

Government of Nepal  
Ministry of Irrigation  
**Department of Irrigation**  
**Irrigation and Water Resources Management Project**  
**(IWRMP-AF)**



**Irrigation Infrastructures Development &  
Improvement, Component-A**  
**(Word Bank Project ID: P144474)**

**3<sup>rd</sup> TRIMESTER REPORT**  
**16 Nov 2016 – 15 Mar 2017**

**CMS Engineering Consult Pvt. Ltd.**  
**Full Bright Consultancy Pvt. Ltd. JV**

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## Abbreviations

AMIS	Agency- Managed Irrigation System
AO	Association Organizer (Social Worker)
CBO	Community Based Organization
CCA	Cultivable Command Area
CFUG	Community Forestry User Group
DADO	District Agriculture Development Office
DDC	District Development Committee
DDG	Deputy Director General
DG	Director General
DHM	Department of Hydrology and Meteorology
DIO	District Irrigation Office
DoA	Department of Agriculture
DoI	Department of Irrigation
DTL	Deputy Team Leader
DTT	District Technical Team
DTW	Deep Tube Well
DWRC	District Water Resources Committee
EIA	Environmental Impact Assessment
FMIS	Farmers Managed Irrigation System
FY	Fiscal Year
GIS	Geographical Information System
GMIS	Geographical Management Information System
GoN	Government of Nepal
GW	Groundwater
GWID	Groundwater Irrigation Directorate
GWIDD	Groundwater Irrigation Development Division
ha	hectare
ICWMP	Integrated Crop and Water Management Program
IDA	International Development Association
IDD	Irrigation Development Division
IDSD	Irrigation Development Sub Division
IEE	Initial Environmental Examination
ISE	Initial Social Examination
ISEA	Integrated Social and Environment Assessment
ISF	Irrigation Service Fee
IWRMP	Irrigation and Water Resources Management Project
M&E	Monitoring and Evaluation
MIS	Management Information System
MM	Mitigation Measure
MoA	Ministry of Agriculture
MoF	Ministry of Finance
MoI	Ministry of Irrigation
MTR	Mid Term Review
MWDR	Mid Western Development Region
NGO	Nongovernmental Organization

NISP	Nepal Irrigation Sector Project
NPC	National Planning Commission
O&M	Operation and Maintenance
OPD	Office of the Project Director
PAD	Project Appraisal Document
PBME	Project Beneficiary Monitoring & Evaluation
PC	Project Coordinator
PD	Project Director
PICC	Project Implementation and Coordination Committee
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PMU	Project Management Unit
PSC	Project Steering Committee
RAC	Regional Appraisal Committee
RAD	Regional Agriculture Directorate
RD	Regional Director
RfP	Request for Proposal
RID	Regional Irrigation Directorate
RPSU	Regional Project Support Unit
SAC	Sub-project Appraisal Committee
SBD	Standard Bidding Document
SDE	Senior Divisional Engineer
SEA	Social and Environment Assessment
SEMP	Social and Environmental Management Plan
SMU	Sub-project Management Unit
STW	Shallow Tube Well
TA	Technical Assistance
ToR	Terms of Reference
VDC	Village Development Committee
WB	World Bank
WUA	Water Users Association
WUG	Water Users Group

## **1 INTRODUCTION**

### **1.1 Background**

The Irrigation and Water Resources Management Project (IWRMP) has been initiated with the aim of supporting the national goal of poverty reduction and to develop Nepalese irrigated agriculture through irrigation development and management. The project is being implemented with grant assistance from the World Bank (WB) along with the direct contribution of Water Users Associations (WUAs) and the Government of Nepal (GoN).

The objective of the Irrigation Infrastructure Development and Improvement Component (Component-A) is to improve irrigation water service delivery in selected schemes in the 40 districts of the western regions and to expand and improve groundwater irrigation in the Terai. During the period of Original Scope (OS) from March 2008 to June 2016, a total of 128 FMIS subprojects were improved and developed, covering 18,312 ha of both surface and groundwater irrigation schemes. The OS was closed on June 30, 2016.

There were huge pressures from users to undertake more subprojects for implementation. In order to address these demands, the World Bank agreed to a GoN request to continue project activities with Additional Financing (AF) from March 2014 to June 2018. Under the scope of the AF, the project prepared detailed project investment plan to cover the rehabilitation and modernization of 72 FMISs (6,899 ha) and 8 clusters of groundwater schemes (6,460 ha), including BLGWP.

31 AF subprojects out of the original 83 had been completed by the beginning of the reporting period and 52 were ongoing. The OPD, with the consent of the World Bank, has also started to implement an additional 23 subprojects using savings from the AF; bringing the total number of subprojects to be completed by 30 June 2018 to 106.

### **1.2 Project Management**

A number of key national, regional and district level institutions have key roles in project implementation and institutional structures have been created at various levels from centre to district. At the centre, a high-level Project Steering Committee (PSC) is chaired by the Secretary of the Ministry of Irrigation (MoI). At executive level, a Project Implementation and Coordination Committee (PICC) is chaired by the Director General (DG) of DoI.

The Office of the Project Director (OPD) coordinates all project activities from all implementation agencies at the centre, while the Regional Project Support Units (RPSU) are directly responsible for implementation of the project. Similarly, Subproject Management Units at the irrigation division or sub division level are responsible for individual subproject execution.

## 2 PROJECT MANAGEMENT

### 2.1 Report Preparation

In addition to the 13 fulltime TA Team members, 6 part-time members were mobilised during the reporting period. They were the agricultural economist/M&E specialist, the environmental expert, the MIS/GIS specialist, the hydrogeologist, the electromechanical engineer and procurement specialist. However, the team leader (TL) was not mobilised. During this trimester TA Team members visited a number of subprojects and submitted field visit reports, individual trimester reports describing progress and the key issues facing the subprojects.

The team worked on updating of draft Inception Report (IR) and held a series of discussions with the OPD on (i) preparation of data collection formats in the form of booklet and (ii) action plans of individual consultants. It would be easy for tracking the progress of each activity and also to collect meaningful and consistent information on the subprojects.

The TA Team also prepared:

- i three reports on regional workshops held at Pokhara (Jan 02-04, 2017), Nepalgunj (Jan 30 - Feb 01, 2017) and Mahendranagar (Feb 26-28, 2017);
- ii ToR for consulting services for software development to enhance and upgrade GMIS application;
- iii ToR for consulting services for an impact study of GW subprojects implemented under the original scope of IWRMP; and,
- iv three status reports on SEMP activities AF and OS subprojects.

### 2.2 DoI Capacity Support

As a part of capacity development of DoI field-based staff, an interaction/orientation/refresher residential workshops on “Process, Progress and Reporting Requirements under IWRMP Component A” were conducted at Pokhara, Nepalgunj and Mahendranagar, as summarized in **Table 1**.

**Table 1 Summary of Regional Workshops during 3<sup>rd</sup> Trimester**

Duration	Development Region	Place	Participants		
			Male	Female	Total
Jan 2-4	Western	Pokhara	98	3	101
Jan 30-Feb 01	Mid Western	Nepalgunj	75	4	79
Feb 26-28	Far Western	Mahendranagar	62	1	63

Each workshop included participants from the respective IDD, IDSDs, GWIDDs as well as officials from DoI, MoI, OPD, the respective RIDs & RADs and TA Team members. The workshops comprised discussions on:

- IWRMP progress updates;
- presentations from field offices;
- IWRMP reporting requirements;
- WUA capacity development;
- an overview of ICWMP activities and financial & administrative procedures; and,

- data collection formats and GMIS-based mechanisms of reporting.

In this context, PowerPoint presentations were delivered by senior officials of the MoI, DoI, RIDs, RADs, OPD and DoI field offices as well as the centrally-based TA Team. At the Pokhara workshop, a World Bank team gave presentations on “Procurement Methodology & Guidelines” and “Systematic Tracking of Exchanges in Procurement (STEP)”. TA Team members gave presentations on:

- IWRMP-A implementation processes
- physical progress reporting requirements
- gender and vulnerable community development (GVCD) action plans
- environmental management
- guidelines for implementation of groundwater ISPs
- installation and operation of GMIS

## 2.3 Project Monitoring

The OPD has overall responsibility for planning and coordinating the M&E activities of the project. In this role, the OPD coordinates M&E activities of the three entities involved in data collection and analysis: (i) the implementing departments/agencies, including at the regional and district levels; (ii) an external M&E agency and (iii) beneficiary WUAs and other relevant stakeholders. The PICC functions as an oversight body to monitor overall project implementation on regular basis. Besides this, the project also monitors the process and results by involving independent consultants (third party).

As a part of this monitoring process, there were fortnightly meetings between OPD officials and centrally-based TA Team members during this trimester. Similar meetings also took place between Regional Irrigation Directorates (RIDs) and regional TA Teams.

Management Information System (MIS) is generally accepted as one of the main monitoring tools. So, in order to make the existing GMIS fully operational, the TA Team’s GIS/MIS specialist was engaged intermittently in previous trimesters to streamline already established GMIS facility in OPD. This was followed up during the reporting period with training sessions at the three regional workshops.

## 2.4 Infrastructure Development

It is to be noted that out of 83 AF sub projects, 31 ISPs covering 3,818 ha had been completed by November 15, 2016. Among 52 remaining ISPs, progress has been satisfactory, except for Kharikhola Bhalabot ISP of Kaski. Since the dispute between two WUAs over the intake point of this subproject could not be settled it is likely that this subproject will have to be dropped from the programme. In the meantime, although no subprojects were completed, most of them have achieved good progress (see **Section 5.1**).

Since their approvals by the PICC in November in December 2016, most of the 23 additional subprojects (2,972 ha) have gone through tendering process and works will start soon. The total number of AF subprojects has now increased from 83 to 106 and with this in mind, the OPD is paying close attention to expediting construction activities and completing all works on or before June 30, 2018.

## 2.5 WUA Capacity Development

As a part of the capacity building of WUAs, 25 training sessions in 14 subprojects in the Mid- and Far Western regions were conducted during the reporting period (see **Section 5.5**). This brings to the total number of training sessions delivered to date to at least 245 (at the time of writing, data covering the last trimester for the Western Region was not yet available). Of the 6,558 trainees, 44% were female, 19% Janajati and 10% Dalit



## **2.6 Agriculture Extension**

The DADO offices of the respective subprojects are responsible for the implementation of ICWM activities. These activities are designed by the Department of Agriculture in close coordination with the respective DADO offices.

The extension activities carried out during this trimester by concerned DADOs under the ICWM Programme were normally focused on seasonal planning, FFS, demonstrations, income generation for disadvantage group, plastic tunnels, cowshed management, seed multiplication and exposure visits to the beneficiary farmers etc. During this trimester, there were 96 different events conducted in some 74 AF subprojects and 17 districts to address these activities where participation from female, Janjati and Dalit were 51%, 23% and 5% respectively.

## **2.7 Project Benefit Trends**

An assessment of data available from 21 completed AF subprojects within three ecological belts shows that average productivity is highest in potato (12.25 t/ha) followed by vegetable (11.89 t/ha) in cash crops. Similarly, in case of cereal crops, the highest productivity of paddy is recorded as 3.35 t/ha and followed by wheat (2.65 t/ha) and maize (2.40 t/ha). Moreover, average cropping intensity has attained a figure of 218% against the base line of 174%.

While analysing cost benefit of 14 completed AF sub projects, the incremental benefits from maize and vegetable were found to be 62% and 173% respectively. All these improvements have been made possible by the adoption of improved varieties of seeds, expansion of cropped area, intensive extension program and better irrigation facilities. It is believed that the sub projects shall gradually achieve its targets upon their completion at full scale.

### 3 SOCIAL & ENVIRONMENTAL MANAGEMENT

IWRMP subprojects are required to be screened against the set of environmental and social criteria derived from the GoN regulation and the Bank's safeguard policies. Each SEMP identifies and assesses the social and environmental impacts resulting from the proposed development activities and prepares a management plan with mitigation measures including the cost of mitigation, monitoring, auditing and capacity building. The SEMP provides the detail roadmap how the project deals with the issues related to environment, resettlement, indigenous people and gender. The SEMP contains action plans with clear timelines and budgets.

SEMPs for all 23 additional AF subprojects were prepared by DoI field offices and submitted to the OPD for approval (including review by the TA Team). Three quarters of the SEMP were rejected but because the subprojects generally comprise rehabilitation works (with no significant social or environmental issues arising from project intervention), and because there was an urgent need to start implementation quickly in order to complete the works before 30 June 2018, it was agreed that these subprojects could nevertheless proceed pending submission of revised SEMP.

#### 3.1 Gender and Vulnerable Groups

From **Tables 2 and 3** it can be seen that the representation of Janajati and Dalits on WUA executive committees is broadly in line with their representation in the population as a whole. Meanwhile, female representation on executive committees is very slightly below the GoN minimum requirement of 33%.

**Table 2 Demography of AF Subprojects**

	ISP (Nos)	HH (No)	Population				
			Total	Male	Female	Janjati	Dalit
West	43	22,385	121,741	59,005	62,736	27,299	8,242
Mid-West	39	9,942	65,240	31,821	33,419	14,992	10,497
Far West	25	4,498	31,753	15,602	16,151	2,571	4,727
Total (No)	106	36,825	218,734	106,428	112,306	44,862	23,466
Total (%)			100%	49%	51%	21%	11%

**Table 3 Levels of Representation in WUA Executive Committees**

Region	No of ISPs	WUA Representatives				
		Total	Male	Female	Janajati	Dalit
West	43	331	239	92	77	40
Mid-West	39	755	512	243	150	91
Far West	25	276	180	96	13	36
Total (No)	106	1,362	931	431	24	167
Total (%)		100%	68%	32%	18%	12%

#### 3.2 Land Acquisition and Resettlement

As part of its system of social safeguards, the WB requested that the OPD submit documents confirming land donations from beneficiary farmers of the execution of 83 AF subprojects. To date the OPD has received relevant documents for 66 subprojects (WR:26, MWR:20 and FWR:20). FMISs have been built and managed by farmers for decades and documents received clearly spell out that land donations for these schemes were voluntary and are not the subject of any dispute. The situation is slightly different for GW schemes where WUAs are required to contribute land for the pump house, overhead tank and alfalfa valve outlets. Documents received so far show farmers willingly contribute the land required for DTW schemes (see **Annex II**).

### 3.3 Implementation of SEMP

The rates of SEMP compliance on 30 AF subprojects reviewed during the reporting period are given in **Table 4**. In general, areas of noncompliance relate to construction of small ponds for cattle, footbridges, and protection works as well as training in safe use of chemical fertilizers and pesticides. The reason usually offered by the concerned IDD/IDSD/GWIDDs for noncompliance is that they lacked the necessary human resources to fulfil all SEMP requirements. However, it is also true that some issues had been found to be no longer relevant, such as safety provisions for blasting when in fact no rock excavation was encountered during the works.

**Table 4 Rates of SEMP Compliance**

District	Subproject	Number of SEMP Issues	Proposed Mitigating Measures (No)			
			Total	Compliant	Noncompliant	
Western Region						
Mustang	Syang	9	9	7	2	
Gulmi	Waorgati S	6	7	7	0	
Gulmi	JherdiKhola	6	7	7	0	
Parbat	AguwaKhola	7	12	11	1	
Tanahu	BilmadeMuplani	10	11	11	0	
Baglung	Chhisti	12	16	15	1	
Palpa	ItiyaKhola	4	4	4	0	
Palpa	Sardewa	5	10	10	0	
Palpa	Serakhet	12	23	20	4	
Palpa	Gairapanari	4	8	6	2	
Syangja/Palpa	AandhiKhola	6	14	10	4	
Arghakhanchi	Damaidhunga	6	7	7	0	
Kapilvastu	Valwad	1	6	6	0	
Total			88	134	121	14
Mid-Western Region						
Rukum	ChaukeTakuri	4	6	6	0	
Pyuthan	GhariKulo	3	3	3	0	
Pyuthan	GartungKhola	8	17	16	1	
Salyan	Darimjyuala	3	3	2	1	
Dang	Lohadabre	5	6	6	0	
Dang	Ratgaiyan	4	6	6	0	
Bardiya	Batule-Kurule	3	3	3	0	
Bardiya	Sanoshree	11	16	16	0	
Banke	Paruwa	4	5	5	0	
Total			45	65	63	2
Far Western Region						
Bajhang	SubedaTalloJyula	5	3	3	0	
Darchula	Goiladi	7	11	11	0	
Baitadi	Nwali	9	9	8	1	
Baitadi	Limuda	4	4	4	0	
Doti	Dhanras Khet	4	5	5	0	
Dadeldhura	Jogijala	7	15	14	1	

District	Subproject	Number of SEMP Issues	Proposed Mitigating Measures (No)		
			Total	Compliant	Noncompliant
Dadeldhura	Badhuwa	5	5	5	0
Kanchapur	Bagun	9	23	23	0
Total		50	75	73	2

Social safeguard issues including Indigenous People Development Plans (IPDP), Gender Action Plans (GAP), Vulnerable Community Development Plans (VCDP), and land donation/acquisition were discussed at regional workshops, including their importance in World Bank and Government of Nepal policy.

## 4 TA TEAM INPUTS

### 4.1 Mobilisation

In total, 19 (6 part-time and 13 full time) of the TA Team's 20 key experts were mobilised during the reporting period. The one expert not mobilised was the Team Leader, whose contract was terminated in November 2016. The sociologist based in the Western Region was also dismissed on 1 March 2017 because of poor performance. TA Team members performed numerous field visits as well as participating in three regional workshops during the reporting period. As of the end of the trimester, CMS Engineering Consult Pvt Ltd & Full Bright Consultancy Pvt Ltd JV were actively recruiting replacements for the two vacant key expert positions.

To date, approximately 181.3 (home 154.7, field 26.6) person-months of key expert inputs have been used out of a total of 447.0 (home 360.5, field 86.5) person-months in the TA contract (refer **Table 5**)

### 4.2 Activities

One of the major activities of the central TA Team members during the reporting period was finalisation of the Inception Report, with particular attention being paid to the preparation of data collection formats (in the form of booklets) and updating action plans of individual team members. Data for each subproject will be collected in infrastructure, institutional, agricultural, environmental planning and monitoring & evaluation. Action plans of all TA team members were developed to cover the following areas: (i) project completion reports, (ii) irrigation service fees, (iii) physical tracking, (iv) conjunctive use, (v) agriculture development plans, (vi) gender and vulnerable community development action plans, (vii) SEMP compliance on AF & OS subprojects, (viii) establishing a fully functional MIS/GIS, and (ix) standardisation of tube well construction. The Inception Report is expected to be issued early in the next trimester.

The central TA Team also prepared:

- i three reports on regional workshops held at Pokhara, Nepalgunj and Mahendranagar;
- ii ToR for consulting services for software development to enhance and upgrade the GMIS;
- iii ToR for consulting services for an impact study of OS GW subprojects; and,
- iv status reports about SEMP activities on completed and ongoing AF subprojects.

All three regional TA Teams assisted the respective IDD/IDSD/GWIDDs while preparing the DFSRs and SEMP of the candidate additional subprojects, including joint walkthroughs of subprojects and assisting in social, agricultural and technical aspects. When requested, the teams also reviewed the reports submitted to Regional Irrigation Directorates (RIDs), prior to consideration by the Regional Appraisal Committee (RAC) meeting.

The central TA Team reviewed the DFSRs and SEMP of all the candidate subprojects submitted to the OPD, prior to approval by the PICC. In the end, a total of 23 additional subprojects (2,972 ha) were approved at three PICC meetings held between 29 November to 29 December 2016. In addition, 7 ongoing subprojects were re-appraised by the PICC. Most of them had already started field works though a few were yet to sign the works contract. See **Annex V**.

### 4.3 Field Visits

In addition to the field visits to candidate additional subprojects, as discussed above, the regional TA Teams carried out regular monitoring of ongoing subprojects, focussing on construction progress as well as collection of data on agriculture, social issues and environment management. The TA Team also assisted in the training courses organised by field offices on quality control, capacity building of WUAs and ICWMP activities carried out by DADOs. Besides AF subprojects, regional TA Teams visited some OS subprojects on request of concerned field offices.

Central TA Team members also joined their regional colleagues on field visits to 14 ISPs in 7 districts to monitor construction progress, hold discussions with WUAs and division officers and offer advice on issues relating to infrastructure, social, agriculture and environmental issues. Due attention was given towards ISF collection, conjunctive use, gauging in canal flows, progress tracking, compliance of SEMP mitigation measures, WUA capacity development and agriculture aspects. During regional workshops and field visits, the TA Team emphasised the importance of the data bookletsto RIDs and field officials. A summary of field visits made by the TA Team during this reporting period is given in **Table 6**. Some of the key observations gathered during field visits of sub projects are as follows.

**Itiya Khola ISP, Palpa:** Completed in FY 2071/72 but monsoon flood of year 2073 damaged intake and main canal over a 40 m length. River at intake is retrograded deeper and semi-permanent structures to protect main canal have been suggested. Local road construction also aggravating the damage of the canal and intake.

**Worgati ISP, Gulmi:** Intake and canal damage by monsoon flood of 2073. The WUA is operating canal and micro hydro power partially with their own resources. Immediate repair of system is required and IDD has initiated necessary actions.

**Damkaphant/Sota ISP, Gulmi:** The core wall at intake site and RCC canal lining in branch canal are almost completed. The capacity of main canal has been redesigned from 220 lps to 1,580 lps, taking into consideration the 430 kW micro hydro power generation.

**Dhiprang Besi ISP, Kaski:** The NCB contract part work for replacing pipe canal by suspended cable pipe has been delayed. This subproject has been re-appraised by PICC in light of present site condition. Due attention with close monitoring by concerned authorities needs will be needed on this critical subproject.

**Naktad ISP, Darchula:** There are three landslides at ch:1+750m and 4+050m,4+250m along the canal alignment. Revisiting the scope of subproject, a DFSR has been prepared by IDD Darchula, addressing the minimum additional works needed. The PICC recently re-appraised it and it has gone through tender process.

**Sadhepani DTW, Kailali:** Construction of tube wells completed and laying of uPVC pipes were in progress as a part of distribution network. The WUA and farmers are active and they are requesting for extension of some additional uPVC pipeline.

**Suda DTW, Kanchanpur:** A new DTW system is being incorporated into the command area of the existing Purbi Ratela ISP, which was maintained with support of the DoI and the ADB-funded Community Irrigation Project (CIP). Civil works are in progress, following the drilling works.

Table 5 TA Team Inputs

Name of Expert	Position	Total Allocated (PM)			Consumed to end of 2 <sup>nd</sup> Trimester (PM)			Consumed in this Trimester (PM)			Total consumed till 2nd Trimester (PM)			Balance (PM)		
		Home	Field	Total	Home	Field	Total	Home	Field	Total	Home	Field	Total	Home	Field	Total
International																
Liaquat Rabbani	Team Leader	13.50	1.50	15.00	2.52	0.07	2.59	-	-	-	2.52	0.07	2.59	10.98	1.43	12.41
Total International		13.50	1.50	15.00	2.52	0.07	2.59	-	-	-	2.52	0.07	2.59	10.98	1.43	12.41
National – Central TA																
Sudhir Man Baisyat	Deputy TL	25.50	2.50	28.00	8.07	0.29	8.37	2.72	1.21	3.93	10.80	1.50	12.30	14.70	1.00	15.70
Shambhu P. Manandhar	IrrigationEng 1	24.50	3.50	28.00	8.14	0.19	8.33	2.90	1.10	4.00	11.04	1.29	12.33	13.46	2.21	15.67
Madhav Lal Shrestha	Agriculturist 1	24.50	3.50	28.00	7.21	-	7.21	4.00	-	4.00	11.21	-	11.21	13.29	3.50	16.79
Madhav P. Joshi	TM- Sociologist 1	21.50	4.50	26.00	8.31	0.19	8.50	2.69	1.30	4.00	11.00	1.50	12.50	10.50	3.00	13.50
Shiva Kumar Upadhyay	Economist/M&E	15.00	3.00	18.00	4.50	-	4.50	1.57	0.17	1.73	6.07	0.17	6.23	8.93	2.83	11.77
Dr. Vimal Narayan P. Gupta	Environment	12.00	6.00	18.00	5.81	0.19	6.00	1.98	1.39	3.36	7.79	1.58	9.36	4.21	4.42	8.64
Sarbagya Man Bajracharya	MIS/GIS	7.50	1.50	9.00	2.79	-	2.79	3.06	0.44	3.50	5.85	0.44	6.29	1.65	1.06	2.71
Siddhi Pratap Khan	Hydrogeologist	9.00	2.00	11.00	3.13	0.07	3.20	2.72	0.81	3.53	5.85	0.88	6.73	3.15	1.12	4.27
Dhurba Singh Nepali	Electro-Mech Eng	7.00	2.00	9.00	-	-	-	2.12	-	2.12	2.12	-	2.12	4.88	2.00	6.88
Damodar Bhattarai	Procurement	10.00	1.00	11.00	1.21	-	1.21	0.91	-	0.91	2.12	-	2.12	7.88	1.00	8.88
Total of Central		156.50	29.50	186.00	49.17	0.94	50.11	24.67	6.41	31.08	73.84	7.35	81.19	82.66	22.15	104.81
National – Western Regional TA																
Tark B. Budhathoki	Irrigation Eng 2	21.00	7.00	28.00	6.49	2.01	8.50	3.18	0.82	4.00	9.67	2.83	12.50	11.33	4.17	15.50
Dr. Madhav Joshi	Agriculturist 2	21.00	7.00	28.00	5.17	0.58	5.76	2.97	0.76	3.73	8.15	1.34	9.49	12.85	5.66	18.51
Satya B. Budhathoki	TM- Sociologist 2	21.50	4.50	26.00	6.06	1.44	7.50	3.04	0.46	3.50	9.10	1.90	11.00	12.40	2.60	15.00
Total of Western		63.50	18.50	82.00	17.73	4.03	21.75	9.19	2.04	11.23	26.91	6.07	32.98	36.59	12.43	49.02

Name of Expert	Position	Total Allocated (PM)			Consumed to end of 2 <sup>nd</sup> Trimester (PM)			Consumed in this Trimester (PM)			Total consumed till 2nd Trimester (PM)			Balance (PM)		
		Home	Field	Total	Home	Field	Total	Home	Field	Total	Home	Field	Total	Home	Field	Total
National – Mid-Western Regional TA																
Tung Raj Pathak	Irrigation Eng 3	21.00	7.00	28.00	4.39	1.37	5.76	2.53	1.46	4.00	6.92	2.83	9.75	14.08	4.17	18.25
RamanandKurmi	Agriculturist 3	21.00	7.00	28.00	6.06	2.43	8.50	3.02	0.98	4.00	9.08	3.41	12.49	11.92	3.59	15.51
Arjun Kumar Ale	TM- Sociologist 3	21.50	4.50	26.00	3.55	0.95	4.50	2.95	1.04	4.00	6.50	1.99	8.49	15.00	2.51	17.51
Total of Mid-Western		63.50	18.50	82.00	13.99	4.76	18.75	8.51	3.48	11.99	22.50	8.24	30.74	41.00	10.26	51.26
National – Far-Western Regional TA																
Harish Chandra P. Rauniyar	Irrigation Eng4	21.00	7.00	28.00	4.82	0.94	5.76	3.04	0.95	4.00	7.86	1.89	9.75	13.14	5.11	18.25
AirleyVazirsingh	Agriculturist 4	21.00	7.00	28.00	7.75	0.75	8.50	3.18	0.82	4.00	10.93	1.57	12.49	10.07	5.43	15.51
Nar Bahadur Sawod	TM- Sociologist 4	21.50	4.50	26.00	6.65	0.97	7.63	3.45	0.48	3.92	10.10	1.45	11.55	11.40	3.05	14.45
Total of Far Western		63.50	18.50	82.00	19.22	2.66	21.88	9.67	2.25	11.91	28.89	4.91	33.80	34.61	13.59	48.20
Grand Total		360.50	86.50	447.00	102.63	12.46	115.08	52.03	14.18	66.21	154.66	26.63	181.29	205.84	59.87	265.71



**Table 6 Overview of Field Activities**

Sub Projects (AF)	Visited Entities	Activities
<b>(A) Up-coming ISPs</b>		
<p><b>Western Region TA Team</b> Bhorlebas, Gyadi, Rati khola, DangrekholadothepataPindlane, 2004 Sale kulo, Bhedabari, RumtaAambot, Chaurasiphant, Petbaniya DTW</p> <p><b>Mid-Western Region TA Team</b> Sanichaur, Chiprakhola, Dhanauri DTW, SanoshreeTaratal DTW,</p> <p><b>Far Western Region TA Team</b> Kotedigad, DeuraJuwalikhet, Bhaunera</p>	<p><b>DADO:</b> Nawalparasi, Parbat, Baglung, Myagdi,, Gulmi</p> <p><b>IDD/IDSD:</b> Nawalparasi, Parbat, Baglung, Myagdi,, Gulmi, Rukum, Dang, Baitadi, Bajhang, Bajura,</p> <p><b>GWIDD:</b> Dang, Bardiya, Kailali, Rupendehi</p>	<p>TA team from all three regions visited most of the up-coming sub projects within their regions with IDD/IDSD/GWIDDs staffs, WUAs and interacted with them about these ISPs from engineering, social and agriculture viewpoints. Also visited DADOs of the respective districts and discussed on the part of agriculture.</p> <p>TA team Surkhet participated in RAC meeting at Nepalgunj where Sanoshree DTW and Dhanauri DTW sub projects were appraised at regional level.</p>
<b>(B) Regular AF ISPs</b>		
<p><b>Central TA Team</b> Worgati, Damkaphantsota, Dhiprangbesi, MalaraniSahare, MathilloBahunichaur, RadhapurSitapur DTW, Thure, AmbasaBalanti, Sanoshree DTW, SanoshreeTaratal DTW, Suda DTW, Sadepani DTW, Ratipur, Badhuwa, Dhittadi, Limuda, Nwali and Kalapani ISP</p>	<p><b>IDD/IDSD:</b> Gulmi, Kaski, Banke, Surkhet, Bardiya, Kailali and Kanchanpur, Dadeldhura, Baitadi.</p>	<p>DTL, IDCE, Sociologist, Hydrogeologist and Environmental expert of centre TA team visited some of these sub projects and monitored work progress, discussed with WUAs &amp; office bearers on project issues. Experts expressed their views and suggested on their subject matters.</p> <p>Works on ISF collection, conjunctive use, compliance of SEMP mitigation measures, WUA capacity development, fixation of gauge in canal system etc were addressed. Also, the team explained extensively to RIDs and region TA TA team all about contents of expert's individual action plans and databooklet and their importance.</p> <p>TA team centre briefed importance and contents of data book in all three RIDs and also highlighted on consultant's action plans.</p> <p>TA team centre and Surkhet visited Thure and Paruwa ISP. Some head reach part of Thure needs canal covering to check debris falling from hill sides. Paruwa is already completed and functioning smoothly.</p>

Sub Projects (AF)	Visited Entities	Activities
<p><b>Western Region</b> Itiyakhola, Worgati, Damkaphantsota, Dhiprangbesi, Tokre,</p> <p><b>Mid-Western Region</b> Thure, Paruwa, MalaraniSahare, RadhapurSitapur DTW, Sanoshree DTW, AmbasaBalanti, Lohadabre, Ratgainya, Bahundanda, Pindalephant, Lamasera, MathilloBahunichaur, Bela DTW, Sakure, and BatuleKurule, Darimjyula ISP.</p> <p><b>Far Western Region</b> Naktad, Sadepani DTW, Ratipur, Kalapani, Badhuwa, Dhittadi, Limuda and Nwali ISP</p>	<p><b>DADO:</b> Dang, Pyuthan, <b>IDD/IDSD:</b> Banke, Surkhet, Bardiya Dang, Pyuthan, Rukum, Salyan, Darchula, Kailali, Kanchanpur, Dadeldhura, Baitadi and Bajhang.</p> <p><b>GWIDD:</b> Banke, Bardiya, Dang.</p>	<p>TA team Surkhet visited AF sub projects of Banke and Bardiya with IDD/IDSD staffs, WUAs and interacted with them about progress and issues related to engineering, social and agriculture aspects. Also visited DADOs and discussed on the part of agriculture.</p> <p>TA team from centre and all three regions participated regional workshops organized by OPD at Pokhara (WR), Nepalgunj (MWR) and Mahendranagar (FWR).</p> <p>Interacted with respective WUAs to give an exposure about quality control of construction works, judicious use of organic manure, pesticides, high yield variety seeds through trainings and orientations.</p> <p>Interaction with officials of respective DADOs were fruitful in terms of ICWM and agriculture extension related activities implemented in IWRMP sub projects and collection of pertinent data and information.</p> <p>Suggested all field offices to expedite the subproject works and other activities in order to complete entire AF sub projects on or before June 30, 2018.</p>

## 5 PROJECT PROGRESS

### 5.1 Infrastructure Improvement and Development

In order to address the demands of farmers, 23 additional subprojects, covering 2,972 ha, were approved by the PICC between 29 November and 29 December 2016, having a total combined value of NRs 624.3 million. In addition, 7 ongoing ISPs were re-appraised by the PICC. A summary of the now 106 ISPs being implemented under IWRMP(AF) is presented in **Table 7**.

**Table 7 Summary of PICC Approved Subprojects**

Region	PICC Approved till July 2016						PICC Approved during Nov.-Dec. 2016						Total approved	
	Surface		GW		Total		Surface		GW		Total			
	Nos	CA (ha)	Nos	CA (ha)	Nos	CA (ha)	Nos	CA (ha)	Nos	CA (ha)	Nos	CA (ha)	Nos	CA (ha)
WR	33	5,554	2	3,460	35	9,014	6	692	2	1240	8	1932	43	10,946
MWR	24	3,236	3	1,160	27	4,396	9	455	2	320	11	775	38	5,171
FWR	20	2,201	1	240	21	2,441	3	105	1	160	4	265	25	2,706
Total	77	10,991	6	4,860	83	15,851	18	1,252	5	1,720	23	2972	106	18,823

No subprojects were completed during this trimester, so total number of completed ISPs remains at 31, with a combined command area of 3,818 ha (refer **Table 8**). An overview of the status of the 75 ongoing projects is given in **Table 9**. It is expected that most of the subprojects with progress above 50% will be completed by July 2017. Kharikhola Bhalaboat ISP in Kaski District remains pending due to a dispute between WUAs and will likely have to be dropped from the programme.

**Table 8 Summary of Completed Subprojects**

Region	Total PICC approved		Completed till 2nd Trim.		Completed during 3rd. trimester		Total Completed till 3rd. Trimester		
	Nos	CA (ha)	Nos	CA (ha)	Nos	CA (ha)	Nos	CA (ha)	Expenditure (NRs '000)
WR	43	10,946	14	1,293	-	-	14	1,293	209,010
MWR	38	5,171	9	1,991	-	-	9	1,991	270,669
FWR	25	2,706	8	534	-	-	8	534	82,098
Total	106	18,823	31	3,818	-	-	31	3,818	561,777

**Table 9 Summary Ongoing Subprojects**

Region	Total PICC approved		On-going			Progress (%)			
						Initial Stage	up to 50	51 to 80	Above 80
	Nos	CA (ha)	Nos	CA (ha)	Expenditure (NRs '000)	Nos	Nos	Nos	Nos
WR	43	10,946	29	9,653	468,881	9	1	6	13
MWR	38	5,171	29	3,180	147,617	11	12	5	1
FWR	25	2,706	17	2,172	181,911	4	1	7	5
Total	106	18,823	75	15,005	798,409	24	14	18	19

Many of the subprojects are spread across the hills and remote mountainous areas and they are normally affected by difficult climate conditions which can limit the construction season to as little as 4 or 5 months per year. Moreover, contractors' and WUAs' passiveness, unfavourable working environment and inadequate logistic support to the field offices can further hinder progress. It is therefore important that all

concerned authorities pay particular attention to facilitating and monitoring the works in order that they be completed before the project end date of June 2018.

## 5.2 Quality Assurance

The project placed its specific efforts in maintaining the quality of construction in all subprojects, especially in the large subprojects of Terai. The intensive and frequent visits to the construction site by various levels of authorities, TA Team members, provision for concrete & other tests and intensive and focused supervision by mobilizing trained WUA are key strategies adopted by the project.

The RIDs have also prepared assessments of existing laboratories in five irrigation directorates as well as in some large irrigation projects like Mahakali, Sikta, and Sunsari Morang. Based on their findings, existing laboratories are eligible for help from the OPD to upgrade their capabilities, including procurement of required laboratory equipment.

## 5.3 Financial Progress

The reported cost of the 31 completed AF ISPs, including WUAs' contributions is NRs 561.8 million, broken down as follows:

- NRs 209.0 million for 14 schemes in the Western Region
- NRs 270.7 million for 9 schemes in the Mid-West Region
- NRs 82.1 million for 8 schemes in the Far West Region.

For completed projects on the Terai, NRs 196.4 million has been spent on 5 surface irrigation schemes and NRs 60.5 million on 2 groundwater schemes.

Overall, WUA contribution against these completed sub projects figured out to be 8.29%.

Total spending to date, including WUA contributions, for the 75 ongoing subprojects NRs 951.3 million, broken down as follows:

- NRs 468.9 million for 29 schemes in the Western Region
- NRs 174.7 million for 29 schemes in the Mid-Western Region
- NRs 307.7 million for 17 schemes in the Far Western Region.

For ongoing subprojects on the Terai, NRs 313.7 million has so far been spent on 10 surface irrigation schemes and NRs 102.1 million for 4 groundwater schemes.

## 5.4 Institutional Development of WUA

The performance of WUA activities in 19 subprojects (data is currently unavailable for the Western Region) were evaluated in terms of the Institutional Development Framework (IDF) during the reporting period and the results are given in **Table 10**. The IDF comprises a total of 72 activities, which are grouped into three phases, corresponding to the preparation, construction and operational phases of the subprojects, and which define a step-by-step approach to institutional development and capacity building of WUAs.

The IDF is the basis of institutional development and capacity building of WUAs. Amongst the WUAs visited, it was found that many were following the steps as given in the IDF activities matrix. Observation of WUA activities is continuing in the field.

**Table 10 IDF Progress on Selected Schemes**

District	Name of Subproject	Status	IDF Progress		
			Phase 1 (Preparatory)	Phase 2 (Construction)	Phase 3 (O&M)
Mid-West					
Pyuthan	Pidalnephant	Ongoing	80%	75%	
Pyuthan	Lamashera	Ongoing	80%	75%	
Surkhet	Malarani Sahare	Ongoing	90%	85%	
Surkhet	Mathillo Bahunichaur	Ongoing	100%	85%	
Dang	Bela-GW	Ongoing	80%	75%	
Dang	Bahundanda	Ongoing	100%	75%	
Dang	Ratgainyan	Complete	90%	85%	65%
Dang	Lohadabre	Ongoing	90%	85%	
Banke	Thure	Ongoing	90%	75%	
Banke	Paruwa	Complete	90%	75%	65%
Banke	Radhapur Sitapur-GW	Ongoing	90%	75%	
Bardiya	Sanoshree-GW	Ongoing	90%	75%	
Far West					
Baiatdi	Kotedi Gad	Ongoing	80%	50%	
Darchula	Naktad	Ongoing	80%	60%	25%
Bajhang	Deura Jupali Khet	Ongoing	80%	50%	
Bajura	Bhaunera	Ongoing	80%	50%	
Kanchanp	Kalapani	Ongoing	80%	60%	40%
Kailali	Ratipur	Ongoing	80%	60%	40%
Kailali	Sandepani	Ongoing	80%	60%	40%

### 5.5 Capacity Development of WUA

As a part of capacity development of WUA, numerous training courses have been provided conducted by the relevant IDD/IDSD/GWIDDs and DADOs, covering institutional development, pre-construction activities, quality control, irrigation service fee collection, fund generation, resource mobilization, canal operation and maintenance, gender empowerment, capacity building, leadership development, office administration, account keeping and agriculture extension. In total, 25 training events in 14 subprojects from 7 districts were conducted during this trimester.

This brings the total number of training events for IWRMP(AF) to 245 in 118 subprojects to the end of the reporting period. Of the participants, 44% were female and the participation of Janajati (19%) and Dalits (10%) was broadly in line with the representation in the community (21% and 11%, respectively, refer **Tables 2 and 11**).

**Table 11 WUA Training Completed to Date**

Region	District (No)	ISP (No)	Events (No)	Participants			Ethnicity	
				Male	Female	Total	Janjati	Dalit
Previously	37	104	220	3,303	2,556	5,859	1,177	564
Current								
West	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mid West	3	6	11	174	147	321	52	34
Far West	4	8	14	200	178	378	10	65
Subtotal	7	14	25	374	325	699	62	99
Total (No)		118	245	3,677	2,881	6,558	1,239	663
Total (%)				56%	44%	100%	19%	10%

## 6 PROJECT BENEFITS

### 6.1 Agricultural Extension through ICWMP

Altogether, 96 extension activity events in 74 AF subprojects from 17 districts were carried out under the ICWM program by respective DADOs. These activities were mainly focused on seasonal planning, FFS, demonstrations, income generation and seed multiplication, as summarised in **Table 12**.

**Table 12 ICWM Activities**

Activities	Current Reporting Period			
	West	Mid-West	Far West	Total
Seasonal Planning	11	4	6	21
FFS	5	2		7
Demonstration	8	2	3	13
District Training	12	3	2	14
Income Generation	5	3	1	9
Youth Employment	1	2	2	5
Cowshed Management		1	2	3
Plastic Tunnels			2	2
SP visits to Farmers	1			1
Coordination Meetings	5		1	6
Seed multiplication (ha)	25.9		6.0	31.9

It is not possible to provide the full range of ICWM activities in every single IWRMP subproject so selected ICWM activities are assigned as per project location and farmers' demands and finalized based on discussions between WUA and DADO officials. Overall participation comprised male (49%), female (51%), Janjati (23%) and dalit (5%), see **Table 13**.

**Table 13 Participation in Agriculture Extension Activities**

Region	Events	Participation								
		Total	Male		Female		Janajati		Dalit	
	(No)	(No)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)
Western	59	848	426	50	422	50	211	25	17	2
Mid Western	17	721	331	46	390	54	186	26	63	9
Far Western	20	305	168	55	137	45	29	10	21	7
Total (No)	96	1,874	925		949		426		101	
Total (%)			49		51		23		5	

### 6.2 Crop Production

#### 6.2.1 Productivity of Cereal Crops

Irrigation plays major role in agriculture production. An assessment of productivity in 21 completed SPs of the Mountains, Hills and Terai shows a pronounced impact of the project's interventions on productivity of cereal crops compared to the baseline data. The average productivity is highest for paddy (3.35 t/ha), followed by 2.65 t/ha and 2.40 t/ha for wheat and maize respectively, see **Table 14**.

**Table 14 Productivity of Cereal Crops in Completed Subprojects**

Ecological Belt	ISP Type	Sub Project (No)	Yield (t/ha)					
			Paddy		Wheat		Maize	
			Base	Current*	Base	Current*	Base	Current*
Mountain	Surface	4	1.93	2.98	1.44	2.08	1.76	2.31
Hill	Surface	12	2.47	3.52	2.09	2.98	1.82	2.38
Terai	Surface+GW	5	2.36	3.24	1.74	2.31	1.90	2.51
Average			2.34	3.35	1.88	2.65	1.83	2.40
Increase (%)				43%		41%		31%

\* Based on the latest (FY 2015/16) data from DoA.

**6.2.2 Productivity of Cash Crops and Cropping Intensity**

An assessment of productivity of cash crops in 21 completed AF sub projects shows significant increases compared to baseline data. The highest average crop productivity is 12.25 t/ha for potatoes, followed by 11.89 t/h for vegetables (**Table 15**). Average cropping intensity has increased from 174% to 218% in the same 21 subprojects (**Table 16**) where it is estimated that farmers are employing improved cultivation techniques learned in agriculture extension training courses on around 30% of the command area.

**Table 15 Productivity of Cash Crops in Completed Subprojects**

Ecological Belt	ISP Type	Sub Project (No)	Yield (t/ha)			
			Potato		Vegetables	
			Base	Current*	Base	Current*
Mountain	Surface	4	8.33	11.33	8.50	11.68
Hill	Surface	12	10.13	13.03	8.62	11.91
Terai	Surface	5	7.55	11.13	7.40	12.00
Average			9.17	12.25	8.31	11.89
Increase (%)				34%		43%

\* Based on the latest (FY 2015/16) data from DoA.

**Table 16 Changes in Cropping Intensity in Completed Subprojects**

Ecological Belt	ISP Type	Sub Project (No)	Cropping Intensity (%)	
			Baseline	Current*
Mountain	Surface	4	172	219
Hill	Surface	12	180	224
Terai	Surface	5	161	201
Average			174	218
Increase (%)				25

\* Based on the latest (FY 2015/16) data from DoA.

**6.2.3 Financial Returns**

Assessment of the financial returns from cereal crops for farmers in 14 completed projects are best for paddy, at 34,557 NRs/ha (**Table 17**). However, comparison with the returns from vegetables (230,251 NRs/ha) clearly underlines the economic importance of winter irrigation for farmers (**Table 18**).



**Table 17 Financial Returns of Cereal Crops in Completed Projects**

Ecological Belt	No of ISPs	Income and Costs (NRs/ha)								
		Paddy			Wheat			Maize		
		Gross Income	Cost of Production	Net Income	Gross Income	Cost of Production	Net Income	Gross Income	Cost of Production	Net Income
Mountain	1	75,000	58,735	16,265	90,000	60,185	29,815	76,000	55,455	20,545
Hill	10	100,519	61,415	39,104	79,544	50,737	28,807	75,449	45,289	30,162
Terai	3	100,733	75,233	25,500	93,550	65,733	27,817	57,780	36,533	21,247
Average	14	98,742	64,185	34,557	83,292	54,625	28,666	71,702	44,139	27,565

**Table 18 Financial Returns of Cash Crops in Completed Projects**

Ecological Belt	Type of sub Project	No of ISPs	Income and Costs (NRs/ha)					
			Potato			Vegetable		
			Gross Income	Cost of Production	Net Income	Gross Income	Cost of Production	Net Income
Mountain	Surface	1	315,000	152,740	162,260	600,000	70,095	531,905
Hill	Surface	10	263,962	129,436	134,526	371,683	147,812	223,871
Terai	Surface + GW	3	202,000	105,667	96,333	257,000	106,033	150,967
Average		14	254,330	126,007	128,323	363,417	133,309	230,251

## 7 KEY ISSUES

Most of 23 additional subprojects are now mobilized to field. Close and regular monitoring from all concerned authorities should be carried out in terms of infrastructure, agriculture, institution of WUAs and environmental aspects etc.

It is recommended that additional emphasis be given to training WUAs and beneficiary farmers on the problems associated with improper use (under- and over-application) of chemical fertilizers and pesticides.

It is recommended that an environmental awareness program be organized on the importance of watershed conservation in order to maintain the sustainability of subprojects in particular as well as local communities in general.

In case of deep tube wells, it is suggested to use vertical electrical resistivity sounding at proposed drilling sites in order to estimate the appropriate drilling depth. Well development should also include step drawdown tests in order to identify the stage of development of a tube well, evaluate the well's characteristics, and select the appropriate pump. The TA Team is currently preparing a training programme for DoI field staff on well development and testing.

While preparing SEMP, proposed issues and mitigation measures should be project-specific and based on ground reality which could be addressed during walkthrough of the subproject with concerned line agencies.

It is recommended that a formal meeting between the WUA, contractor and concerned field office needs to be arranged prior to commencement of works in order to discuss and clarify issues such as:

- i the overall scope of the proposed works;
- ii which works are to be carried out by the WUA (payable & contribution);
- iii which works are to be carried out by the contractor;
- iv responsibilities for supervising construction quality and issuing contractual instructions to the contractor
- v (where necessary) how these works will be coordinated; and,
- vi cost and completion time.

It is believed that it will maintain transparency and help for smooth implementation of the sub project.

Besides regular monitoring, intensive and timely monitoring from concerned authorities is recommended in case of technically complex ISPs in order to avoid time and/or cost overruns and undue claims due to contractual complications.