less intension to utilize irrigation water.) As discussed in "indicator 4-4 in Output 4", KVA is playing a fundamentally important role for O&M of the irrigation facility and water distribution. In addition, KVA now became capable enough to mediate conflicts of interests related to farming activities among members, too. KVA is a key community organization to accelerate crop diversification, indeed.

Annex 3: Evaluation Grid (Results)

			Currently, farmers' association is playing an expected role, and therefore involvement and commitment of farmers and KVA can be concluded as satisfactory.
		Change in involvement and commitment of SHG members	As discussed in "indicator 4-3 in Output 4", three SHGs have continued economic activities such as group farming, food processing and nursery raising after acquiring enough knowledge and training from TCP. At the time of interaction with SHG members, they confirmed that now they have substantial knowledge to keep up with their activities even without support of TCP. (In fact, the supports from TCP have been reduced gradually.) A leader of Naman has mentioned that key for successful nursery is the quality of seeds, and she wanted to buy seeds guaranteed by DOA. This is just an example, but it clearly shows that they have gained new technical knowledge and also eager to continue their work.
	Ownership of C/P organizations	Appropriateness of allocation and assignment of C/Ps	Same as discussed in "Appropriateness of selected C/Ps".
		Budget allocation, Support in kind	TCP does not expect any budget allocation and support in kind.
		Degree of participation of C/P organization	Same as discussed in "Change in C/Ps' attitude".

Annex 3: Evaluation Grid (Results)

Evaluation by Five Evaluation Criteria

Criteria	Evaluation Questions	Sub-questions (indicators)	Result
Relevance	Is the Project (Overall Goals and Project Purposes) consistent with the national/state development plans and national/state agricultural policies?	Consistency of the Overall Goal with the national/state development plans and agricultural policies	The 12th Five Year Plan (2012-2017) pointed out the enhancement of productivity is one of the priorities issues in agricultural sector. Also, the Five Year Plan (2012-2017) of Himachal Pradesh highlights 7 issues as objectives in agricultural sector during this five-year-plan period, and they include increase of production and productivity and diversification for higher farm income. Thus the project is consistent with both the national and state development policies in agricultural sector. No supports from other donor countries.
		Consistency of the Project Purpose with the national/state development plans and agricultural policies	
		Consistency with support from other donor countries	
	Was the selection of the target group appropriate?	Is the Project which aims to enhance DOA's capacity to promote crop diversification highly needed?	According to JICA's "The Study on Diversified Agriculture for Enhanced Farm Income in the State of Himachal Pradesh (January 2007 to March 2009)" the demand for fresh vegetables is expected to increase 1.9 times by 2022 (base year: 2005). The state has a considerable potential for vegetable production with an advantage of cool climate compared to other parts of the country, as well as the geographical proximity to the largest city, Delhi. This would enable the farmers to produce off-season vegetables and fruits. Also, as seen above, the Five Year Plan (2012-2017) of Himachal Pradesh also prioritizes improving rural livelihood through crop diversification. Thus the project which strengthens the extension capacity of frontline officers to promote crop diversification is highly needed.
		Does C/P agency play an important role in crop diversification in HP?	Main C/Ps of TCP are more than 100 technical staff of PMU, an institution established for implementation of HPCDPP. PMU is a responsible institution to construct irrigation facilities and promote crop diversification in 210 sub-project sites. (Note: PUM will be dissolved in March 2018)
		Are the project's components highly needed by C/P agency?	Main C/P, PMU, is promoting crop diversification in the target 5 districts. Under HPCDPP, PMU is responsible for construction of irrigation facilities, organizing farmers, formulating CDP and providing extension services to farmers in 210 sub-project sites in line with CDP. TCP provides core CEOs of PMU with opportunities to develop their capacities, i.e. both on and off-site training. With CEOs who improved their capacity, PMU could run HPCDPP smoothly. The project's components which help PMU substantially are highly needed by PMU.

Annex 3: Evaluation Grid (Results)

		Is the size of the target group appropriate?	C/Ps of TCP are more than 100 technical staff of PMU, and 30 among them, CEOs who actually provide extension services to farmers, are the main target of technological transfer. Since the Project Purpose aims to promote crop diversification in the five target district, and in fact the extension services have started in those areas by CEOs, it is appropriate to target the entire CEOs. Thus the size is more or less appropriate. However, by considering the fact that two-third of CEOs are outsourced and PMU exists only till March 2018, the discussion in terms of sustainability is necessary in the latter part.
	Is the Project consistent with Japan's foreign aid policy?	Is the Project related with any prioritized areas of ODA strategy?	Rolling Plan for Project Planning for India (June 2011) identifies several priority areas, and one of them is "support for poverty alleviation". It says that (1) to enhance productivity (2) to develop agricultural infrastructure and (3) to generate employment opportunity in rural area are focused issues under the priority area of "support for poverty alleviation", and TCP which contributes all three aspects is considered as an important project.
	Suitability as a means	Is the project suitable as a strategy to produce an effect with respect to the agricultural sector of HP?	The 12th Five Year Plan (2012-2017) pointed out the enhancement of productivity is one of the priorities issues in agricultural sector. Also, the Five Year Plan (2012-2017) of Himachal Pradesh highlights 7 issues as objectives in agricultural sector during this five-year-plan period, and they include increase of production and productivity and diversification for higher farm income. A major prerequisite condition to promote crop diversification in line with these plans is to develop irrigation facilities and increase irrigated CCA, and now HPCDPP is playing an important role in this regard. For crop diversification, it also requires intensive extension services which encourage farmers to start vegetable cultivation and adopt new farming technologies. TCP focusing on extension part through building capacity of CEOs, thus, is suitable as a means.
		Does Japan have a technology advantage? (Can Japan have accumulated know-how on the target technology? Can Japan's experiences be put to use?)	When introducing farming technology, TCP did introduce a very new technology o Himachal Pradesh, i.e. grafting, and demonstrate its applicability and technological significance. In addition, Japan accumulated knowledge and experiences regarding formation of water user's association and farmers' association, etc.
	Others	Have there been any changes in the environment of the project (politics, economy, society, etc.) since the	Nothing in particular.

Annex 3: Evaluation Grid (Results)

		ex-ante evaluation / mid-term review?	
Effectiveness	Is the achievement level of the Project Purpose adequate at this stage?	Adequacy of the achievement level of the Project Purpose	Same as "Verification of Performance".
	Were the outputs sufficient to achieve the Project Purposes?	Numbers, contents and qualities of the outputs	TCP consists of four outputs, i.e. output 1 which aims to strengthen DOA's capacity to formulate and implement crop diversification plan, output 2 and output 3 which contribute to capacity development of extension officers, and output 4 which summarize experiences at the pilot site, Lahaul. By considering importance of five components of MCD, namely institution, human resource, process, technique and lessons learned at pilot site, (i) the process is enhanced through output 1, (ii) extension officers (human resource) improved their capacity to promote crop diversification through output 2 and output3 and (iii) lessons learned from the pilot site is reflected mainly to process and techniques. Moreover, TCP prioritizes contributing to smooth implementation of HPCDPP, and thus highly needed supports were given to PMU by TCP. Thus effectiveness is secured.
	What are the inhibiting factors for the achievement of the Project Purposes?	Any changes in external factors	• Due to the delay in commencement of infrastructure development, crop diversification based on CDP was promoted only since Kharif 2015, and currently irrigation facilities was completed in 29 sub-project sites only. TCP will terminate before HPCDPP becomes fully in progress. • In PDM, several ambiguous expressions such as "model", "mechanism" and "system" are used. In fact, TCP discussed this issue with PMU and also at JCC (the mid-term review). Using ambiguous words cause unnecessary confusion, and it is partially inhibiting TCP's effectiveness.
	What are the promoting factors for the achievement of the Project Purposes?	Any changes in external factors	• DOA, HP and JICA's collaboration started way back in 2007, when "The Study on Diversified Agriculture for Enhanced Farm Income in the State of Himachal Pradesh (January 2007 to March 2009)" was inaugurated. This long-term professional relationship created rapport and mutual trust, and such a relationship created foundation for smooth implementation of TCP. • Since the main C/P institution become PMU, TCP could prioritize contributing to smooth implementation of HPCDPP, and thus highly needed supports were given to PMU by TCP. This enhanced effectiveness of TCP. (Issues regarding sustainability will be discussed later).

Annex 3: Evaluation Grid (Results)

Efficiency	Is the achievement level of the outputs adequate at this stage?	Adequacy of the achievement level of the outputs	Same as "Verification of Performance".
	Are the activities adequate and enough to produce three outputs?	Numbers, contents and qualities of the activities	Varieties of activities, i.e. infrastructure development (construction of irrigation facilities), formation of KVA and SGHs, demonstration activities with progressive farmers, etc. were carried out at the pilot site, Lahalri. The activities of Lahalri provided TCP experts with a great opportunity to learn the challenges faced by farmers as well as concerns of PMU regarding crop diversification in this area. With both experiences of the pilot site and their own expertize, the TCP team conducted project activities such as organizing workshops and training sessions, and numbers, contents and qualities of such activities can be considered as appropriate. This point is confirmed by PMU, too. (Note: Whether the concentration of activities in a single pilot site is appropriate is a question related to efficiency. However, since this entire framework of TCP is somehow pre-set, and therefore this issue will not be discussed by five evaluation criteria. In fact, this is an important point to discuss, and will be taken up at the section of lessons learned.)
	Is the output production adequate compared to the inputs?	Adequacy of human resources, training and equipment invested Level of utilization of inputs (human resources, training, equipment) Adequacy of timing of inputs Cost	**Human Resources (TCP experts and C/P)** From the interview with several technical staff of PMU, the main target of technological transfer, it became clear that they considered TCP's supports as very helpful for smooth implementation of their duties (implementation of HPCDPP). Thus inputs form TCP, number of experts and their expertise can be concluded as appropriate. (As for the assignment of experts and their expertise, please see the annex of the Evaluation Report.) As previously noted, the target of technological transfer of TCP is more than 100 technical staff of PMU, and most of them have either experience or knowledge, sometimes both, in agriculture. From the view point of their number and expertise, adequate human resources are devoted from the Indian side. However, as reiterated previously, by considering the fact that two-third of technical staff of PMU is outsourced and PMU exists only till March 2018, the discussion in terms of sustainability is necessary in the latter part. **Training in Japan** Eight members of PMU who are DOA officials participated in training in Japan from 29 June 2014 to 10 July 2014 as per annexed to the Evaluation Report. The training course covered five important

Annex 3: Evaluation Grid (Results)

			themes namely, agricultural extension, vegetable farming and post-harvest, water management and O&M of irrigation facilities, gender and marketing. Geographically, they have visited Nagao prefecture whose climate is similar to HP and Chiba prefecture where peri-urban agriculture flourishes. During the terminal evaluation, the evaluation team interviewed two out of eight. They listed up what they have seen in Japan, i.e. farming technologies in each prefecture, activities of JA, activities of women's cooperatives, agricultural-related business activities initiated by farmers. They said what they have seen in Japan enabled them to delineate a future vision of HP's agricultural development. **Equipment** The biggest physical input of TCP is irrigation facility (however this is not equipment), and this input is essential for every activity in the pilot site, Lahalri, and therefore highly utilized. In addition, equipment input by TCP, office equipment such as computer, printer, etc., is in full use now.
	What are the inhibiting and promoting factors?	With or without inhibiting and promoting factors	Due to the delay in commencement of infrastructure development, crop diversification based on CDP was promoted only since Kharif 2015, and currently irrigation facilities were completed in 29 sub-project sites only. TCP will terminate before HPCDPP becomes fully in progress. If more sub-projects were completed, then TCP could have provided supports to more sub-projects. Thus, the delay in HPCDPP affects partially to efficiency.
Impact	Are there prospects that the Overall Goal will be achieved as an effect of the Project?	Whether crop diversification will be promoted in the target area based on the advantageous climate conditions.	The path to the Overall Goal is set out.
	Are there any ripple effects to people or organizations other than the target groups?	Cases of ripple effects	The target areas aimed by both the Project Purpose and the Overall Goal are the same five districts covered under HPCDPP. However TCP provides training to extension officers of other seven districts, too. (For details, please refer to the annex of the Evaluation Report) One of major output of TCP, the Guidelines, can be disseminated well beyond the five target districts once the Guidelines receive a kind of acknowledgement from DOA.
	Any other impacts, either positive	Cases of any other impacts	• When introducing farming technology, TCP did introduce a very new technology to Himachal

Annex 3: Evaluation Grid (Results)

	or negative?	(Policies, society, environment, technological change, economic influence, etc.)	Pradesh, i.e. grafting. For example, a farmer in Lahalri who tried out grafting technology received a "Best Farmers Award" from the state government and the prize was awarded from the Governor. • The same technology was highly appreciated by the Agricultural University of HP. With the government's financial assistance, the University imported two semi-automatic grafting machines and started research on grafting. • In Lahalri as well as the sub-pilot sites the evaluation team visited, farmers confirmed that fodder crop was raised even during dry season thanks to the irrigation, and the availability of fodder throughout the year rise their income through increment of milk production.
	Causal relationship between the overall goal and the project purpose	Are the overall goal and the project purpose consistent?	The causal relationship between the overall goal and the project purpose is clear, but as mentioned earlier since the indicator seems rather too optimistic, it needs clarification of the indicator at this occasion.
		Are the important assumptions from the project objective to the overall goal correct also at the present point of time?	
Sustainability	By considering policies, are there prospects that the sustainability is secured?	Position of C/P agency in the field of crop diversification (Will the organization be responsible to promote crop diversification even in the future?)	As mentioned earlier, the 12th Five Year Plan (2012-2017) pointed out the enhancement of productivity is one of the priorities issues in agricultural sector. Also, the Five Year Plan (2012-2017) of Himachal Pradesh highlights 7 issues as objectives in agricultural sector during this five-year-plan period, and they include increase of production and productivity and diversification for higher farm income. Thus the DOA, as a state department, is indeed a prime institution to promote crop diversification in line with these plans. In addition, discussion with Director of DOA also confirmed that crop diversification is one of prioritized areas in agricultural sector, and the next five-year plan of HP is likely to continue focusing on crop diversification, too. Thus, by considering policies, there are prospects that the sustainability is secured.
		Will the relevant policies continue also after the cooperation is finished?	
	By considering organizational and institutional aspects, are there prospects that the sustainability is	Has C/P agency been acquiring organizational capacity to continue promoting crop diversification?	Main C/Ps of TCP are technical staff of PMU, an organization established to implement HPCDPP, and not both DOA and PMU officers as expected in the planning phase of TCP. Some of those who are currently working in PMU, especially those who are seconded from DOA, are expected to

Annex 1: Project Design Matrix (PDM)

Project Name : Technical Cooperation Project for Crop Diversification in Himachal Pradesh | Duration: 5 years | Ver. 01
Target Area: State of Himachal Pradesh | Target Group: Core Extension Officers | Date: Oct. 2013

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal (Target at 5 years after the end of the Project) Crop diversification is promoted in the target area based on the advantageous climate conditions	(After 5 years of completion of the project) (1) 20% of total cultivated land in the target area is diversified to the vegetable	(1) Agricultural census by DOA / Other reports	
Project Purpose (Target at the end of the Project) The promotion mechanism for crop diversification is established in DOA Himachal Pradesh.	(1) Extension activities based on the Crop Diversification Model are expanded in 5 districts.	(1) Monitoring survey carried out by the Project	- RIDF project is continued on the same scale - No severe decline in agriculture production price
Outputs 1. DOA*1's capacity to plan and implement crop diversification is strengthened.	(1)-1 Implementation guideline for crop diversification is prepared. (1)-2 Annual PDCA cycle of crop diversification functions in DOA*1. (i.e. Annual Plan on crop diversification is formulated, monitored and evaluated.)	(1)-1 Check the output (1)-2 Monitoring survey carried out by the Project	- No severe decline of the state government budget on the agriculture development and support - No severe decline in agriculture production price
2. Training system to promote crop diversification is developed.	(2)-1 Training curriculum and materials are developed after revision in each subject.	(2)-1 Check the output	
3. The extension skill of the core extension officers is improved.	(3)-1 80% of the core extension officers can conduct farmers' training by themselves on the various technologies. (3)-2 50% of the core extension officers can launch extension activities in the areas they cover.	(3)-1 Monitoring survey carried out by the Project (3)-2 - do -	
4. Crop diversification model is developed and practiced in the Pilot area.	(4)-1 30% of the farmers/20% of CCA in the pilot area undertake vegetable cultivation. (4)-2 30% of farmers in the pilot area can increase their income by the Project. (4)-3 SHGs in the pilot area can increase their income by their group activities. (4)-4 Irrigation facilities in the pilot area are properly maintained by farmers	(4)-1 - do - (4)-2 - do - (4)-3 - do - (4)-4 - do -	

Annex 1: Project Design Matrix (PDM)

Activities

1-1. Review the existing plan on crop diversification and study, how the pilot project should be.
1-2. Conduct Plan-Do-Check-Act training on crop diversification
1-3. Facilitation in the preparation of annual plan on crop diversification
1-4. Develop Crop Diversification Guideline based on the lesson learned from crop diversification model practiced in the Pilot Area and Sub-pilot Area

2-1. Formulate annual plan on extension training
2-2. Review the existing training curriculum and materials on extension
2-3. Develop training curriculum and materials on extension of crop diversification
2-4. Revise curriculum and materials incorporating feedback from the Pilot Project

3-1. Conduct hands-on training to core extension officers assigned to the pilot area and highlited 5 districts (Kangra, Una, Hamirpur, Bilaspur and Mandi) on:
- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Infrastructure development/operation and maintenance

3-2. Conduct trainings for extension officers in Sub-Pilot Areas (Government of Himachal Pradesh will establish Sub-Pilot Areas by its own budget)

4-1. Conduct baseline survey
4-2. Selection of a pilot area to be approved by JCC
4-3. Construct irrigation facilities and prepare demonstration plot in the pilot area.
4-4. Organize farmers groups and Self-help groups
4-5. Conduct trainings for farmers on:
- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Operation and maintenance

Inputs

<Japanese Side>
1) Experts
- Chief Advisor / Agriculture Extension
- Water Management / Operation and Maintenance
- Crop Cultivation / Post Harvest
- Training / Project Coordination
- Gender / Social Inclusion
- Design & Construction Management

2) Training for beneficiaries and Himachal Pradesh C/Ps
3) Cost for project office management (personnel, equipment, and consumables)
4) Cost for construction of pilot area and preparation of demonstration plot
5) Equipments for project management, if necessary

<Himachal Pradesh Side>
1) Counterparts (from Shimla Headquarter to field level)
2) Necessary transport and other expenditures for counterparts
3) Project office at Shimla and site
4) Sharing of project office running expenses
5) Tax exemption measures, etc.

<Abbreviation>

DOA: Department of Agriculture, Government of Himachal Pradesh
PMU: Project Management Unit
DPMU: District Project Management Unit
BPMU: Block Project Management Unit
TCP: Technical Cooperation Project
CCA: Cultivable/Culturable Command Area
SHG: Self Help Group

- Proposed ODA Loan Project is implemented on schedule
- No disaster is occurred (drought / flood)
- No policy change in the agriculture

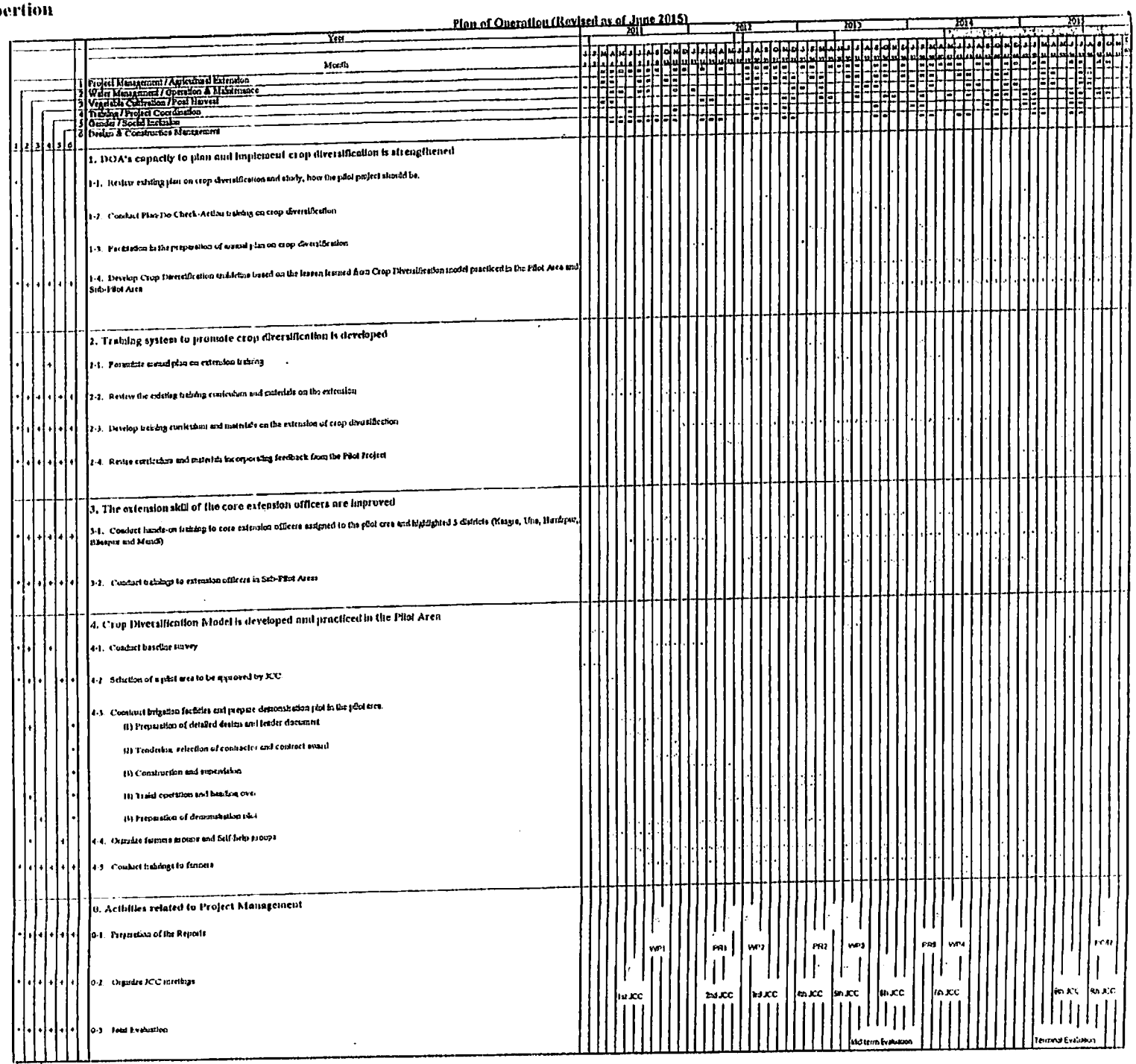
Pre-conditions

- There is a need on the agriculture development in the state
- There is the budget to bear the counterpart budget for project implementation in the State

Gender and social inclusion should be considered in every activity as well as measured by objectively verifiable indicators
*1 The Target group will be the core extension officers of PMU staffs

Annex 2: Plan of Operation

Plan of Operation (Revised as of June 2015)



Legend
* Main person in charge
› Responsible for the part of specialty

Original Plan
Actual
Revised Plan on June 2015

Annex 3: Evaluation Grid (Results)

India **Terminal Evaluation of the Technical Cooperation Project for Crop Diversification in Himachal Pradesh** 2015.07.08

	Evaluation Questions		Result
	Questions	**Sub-questions (indicators)**	
Verification of performance	**Achievement of Overall Goal** Crop diversification is promoted in the target area based on the advantageous climate conditions.	1. Twenty percent (20%) of total cultivated land in the target area is diversified to the vegetable.	In the target area, CCA will surely expand up to certain extent because of 210 irrigation facilities under ODA-loan "Himachal Pradesh Crop Diversification Promotion Project (HPCDPP)", and therefore crop diversification is expected to be further promoted through "the promotion mechanism for crop diversification" developed by this Technical Cooperation Project (TCP) during the project period. Thus, the path to the Overall Goal is set out. However, despite the fact that the adoption process is slower in agricultural sector PMU, an institution, which is one of five components of "Mechanism for Crop Diversification" (as detailed later), exists only till the end of HPCDPP, March 2018. Some DOA officers who are currently working in PMU are likely to work in promotion of crop diversification in the target area even after March 2018. However, many staff of PMU are outsourced for the project period, and also DOA officers are transferable as so do many other officials in public sector. Thus, it is advisable to discuss how to achieve the overall goal at this occasion of the terminal evaluation.
	Achievement of Project Purpose The promotion mechanism for crop diversification is established in DOA of Himachal Pradesh (HP).	1. Extension activities based on the Crop Diversification Model are expanded in five districts (Note: The indicator can be rephrased as "Extension activities based on the Guidelines which capture the essence of CDM are expanded in five districts.")	TCP defines "Crop Diversification Model (CDM)" as a systemized knowledge consisting of (i) process of six crop diversification themes, (ii) techniques in each six theme and (iii) lessons learned from the pilot activities, and details of CDM is described in "Guidelines for Crop Diversification in Himachal Pradesh (The Guidelines). TCP also defines "Mechanism for Crop Diversification (MCD)" as mechanism consisting of five components, i.e. three components of CDM plus (iv) human resources and (v) institutions. By employing these definitions, the indicator can be rephrased as "Extension Activities based on the Guidelines which capture the essence of CDM are expanded in five districts." At the commencement of extension activities, first of all, extension officers need to prepare Crop Diversification Plan (CDP) consisting of Agricultural Development Plan (ADP) and Extension Training Plan (ETP) by referring the Guidelines which capture all the aspects of CDM, and then will start providing extension services. Also, as detailed in later, solely for evaluation purpose, extension activities are defined as follows.

			(i) Extension activities (preparatory phase) : formation of farmers' associations/ formulation of CDP jointly with farmers (ii) Extension activities (main phase): provision of extension services to farmers based on CDP Interview survey to the core extension officers (CEOs) conducted by TCP just before this terminal evaluation reveals that 88.5% and 100% of CEOs formulated ADP and ETP respectively, and therefore most of the CEOs started extension activities in the preparatory phase. As for extension activities in the main phase, it was initiated in first sub-project site only in Kharif 2015 due to the delay in commencement of infrastructure development under HPCDPP. Thus extension activities in the main phase have just started. As mentioned above, it is true that extension activities in the main phase have just started. However, as for fourth component of MCD, human resources, TCP endeavors to improve CEO's capacity as one of mandates of TCP. (Note: Output 3 is "The extension skill of the core extension officers is improved."). As for the fifth component, institution, PMU is functioning well to promote crop diversification in the target area through HPCDPP. Thus it can be concluded that "The promotion mechanism for crop diversification in the target area is established in DOA of Himachal Pradesh (HP)". (Note: There is a concern how to ensure the sustainability after March 2018 since PMU is a non-permanent institution established solely to implement HPCDPP till March 2018. This will be discussed separately later.
	Achievement of Outputs 1. DOA's capacity to plan and implement crop diversification is strengthened.		As for indicator 1-1, the Guidelines are in the process of finalization. As for indicator 1-2, 33 CDP were formulated based on PDCA concept in 33 sub-projects of HPCDPP, but due to the delay in commencement of infrastructure development, crop diversification based on CDP was promoted only since Kharif 2015, and therefore it is not yet in a position to conduct monitoring and evaluation based on PDCA. However, TCP provided series of training which include monitoring and evaluation techniques based on PDCA, and therefore it is likely that all the sub-projects will be planed and implemented in accordance with PDCA. It is worth noting here that also the output question "DOA's capacity", it is logical and important first to focus on "DOA's capacity in the five target districts" since the project purpose and the overall goal

1－1
Implementation guideline for crop diversification is prepared.

aim at the target area. Staff of PMU, the target of technological transfer under TCP, consists of DOA officials and outsourced persons, and their capacity to plan and implement crop diversification is indeed being strengthened.

The Guidelines consist of two parts, Part I which discusses technical aspects in the six crop diversification themes, i.e. (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing, and Part II which contains practical information for CEOs to provide farmers with extension services such as procedure of training, technical information on each subject, training curriculum, training materials, lessons learned in the TCP pilot site, etc.

The Guidelines (second version) are currently in use by CEOs in the selected sub-pilot site of HPCDPP. Then, it is soon to be used widely in all the sub-pilot sites by more than 100 officials in PMU. In addition, the Guidelines are prepared by considering the applicability beyond the sub-project sites, and therefore it can be widely used in other areas once the Guidelines are officially acknowledged by DOA.

Table1 : Target Users of the Guidelines

Office	Technical Staff of PMU								
	Extension Staff			Engineering Staff			Total		
	DOA	Out-source	Sub-total	DOA	Out-source	Sub-total	DOA	Out-source	Sub-total
1. SPMU	3	1	4	3	2	5	6	3	9
2. DPMU Hamirpur	2	2	4	1	4	5	3	6	9
1.1 BPMU Hamirpur	3	2	5	3	4	7	6	6	12
1.2 BPMU Bilaspur	2	2	4	2	5	7	4	7	11
1.3 BPMU Una	1	2	3	1	6	7	2	8	10
3. DPMU Mandi	2	2	4	1	3	4	3	5	8
2.1 BPMU Mandi	1	2	3	2	5	7	3	7	10
2.2 BPMU Sarkaghat	2	2	4	1	6	7	3	8	11
4. DPMU Palampur	2	2	4	1	4	5	3	6	9
3.1 BPMU Dehra	1	2	3	2	5	7	3	7	10
3.2 BPMU Nurpur	1	2	3	1	5	6	2	7	9
3.3 BPMU Baijinath	2	2	4	2	5	7	4	7	11
Total	22	23	45	20	54	74	42	77	119

			(Source) Documents of PMU (as of June 2015) First version of the Guidelines is drafted by TCP experts in August 2014. After that, the second version which incorporated all the feedbacks from CEOs was drawn up in February 2015. Currently this second version of the Guidelines is in use by CEOs in the field. After revising the second version based on the feedbacks from CEOs once again, the final version is going to be presented in September 2015.
		1－2 Annual PDCA cycle of crop diversification is formulated, monitored and evaluated. (Note: Annual plan on crop diversification is formulated, monitored and evaluated.)	Annual plan of crop diversification is called Crop Diversification Plan (CDP) which consists of Agricultural Development Plan (ADP) and Extension Training Plan (ETP). In response to the recent request from PMU, the needs of Implementation Plan (IP) to ensure implementation of CDP is discussed and shared by both PMU and CTP, and IP is now annexed to CDP. As seen in the annex of the evaluation report, TCP provided substantial amount of training on formation of ADP, ETP and IP as well as on PDCA. As of May 2015, construction of irrigation facilities was completed in 29 sub-project sites, and is in progress in 34 sub-project sites. Also, it is just started in 30 sub-project sites. CDP is already formulated for 33 sub-projects. (Please note that some of the sub-project sites with completed irrigation have not formulated CDP yet, while others where the construction is ongoing have already prepared CDP in order to be ready for crop diversification right after the completion of the construction.) By considering the fact that CEOs have undergone enough training on PDCA and CDP formulation, and in fact 33 CDP has been formulated in 33 sub-projects, crop diversification plan, CDP, is actually formulated based on PDCA. However, as mentioned previously, crop diversification based on CDP was promoted only since Kharif 2015, and therefore CEOs are not yet in a position to conduct monitoring and evaluation based on PDCA.

Annex 3: Evaluation Grid (Results)

2. Training system to promote crop diversification is developed.	2 – 1 Training curriculum and materials are developed after revision in each subject.	TCP have developed training curriculum and materials by interpreting "training system" as "system of extension services provision by CEOs to farmers". Developed curriculum and materials are all compiled in the part II of the Guidelines, and the Guidelines (2nd edition) have been circulated to all relevant offices (1 SPMU, 3 DPMU and 8 BPMU). Training curriculum and materials compiled in the Guidelines are currently in use by the advanced sub-projects, and therefore it can be concluded that the output 2 is produced. TCP developed training curriculum and materials by (i) reviewing all the existing training materials used in universities, Farmers' Training Centre (FTC), Krishi Vigyan Kendra(KVK), State Agricultural Management and Extension Training Institute (SAMETI) and (ii) incorporating lessons learned in the pilot area (Lahaul).
3. The extension skill of the core extension officers is improved.	3 – 1 Eighty percent (80%) of the core extension officers can conduct famers' training by themselves on the various technologies.	As for indicator 3-1, all the CEOs started conducting farmers' training by themselves although for the limited subjects. As for indicator 3-2, it is clear that the extension activities in the preparatory phase are initiated. In addition, CEOs are trained on various technologies through TCP and enhanced their capacity to conduct farmers' training. Thus the extension skill of CEOs is indeed improved. Extension activities in the field are carried out CEOs listed in the table below. Table 2 : CEOs of PMU

Offices	CEOs		
	DOA	Out-source	Total
1. DPMU Hamirpur	2	1	3
1.1 BPMU Hamirpur	2	2	4
1.2 BPMU Bilaspur	1	2	3
1.3 BPMU Una	0	2	2
2. DPMU Mandi	1	2	3
2.1 BPMU Mandi	0	2	2
2.2 BPMU Sarkaghat	1	2	3
3. DPMU Palampur	1	2	3
3.1 BPMU Dehra	0	2	2
3.2 BPMU Nurpur	0	2	2
3.3 BPMU Baijinath	1	2	3
Total	9	21	30

(Source) Documents of PMU (as of June 2015)

TCP has provided 29 CEOs with various training sessions as well as on-site training opportunities as listed in the annex of the evaluation report in both (i) technical side such as infrastructure development, water management, O&M of irrigation facilities, farming techniques and (ii) non-technical side such as PDCA cycle and institutional development of KVAs and SHGs in order to enable them to conduct farmers training by themselves. (One CEO is recently joined in PMU, thus not included in the above discussion.)

Interview survey to the 29 CEOs conducted by TCP just before this terminal evaluation reveals that all of them have started farmers training by themselves. Since the irrigation facilities are completed in only 29 sub-projects out of 210, most of the farmers' training is regarding formation of KVA and etc. which are suitable to conduct even before the availability of irrigated water. However, it is also known from the interview to PMU that in some sub-pilot sites, the farmers' training on vegetable farming has been conducted in response to the farmers' requests.

【Sub-project H-1002 (LIS) Panjahli Village】
On 30th June 2015, the evaluation team visited Panjahli village where the irrigation facility was completed in February 2013, and vegetable cultivation has been started since Rabi 2014. Number of benefited households are 31 and all of them are member of KVA. As much as 20 out of 31 benefitted households have started vegetable cultivation. Water user fee is Rs.40 per hour for KVA members and Rs.60 per hour for non-members. All the KVA members also pays Rs.20 monthly and collected amount is saved as Institutional Development Fund of KVA, which will be used for O&M.

The evaluation team interviewed CEOs who are in charge of this sub-project site, and also checked the CDP (draft). CEOs are now preparing ADP and ETP through participatory consultation with farmers. Since the irrigation facilities was completed here, training on institutional development of KVA and SHG as well as O&M of the irrigation facilities were conducted by CEOs.

【Sub-project G-1011 (LIS) Kahali Village】
On 1st July 2015, the evaluation team visited Kahali village where the irrigation facility was completed in January 2015, and vegetable cultivation has been started since Kharif 2015. Number of benefited households are 21 and all of them are member of KVA. Since crop diversification is just

			started in this season, currently 1.48 ha out of 15.65 ha of CCA is converted to vegetable cultivation. It is approximately 1% but the figure is in fact more than the planned in CDP for this Kharif 2015. (The evaluation team received a copy of CDP.) Water user fee is Rs.100 per hour. Currently more than Rs.50,000 are saved in KVA's account which will be used for O&M. At this sub-project site, the evaluation team interacted with KVA members and SHG members to see how farmers' training provided by CEOs are accepted by villagers, and if training was considered as practical and useful for them. The answers from KVA members and SHG members are very positive, and it became known that many benefited households are now ready for crop diversification along with individual crop diversification plan since they are confident enough for successful crop diversification thanks to water and knowledge. (CDP is a compilation of crop diversification plans of individual famers.)
		3－2 Fifty percent (50%) of the core extension officers can launch extension activities in the areas they cover.	As previously noted, solely for evaluation purpose, extension activities are defined as follows. (i) Extension activities (preparatory phase) : formation of farmers' associations/ formulation of CDP jointly with farmers (ii) Extension activities (main phase): provision of extension services to farmers based on CDP Interview survey to CEOs conducted by TCP just before this terminal evaluation reveals that 88.5% and 100% of CEOs formulated ADP and ETP respectively, and therefore most of the CEOs started extension activities in the preparatory phase. As for extension activities in the main phase, it was initiated in first sub-project site only in Kharif 2015 due to the delay in commencement of infrastructure development under HPCDPP. Thus extension activities in the main phase have just started in one sub-project site.

	4. Crop diversification model is developed and practiced in the Pilot area.		As previously noted, TCP defines "Crop Diversification Model (CDM)" as a systemized knowledge consisting of (i) process of six crop diversification themes, (ii) techniques in each six theme and (iii) lessons learned from the pilot activities, and CDM was indeed developed through the pilot activities, and it is also articulated in the Guidelines. (Note: Six crop diversification themes are (1) agricultural extension, (2) infrastructure development, (3) water management and O&M of irrigation facilities, (4) vegetable farming and post-harvest, (5) SHG development and (6) Marketing.) In addition, four indicators show the positive results, and therefore it can be said that the achievement level of output 4 is acceptable.
		4-1 Thirty percent (30%) of the farmers or 20% of CCA in the pilot area undertake vegetable cultivation.	Construction of irrigation facility in the pilot site was completed in November 2012, and vegetable cultivation has started since Rabi 2012/13. Number of farmers who started vegetable cultivation is in the upward trend both in Rabi and Kharif. Although as for vegetable-cultivated area, the figure of Kharif 2015 fell below that of Kharif 2015, this is because cereals are major crop cultivated in Kharif in this area. Thus, by looking at the upward trends in Rabi both in terms of number of farmers and in terms of vegtable-cultivated areas, it can be said this indicator is basically met.

Table 3: Farmers who started vegetable cultivation and vegetable cultivated area.

		Target	2012/13 Rabi	2013 Kharif	2013/14 Rabi	2014 Kharif	2014/15 Rabi	2015 Kharif
Farmers who started veg cultivation*1	Nos	-	10	14	19	19	30	21
	%	30%	10	14	19	19	30	23
Vegetable cultivated area in CCA*2	ha	-	0.64	1.36	3.17	2.78	4.88	2.47
	%	20%	3	6	13	12	20	10

(Note) *1 : Number of farming households in the pilot site is 99 from 2012 to 2014, and 93 in 2015.
*2 : CCA is 24ha according to the district cadastral survey 2006/07

4-2
Thirty percent (30%) of farmers in the pilot area can increase their income by the Project.

As seen the table below, the farmers (households) who started vegetable cultivation increased their income tremendously through selling vegetable.

Table 4:Number of vegetable farmers and their average income from vegetable cultivation

	2012 Kharif	2012/13 Rabi	2014 Kharif	2014/15 Rabi
Vegetable Farmers(HHs)	0	10	19	30
Vegetable Income (Rs./HH)	0	5,800	11,700	18,900

(Source) : JICA TCP

4-3
SHGs in the pilot area can increase their income by their group activities.

In the first year, five SHGs, including existing SHGs, started working with TCP. Two SHGs stopped working due to lack of interests. So, during the terminal evaluation (28 June 2015), the evaluation team interacted with three SHGs who continues income generating activities as seen in the table below.

Table 5: Activities of SHGs

SHG	Year of formation	Nos.	Activities	Income from activities mentioned in the left column
Shiv Shakti	2011 Nov.	18	Group farming of vegetables such as cauliflower, cabbage, broccoli, okura etc.	Rs.37,190 (Rs.20,712)
Naman*	2012 June**	12	Nursery raising of cauliflower, onion, broccoli, etc.	Rs.47,340 (Rs.30,440)
Bhole Shankar	2012 Jan.**	15	Food processing such as Bahri, Barumichuri, Mulberry leaf and powder	Rs.38,310 (Rs.27,755)

(Note1) *Naman is a SHG outside of CCA.**Year of re-formation.
(Note2) Bracketed figures are figures without project supports.
(Source) Progress Report -4th Phase- of TCP, Interaction with SHG members

During the interaction, members of SHGs confirmed that the training received under TCP covers wide topics such as institutional capacity development and techniques of food processing, nursery raising,

			etc. Thanks to the training, they said that now they gained SGH management skill as well as technical knowledge. Some even said they are now financially more independent. Support from TCP is gradually reduced and their capacity to sustain activities is being increased. Also, as seen above, they gained substantial income, thus this indicator is well met.
		4-4 Irrigation facilities in the pilot area are properly maintained by farmers.	Irrigation facilities constructed under TCP in Lahalri was completed on 15 November 2012 and handed over to KVA on 11 April 2013. Even after completion of the construction, a few small-scale improvements, i.e. roofing of distribution tanks, covering hydrants, etc., have been made. TCP supports establishments of KVA through the following steps. i) Conducted awareness camp on spot jointly by PMU and TCP to explain the outline of the pilot project and importance of establishing KVA and expected functions of KVA. ii) Organized farmers meetings attended by TCP experts. Farmers group named Gagan Memorial Krishak Vikas Association (GMKVA) was formally established and office bearers such as the president, the vice president, the secretary, etc. were elected. iii) Formulated KVA by-laws by the management committee of KVA and registered as an official society at the Sub Divisional Magistrate Hamirpur Office Outline of GMKVA is as follows as of June 2015. Table 6: Outline of GMKVA (Source) Progress Report -4th Phase- of TCP, Interaction with KVA members On 28 June 2015, the evaluation team interacted with GMKVA members to find out their roles and duties in the pilot project.

Name	Gagan Memorial Krishak Vikas Association (GMKVA)
Registration Date	21 June 2011
Member	88 (registration fee Rs.50)
Management Committee	11
Advisory Committee	4
Social-audit committee	3
O&M sub committee	6
Marketing sub-committee	6

			• GMKVA employs two members; one works as a pump operator and one does as a water distribution coordinator. • Farmers who want to use irrigation water first access to the water distribution coordinator and pay Rs. 100 as an advance. The water distribution coordinator checks if there is enough water in the storage tank. If not, he calls to the pump operator to pump up water. Then he distributes water by opening up appropriate bulbs of pipelines to deliver water to the requested farmer. • Water charge is Rs. 60 per hour, and the water distribution coordinator is in charge of collecting fees. • Operational records are kept by both the pump operator and the water distribution coordinator in an appropriate manner (Records were checked by the evaluation team members.) • Members of O&M sub-committee have conducted cleaning of storage tank seven times and minor repairs 11 times. • GMKVA has now acquired ability to mediate disputes among farmers. Once the construction started, complaints and requests such as "Why are you excavating my land? Why not others?" or "We want a hydrant in our land." etc. were raised. Those conflicts of interests are now solved through KVA. TCP provided farmers enough training on water distribution, O&M of irrigation facilities in order to secure sustainability of GMKVA, and in fact the current O&M status is good enough. Thus this indicator is safely met.
Verification of implementation process	**Implementation status of activities** Implementation status	Were activities implemented as planned?	At individual activity level, both construction of irrigation facilities and setting-up of 6 poly houses were delayed a few months. However, these delays do not affect the progress of TCP as a whole. On the other hand, the delay in HPCDPP affects TCP. Originally the outcome of TCP is supposed to spread to many sub-project sites of HPCDPP, but due to the delay in HPCDPP, the actual application of TCP outcome was limited to several sub-projects.
	Implementation status of monitoring	Has monitoring been carried out?	Based on RD, JCC chaired by Principle Secretary/ Secretary (Agriculture), Gov't of HP was formed and several JCC meetings were organized as seen in the table below.
		Is monitoring mechanism appropriated?	

		Are responsibilities shared clearly among relevant organizations?	Table 7: List of JCC Meetings (Source) MM of JCC meetings JCC is a formal institution bound by RD. In addition to JCC, C/P meetings were regularly held before every JCC to substantially discuss the important issues which plan to be presented at JCC. Furthermore at the project-level, TCP experts attend a monthly meeting called project management committee meeting. The meeting is participated by DOA officials, i.e. the director of DOA, PMU and PMC, and TCP experts shared information with them officially. In addition, the interview to PMU officials revealed that TCP experts and DOA officials of PMU well communicate and share information. Thus implementation status of monitoring can be said as appropriate.
	Relationship between Indian C/Ps and Japanese experts	Status of communication	As mentioned in the section of "Implementation status of monitoring", Indian C/P and TCP experts communicates well both formally and informally. Status of communication is good enough.
		Appropriateness of selected C/Ps	Main C/Ps of TCP are technical staff of PMU, an organization established to implement HPCDPP, and not both DOA officers and PMU officers as expected in the planning phase of TCP. Currently more than 100 technical staff is working in PUM and the size of C/Ps seems enough. Technical staff of PMU consists of extension officers to promote crop diversification and engineering

Times	Date	Main points discussed
1st	30 June 2011	• Shared basic information of TCP
2nd	6 Feb. 2012	• Reviewed the progress of TCP • Discussed crop diversification plan in the pilot site
3rd	18 Aug. 2012	• Reviewed the progress of TCP • Reviewed the progress of construction work • Confirming the importance of farmers association for O&M
4th	8 April 2013	• Reviewed the progress of TCP
5th	11 July 2013	• Reviewed the progress of TCP • Approved the work plan of TCP
6th	30 Oct. 2013	• Shared the result of the mid-term review of TCP
7th	18 June 2014	• Discussed training in Japan • Followed up the issues discussed in the previous JCC, i.e. SHGs activities, etc.

			staff to supervise construction of irrigation faculties. Some of them who are seconded from DOA have substantial experience in extension and infrastructure development. Thus the selected C/Ps can be said as appropriate. Since the both Project Purpose and the Overall Goal focuses on the five target districts, technical staff of PMU is indeed an appropriate C/Ps. However, by considering the fact that two-third of technical staff of PMU is outsourced and PMU exists only till March 2018, the discussion in terms of sustainability is necessary in the latter part.
		Project management (e.g. Ways to handle challenges and problems)	Basically TCP handles challenges and problems through a series of discussion with C/Ps both officially and unofficially. Moreover, the progress of TCP is regularly presented at the time of JCC and major issues shall be discussed and approved at JCC level.
		Change in C/Ps' attitude (Independence and activeness)	From the discussion with the management-level official of PMU who are seconded from DOA, it became clear that they have been serious to utilize the outcome of TCP by knowing it helps them to accelerate sub-projects of HPCDPP. Important suggestions such as the process improvement of CDP formulation, etc. were raised, too. Also, based on the needs at the field-level, PMU recently requested TCP to conduct new training on preparation of IP which aims to ensure implementation of CDP. They were serious and became more serious after the commencement of infrastructure development under HPCDPP.
	Involvement of beneficiaries	Change in involvement and commitment of C/Ps (DOA, SPMU, DPMU, BPMU)	Director of Agriculture is a Project Director of TCP, and he supervises the overall progress of TCP. As just mentioned, from the discussion with the management-level official of PMU who are seconded from DOA, it became clear that they are serious to utilize the outcome of TCP by realizing it help them to accelerate sub-projects of HPCDPP.
		Change in involvement and commitment of farmers	Out of 93 households in Lahalri who are benefitted from the irrigation facility of TCP, 88 households joined GMKVA. (Those who did not join in GMKVA, 5 households, are basically ones with less intension to utilize irrigation water.) As discussed in "indicator 4-4 in Output 4", KVA is playing a fundamentally important role for O&M of the irrigation facility and water distribution. In addition, KVA now became capable enough to mediate conflicts of interests related to farming activities among members, too. KVA is a key community organization to accelerate crop diversification, indeed.

Annex 3: Evaluation Grid (Results)

			Currently, farmers' association is playing an expected role, and therefore involvement and commitment of farmers and KVA can be concluded as satisfactory.
		Change in involvement and commitment of SHG members	As discussed in "indicator 4-3 in Output 4", three SHGs have continued economic activities such as group farming, food processing and nursery raising after acquiring enough knowledge and training from TCP. At the time of interaction with SHG members, they confirmed that now they have substantial knowledge to keep up with their activities even without support of TCP. (In fact, the supports from TCP have been reduced gradually.) A leader of Naman has mentioned that key for successful nursery is the quality of seeds, and she wanted to buy seeds guaranteed by DOA. This is just an example, but it clearly shows that they have gained new technical knowledge and also eager to continue their work.
	Ownership of C/P organizations	Appropriateness of allocation and assignment of C/Ps	Same as discussed in "Appropriateness of selected C/Ps".
		Budget allocation, Support in kind	TCP does not expect any budget allocation and support in kind.
		Degree of participation of C/P organization	Same as discussed in "Change in C/Ps' attitude".

Annex 3: Evaluation Grid (Results)

Evaluation by Five Evaluation Criteria

Criteria	Evaluation Questions	Sub-questions (indicators)	Result
Relevance	Is the Project (Overall Goals and Project Purposes) consistent with the national/state development plans and national/state agricultural policies?	Consistency of the Overall Goal with the national/state development plans and agricultural policies	The 12th Five Year Plan (2012-2017) pointed out the enhancement of productivity is one of the priorities issues in agricultural sector. Also, the Five Year Plan (2012-2017) of Himachal Pradesh highlights 7 issues as objectives in agricultural sector during this five-year-plan period, and they include increase of production and productivity and diversification for higher farm income. Thus the project is consistent with both the national and state development policies in agricultural sector. No supports from other donor countries.
		Consistency of the Project Purpose with the national/state development plans and agricultural policies	
		Consistency with support from other donor countries	
	Was the selection of the target group appropriate?	Is the Project which aims to enhance DOA's capacity to promote crop diversification highly needed?	According to JICA's "The Study on Diversified Agriculture for Enhanced Farm Income in the State of Himachal Pradesh (January 2007 to March 2009)" the demand for fresh vegetables is expected to increase 1.9 times by 2022 (base year: 2005). The state has a considerable potential for vegetable production with an advantage of cool climate compared to other parts of the country, as well as the geographical proximity to the largest city, Delhi. This would enable the farmers to produce off-season vegetables and fruits. Also, as seen above, the Five Year Plan (2012-2017) of Himachal Pradesh also prioritizes improving rural livelihood through crop diversification. Thus the project which strengthens the extension capacity of frontline officers to promote crop diversification is highly needed.
		Does C/P agency play an important role in crop diversification in HP?	Main C/Ps of TCP are more than 100 technical staff of PMU, an institution established for implementation of HPCDPP. PMU is a responsible institution to construct irrigation facilities and promote crop diversification in 210 sub-project sites. (Note: PUM will be dissolved in March 2018)
		Are the project's components highly needed by C/P agency?	Main C/P, PMU, is promoting crop diversification in the target 5 districts. Under HPCDPP, PMU is responsible for construction of irrigation facilities, organizing farmers, formulating CDP and providing extension services to farmers in 210 sub-project sites in line with CDP. TCP provides core CEOs of PMU with opportunities to develop their capacities, i.e. both on and off-site training. With CEOs who improved their capacity, PMU could run HPCDPP smoothly. The project's components which help PMU substantially are highly needed by PMU.

Annex 3: Evaluation Grid (Results)

		Is the size of the target group appropriate?	C/Ps of TCP are more than 100 technical staff of PMU, and 30 among them, CEOs who actually provide extension services to farmers, are the main target of technological transfer. Since the Project Purpose aims to promote crop diversification in the five target district, and in fact the extension services have started in those areas by CEOs, it is appropriate to target the entire CEOs. Thus the size is more or less appropriate. However, by considering the fact that two-third of CEOs are outsourced and PMU exists only till March 2018, the discussion in terms of sustainability is necessary in the latter part.
	Is the Project consistent with Japan's foreign aid policy?	Is the Project related with any prioritized areas of ODA strategy?	Rolling Plan for Project Planning for India (June 2011) identifies several priority areas, and one of them is "support for poverty alleviation". It says that (1) to enhance productivity (2) to develop agricultural infrastructure and (3) to generate employment opportunity in rural area are focused issues under the priority area of "support for poverty alleviation", and TCP which contributes all three aspects is considered as an important project.
	Suitability as a means	Is the project suitable as a strategy to produce an effect with respect to the agricultural sector of HP?	The 12th Five Year Plan (2012-2017) pointed out the enhancement of productivity is one of the priorities issues in agricultural sector. Also, the Five Year Plan (2012-2017) of Himachal Pradesh highlights 7 issues as objectives in agricultural sector during this five-year-plan period, and they include increase of production and productivity and diversification for higher farm income. A major prerequisite condition to promote crop diversification in line with these plans is to develop irrigation facilities and increase irrigated CCA, and now HPCDPP is playing an important role in this regard. For crop diversification, it also requires intensive extension services which encourage farmers to start vegetable cultivation and adopt new farming technologies. TCP focusing on extension part through building capacity of CEOs, thus, is suitable as a means.
		Does Japan have a technology advantage? (Can Japan have accumulated know-how on the target technology? Can Japan's experiences be put to use?)	When introducing farming technology, TCP did introduce a very new technology o Himachal Pradesh, i.e. grafting, and demonstrate its applicability and technological significance. In addition, Japan accumulated knowledge and experiences regarding formation of water user's association and farmers' association, etc.
	Others	Have there been any changes in the environment of the project (politics, economy, society, etc.) since the	Nothing in particular.

Annex 3: Evaluation Grid (Results)

		ex-ante evaluation / mid-term review?	
Effectiveness	Is the achievement level of the Project Purpose adequate at this stage?	Adequacy of the achievement level of the Project Purpose	Same as "Verification of Performance".
	Were the outputs sufficient to achieve the Project Purposes?	Numbers, contents and qualities of the outputs	TCP consists of four outputs, i.e. output 1 which aims to strengthen DOA's capacity to formulate and implement crop diversification plan, output 2 and output 3 which contribute to capacity development of extension officers, and output 4 which summarize experiences at the pilot site, Lahaul. By considering importance of five components of MCD, namely institution, human resource, process, technique and lessons learned at pilot site, (i) the process is enhanced through output 1, (ii) extension officers (human resource) improved their capacity to promote crop diversification through output 2 and output3 and (iii) lessons learned from the pilot site is reflected mainly to process and techniques. Moreover, TCP prioritizes contributing to smooth implementation of HPCDPP, and thus highly needed supports were given to PMU by TCP. Thus effectiveness is secured.
	What are the inhibiting factors for the achievement of the Project Purposes?	Any changes in external factors	• Due to the delay in commencement of infrastructure development, crop diversification based on CDP was promoted only since Kharif 2015, and currently irrigation facilities was completed in 29 sub-project sites only. TCP will terminate before HPCDPP becomes fully in progress. • In PDM, several ambiguous expressions such as "model", "mechanism" and "system" are used. In fact, TCP discussed this issue with PMU and also at JCC (the mid-term review). Using ambiguous words cause unnecessary confusion, and it is partially inhibiting TCP's effectiveness.
	What are the promoting factors for the achievement of the Project Purposes?	Any changes in external factors	• DOA, HP and JICA's collaboration started way back in 2007, when "The Study on Diversified Agriculture for Enhanced Farm Income in the State of Himachal Pradesh (January 2007 to March 2009)" was inaugurated. This long-term professional relationship created rapport and mutual trust, and such a relationship created foundation for smooth implementation of TCP. • Since the main C/P institution become PMU, TCP could prioritize contributing to smooth implementation of HPCDPP, and thus highly needed supports were given to PMU by TCP. This enhanced effectiveness of TCP. (Issues regarding sustainability will be discussed later).

Annex 3: Evaluation Grid (Results)

Efficiency	Is the achievement level of the outputs adequate at this stage?	Adequacy of the achievement level of the outputs	Same as "Verification of Performance".
	Are the activities adequate and enough to produce three outputs?	Numbers, contents and qualities of the activities	Varieties of activities, i.e. infrastructure development (construction of irrigation facilities), formation of KVA and SGHs, demonstration activities with progressive farmers, etc. were carried out at the pilot site, Lahalri. The activities of Lahalri provided TCP experts with a great opportunity to learn the challenges faced by farmers as well as concerns of PMU regarding crop diversification in this area. With both experiences of the pilot site and their own expertize, the TCP team conducted project activities such as organizing workshops and training sessions, and numbers, contents and qualities of such activities can be considered as appropriate. This point is confirmed by PMU, too. (Note: Whether the concentration of activities in a single pilot site is appropriate is a question related to efficiency. However, since this entire framework of TCP is somehow pre-set, and therefore this issue will not be discussed by five evaluation criteria. In fact, this is an important point to discuss, and will be taken up at the section of lessons learned.)
	Is the output production adequate compared to the inputs?	Adequacy of human resources, training and equipment invested Level of utilization of inputs (human resources, training, equipment) Adequacy of timing of inputs Cost	**Human Resources (TCP experts and C/P)** From the interview with several technical staff of PMU, the main target of technological transfer, it became clear that they considered TCP's supports as very helpful for smooth implementation of their duties (implementation of HPCDPP). Thus inputs form TCP, number of experts and their expertise can be concluded as appropriate. (As for the assignment of experts and their expertise, please see the annex of the Evaluation Report.) As previously noted, the target of technological transfer of TCP is more than 100 technical staff of PMU, and most of them have either experience or knowledge, sometimes both, in agriculture. From the view point of their number and expertise, adequate human resources are devoted from the Indian side. However, as reiterated previously, by considering the fact that two-third of technical staff of PMU is outsourced and PMU exists only till March 2018, the discussion in terms of sustainability is necessary in the latter part. **Training in Japan** Eight members of PMU who are DOA officials participated in training in Japan from 29 June 2014 to 10 July 2014 as per annexed to the Evaluation Report. The training course covered five important

Annex 3: Evaluation Grid (Results)

			themes namely, agricultural extension, vegetable farming and post-harvest, water management and O&M of irrigation facilities, gender and marketing. Geographically, they have visited Nagao prefecture whose climate is similar to HP and Chiba prefecture where peri-urban agriculture flourishes. During the terminal evaluation, the evaluation team interviewed two out of eight. They listed up what they have seen in Japan, i.e. farming technologies in each prefecture, activities of JA, activities of women's cooperatives, agricultural-related business activities initiated by farmers. They said what they have seen in Japan enabled them to delineate a future vision of HP's agricultural development. **Equipment** The biggest physical input of TCP is irrigation facility (however this is not equipment), and this input is essential for every activity in the pilot site, Lahalri, and therefore highly utilized. In addition, equipment input by TCP, office equipment such as computer, printer, etc., is in full use now.
	What are the inhibiting and promoting factors?	With or without inhibiting and promoting factors	Due to the delay in commencement of infrastructure development, crop diversification based on CDP was promoted only since Kharif 2015, and currently irrigation facilities were completed in 29 sub-project sites only. TCP will terminate before HPCDPP becomes fully in progress. If more sub-projects were completed, then TCP could have provided supports to more sub-projects. Thus, the delay in HPCDPP affects partially to efficiency.
Impact	Are there prospects that the Overall Goal will be achieved as an effect of the Project?	Whether crop diversification will be promoted in the target area based on the advantageous climate conditions.	The path to the Overall Goal is set out.
	Are there any ripple effects to people or organizations other than the target groups?	Cases of ripple effects	The target areas aimed by both the Project Purpose and the Overall Goal are the same five districts covered under HPCDPP. However TCP provides training to extension officers of other seven districts, too. (For details, please refer to the annex of the Evaluation Report) One of major output of TCP, the Guidelines, can be disseminated well beyond the five target districts once the Guidelines receive a kind of acknowledgement from DOA.
	Any other impacts, either positive	Cases of any other impacts	• When introducing farming technology, TCP did introduce a very new technology to Himachal

Annex 3: Evaluation Grid (Results)

	or negative?	(Policies, society, environment, technological change, economic influence, etc.)	Pradesh, i.e. grafting. For example, a farmer in Lahalri who tried out grafting technology received a "Best Farmers Award" from the state government and the prize was awarded from the Governor. • The same technology was highly appreciated by the Agricultural University of HP. With the government's financial assistance, the University imported two semi-automatic grafting machines and started research on grafting. • In Lahalri as well as the sub-pilot sites the evaluation team visited, farmers confirmed that fodder crop was raised even during dry season thanks to the irrigation, and the availability of fodder throughout the year rise their income through increment of milk production.
	Causal relationship between the overall goal and the project purpose	Are the overall goal and the project purpose consistent?	The causal relationship between the overall goal and the project purpose is clear, but as mentioned earlier since the indicator seems rather too optimistic, it needs clarification of the indicator at this occasion.
		Are the important assumptions from the project objective to the overall goal correct also at the present point of time?	
Sustainability	By considering policies, are there prospects that the sustainability is secured?	Position of C/P agency in the field of crop diversification (Will the organization be responsible to promote crop diversification even in the future?)	As mentioned earlier, the 12th Five Year Plan (2012-2017) pointed out the enhancement of productivity is one of the priorities issues in agricultural sector. Also, the Five Year Plan (2012-2017) of Himachal Pradesh highlights 7 issues as objectives in agricultural sector during this five-year-plan period, and they include increase of production and productivity and diversification for higher farm income. Thus the DOA, as a state department, is indeed a prime institution to promote crop diversification in line with these plans. In addition, discussion with Director of DOA also confirmed that crop diversification is one of prioritized areas in agricultural sector, and the next five-year plan of HP is likely to continue focusing on crop diversification, too. Thus, by considering policies, there are prospects that the sustainability is secured.
		Will the relevant policies continue also after the cooperation is finished?	
	By considering organizational and institutional aspects, are there prospects that the sustainability is	Has C/P agency been acquiring organizational capacity to continue promoting crop diversification?	Main C/Ps of TCP are technical staff of PMU, an organization established to implement HPCDPP, and not both DOA and PMU officers as expected in the planning phase of TCP. Some of those who are currently working in PMU, especially those who are seconded from DOA, are expected to

	secured?	Are supports from the State Government expected?	continue their extension activities at the target areas. Moreover, TCP and PMU jointly endeavor to secure sustainability as follows: i) Regarding the Guidelines, a major output of TCP, TCP starts discussing acknowledgement of the Guidelines with DOA and also plans to invite five DDA for the explanatory workshop at the time of releasing the final version of the Guidelines. ii) Along with the progress of HPDCP, PMU starts developing a channel to communication with DDAO in the target area. For example, PMU officers attended a monthly meeting of DDAO Hamirpur to inform the progress of HPCDPP in Hamirpur District, and request DDA to send his extension officers to the sub-project sites to share the experience of HPDCP. iii) PMU officially appointed Master Trainers as per recommendation of the mid-term evaluation. Currently eight BPMs and eight AEOs and three DPM are appointed as master trainers officially. All of them are seconded from DOA. iv) DOA plans to hire 150 persons mainly as extension officers; currently DOA is receiving applications, and job interview will start from the middle of July, 2015. Many of CEOs who are outsourced are likely to apply for the posts. Once they are hired, they are likely to internalize what they have learned from TCP into DOA. As seen above, serious efforts were made and are to be made by DOA, PUM and TCP, and in fact it helps tremendously to secure sustainability of TCP.
	By considering financial aspects, are there prospects that the sustainability is secured?	Are financial situations of C/P agency sound? Are C/P agency likely to secure budget (incl. personnel expenses) to continue crop diversification activities?	DOA is a state nodal agency to promote agricultural development. Moreover, promotion of crop diversification is a key area of their activities, and therefore DOA is highly likely to secure budget to continue promoting crop diversification. As mentioned earlier, DOA currently plans to hire 150 new graduates. This self-evidently shows that DOA is likely to secure enough budgets (incl. personnel expenses).
	By considering technical aspects, are there prospects that the sustainability is secured?	Are appropriate technologies developed and transferred, in consideration of the technical level of C/P agency?	As stated in the section of "Efficiency", varieties of activities, i.e. infrastructure development (construction of irrigation facilities), formation of KVA and SGHs, demonstration activities with progressive farmers, etc. were carried out at the pilot site, Lahalri. Based on experiences of the pilot site, TCP team conducted training activities which are highly needed at the ground and enhanced

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		Have C/Ps acquire knowledge and the transferred technology enough?	capacity of CEOs. As seen in the section of "Output 3", the extension skill of CEOs and their capacities to promote crop diversification have been strengthened through a variety of TCP activities. Currently, they are actively working, i.e. formulating CDP, etc., in sub-project sites of HPCDPP. From now on, the activities are replicated in all 210 sub-project sites, and therefore the transferred technology is and will be used widely in the target areas. Moreover, through the effective distribution of the Guidelines and training provided to extension officers of 7 non-HPCDPP districts, it is possible for some transferred technology is used even beyond the target areas.
		Will the transferred technology and equipment be used widely?	

Annex 2: Plan of Opertion

Plan of Operation (Revised as of June 2015)

1. Project Management / Agricultural Extension
2. Water Management / Operation & Maintenance
3. Vegetable Cultivation / Post Harvest
4. Training / Project Coordination
5. Gender / Social Inclusion
6. Design & Construction Management

1	2	3	4	5	6	Activity
						1. DOA's capacity to plan and implement crop diversification is strengthened
•						1-1. Review existing plan on crop diversification and study, how the pilot project should be.
•						1-2. Conduct Plan-Do Check-Action training on crop diversification
•						1-3. Facilitation in the preparation of annual plan on crop diversification
•	•	•	•	•	•	1-4. Develop Crop Diversification Guideline based on the lesson learned from Crop Diversification model practiced in the Pilot Area and Sub-Pilot Area
						2. Training system to promote crop diversification is developed
•			•			2-1. Formulate annual plan on extension training
•	•	•	•	•	•	2-2. Review the existing training curriculum and materials on the extension
•	•	•	•	•	•	2-3. Develop training curriculum and materials on the extension of crop diversification
•	•	•	•	•	•	2-4. Revise curriculum and materials incorporating feedback from the Pilot Project
						3. The extension skill of the core extension officers are improved
•	•	•	•	•	•	3-1. Conduct hands-on training to core extension officers assigned to the pilot area and highlighted 5 districts (Kangra, Una, Hamirpur, Bilaspur and Mandi)
•	•	•	•	•	•	3-2. Conduct trainings to extension officers in Sub-Pilot Area
						4. Crop Diversification Model is developed and practiced in the Pilot Area
•	•		•			4-1. Conduct baseline survey
•	•	•		•	•	4-2. Selection of a pilot area to be approved by JCC.
						4-3. Construct irrigation facilities and prepare demonstration plot in the pilot area
	•				•	(1) Preparation of detailed design and tender document
					•	(2) Tendering, selection of contractor and contract award
					•	(3) Construction and supervision
	•				•	(4) Trial operation and handing over
		•			•	(5) Preparation of demonstration plot
	•			•		4-4. Organize farmers groups and Self help groups
•	•	•	•	•	•	4-5. Conduct trainings to farmers
						0. Activities related to Project Management
•	•	•	•	•	•	0-1. Preparation of the Reports
•	•	•	•	•	•	0-2. Organize JCC meetings
•	•	•	•	•	•	0-3. Joint Evaluation

Year: 2011, 2012, 2013, 2014, 2015 — Month: J F M A M J J A S O N D

Reports: WP1, PR1, WP2, PR2, WP3, PR3, WP4, PC/R

JCC meetings: 1st JCC, 2nd JCC, 3rd JCC, 4th JCC, 5th JCC, 6th JCC, 7th JCC, 8th JCC, 9th JCC

Evaluation: Mid-term Evaluation, Terminal Evaluation

Legend
- • Main person in charge
- • Responsible for the part of specialty

Original Plan
Actual
Revised Plan on June 2015

Annex 1: Project Design Matrix (PDM)

Project Name : Technical Cooperation Project for Crop Diversification in Himachal Pradesh | Duration: 5 years | Ver. 01
Target Area: State of Himachal Pradesh | Target Group: Core Extension Officers | Date: Oct. 2013

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal (Target at 5 years after the end of the Project) Crop diversification is promoted in the target area based on the advantageous climate conditions	(After 5 years of completion of the project) (1) 20% of total cultivated land in the target area is diversified to the vegetable	(1) Agricultural census by DOA / Other reports	
Project Purpose (Target at the end of the Project) The promotion mechanism for crop diversification is established in DOA Himachal Pradesh.	(1) Extension activities based on the Crop Diversification Model are expanded in 5 districts.	(1) Monitoring survey carried out by the Project	- RIDF project is continued on the same scale - No severe decline in agriculture production price
Outputs 1. DOA*1's capacity to plan and implement crop diversification is strengthened.	(1)-1 Implementation guideline for crop diversification is prepared. (1)-2 Annual PDCA cycle of crop diversification functions in DOA*1. (i.e. Annual Plan on crop diversification is formulated, monitored and evaluated.)	(1)-1 Check the output (1)-2 Monitoring survey carried out by the Project	- No severe decline of the state government budget on the agriculture development and support - No severe decline in agriculture production price
2. Training system to promote crop diversification is developed.	(2)-1 Training curriculum and materials are developed after revision in each subject.	(2)-1 Check the output	
3. The extension skill of the core extension officers is improved.	(3)-1 80% of the core extension officers can conduct farmers' training by themselves on the various technologies. (3)-2 50% of the core extension officers can launch extension activities in the areas they cover.	(3)-1 Monitoring survey carried out by the Project (3)-2 - do -	
4. Crop diversification model is developed and practiced in the Pilot area.	(4)-1 30% of the farmers/20% of CCA in the pilot area undertake vegetable cultivation. (4)-2 30% of farmers in the pilot area can increase their income by the Project. (4)-3 SHGs in the pilot area can increase their income by their group activities. (4)-4 Irrigation facilities in the pilot area are properly maintained by farmers	(4)-1 - do - (4)-2 - do - (4)-3 - do - (4)-4 - do -	

Annex 1: Project Design Matrix (PDM)

Activities

1-1. Review the existing plan on crop diversification and study, how the pilot project should be.
1-2. Conduct Plan-Do-Check-Act training on crop diversification
1-3. Facilitation in the preparation of annual plan on crop diversification
1-4. Develop Crop Diversification Guideline based on the lesson learned from crop diversification model practiced in the Pilot Area and Sub-pilot Area

2-1. Formulate annual plan on extension training
2-2. Review the existing training curriculum and materials on extension
2-3. Develop training curriculum and materials on extension of crop diversification
2-4. Revise curriculum and materials incorporating feedback from the Pilot Project

3-1. Conduct hands-on training to core extension officers assigned to the pilot area and highlited 5 districts (Kangra, Una, Hamirpur, Bilaspur and Mandi) on:
- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Infrastructure development/operation and maintenance

3-2. Conduct trainings for extension officers in Sub-Pilot Areas (Government of Himachal Pradesh will establish Sub-Pilot Areas by its own budget)

4-1. Conduct baseline survey
4-2. Selection of a pilot area to be approved by JCC
4-3. Construct irrigation facilities and prepare demonstration plot in the pilot area.
4-4. Organize farmers groups and Self-help groups
4-5. Conduct trainings for farmers on:
- Group formation
- Crop cultivation
- Farm management
- Post harvest/processing
- Marketing
- Operation and maintenance

Inputs

<Japanese Side>
1) Experts
- Chief Advisor / Agriculture Extension
- Water Management / Operation and Maintenance
- Crop Cultivation / Post Harvest
- Training / Project Coordination
- Gender / Social Inclusion
- Design & Construction Management

2) Training for beneficiaries and Himachal Pradesh C/Ps
3) Cost for project office management (personnel, equipment, and consumables)
4) Cost for construction of pilot area and preparation of demonstration plot
5) Equipments for project management, if necessary

<Himachal Pradesh Side>
1) Counterparts (from Shimla Headquarter to field level)
2) Necessary transport and other expenditures for counterparts
3) Project office at Shimla and site
4) Sharing of project office running expenses
5) Tax exemption measures, etc.

<Abbreviation>

DOA: Department of Agriculture, Government of Himachal Pradesh
PMU: Project Management Unit
DPMU: District Project Management Unit
BPMU: Block Project Management Unit
TCP: Technical Cooperation Project
CCA: Cultivable/Culturable Command Area
SHG: Self Help Group

- Proposed ODA Loan Project is implemented on schedule
- No disaster is occurred (drought / flood)
- No policy change in the agriculture

Pre-conditions

- There is a need on the agriculture development in the state
- There is the budget to bear the counterpart budget for project implementation in the State

Gender and social inclusion should be considered in every activity as well as measured by objectively verifiable indicators
*1 The Target group will be the core extension officers of PMU staffs

Annex 4: List of the Japanese experts

Phase-1 (Feb. 2011 to May 2012)

	Expert Name	Expertise	Duration		Man-Month
1	MORIOKA Naoto	Chief Advisor / Agricultural Extension	07-Mar-11	27-May-11	2.73
			06-Jun-11	06-Jul-11	1.03
			26-Jul-11	15-Sep-11	1.73
	KAWANAMI Hidetsugu	Chief Advisor	03-Oct-11	07-Dec-11	2.20
			03-Feb-12	10-Feb-12	0.27
2	MURUGABOOPATHI Chellasamy	Water Management / O&M	07-Mar-11	05-May-11	2.00
			10-Jul-11	07-Sep-11	2.00
			11-Oct-11	09-Dec-11	2.00
3	NAGATA Yoko	Vegetable Farming / Post-harvest	22-Mar-11	20-May-11	2.00
			10-Jul-11	07-Sep-11	2.00
			01-Nov-11	09-Dec-11	1.30
			03-Jan-12	23-Jan-12	0.70
4	SHIMIZU Keisuke	Training / Project Coordinator	07-Mar-11	05-May-11	2.00
			01-Feb-12	16-Mar-12	1.50
5	MITSUI Ayako	Gender / Social Inclusion / Institutional Develo	27-Jun-11	10-Aug-11	1.50
			20-Nov-11	04-Dec-11	0.50
6	KAWANAMI Hidetsugu	Design & Construction I	22-Mar-11	20-Apr-11	1.00
			17-May-11	15-Jun-11	1.00
7	HOTTA Takashi	Design & Construction II	22-Mar-11	14-Jul-11	3.83
			31-Jul-11	02-Dec-11	4.17
			16-Feb-12	29-Apr-12	2.47
8	USUKI Nobuharu	Design Inspection	21-Jun-11	14-Jul-11	0.80
Total					38.73

Note: Work in Japan: 0.60 Man-month in total

Phase-2 (Jun. 2012 to Apr. 2013)

	Expert Name	Expertise	Duration		Man-Month
1	KAWANAMI Hidetsugu	Chief Advisor	17-Jul-12	01-Aug-12	0.53
	ISHIZAKI Yoshiyuki	Chief Advisor / Agricultural Extension / Marke	20-Jul-12	17-Oct-12	3.00
			01-Nov-12	15-Dec-12	1.50
			17-Jan-13	28-Feb-13	1.43
			15-Mar-13	15-Apr-13	1.07
2	MURUGABOOPATHI Chellasamy	Water Management / O&M I	20-Jul-12	01-Sep-12	1.47
			18-Sep-12	02-Nov-12	1.53
			15-Jan-13	15-Mar-13	2.00
3	FUKUDA Akihiro	Water Management / O&M II	10-Oct-12	08-Dec-12	2.00
4	NAGATA Yoko	Vegetable Farming / Post-harvest	01-Aug-12	05-Oct-12	2.20
			03-Dec-12	24-Jan-13	1.77
			16-Mar-13	15-Apr-13	1.03
5	MITSUI Ayako	Gender / Social Inclusion / Institutional Develo	28-Aug-12	03-Oct-12	1.23
			24-Oct-12	15-Dec-12	1.77
6	HOTTA Takashi	Design & Construction	17-Jul-12	30-Aug-12	1.50
			15-Nov-12	29-Dec-12	1.50
7	SHIMIZU Keisuke	Marketing II / Training / Project Coordinator I	17-Jul-12	02-Aug-12	0.57
			06-Nov-12	21-Dec-12	1.53
			02-Mar-13	15-Apr-13	1.50
8	KOIDE Ryu	Training / Project Coordinator II	06-Nov-12	03-Feb-13	0.33
Total					29.46

Note: Work in Japan: 0.40 Man-month in total

Annex 4: List of the Japanese experts

Phase-3 (May 2013 to Apr. 2014)

	Expert Name	Expertise	Duration		Man-Month
1	ISHIZAKI Yoshiyuki	Chief Advisor / Marketing I	15-May-13	25-Jul-13	2.40
			01-Sep-13	30-Oct-13	2.00
			02-Dec-13	03-Jan-14	1.10
			15-Feb-14	15-Apr-14	2.00
2	MISAO Yasushi	Agricultural Extension	30-May-13	13-Jul-13	1.50
			16-Sep-13	30-Oct-13	1.50
3	MURUGABOOPATHI	Water Management / O&M I	26-Jun-13	25-Jul-13	1.00
4	FUKUDA Akihiro	Water Management / O&M II	15-May-13	28-Jun-13	1.50
			17-Aug-13	15-Oct-13	2.00
			16-Nov-13	15-Dec-13	1.00
			12-Feb-14	28-Mar-14	1.50
5	NAGATA Yoko	Vegetable Farming / Post-harvest	16-Jul-13	04-Oct-13	2.70
			09-Dec-13	10-Jan-14	1.10
			11-Mar-14	15-Apr-14	1.20
6	MITSUI Ayako	Gender / Social Inclusion / Institutional Develo	17-Aug-13	30-Sep-13	1.50
			07-Jan-14	20-Feb-14	1.50
7	HOTTA Takashi	Design & Construction	08-Sep-13	22-Oct-13	1.50
			31-Jan-14	31-Mar-14	2.00
8	SHIMIZU Keisuke	Marketing II / Training / Project Coordinator	01-Jul-13	30-Jul-13	1.00
			15-Oct-13	22-Nov-13	1.30
			11-Mar-14	15-Apr-14	1.20
Total					32.50

Note: Work in Japan: 1.00 Man-month in total

Phase-4 (May 2014 to Jun. 2015 Actual, Jul. 2015 to Dec. 2015 Planned)

	Expert Name	Expertise	Duration		Man-Month
1	ISHIZAKI Yoshiyuki	Chief Advisor / Agricultural Extension / Marke	18-May-14	31-Jul-14	2.50
			04-Sep-14	30-Nov-14	2.93
			04-Jan-15	22-Feb-15	1.67
			19-Mar-15	30-Apr-15	1.43
			01-Jun-15	31-Jul-15	2.03
			17-Aug-15	15-Nov-15	3.03
2	FUKUDA Akihiro	Water Management / O&M	01-Jun-14	15-Jul-14	1.50
			09-Nov-14	23-Dec-14	1.50
			01-Feb-15	03-Mar-15	1.03
			12-Mar-15	14-Apr-15	1.13
			24-May-15	17-Jul-15	1.83
3	NAGATA Yoko	Vegetable Farming / Post-harvest	02-Jul-14	11-Sep-14	2.40
			30-Oct-14	29-Dec-14	2.03
			01-Apr-15	10-Jul-15	3.37
			01-Sep-15	21-Oct-15	1.70
4	MITSUI Ayako	Gender / Social Inclusion / Institutional Develo	10-Aug-14	29-Sep-14	1.70
			14-Feb-15	28-Mar-15	1.43
			11-Jun-15	21-Jul-15	1.37
5	HOTTA Takashi	Design & Construction	22-Aug-14	19-Nov-14	3.00
			13-May-15	21-Jul-15	2.33
			12-Oct-15	15-Nov-15	1.17
6	SHIMIZU Keisuke	Marketing Ii / Training / Project Coordinator	23-May-14	21-Jun-14	1.00
			22-Jul-14	22-Aug-14	1.07
			26-Jan-15	04-Mar-15	1.27
			07-Jun-15	10-Jul-15	1.13
			02-Aug-15	22-Aug-15	0.70
			07-Oct-15	15-Nov-15	1.33
Total					47.60

Note: Work in Japan: 0.85 Man-month in total

Annex 5: List of the trainees in Japan

Title: Training in Japan organized by JICA TCP (From 29 June 2014 to 10 July 2014)

	No.	Name	Designation/Organization
2014	1	Mr. Ram Adhin Singh PATEL	Assistant Commissioner, Department of Agriculture and Cooperation/Natural Resource Management, Ministry of Agriculture (MoA)
	2	Mr. Som Raj KALIA	Joint Director, Department of Agriculture (DoA)
	3	Mr. Ashwani Kumar BHARDWAJ	Divisional Engineer, Soil Conservation Division, Department of Agriculture (DoA)
	4	Mr. Pradeep BEHL	Deputy Project Director, State Project Management Unit (SPMU)
	5	Mr. Prem Lal SHARMA	Block Project Manager, Block Project Management Unit (BPMU), Bilaspur
	6	Mr. Rattan Chand BHARDWAJ	Block Project Manager, Block Project Management Unit (BPMU), Sarkaghat
	7	Mr. Bharat Raj SOOD	District Project Manager, District Project Management Unit (DPMU), Palampur
	8	Mr. Navneet Kumar SOOD	Subject Matter Specialist (SMS), District Project Management Unit (DPMU), Palampur

Note: Training carried out from June to July, 2014, Postion of the participants as of June 2014

Annex 6: List of the Equipments

*1 Use: A-frequently (almost every day), B-Sometimes (1-3 week), C-Use concentrated on particular period, D-Rarely (1-3 times a year), E-No used
*2 Mgt: A: Always possible to use with sufficient maintenance, B-Almost no problem in use, C-Possible to use if required, D-Difficult to use

JFY	No.	Item	Qty	Unit Price Rs.	Total Price Rs.	Total Price equipment to JPY	Model number/ Management number	Location	Responsible Organization	International or local procument	Date of Delivery	Use (*1)	Mgt (*2)	# of disposed eqpt	# of available eqpt	Relevant major activity # of PDM
2011	1	Air conditioner	4	53,000	212,000		Bluestar AC	Project Office	Project	Local	02/12/2012	A	A	0	4	1-1~4-3
2011	2	Laptop	8	35,175	281,400		HP PRO 4420	Project Office	Project	Local	23/07/2011	A	A	0	8	1-1~4-3
2011	3	Desktop PC	3	48,000	144,000		Wipro	Project Office	Project	Local	11/04/2011	A	A	0	3	1-1~4-3
2011	4	Projecter	1	47,000	47,000		Mitsubishi EX200U	Project Office	Project	Local	11/04/2011	B	A	0	1	1-1~4-3
2011	5	Printer	1	125,000	125,000		LBP9100	Project Office	Project	Local	16/08/2011	A	A	0	1	1-1~4-3
2011	6	AutoCAD	3	27,679	83,037		AutoCAD LT 2012	Project Office	Project	Local	13/06/2011	D	A	0	3	4-3
2011	7	Plotter	1	149,496	149,496		HP DesignJet 510	Project Office	Project	Local	05/05/2011	C	A	0	1	4-3
2011	8	Photocopy machine	1	198,300	198,300		Canon IR2525	Project Office	Project	Local	22/11/2011	A	A	0	1	1-1~4-3
2011	9	Microsoft Office	8	21,425	171,400		Microsoft Office Standard 2010	Project Office	Project	Local	22/12/2011	A	A	0	8	1-1~1-3
		Total			1,411,633	2,386,000										

Annex 7: List of the training provided to technical staff of PMU

<Phase 2>

Category	Title	Date	PMU			DoA			Total		
			Male	Female	Total	Male	Female	Total	Male	Female	Total
Farming	Exposure Visit of Extension Officers of PMU to Pilot Project Site Lahaul-i	Dec. 12,2012	15	9	24			0	15	9	24
	Cropping Pattern Arrangement and Farm Management	Nov.16 and 17,2012	18	5	23			0	18	5	23
	Protected Cultivation of Vegetables	Dec.28 and 29, 2012	13	8	21			0	13	8	21
	Kharif Season Crop Cultivation	Jan.9 and 10,2013	14	7	21			0	14	7	21
	Organic Farming	Feb 6,7 and 8 2013	11	2	13	8	1	9	19	3	22
	(i) Vegetable Promotion and Improvement of Food Grains Productivity and (ii) Insect Pest	May.18, 19 and	15	6	21			1	15	7	22
	Water Use and Fertilizer Application (To be carried out in	Apr.2013)	15	7	22			0	15	7	22
Water Management	Soil Conservation and Water Management	Feb.15 and 16,2013	17	3	20	5		5	22	3	25
	Institutional Aspects related to Water management and O&M	Mar.1 and 2,2013	4		4	4		4		0	8
Design and Construction	Operation and Maintenance of Micro-Irrigation System (MIS) in at PMU and Patora village, Bhotta	Feb.21, 2013	21	6	27	1		1	22	6	28
Gender and S/I	Workshop on Experiences Sharing of TCP on Institutional Development	Dec. 11,2012	16	9	25			0	16	9	25
Marketing	Agricultural Marketing Workshop for Sharing Experiences on TCP Marketing Survey	Dec. 12, 2012	15	8	23			0	15	8	23
Total			174	70	244	18	2	20	184	72	264

<Phase 3>

Category	Title	Date	PMU			DoA			Total		
			Male	Female	Total	Male	Female	Total	Male	Female	Total
Extension	Workshop on Need and requirements for DOA 4 District on	Jan. 8, 2013.	22	1	0			23	22	1	23
	Workshop on Need and Requirements on Training for PMU	Jan.14,2013.	19	5	24			0	19	5	24
	PDCA Workshop for Planning	Sep. 23 &24, 2013.	16	5	15			6	16	5	21
	Workshop on Need and Requirements on Training for 7 District	Jul.5,6,7, 2013.	0	0	0	32		32	32	0	32
	Needs and Requirements on Training Programs for PMU officers	Feb. 19 ,2014.	17	4	20			1	17	4	21
	Needs and requirements on training program for 5 District	Feb. 22,2014.			0	27	2	29	27	2	29
	Needs and requirements on training program for DPMU Palampur	Feb.26, 2014.	14	8	22				14	8	22
	Needs and Requirements for DPMU Mandi	March.7,2014.	14	5	19				14	5	19
	PDCA Training on Check	Oct.7,2013.	22	0	18			4	22	0	22
Water Management	The Sharing Workshop on Participatory Irrigation Management in Lahaul-i Pooh	Oct. 3,2013.	13	3	12			4	13	3	16
	Sharing Workshop on Participatory Irrigation Management	Dec. 10,2013.	15	5	20			0	15	5	20
	Participatory Irrigation Management &Needs and Requirement for 6 Distt	Feb. 6 &7,2014.	20	0				20	20	0	20
	Interactive Workshop on Training Manuals	Jan.29,2014.	11	0	9			2	11	0	11
Farming	Exposure Visit to Karnal	Aug. 22 to 25,2013.	13	7	20			0	13	7	20
	Training on protected cultivation and post harvest activities	Sep.30&1 Oct.2013.	14	6	14			6	14	6	20
	Training on Tips &Techniques	Nov. 27&28,2013.	18	1	19			0	18	1	19
	Training on Organic certification at palampur	Jan. 9 &10 2013.	24	3	23	4	2	6	28	5	29
	Training on summer season vegetable cultivation	March. 14, 2014.	10	10	20				10	10	20
Design and Construction	Training on Auto-Cad	Oct. 5 &6,2013.	15	2	16			1	15	2	17
	Training on total Station	Nov .29 &1	18	2	20			0	18	2	20
	Training on Management of investigation/Planning/Designing/Construction of irrigation project	Mar.22 &23,2014.	26	0	26				26	0	26
Marketing	Agriculture Marketing	Dec.12 &13, 2013.	22	1	0			23	22	1	23
Gender and S/I	Trainiee on SHG Development and Support	Feb.13,2014.	14	11	25				14	11	25
Total			357	79	342	63	4	157	420	83	499

<Phase 4>

Category	Title	Date	PMU			DoA			Total		
			Male	Female	Total	Male	Female	Total	Male	Female	Total
Water Management	Training on Monitoring System for securing the sustainability of irrigation Project	Jul.3,2014	20	4	24			0	20	4	24
	Training on Monitoring System for securing the sustainability of irrigation Project	Jul.5,2014	22	8	30			0	22	8	30
Farming	Training on Exotic and off season vegetable cultivation	Jul.18 &19,2014	15	2	12			5	15	2	17
	Training on Exotic and off season vegetable cultivation	Jul.25 &26,2014	11	8	15			4	11	8	19
	Training on Exotic and off season vegetable cultivation	Jul.30 &31,2014	9	5	9			5	9	5	14
	Training on Exotic and off season vegetable cultivation	Aug.6 &7,2014	10	1	4			8	10	1	12
	Training on Exotic and off season vegetable cultivation	Aug.13 &14,2014.	11	2	3			10	11	2	13
	Exposure Visit of PMU Extension staff PAU,Ludhiana	Nov- dec.27to 1,2014	13	4	17			0	13	4	17
	Harvest,post harvest and seed preservation techniques for Hamirpur	Dec.3.2014	2	1	3			0	2	1	3
	Harvest,post harvest and seed preservation techniques for Kasaza	Dec.12,2014	7	4	11			0	7	4	11
	Training on improved techniques for cultivation of Exotic and off- season VegetablesAt SAMETI	May.29 &30,2015				19	2	22	19	2	22
Gender and S/I	Training on SHG development and support on	Sep.9 &10,2014	14	8	22			0	14	8	22
	Training on SHG Development and Support(4) Hamirpur	Mar.25 &26,2015	12	9	21			0	12	9	21
Extension	Preparation of Crop Diversification plan,Monitoring and Evaluation at SAMETI	Sep.19&20,2014			0	23	0	23	23	0	23
	Workshop of CDP ,Monitoring and Evaluation at DPMU Palampur	Oct.29,2014	8	4	12			0	8	4	12
	Workshop of CDP ,Monitoring and Evaluation at SPMU Hamirpur	Oct.30,2014	10	4	14			0	10	4	14
	Workshop of CDP ,Monitoring and Evaluation and training on post harvest at DPMU Mandi	Nov.15,2014.	7	2	9			0	7	2	9
	Workshop of CDP ,Monitoring and Evaluation and training on post harvest at DPMU Mandi	Nov.22,2014.	6	0	6			0	6	0	6
	Workshop of CDP ,Monitoring and Evaluation and training on post harvest at BPMU Bilaspur	Dec.5,2014	3	1	4			0	3	1	4
	Workshop on feed back on preparation of crop diversification plan and monitoring&Evaluation at BPMU,Nirmand	Dec.11,2014	7	0	7			0	7	0	7
	Workshop on feed back on preparation of crop diversification plan and monitoring&Evaluation at BPMU,Baijnath	Dec.18,2014.	6	1	7			0	6	1	7
	Workshop on feed back on preparation of crop diversification plan and monitoring&Evaluation at BPMU,Hamirpur	Dec.23,2014	2	1	3			0	2	1	3
	Workshop of CDP ,Monitoring and Evaluation at BPMU Sarkaghat	Dec.26,2014	6	0	6			0	6	0	6
Extension	Workshop on feed back on preparation of crop diversification plan and monitoring&Evaluation at BPMU,Dehra	Jan.9,2015.	4	2	6			0	4	2	6
	On basic knowledge and skills for protected cultivation at DDA Hamirpur	Jan.10,2015	14	8	22			0	14	8	22
	Workshop of CDP ,Monitoring and Evaluation at BPMU Una	Jan.17,2015	3	0	3			0	3	0	3
	Workshop on Feedback on preparation of Crop diversification plan, Monitoring & Evaluation BPMU Bilaspur	Feb.12,2015.	4	1	5			0	4	1	5
	Workshop on Feedback on preparation of Crop diversification plan, Monitoring & Evaluation BPMU Nirmand	Feb.21,2015.	5	0	5			0	5	0	5
	Workshop on Feedback on preparation of Crop diversification plan, Monitoring & Evaluation BPMU Sarkaghat	Feb.13,2015.	4	1	5			0	4	1	5
	Workshop on Feedback on preparation of Crop diversification plan, Monitoring & Evaluation BPMU Dehra	Feb.17,2015.	2	2	4			0	2	2	4
	Workshop on Feedback on preparation of Crop diversification plan, Monitoring & Evaluation BPMU Baijnath	Feb.24,2015	3	2	5			0	3	2	5
	Training on Preparation of Crop Diversification Plan and Implementation Schedule at Mandi	Apr.23,2015	8	2	10			0	8	2	10
	Training on Preparation of Crop Diversification Plan and Implementation Schedule at Hamirpur	Apr.25,2015	10	4	14			0	10	4	14
	Training on Preparation of Crop Diversification Plan and Implementation Schedule at Palampur	Apr.28,2015	12	5	17			0	12	5	17
	Workshop of CDP ,Monitoring and Evaluation at BPMU Mandi	Jan.23,2015.	4	0	4			0	4	0	4
Design and Construction	Training on Auto CADD at CADD Center Hamirpur	Jan.31&Feb 1,2015	12	0	12			0	12	0	12
	Training on planning Designing and Construction Management in 7 District at SAMETI	Jan.26&27,2015				21	0	21	21	0	21
Marketing	Dialogue on Marketing of Vegetables at Chandigarh	Aug.8&9,2015	7	8	15			0	7	8	15
Total			293	104	366	62	2	98	356	106	464