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ABBREVIATION

A.D	Anno Domini
AF	Additional Financing
B.S	BikramSambat
AMIS	Agency Managed Irrigation System
DADO	District Agriculture Development Office
DDC	District Development Committee
DFO	District Forest Office
DOI	Department of Irrigation
DSCO	District Soil Conservation Office
ESI	Essential Structural Improvement
FGD	Focus Group Discussion
F.Y	Fiscal Year
HH	Household
IMD	Irrigation Management Division
IMT	Irrigation Management Transfer
IMTA	Irrigation Management Transfer Agreement
ISF	Irrigation Service Fee
IWRMP	Irrigation and Water Resource Management Project
JCB	Josephy Cyril Bamford
KIMD	Kankai Irrigation Management Division
KII	Key Informant Interview
KIS	Kankai Irrigation System
KM	Kilometer
M	Meter
O&M	Operation and Maintenance
OPD	Office of Project Director
SEMP	Social and Environment Management Plan
SMU	System Management Unit
TOT	Training of Trainer
ToR	Terms of Reference
US	United State
VAT	Value Added Tax
VDC	Village Development Committee
WUA	Water Users Association

EXECUTIVE SUMMARY

This report has been prepared as the contract between Department of Irrigation (DOI) / Irrigation and Water Resource Management Project (IWRMP) as the client and SITARA Consult Pvt Ltd. as the consultant for the consultancy service for Performance Evaluation of WUA in Irrigation Management Transfer Program in Kankai Irrigation System.

The governments pursue management transfer programs to reduce their expenditures on irrigation, improve productivity and stabilize worsening the irrigation systems. Eastern Irrigation Development Division, Jhapa has transferred 7000 ha command area from the government to WUAs to achieve more efficient use of irrigation water in irrigation schemes, farmers' participation, self-control, reduction of operation and maintenance costs, more equitable distribution of water.

The WUAs organizations has excellent setup at main level, however for secondary and tertiary level office management is not satisfactory. The major resource generation of WUA is ISF and the collection rate is found satisfactory as per target, which is very strong point for sustainability of the organization. It is very essential to increase the target of ISF collection in near future to reduce the government expenses and fulfill the IMTA objectives. Other important sources of income are hiring excavator, tractor and hall renting etc. Dhalpa are being used by WUA on paid salary from KIMD office. To enhance the status of women, backward group and vulnerable groups in society, WUA helped in capacity development of these groups through agriculture trainings, skilled enhancement trainings, and value add training in agriculture.

During high water availability there is no need of rotational supply of water but during the scarcity of water the demand is minimized with rotational supply of water. In the Kankai irrigation system, even though Parshall flumes and orifices were already installed, they were not properly finished so were not accurate enough to provide satisfactory flow measurement data. All off-take structures were calibrated and a system of observing discharge measurements at the different reaches of the canal system was initiated. Gauge sticks were painted and a process of taking readings on a regular basis was established. The calibration of many gates makes easier to know discharge from rating table.

Equity in water distribution has significantly improved. It is thought to further improve after the outcome of the applied research on economical use of water is disseminated to all the farmers. The discharge measurements observable at the off-take structures have helped improve equity in water distribution. As the structures have been calibrated and the designed discharge level for each canal marked on the gauge, farmers can easily see whether they are getting their share of water or not and also whether the farmers of some other canals are taking more water than their share. There are also indications of the system moving toward self-sustainability and financial autonomy.

Water adequacy and reliability conditions slightly improved as reported by farmers. It was improved because the farmers are now well informed as they themselves are involved in decision-making. Improvements can be seen in water distribution System also. The decrease in the number of water-related conflicts is a clear indicator of this.

CHAPTER 1: INTRODUCTION

1.1 Background

The Kankai irrigation system was developed for the purpose of irrigating 7000 ha of agricultural land in Jhapa, a Terai district located at the south-eastern corner of Nepal. Its command area is flanked by the Kankai River in the east, the Khrisna River in the west, the Mahendra highway in the north and the Indian border in the south. A detailed feasibility study of the project was completed in 1970 with the technical assistance of ADB. The construction was carried out in two phases. The first phase was initiated in 1973 and completed in 1981 with substantial delays and cost overruns. The second phase, to irrigate an additional 3 000 ha, started in 1980 and was completed in 1991, bringing only 2 000 ha of land under irrigation. Thus irrigation infrastructure has been developed for a total of 7 000 ha of land. The total cost of the project was NRs310 million, 63 percent of which came from an Asia Development Bank loan.

The diversion structure of the system is an ogee-type, concrete weir constructed at the debouncing point of the Kankai River. This 126m-long, 1.85 m-high weirs has been quite troublesome for the project since the beginning. Immediately after the weir was built, heavy silt deposition upstream and scouring of the riverbed downstream was observed. To prevent a possible failure of the diversion structure, the damaged launching apron was removed and in its place a depressed concrete stilling basin was constructed just downstream of the existing diversion weir. The structure still seems quite vulnerable as it suffers from aberration.

The canal system consists of a three-tier network of canals. The main canal length is 34 km with 74 km of secondary canals and 110 km of tertiary canals. The first 11.5 km reach of the main canal is lined with a design capacity of 10.15 m^3/s; the other reaches are unlined and their capacity decreases from 7.25 to 1.75 m^3/s.

The density of structures in the system is quite high. The canal network crosses many flashy rivers; hence many cross drain structures (siphons) have been built in the system. Steel gates have been built at all off-take points from the main canal and at all tertiary off-takes from secondary canals. The total number of such regulating structures is 322. Including all other subsidiary hydraulic structures, the structural density is as high as 0.2 per ha.

The command area consists of flat land (average slope of 1/800) with fertile soil. The soil texture varies from loamy to sandy loam. Alluvial soils exist in most parts of the command area. Brown forest soil is found in the northern part of the command while paddy soil exists in the southern parts.

The Government of Nepal, Department of Irrigation, Irrigation and Water Resources Management Project (IWRMP) has launched Irrigation Management Transfer Program under Component-B to address the problems exhibited in large public irrigation schemes of below capacity performance, poor operation and maintenance, low cost recovery and inadequate maintenance funds. The program is financed by the World Bank, the Government of Nepal and involved Water Users Association (WUA). The program was executed from 31st January 2008 and the first phase of the program was ended in June 2015. Meanwhile, the World Bank and the Government of Nepal have signed a new agreement for Additional Financing (AF) for the second phase of the project ending on June 30, 2018, with a credit support of US$ 30 million and Grant support of US$ 20 million.

The overall objective of Component-B is to improve irrigation service performance and service delivery to the selected irrigation systems in the Terai through the completion and consolidation of Irrigation Management Transfer (IMT) to the relevant Water Users Association (WUAs). The main activities to achieve the overall objective of Component-B are mostly focused on infrastructure development through Essential Structures Improvement, water management and Institutional Development and mitigation measures for social and environmental impacts on the irrigation system. The expected output of the Irrigation Management Transfer (IMT) program through the implementation of the program objectives are efficient and equitable service delivery by financially and institutionally sustainable WUAs, Improved physical performance of the selected irrigation schemes, Reliable bulk water service delivery by Department of Irrigation (DOI) in line with the transfer agreement and Formation and strengthening of WUAs to become self-governing, self-financing and self-regulating organizations.

Component-B is engaged in ongoing work with 4 legally empowered WUAs which are (or are intended to be) responsible for the operation and maintenance of 4 existing sub-systems within 4 AMISs. These systems/subsystems were selected on the basis of condition of infrastructure, receptive user organizations, and relatively favorable socio-political environment. These four sub-projects are located within the four AMIS systems of Kankai, Sunsari Morang, Narayani, and Mahakali. These 4 WUAs cover about 23,100 ha and approximately 37,000 households, and an estimated population within these 4 sub-project areas of over 200,000 persons.

Component B is also working with WUAs at three recently added sub-project sites. These are the SMIS-Ramgunj (7800 ha), NIS Block-2 (2996 ha), and MIS Stage-II (6500 ha) sub-systems. Recently two of the sub systems named NIS Block-2 and the MIS Stage-II was handed over to their respective WUA. One of the primary focuses of IMT is to strengthen the capacity of WUA or Institutional development to become self-governing, self-financing and self-regulating organization. Similarly Water management, Infrastructure development and mitigation measures for social and environmental impacts on the irrigation system.

1.2. Objective

The overall objective was to evaluate WUA performance regarding irrigation management transfer. The specific objectives of this study are written below not limited to;

- Assess the WUA activities in connection of institutional development.
- Review the improvement of infrastructure through ESI work,
- Assess the water management activities within the sub-systems,
- Evaluate mitigation measures for social and environmental impacts,
- Assess the activities of IMT agreement documents implement in the field

1.3 Scope of Consulting Services

The main aim of consulting service was to evaluate WUA Performance in IMT sub-system named Kankai Irrigation System and report was produced based on the following guidelines and scope of works:

1. Review of concerned documents of the project.
2. The Evaluation of WUA Performance was carried in close consultation with concerned WUAs, project office, water users, stakeholders and local line agencies, consultants, donor and client through individual interview, focus group discussion, participatory rural appraisal methods,
3. The Evaluation of WUA Performance covered the Institutional development of WUA, water management within the sub-systems, improvement of infrastructures and mitigation measures for social and environmental impacts topics,
4. The Evaluation of WUA Performance report was prepared with available color photographs and cover page.
5. The Evaluation of WUA Performance report was prepared in English language.

CHAPTER 2: LITERATURE REVIEW

2.1 IMTA Documents

Since 2008, the Irrigation and Water Resources Management Project (IWRMP) has been working towards improving agriculture productivity and the management of selected irrigation schemes in Nepal as well as enhancing institutional capacity for integrated water resources management. The primary beneficiaries are over 4,15,200 water users of selected farmer-managed irrigation systems (FMIS) covering over 26,859 ha, mainly in the hill regions. The project also targets the irrigation management transfer in four agency-managed irrigation systems (AMIS) and essential structural improvements covering about 23,000 ha.

The overall objective of irrigation Institution Development and Management Transfer is to improve service performance and service delivery of selected public irrigation schemes in the Terai through the completion and consolidation of management transfer to WUAs. The component is designed to address the problem of below-capacity performance, poor O&M, negligible cost recovery (below 5% on average) and inadequate maintenance funds in large public irrigation schemes. The expected outputs are: (a) efficient and equitable service delivery by financially and institutionally sustainable WUAs; (b) improved physical performance of the selected irrigation schemes; and (c) reliable bulk water service delivery by DoI in line with the Irrigation Management Transfer (IMT) Agreement. Activities to be financed under this component include (a) completion/consolidation of Management Transfer Plans (MTP); (b) Essential Structural Improvements (ESI); (c) repair/up gradation of buildings, information systems, and transportation and maintenance equipment; and (d) building capacity of WUAs and DoI. The approach will be to improve performance and service of the selective schemes through improved governance mechanisms and financing arrangements as well as capacity building of WUAs and DoI, in addition to ESI.

The Irrigation management transfer agreement (IMTA) between WUA and IWRMP/DOI was officially signed on 2066 Mansir 22 B.S at KIS. The main change that was introduced after this agreement was a shift in the roles and responsibilities of canal operation and maintenance to the water user associations and the Kankai irrigation office saw itself more as a facilitator than as an implementer. The main focus of this Agreement is to delivery timely, reliable and adequate supply of water to the farmers of the command area by the water user association. The main activities to achieve the overall objective of Irrigation management transfer are mostly focused on infrastructure development through Essential Structures Improvement, water management and Institutional Development and mitigation measures for social and environmental impacts on the irrigation system.

2.2 Water Resources Act 2049

The main legislation in relation to drinking water in Nepal is the Water Resource Act 1992 (2049 BS). This Act is an umbrella Act, governing not only drinking water, but other uses of water and overall water resource management in Nepal. The Act gives priority to the right to use water for drinking purposes over any other domestic or commercial use. The Water Resource Act 1992 (2049 BS) provides for the formation of Water User Associations when a group of individuals wish to make use of a water resource for their collective benefit. Water User Associations must be registered which provides the government with a mechanism to regulate the collective use of drinking water. The Water Resource Act 1992 (2049 BS) determines which uses of water are given priority and in what order. The use of water for drinking and domestic purposes is given first priority. The priority given to the different uses of water is set out in Section 7 of the Water Resource Act 1992 (2049 BS) as follows:

1. Drinking water and domestic use
2. Irrigation
3. Agricultural use such as animal husbandry, fisheries
4. Hydroelectricity

2.3 Irrigation Policy 2060

The irrigation policy 2060 has been drafted on the basis of the achievement and experience, towards implementation of Irrigation Policy, 2049 (First Amendment, 2053), objectives of the Tenth five year plan and the principle incorporated in the Water Resources Strategy. The irrigation policy includes program identified output activities to maximize the sustainable benefits of Irrigation. The major objective of Irrigation Policy is to provide round the year irrigation facility to the irrigation suitable land by effective utilization of the current water resources of the country, to develop institutional capability of Water Users for sustainable management of existing system and to enhance the knowledge, skill and institutional working capability of technical human resources, water users and non-governmental association / organization relating to development of irrigation sector.

According to Policy the Users Association shall be organized at different levels of every project/ system right from tertiary to main the canal. These organized users shall be involved in different activities of implementation and management of the project/system. Similarly user association shall be constituted and their capacity building program shall be conducted from the very beginning of the physical construction of the project to make more effective the transfer process of the system and management thereof to the users association. User association shall be composed of with at least thirty three percent of the women representation as well as, there shall be representation of dalit, downtrodden and backward ethnic communities in such association. User association shall be organized in the integrated watershed framework and at national level, for the sustainable development of irrigation in the country upon accountable participation of the users association in different level of the policy formation and

implementation. The maintenance, rehabilitation and reform of the system constructed/operated by the user association and traditional irrigation system managed by farmers shall be conducted by the people participation upon their request. Users association shall be made competent for the sustainable management of such system. The arrangement of registration and renewal of such types of users association shall be conducted from a single institution.

2.4 Irrigation Regulation 2056

The Irrigation Regulation 2000 (2056 BS) deals with irrigation systems developed and operated by HMG as well users groups and provides for the handing over and operation of irrigation systems developed and operated by HMG to Irrigation Water User Associations. The Irrigation Regulation 2000 (2056 BS) also establishes a right to form a Water User Association to use water for irrigation. However, the right to use water for irrigation is not absolute and is subject to certain duties and prohibitions which must be complied with by the user. The Irrigation Regulation 2000 (2056 BS) envisioned four kinds of irrigation management systems: (i) an irrigation project operated by HMG, (ii) an irrigation project operated by an IWUA, (iii) an irrigation projected jointly operated by HMG and an IWUA, and (iv) an irrigation project operated by a licensee. In all management systems the Regulation focuses on community participation in irrigation system management. Below we will discuss irrigation projects operated by HMG and IWUAs. Irrigation projects managed by a licensee are largely governed by the Water Resource Act 1992 (2049 BS) and its Regulation.

2.5 Water Resource regulation 2050

The Water Resource Regulation 1993 (2050 BS) is an umbrella Regulation covering all uses of water and providing procedural mechanisms for the implementation of the Water Resource Act 1992 (2049 BS). The Regulation covers the formation of Water User Associations and District Water Resource Committees, licensing, provides a dispute settlement mechanism in relation to water use service charges, sets out the process to be followed by the State in relation to land acquisition and compensation and provides some forms in the Schedules to the Regulations for certain administrative procedures.

2.6 Water Resource Strategy 2059

His Majesty's Government through Water and Energy Commission Secretariat (WECS) formulated the first comprehensive Water Resources Strategy of the country under the financial assistance of the World Bank/IDA and CIDA. The Specific objectives of Water Resource Strategy 2059 are:

- Help reduce the incidence of poverty, unemployment and under-employment.
- Provide access to safe and adequate drinking water and sanitation for ensuring health security.
- Increase agricultural production, ensuring the nation’s food security.
- Generate hydropower to satisfy national energy requirements and to allow for export of surplus energy.
- Supply the needs of the industrial sector and other sectors of the economy.

- Facilitate water transport, particularly connection to a seaport. ·
- Protect the environment and sustain the biodiversity of natural habitat.
- Prevent and mitigate water-induced disasters.

The Water Resources Strategy outputs will contribute to achieve the goal through the achievement of short-, medium- and long-term purposes, defined as follows:

Short-term (5-year) Purpose: Implementation of the comprehensive Water Resources Strategy provides tangible benefits to people in line with basic needs fulfillment, supported and managed by capable institutions involving all stakeholders.

Medium-term (15-year) Purpose: The Water Resources Strategy is operationalized to provide substantial benefits to people for basic needs fulfillment as well as other increased benefits related to sustainable water use.

Long-term (25-year) Purpose: Benefits from water resources are maximized in Nepal in a sustainable manner.

2.7 National Water Plan 2062

The National Water Plan (NWP) has been prepared to operationalize the Water Resources Strategy (WRS) of Nepal, approved by the HMGN in January 2002. The NWP includes programmes in all strategically identified output activities so that all these programmes, in consonance with each other, will contribute to maximizing the sustainable benefits of water use. The broad objective of the NWP is to contribute in a balanced manner to the overall national goals of economic development, poverty alleviation, food security, public health and safety, decent standards of living for the people and protection of the natural environment. The NWP is a framework to guide, in an integrated and comprehensive manner, all stakeholders for developing and managing water resources and water services. The NWP has developed a set of specific short-, medium- and long-term action plans for the water sector, including program and project activities, investments and institutional aspects.

CHAPTER 3: METHODOLOGY

The survey was designed to collect both qualitative and quantitative data. The survey questionnaire was the main basis for the generation of quantitative information. For the generation of qualitative information number of Participatory Rapid Appraisal (PRA) tools and techniques were administered. These tools included mainly Focus Group Discussion (FGD), Key Informant Interview and observation. The members of Water users Association, local elites, political leaders, women groups, disadvantaged groups were consulted to generate qualitative information using the PRA tools. Resource mapping, time line and Venn Diagrams were also considered in the study.

3.1 Desk Review Appraisal

Relevant policies (e.g. Constitution to acts/regulations related to Water Resource and Irrigations) Water Resources Act 2049, Irrigation Policy 2070, Irrigation Regulation 2056, Water Resource regulation 2050, Water Resource Strategy 2059, National Water Plan 2062 , Financial Rules of GoN were reviewed to understand whether the followed processes at field level are in line with them or not. Further, project reports, research articles were reviewed to understand the best practices, issues and gaps.

3.2 Data Collection

Participatory tools like Interaction meeting, focus group discussion (FGD), key informant interviews (KII), household visits was applied to collect data. The method employed was a questionnaire survey cum in-depth interview. A questionnaire was designed, pretested and revised prior to final survey.

Focused Group Discussion (FGD): Focus Group Discussion was conducted with WUA committee, women, men, dalits and janajatis during the study to acquire in depth information.

Household interview: For household selection, the Water User Association Members households were divided into different strata in consultation with committee members. The sample HHS was then selected randomly from the list of vulnerable HHS.

Key Informant Interview (KII): This method/tool was mainly designed to generate idea from high level officials from government. KII was conducted with the stakeholders of central and district level.

3.3 Data Analysis

Qualitative data was analyzed in the descriptive text mode, while quantitative data was analyzed in absolute and/or relative frequency mode. The report was prepared with a blend of both quantitative and qualitative information substantiating each other's findings as relevant. The data analysis focused on the components covered under the scope of the study.

CHAPTER 4: RESULT AND DISCUSSION

4.1 Institutional (WUA) Capacity Development

4.1.1 WUA office establishment and Management

There are three tier of WUA in Kankai Irrigation system. One uppermost committee called as Main committee, 22secondary committee and 181 tertiary committee. New office building of main committee (figure 1) started to construct in 2068 and completed in 2070 B.S. The total cost of office building was 59,43,348 with 10 % WUA kind contribution and financed by IWRMP.Out of 22 secondary committee 4 of them i.e. S6, S7, S9 &S10 have their own building and 18 of them are using hired building for office room. There is altogether 5 regular office support staff to conduct daily activities of WUA office. The monthly salary of these staff is paid by WUA income the details of office support staffs are as below:

Table 1: List of office support staff

S.N	Name of staff	Designation	Gender	Date of Joining	Salary (month)	Source of Salary
1	Bhakti Pd.Bhandari	Computer operator	M	2067 B.S	11000	WUA income
2	Bhawani Dangal	JCB Operator	M	2067 B.S	8000 Allowance: Rs 100/hr.	WUA income
3	Sunil Budhathoki	Assistant	M	2072 BS	50000 Allowance: Rs 25/hr	WUA income
4	Padam Narayan Shrestha	Tractor Driver	M	2071 BS	9500	
5	Pramila Thakur	Office Assistance	F	2070 BS	4000	

Source: WUA (2016)

Figure 1: Office building of WUA Main Committee

The Study Team found that WUA has used official letter pad, stamp, registration of letter, signboard etc. There lacks a system of keeping the citizen character but the organization has the good information board for dissemination of their information. The Office manager of main committee is responsible for keeping legal document such as IMTA, organization certificate, renew etc. WUA of main committee has excellent office setup.

Figure 2: Office Letter pad, Stamp and Cash voucher

4.1.2 WUA organization, good governance and administration

In Kankai irrigation System, there are 5 to 7 members in the tertiary committee. Secondary committee is formed from its tertiary committees. The number of members in secondary committee depends on number of tertiary committee they have, generally, it is 7 to 9 in numbers. There are 31 members in main committee, which consists of chairperson, vice chairperson, secretary, treasurer, 22 members from Secondary committee, one former chairperson of main committee as Ex. Officio member and four female members. There are all together 225 general assembly members.

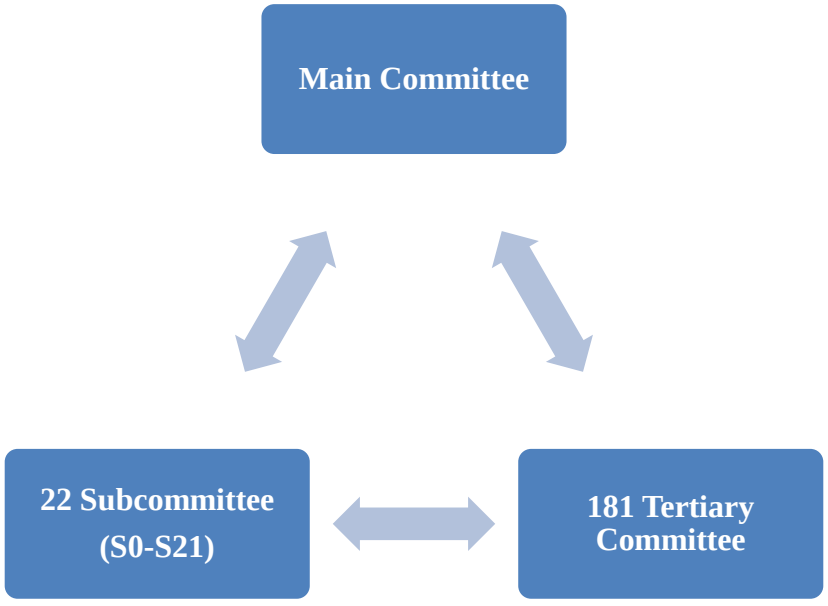
Table 2: List of Executive Members of Main Committee

S.N.	Name of executive Members	Post	Branch	Mobile No
1	Mr. Suryanarayan Singh Tajpuriya	Chairman		9842639157
2	Mr. Khadag Bd. Bhandari	Vice-Chairman		9742653186
3	Mr. Kamal Bhandari	Secretary		9844608161
4	Mr. NajarlalRajbansi	Treasurer		9804968902
5	Mr. TilBahadurKatuwal	Member	S0	9741102709
6	Mr. Ranga Prasad Rijal	Member	S1	9842707101
7	Mr. Janga Chemjung	Member	S2	9806034917
8	Mr. Ramkrishna Sitaula	Member	S3	9742620392
9	Mr. Laxmi Prasad Guragain	Member	S4	9752600241
10	Mr. Phagulal Rajbansi	Member	S5	9807963360

S.N.	Name of executive Members	Post	Branch	Mobile No
11	Mr. Pedarulal Tajpuriya	Member	S6	9806058652
12	Mr. Sagar Singh Rajbansi	Member	S7	9815944692
13	Mr. Kalyanraj Dahal	Member	S8	9804919185
14	Mr. Khyamnath Dulal	Member	S9	9804977960
15	Mr. Devi Prasad Tiwari	Member	S10	9804984419
16	Mr. Rajesh Kumar Shrestha	Member	S11	9804913197
17	Mr. Bijaya Kr. Agrawal	Member	S12	9807944944
18	Mr. Dharmaraj Subedi	Member	S13	9807978462
19	Mr. Rajendra Shrestha	Member	S14	9806045247
20	Mr. LayaPrasad Chamlagain	Member	S15	9842658651
21	Mr. Netrapati Pokharel	Member	S16	9842666978
22	Mr. Bansi Subedi	Member	S17	9804063086
23	Mr. Mohan Bahadur Basnet	Member	S18	9806045455
24	Mr. Narendra Bd. Basnet	Member	S19	9806062116
25	Mr. Bishnu Luitel	Member	S20	9804934827
26	Mr. Gyanendra Luitel	Member	S21	9807947470
27	Mr. Tanka Dhungel	Ex. Officio member		9807952995
28	Ms. Devi Dhungana	Female member		9807933401
29	Ms. Padma Rajbansi	Female member		9805326451
30	Ms. Kamala Subba	Female member		9804929179
31	Ms. Geeta Darji	Female member		9808255339

Source: WUA (2016)

The WUA main committee was registered on B.S. 2050-8-16 with registration number 148 at District Administration office, Jhapa. The secondary committee and sub secondary & tertiary committee need not to be registered as they were under the main committee. The WUA organization chart is presented in figure 3.



Source: WUA (2016)

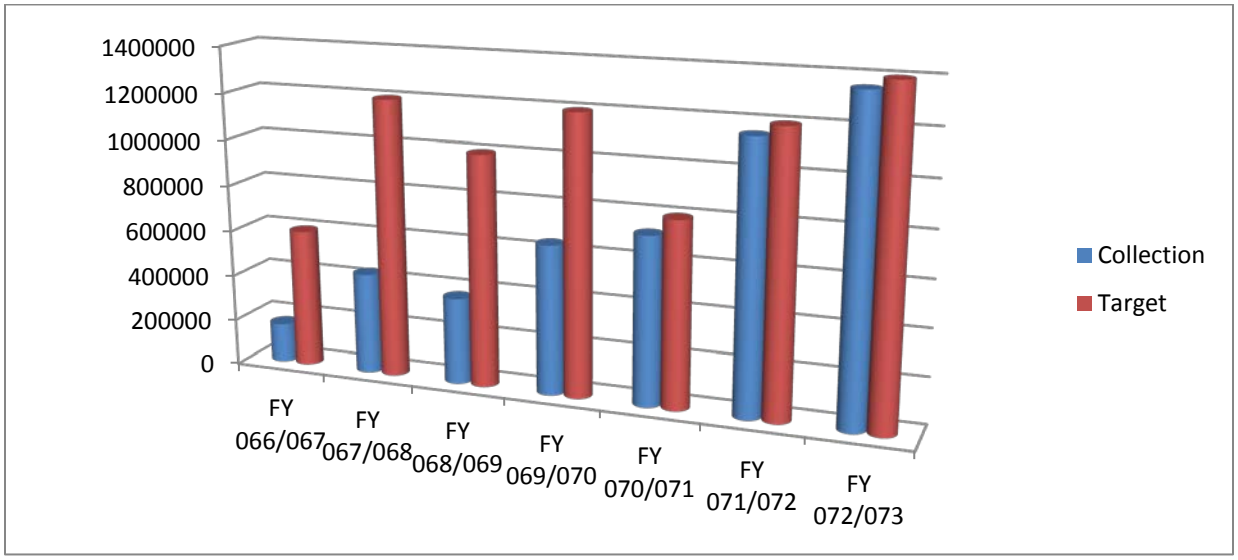
Figure 3: Organization chart of WUA in KIS

WUA has formed according to WUA by-laws but provision of 33% female candidate in main committee according to irrigation regulation was not followed in previous years. But the latest amendment of their constitution by General Assembly held of 2072 Poush 27 made an amendment to secure the 33 percent of female participation in the executive committee with at least one female member in the position of treasurer.

The WUA of main committee had distributed 5777 membership to users of Kankai irrigation system. The WUA of main committee organize regular meeting on 9th of each month, whereas secondary and tertiary committees organize their meetings whenever necessary to direct the functionaries, resolve conflicts, discuss financial matters and adjust rules and operational policies, maintenance of canal etc. The General assembly held in annual basis to share the work accomplished and formulate the plan for the next year and the latest General Assembly of the main committee was held on 2072 Poush 27

4.1.3 WUA resource generation and mobilization

The major sources of income in WUA are ISF, membership fee, hiring of excavator, thrasher, tractor, hall rent. The person selected by the WUA tertiary committee is responsible for ISF collection from users. The ISF rate was NRs 102/ha before IMTA. The General Assembly of main committee increased to NRs 300/ha after IMTA. Rs.300per hectare is the rate of ISF collection along with this rate; KIS also collect additional 300 per hectare from those farmers who plant spring rice. The ISF Collection for FY 2072/73 was Nrs 13, 57,000. The figure 4 shows ISF collection and targets in last Seven years of KIS.



Source: WUA, KIS (2016)

Figure 4: ISF collection and targets in last Seven years of KIS

From above figure, we can clearly indicate that the ISF collection is increasing every year although it fails to achieve the target. The increasing trend on collection of ISF shows users are very sensitive towards ISF collection. It is very positive sign for sustainability of WUA. Beside ISF collection, the other income of last year (FY 072/073) is as shown in table 3

Table 3: Other income sources of WUA, KIS

S.N.	Description of Items	Amount	Remarks
1	JCB hiring	12,90,090	
2	Tractor hiring	4,44,440	
3	Maintenance Cost	42,542	
4	Thresher	65,000	
5	Hall rent	36,900	

Source: WUA, KIS (2015)

The WUA of KIS mobilizes the collected ISF in different categories. The Table 4 shows details of ISF mobilization.

Table 4: ISF Mobilization of WUA, KIS

S.N.	Activities	ISF share
1	Government revenue	10%
2	Sub secondary committee	15.3%
3	Transfer to sub secondary committee	30.6%
4	Transfer to water course level	30.6%
5	Remuneration to ISF collecting institution	13.5%
	Total	**100%**

Source: WUA, KIS (2016)

The main committee of WUA of KIS has opened bank account in RBB bank Chandragadhi branch, Birtamode branch, Shivgunj branch previously but from the last year the bank account of Chandragadi and Birtamod was closed and the balance of those branches was transferred to the shivagunj branch. The Association also has an account on Excel development bank Shivgunj branch and Nepal Bank Limited. Chairperson and treasurer have authorization for signature in bank cheque. The saving in various bank accounts is as shown in table 5.

Table 5: Saving in different bank of WUA, KIS

S.N.	Bank Name	Saving Amount	Remarks
1	RBB Shivagunj	1,44,752.44	
2	Excel Development Bank, Shivagunj Branch	8,17,525.58	
3	Nepal Bank Limited	50,038	

Source: WUA, KIS (2016)

The WUA of KIS collected Rs. 42,542 in last FY (2072/073) as operation & maintenance cost from users of tertiary canal where maintenance works are required. Farmers contributed 10% of total project cost as contribution for system rehabilitation. The expenditure was made for salary of office support staff, JCB driver and assistant, tractor driver, office expenses, maintenance of JCB, tractor, motorbike & computer, general assembly etc. There are 22 number of Dhalpa, who are responsible for canal operation. They are under control of division office.

4.1.4 WUA communication and linkage development

Since, representatives of main committee are the members of the secondary committee; he/she is responsible for disseminating any information of main committee to lower tiers of the committee. Similarly, representatives of the second level committee are responsible for the information sharing to the tertiary level. However, for quick information sharing, lower tiers of committee are informed by making telephone call. Along with telephone call, a motorcycle has been provided to Chairperson of KIS to disseminate the information and for administrative purpose. Radio and Newspaper media also used for the information dissemination.

There is a good linkage between water users and executive committee. They have reported that experience gained from training, exposure visits were shared to water users. Besides KIMD, they have good coordination with District Agriculture Development Office (DADO). The details of support from DADO office is presented in table 6.

Table 6: Support from DADO

S.N.	Type of support	Amount	FY
1	Farm Machinery Equipment (Subsidy on 5 Power trailer)	4,40,000	072/073
2	Farm Machinery Equipment	16,00,000	071/072
3	Farm Machinery Equipment	10,50,000	070/071

Source: WUA, KIS (2016)

4.1.5 Institutional building/ capacity development trainings

Trainings

After IMTA various numbers of capacity development activities for WUA were conducted which includes the capacity building training and exposure visits. These training program and exposure visit to similar irrigation project in Nepal was very useful to the farmers. Table 7 represents the type of training, date of conduction and numbers of participants (Male/female) involved after IMTA.

Table 7: Name of trainings organized for WUA

S.N.	Subjects	Participants			Date
		Female	Male	Total	
1.	Capacity Building	5	25	30	20-21 April 2016
2.	Capacity Building	9	21	30	16-17 April 2016
3.	General Accounting	8	22	30	2-3 June 2015
4.	General Accounting	8	22	30	1-2 June 2015
5.	General Accounting	9	21	30	30-31 May 2015

S.N.	Subjects	Participants			Date
		Female	Male	Total	
6.	General Accounting	6	24	30	27-28 May 2015
7.	General Accounting	12	18	30	25-26 May 2015
8.	General Accounting	4	26	30	21-22 May 2015
9.	General Accounting	4	26	30	19-20 May 2015
10.	General Accounting	7	23	30	17-18 May 2015
11.	Irrigation Canal Table Development	4	26	30	7-8 Feb 2015
12.	Irrigation Canal Maintenance and Construction management	2	28	30	5-6 Feb 2015
13.	Capacity Building	8	22	30	10-11 Feb 2015
14.	Capacity Building	3	27	30	9-10 Feb 2015
15.	Capacity development	1	29	30	3-4 Feb 2015
16.	Two days Basic Account training	58	182	240	17 may to 5 June 2015
17.	Two days Canal operation and water management, canal operation schedule training	4	26	30	7-8Jan2015
18.	Two days Canal maintenance and construction training	2	28	30	5-6 Jan2015
19.	Fishery	40	60	100	2014
20.	Vegetable farming	38	62	100	2014
21.	Office management training	40	4	44	2014
22.	Institutional Development training	21	1	22	2014
23.	One day work shop ISF collection	84	6	90	2014
24.	Organic pesticides training	46	5	51	2014
25.	Canal operation and maintenance training	74	26	100	2014
26.	Farmers field school	195	105	300	2014
27.	ISF related training-4 packages	45	55	100	2014

S.N.	Subjects	Participants			Date
		Female	Male	Total	
28.	Organic vegetable farming technique four groups	40	60	100	2014
29.	Good governance and conflict management training			25	2014
30.	Farmers' fields school	136	89	225	2014
31.	Irrigation service fee related training	22	53	75	2014
32.	Irrigation service fees related training -10 packages	135	165	300	2014
33.	Farmer field school	94	256	350	2014
34.	one day workshop on integrated crop water management-8 packages	94	96	190	2014
35.	Canal operation and maintenance trainings-3 packages	1	74	75	2014
36.	Preparation of Action Plan (Two packages)	5	47	52	15-16 June, 2013
37.	ISF collection and management (Two packages)	21	29	50	01-02 June, 2013
38.	Increasing Awareness (Chetana Abhibridhi)	87	153	240	07-16 May, 2013
39.	ISF Collection and Management	13	68	81	25 April-03 May, 2013
40.	On and Off Farm Water Management	1	21	22	5-7 February, 2013
41.	On and Off Farm Water Management	4	27	31	11-13 January, 2013
42.	Water Users Organization Management, Resource Collection & Mobilization	4	25	29	1-2, January, 2013, 2012
43.	On and Off Farm Water Management	3	21	24	26-28 December, 2012
44.	Review and Interaction" workshop on Present Status of IWRMP/IMT and WUA of	4	25	29	5-6, December, 2012

S.N.	Subjects	Participants			Date
		Female	Male	Total	
	KIS				
45.	Training of Trainers (TOT) Training	4	20	24	15 -27 June 2012
46.	Irrigation Service Fee collection	10	64	74	11 – 16 June 2012
47.	One day training of fertilizer management	184	176	360	May 28 - June 10, 2012
48.	Two days' Workshop on WUA Capacity Development and Orientation Related to Irrigation Management Transfer (IMT)	08	32	40	27-28 January, 2012
49.	Construction management and quality control (2 packages & 3 days for each package)	09	48	57	07-09 Feb, 2012 & 27-29 Feb. 2012
50.	Off season vegetables farming (4 packages)	105	-	105	18-21/1/2012
51.	Account record keeping (5 packages)	18	104	122	14-26/3/2012
52.	Parcellary map preparation & review training	-	4	4	25-27/7/2010
53-	Structure calibration training	-	17	17	14-18/7/2010
54-	Gender awareness & women's participation (3 packages)	75	-	75	12-14/6/2011
55-	Workshop training on income generation women members of WUA	35	-	35	12-14/4/2011
56-	Women empowerment	22	-	22	19-21/4/2011
57	Mid-term progress review workshop	02	44	46	19/5/2011
58	ISF collection and management (4 packages), 3 days	19	83	102	4-21/5/2011
59	Basic account record keeping (4 packages), 2 days	11	89	100	19-26/4/2011
60	Computer basic training	01	07	8	2010/11
61	Office and record management (2 packages)	04	50	54	2010/11

S.N.	Subjects	Participants			Date
		Female	Male	Total	
62	Construction management & quality control (3 packages)	08	79	87	2010/11
63	Resource collection and mobilization	-	180	180	2010/11
64	Orientation on IMT program (WUA S0 to S16)				2010/11
65	Participatory monitoring and evaluation (2 days)	-	-	-	2009/10
66	Orientation on ISF collection, Inventory collection (7 packages)	-	175	175	2009/10
67	Office management and record keeping training (4 packages)	-	100	100	2009/10
68	Orientation workshop on IMTP (II packages)	-	660	660	2009/10

Source: WUA (2016)

Various numbers of Capacity development training was provided to the water users after IMTA. Basically these trainings were provided to water users to enhance their capacity for the better performance in WUA. According to Table 7 altogether 68 training was provided to the water users of WUA related to Accounting, Irrigation and water management, Organic Farming, Income Generation, Gender Equality and Women Empowerment, Monitoring and Evaluation etc. A total of 6006 farmers were benefited from these training that include 1916 Female and 4090 Male.

Exposure visits

Beside the trainings, WUA organized many exposure visits. Table 8 shows the details of exposure visit.

Table 8: List of Exposure Visit

S.N.	Exposure Visit	Participants			Date
		Female	Male	Total	
1	Study Tour (Mechi-Mahakali)	5	24	29	15-21 May 2016
2	Inter District Exposure Visit (Pokhara)	22	4	26	5-8 June 2015
3.	Study and exposure visit (3 days),NITP Dhankuta	2	23	25	Dec 2013
4.	Study Tour (Central WUA)	4	24	28	5 – 8 July 2012
5.	Study & exposure visit	05	25	30	19-22 June 2011

6.	Study and exposure visit (4 days)	30	-	30	19-22 June,2011
7.	Study and observation tour program	04	26	30	2010

Source: WUA (2016)

Farmers and executive members have been selected for exposure visits to different irrigation system of Nepal. The WUA and farmers focused on the water management process within the command area, application of irrigation methods, collection of Irrigation Service Fee (ISF) and its management etc. and sustainability of transferred irrigation system. This type of interaction, discussion and sharing experience enhanced them for well management of the system.

4.1.6 WUA conflict management

Normally Tertiary committee and Subcommittees in KIS deals about the various types of conflict rose due to the water distribution but for the big issues of conflict WUA had established the conflict management committee. Table 9 shows the Conflict management committee in KIS.

Table 9: Conflict management committee of KIS

Name	Designation
Suryanarayan Tajpuriya	Chairperson of WUA
Pradip Bantawa	Senior Engineer of division office
Najarlal Rajbansi	Treasurer WUA
Laxmi Guragain	Member of WUA
Kamal Pdr. Bhandari	Secretary of WUA
Shyamnath Dulal	Member of WUA
Tilbdr. Katuwal	Member of WUA

Source: WUA (2016)

The conflict usually arises due to water right. Other conflict that arises in the system was prioritization for maintenance of canal, land issue i.e. using land of other users as field channel in tail end of watercourse. To solve the conflict arises due to water right issue WUA of KIS has implemented rotational method of water distribution in the tertiary level.

4.1.7 Women's participation in irrigation

WUA has formed according to WUA by-laws but provision of 33% female candidate in main committee according to irrigation regulation was not followed in previous year but the latest amendment of their constitution by General Assembly of 2072 Poush 27 has made the provision of 33 percent female participation in the executive committee with at least one female member in the position of treasurer.

There is no any gender discrimination in wage parity. Both are getting equal amount i.e. NRs 400 as unskilled labor.

4.1.8 System operation, maintenance and management

WUA has its own canal operation and Maintenance Plan. Generally these plans were made during the annual general assembly of the organization with technical support from irrigation users and Kankai Irrigation management division. WUA of KIS was given training about various structures of canal, their types and function. Therefore, WUA of KIS has better knowledge of the different canal structures, types, their function etc. There are 22 head-regulator operator (Dhalpa) working in KIS. They are responsible for operation of canal and their monthly salary is paid by the Kankai Irrigation management division.

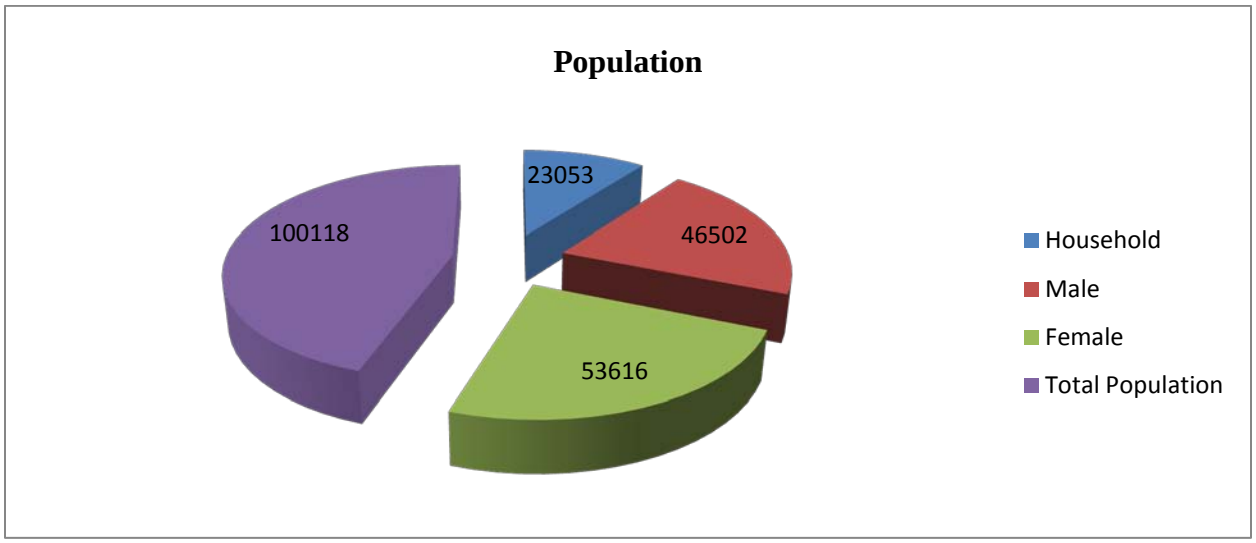
Regular and emergency maintenance activities were carried out to run the system properly. Then staff of KIMD and WUA prioritizes the works according to the importance and budget availability. The maintenance works of canals are carried out by the WUA, however; large volume of works is tendered by KIMD.WUA contribute10 % (kind) of the total maintenance work. For the Sustainability and feeling of ownership in the tertiary level has rendered higher percentage of kind contribution of WUA in maintenance works.

4.1.9 Legal Aspect of WUA

WUA of KIS has formed based on water resource act 2049, water resource regulation 2050 and irrigation regulation 2056 (first amendment 2060). The IMTA documents, registration and renew of WUA organization and WUA By-laws are most important legal documents, which are available in WUA office. The latest amendment of their constitution by General Assembly of 2072 Poush 27 has secured the 33 percent of female participation in the executive committee with at least one female member in the position of treasurer.

4.1.10 Socio-economic information

The KIS covers the 5 VDCs namely Baigundhura, Dharampur Mahabhara, Panchgachhi Topgachhi and ward no 1,2,3,8 and9 of Shivasatakshi municipality of Jhapa district. The total number of households and the population of the current water users in the project area are 23053 and 100118 (Male-46502, Female -53616) respectively. The Major communities of the project area are Bhramin, Chhetri, Ranjbansi, Tajpurai, Rai, Limbu and Newar.



Source: District Profile, Jhapa (2071)

Figure 5: Population Status of Command area

The permanent migration is not significant in the project area within the last 5 years. However, there is seasonal migration of persons searching for work. According to District profile (2071) 1761HH of the command area migrated to other places and 1757 HH migrated to command area from other places

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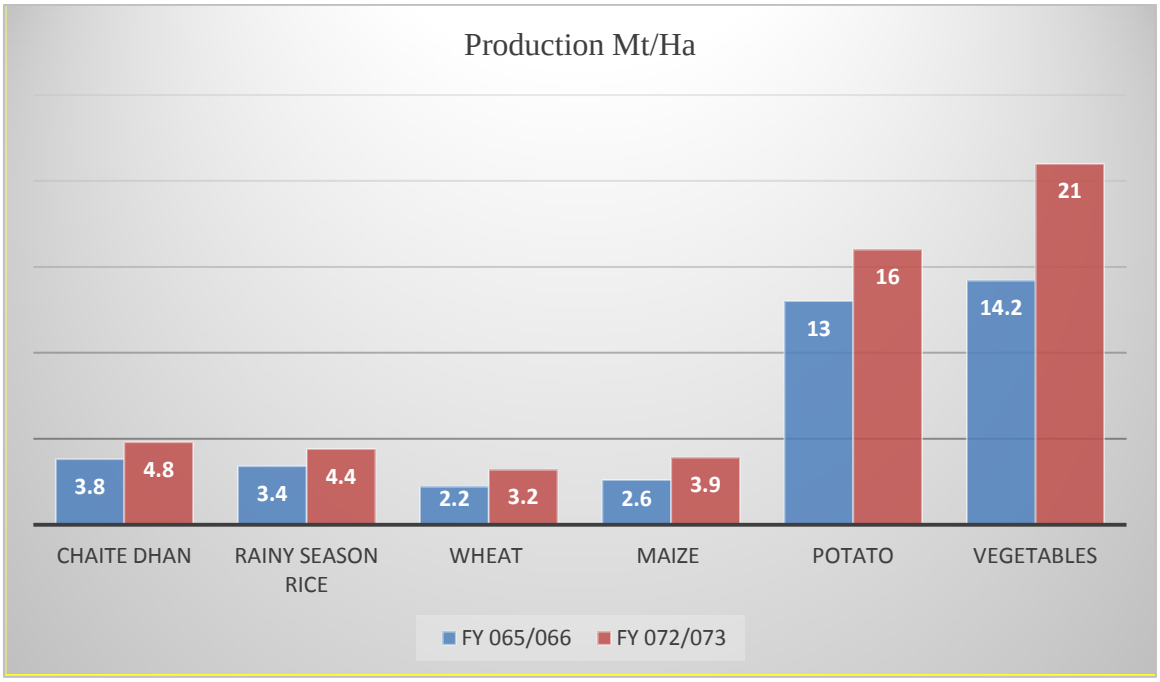
Table 10: Migration Trend in Command Area

SN	Name of VDC/Municipality	No of Emigrant	No of Immigrant	Total
1	Baigundhara	28	32	60
2	Mahabhara	119	43	162
3	Panchgachi	165	65	230
4	Topgachi	448	517	965
5	Dharampur	304	335	639
6	Shivasatakshi Municipality	697	765	1462

Source: District Profile, Jhapa (2071)

Agriculture is the main occupation of 85% of the economically active population in the area. 15% of the populations have other professions. Few women were found active in social activities. However, the society is male dominant as most parts of the country. Agricultural practices are to some extent tending towards farm mechanization through the use of tractors, threshing machines etc. The predominant crops are paddy rice, wheat, potato and vegetables. Cropping pattern has changed after introduction of irrigation in the area and since then the cropping intensity has increased significantly. Marketing system for the crops is found satisfactory and market is easily available at distance of 4-6 km.

The figure 6 shows the comparison of production (Mt/ha) of major crops before and after ESI works in KIS.



Source: WUA (2016)

Figure 6: Comparison of production (Mt/ha) of major crops

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The production of crops and vegetables increased in command area after the introduction of irrigation system. The comparative study of last seven years as shown in figure 7 indicates that production of crops and vegetable is increasing every year. In FY 2065/066 the production of chaitedhan was 3.8 mt/ha which increased to 4.8 mt/ha in FY 2072/073.Similarly the production of Rainy season rice increased from 3.4 mt/ha to 4.4 mt/ha and production of wheat increased from 2.2 mt/ha to 3.2 mt/ha. In the same way maize production in command area increased from 2.6 mt/ha to 3.9 mt/ha and the production of potato increased from 13 mt/ha to 16 mt/ha and other vegetables production increased from 14.2 mt/ha to 21 mt/ha.

4.1.11 IMD/SMU support

The sub-project management unit (SMU) is formed for the execution of Component "B" of IWRMP program in KIMD office. SMU perform the activities related to M&E at scheme level such as the benchmarking, user satisfaction surveys and process documentation with the assistance of NGOs. The WUA of KIS has good coordination with SMU.SMU is continuously supporting WUA to prepare institutional development and water management action plan, TOT conduction, Training, exposure visit, local trainer production, providing training materials and preparing annual program.

4.1.12 WUA Requirements

After FGD with Consultant team during the field visit the members of WUA had noticed the following requirements;

- Support from DOI and Irrigation ministry for strong law about ISF collection.
- Support for office room of secondary and tertiary committee.
- Water distribution training for proper water distribution.
- Training in the field of cooperative, agriculture, agriculture mechanization and processing.

Figure 7: FGD with committee member and locals

4.2 Canal Operation & Maintenance and Water Management

4.2.1 Canal operation & Maintenance

As the operation of the system deals with the water allocation, distribution and their monitoring, the Kankai Irrigation Management Division (KIMD) has appointed canal caretakers (Dhalpa) for regular observation of the system. There are 22 head-regulator operator (Dhalpa) working in KIS. They are responsible for operation of canal. The tertiary committee and respective users carry out operation of the system below tertiary head. The main committee of WUA in coordination with KIMD staff has formulated the canal operation and maintenance plan but there is lack of Canal Operation and Maintenance Plan in secondary and tertiary committee. A total of 20 tertiary canals have been constructed in S17-S21 during this fiscal year (2072/073). The main canal runs continuously throughout the year, except for the regular and emergency maintenance of canal. The regular repair period is mainly after ripening of wheat crop until start of summer rice. The table 11 shows the ranking of various secondary canals based on the ranking of respective tertiary

Table 11: Ranking of Secondary canals

S.N	Secondary	Rank(1-3)	Remarks
1	S0	3	This Secondary is performing very well
2	S1	3	The overall performance of this secondary is good
3	S2	2	The overall Performance of Canal is good
4	S3	3	Only few canal in this secondary in underperforming
5	S4	3	All canals are performing the required function properly
6	S5	2	The number of performing and not performing canal is equal here
7	S6	2	Overall Performance of this Secondary is Satisfactory

S.N	Secondary	Rank(1-3)	Remarks
8	S7	2	Most of the canals are performing good only one is non-functional
9	S8	2	The functionality of this secondary is satisfactory
10	S9	2	The functionality of this secondary is satisfactory
11	S10	2	The functionality of this secondary is satisfactory
12	S11	2	The functionality of this secondary is satisfactory
13	S12	2	The functionality of this secondary is satisfactory
14	S13	2	The functionality of this secondary is satisfactory
15	S14	2	Overall functionality is satisfactory
16	S15	2	The overall performance of this secondary is satisfactory
17	S16	1	This Secondary consists mostly of underperforming Tertiary canals
18	S17	1	Tertiary canal has been developed in FY 2072/73
19	S18	1	Tertiary canal has been developed in FY 2072/73
20	S19	1	Tertiary canal has been developed in FY 2072/73
21	S20	2	Half of the canals are performing satisfactory and half are not satisfactory and Tertiary canal has been developed in FY 2072/73
22	S21	1	Tertiary canal has been developed in FY 2072/73

Source: WUA (2016)

In above table Rank1 means no satisfactory performing, Rank2 means satisfactory and Rank3 means functionally mean well performing.

4.2.2 Water Management

In KIS, there is no major problem of water acquisition and water right; however, there is scarcity of supply of water during spring season. In rainy season, whole command area is benefited by the system.WUA and farmers of KIS get different training related to water management from IWRMP, which is very beneficial, them to know relation of plant, soil, water and different stages of irrigation for different crops. Parcellary map for KIS was prepared but WUA still hasn't got copy of it. There is rotational water supply system for the irrigation of land in the command area. In rainy season huge availability of water the WUA don't follow the rotation system but in spring season the committee follows the rotation for irrigation. The detail of rotational method of water distribution in the tertiary level is as shown in the table 12.

Table 12: Irrigation schedule of KIS

Year	Water Supply	Irrigation Used for Production
First	S0-S12	Paddy
	S13-S21	Wheat, Potato
Second	S13-S21	Paddy
	S0-S12	Wheat, Potato

Source: WUA (2016)

Small V-notch and cut-throat weirs have been fabricated and installed for measurements on lower level canals in intensive water management pilot areas. Lysimeters have been designed, constructed, installed and Water flow, water loss, and evapotranspiration measurements are being taken. Local farmers are

involved in the process of measuring losses. These direct field loss measurement are currently being taken and used in the COP pilot test areas.

Staff Gauge attached at main canal

Flow of water in the main canal

Figure 8: Main Canal of Irrigation system

Daily water measurements were recorded in several section of canal. Rating tables were prepared for most of the structures. From this, the discharge in the canal was calculated in the end of fiscal year by official staff and data was recorded in division office. Completion of calibration works in many gates make farmers easier to understand the quantity of water they receive. It is necessary that WUA and staff should understand about supply and demand in command area.

Figure 9: Calibration of different gates

4.3 Infrastructure development

The ESI works consists of improvement and new construction of several structures from S0 to S16 branch canal in different location of KIS. The works are mainly reshaping, lining, pipe outlets, footbridges,

pipe culverts, cross drainage, village Road Bridge, road crossing, gabion works and gate repair and maintenance. Table 13 represents the ESI activities and their progress.

Table 13: ESI activities and their Progress

No.	Description	Contracted Amount (incl. VAT) [NRs]	Financial Progress (%)	Remarks
1	Package 1 (S0 - S7)	29,379,463	100%	IWRMP funded
2	Package 2 (S8 - S12)	21,940,832	100%	IWRMP funded
3	Package 3 (S13 - S16)	24,317,489	100%	IWRMP funded
4	WUA Payable	5,214,565	100%	IWRMP funded
5	WUA Contribution	11,838,007	100%	
6	Package 4 (S17, S18, Dyangri aqueduct repair, service road repair)	19,894,709	85%	DOI funded
7	Package 5 (S19 & S21 branches)	12,511,994	100%	DOI funded
8	Package 6 (S20 branch)	6,984,988	100%	DOI funded
9	Package 7 (Bhalu&Jhijhile causeways)	19,100,990	100%	DOI funded
10	Package 8 (Head reach, R-2, R-3, R-5)	17,758,821	100%	DOI funded

Source: KIS / WUA (2016)

According to Table 13, the construction of Package 1 (S0-S1) was completed with the total amount of 29,379,463 from the financial support from IWRMP. Similarly the construction of Package 2 (S8-S21) was completed with total amount of 21,940,832 and Package 3 (S13-S16) with the total amount of 24,317,489 from the financial support of IWRMP. The WUA Payable and Contribution in infrastructure development was 5,214,565 and 11,838,007 respectively. In addition the Dyangri adequate repair and service road repair of package 4 was completed with the total amount of 19,894,709 with the financial support from DOI and the construction of S19 and S21 of Package 5 was completed with amount of 12,511,994. The construction of S20 branch of package 6 was completed with amount of 6,984,988 and construction of Bhalu and Jhiljhile causeway of Package 7 and Head reach R-2, R-3 and R-5 was completed with the total amount of 19,100,990 and 17,758,821 with the financial support from DOI In addition to above works, some of the essential structures are under construction, so complete renovation of essential structure is ongoing.

4.4 Mitigation measures for social and environmental impacts

The Social and Environment Management Plan (SEMP) was prepared that was approved by IWRMP on Jan 2011. The overall objective was to mitigate the adverse social and environmental impacts due to the ESI activities. The SEMP team visited in all branch canals and identified the ESI whose SEMP needed to be prepared. The ESI structures who's SEMP conducted are as follows;

- Aqueduct Construction
- Dhardhare Protection
- Canal Protection

4.4.1 Social issues

The acquisition of land of overall canal alignment has already been done. Due to the proper demarcation of land there is no such land related conflict for widening canal width, head regulator and other structure. The WUA has a mechanism of providing the compensation for the loss of community resources and structures. To hoist the status of women, backward group and vulnerable groups in society, WUA helped in capacity development of these groups through agriculture trainings, skilled enhancement trainings, and value add training in agriculture. In KIS, there is no major problem of water acquisition and water right; however, there is scarcity of supply of water during spring season. The respective farmers have donated their land voluntarily for the new outlets and associated new tertiary canal. Similarly, with support from WUA, KIMD acquired some of the encroachment area of main, secondary and tertiary canals. During reshaping of canal works from (S0 to S16) secondary canals, while making banks the trees and other existing crops was replaced. In addition to this, there is proportionate participation of women, backward groups and vulnerable groups in the community. There is no any gender discrimination in wage parity. Both are getting equal amount of NRs 400 as unskilled labor Conflicts and disputes and grievance redress mechanism is in developing process.

3.4.2 Environmental issues

The focused group discussion with executive committee reported that, the canal sections have been damaged by encroachment of people and animals into the canal. Beside this, burying animals have made holes and damaged in the canal section. The continuation of such practices will have adverse impact on the sustainability of the canal system. The changes in river morphology of Kankai and Kamal River have damaged the command area and the canals of the system. Gabion protection work, earthen embankment, bioengineering works had done by KIMD to mitigate damage of canal and command area by river morphology change.

In KIS, sediment has controlled at the main gate and flushing of sediment is carried out regularly to adjacent Sardarekhola. Therefore, farmers are not facing problems of high sediment intrusion canal. The ESI improvement activities do not use toxic chemicals or dangerous construction technologies. All the

construction materials, methods and technologies are of general use. Therefore, D/S water quality is not changed. The irrigation water has not affected water logging problem in project area. In some places, these problems are due to drainage problem, which is to be tackled by appropriate drainage structures. Construction of permanent outlets controlled farmers diverting water to their fields by cutting and breaching the canal banks. Similarly, construction of Footbridges and VRBs across canals in different places made easy access for movement of wild life and people.

	
Tree Plantation for canal protection	**Earthen Canal Damaged by burrying animals**

Figure 10: Environmental Issues and mitigation measures

4.5 Summary of Evaluation of WUA performance in KIS

Table 14: Summary of Evaluation of WUA performance

S.N	Particulars	Descriptions
A	**Organizational Indicators**	
A1	WUA office established and management	• Three tier of WUA, the uppermost WUA called as Main committee, 22 secondary committee and 181 tertiary committee. • Five regular staffs in office of MC. • Excellent office setup. • For office room of secondary committee, four have own buildingi.e. S6, S7, S9 & S10 and 18 of them are using hired building,
A2	WUA organization, Good governance and administration	• 31 members in main committee, chairperson, vice chairperson, secretary, treasurer, 22 members from main committee members of Secondary committee, former chairperson of main committee as member and four female members. • Latest amendment of their constitution by General Assembly of 2072 Poush27 has secured the 33 percent of female participation in the executive committee with at least one female member in the position of treasurer. • 225 general assembly members. • Elected Committee in each tier controls the management of the system. • Main committee has distributed 5777 membership. • Regular meeting of MC is organized on 9th of each month. • Secondary and sub secondary & tertiary committee organized meeting whenever necessary. • Prepared the annual program and almost all the activities has implemented.
A3	WUA resource generation and mobilization	• Major sources are ISF, membership fee, hiring of excavator and tractor, hall rent, earning from photocopy machine, shelling of grass etc. • ISF has collected by the secretary of the respective tertiary

S.N	Particulars	Descriptions
		committee. • Rs.300 per hectare is the rate of ISF collection, along with this rate; KIS also collect additional 300 per hectare from those farmers who plant spring rice. • WUA and users are very sensitive towards ISF collection. • The ISF Collection for FY 2072/73 was Nrs 13, 57,000 • For FY 2072/73 Nrs 42,542 was collected as operation & maintenance cost from users of tertiary canal where maintenance works are required which is 10% of total project cost as contribution from the farmers. • 22 number of Dhalpa remunerated by division office and are responsible for canal operation.
A4	WUA communication	• Representative from lower tier committee are responsible for disseminating any information. • For quick information sharing, lower tiers of committees are informed by making telephone call. A motorcycle has been provided to Chairperson to disseminate the information. • Radio and Newspaper media also used for the information dissemination. • Good linkage between water users and executive committee. • Good coordination with District Agriculture Development Office (DADO) and division office.
A5	Institutional building/capacity development training	• After IMTA Sufficient, capacity development activities were conducted. • Received sufficient information on role and responsibilities of water users, ISF collection and management, crop management, income generation, leadership development, account keeping etc. • Facing difficult to conduct trainings in the field of cooperative, agriculture, agriculture mechanization and processing. • Water management process within the command area, application of irrigation methods, collection of Irrigation Service Fee (ISF) and its management etc. and sustainability of transferred irrigation system were focused during exposure visits.

S.N	Particulars	Descriptions
A6	WUA Conflict management	• Conflict management committee deals about the various types of conflict rose due to the water distribution. • For big issues of conflict KIMD and WUA will finally resolve it. • To solve the conflict arises due to water right issue; WUA has implemented rotational method of water distribution in the tertiary level.
A7	Women's participation in irrigations	• Only 4 members out of 31 i.e. 13% of total is the women participation in main committee. • WUA has planned to participate 33% of female candidate in main committee near future • Latest amendment of their constitution by General Assembly of 2072 Poush27 has secured the 33 percent of female participation in the executive committee • There should be at least one female member in the position of treasurer • Women were involved in decision-making process, meetings, trainings, and exposure visits etc. • No any gender discrimination in wage parity. • Male and female are getting equal amount i.e. NRs 400 as unskilled labour as district rate.
A8	System operation, maintenance and management	• 22 head-regulator operator (Dhalpa) are responsible for operation of canal. • The rotational method of irrigation is less effective, as each household of tertiary has no fixed duration of irrigation according to their land sizes. • There is rotational water supply system for the irrigation of land in the command area. • In rainy season huge availability of water the WUA don't follow the rotation system but in spring season the committee follows the rotation for irrigation • Emergency maintenance including most of the regular maintenance has taken up after demands collected from jointly walk thru survey with WUA. • Staff of KIMD and WUA prioritizes the works according to the importance and budget availability.

S.N	Particulars	Descriptions
		• The maintenance works of canals are carried out by the WUA, however; large volume of works is tendered by KIMD. • WUA contribute 10 % (kind) of the total maintenance work. • Feeling of ownership in the tertiary level has rendered higher percentage of kind contribution of WUA in maintenance works is observed.
A9	Legal aspect of WUA	• WUA of KIS has formed based on water resource act 2049, water resource regulation 2050 and irrigation regulation 2056(first amendment 2060). • The IMTA documents, registration and renew of WUA organization and WUA By-laws are most important legal documents, which are available in WUA office. • WUA has made latest amendment of their constitution by their general assembly to secure 33 % Female participation in executive committee.
A10	Socio economic information in brief	• The KIS covers the 5 VDCs namely Baigundhura, Dharampur Mahabhara, Panchgachhi Topgachhi and ward no 1,2,3,8 and9 of Shivasatakshi municipality of Jhapa district • The total number of households and the population of the current water users in the project area are 23053 and 100118 (Male-46502, Female -53616) respectively. • Major communities of the project area are Bhramin, Chhetri, Ranjbansi, Tajpurai, Rai, Limbu and Newar. • Permanent migration is not significant However; there is seasonal migration of persons searching for work. • Agriculture is the main occupation of 85% of the economically active population in the area. 15% of the population have other professions. • Few women were found active in social activities. • Agricultural practices are to some extent tending towards farm mechanization through the use of tractors and attachments, threshing machines etc. • The predominant crops are paddy rice, wheat, potato and vegetables.

S.N	Particulars	Descriptions
		• Cropping pattern has changed after introduction of irrigation in the area. • Marketing system for the crops is found satisfactory and market is easily available at distance of 4-6 km.
A11	Support of IMD/SMU	• WUA has good coordination with SMU. • SMU is continuously supporting WUA to prepare institutional development and water management action plan, TOT conduction, Training, exposure visit, local trainer production, providing training materials and preparing annual program.
A12	WUA requirement	• Support from DOI and Irrigation ministry for strong law about ISF collection. • Support for office room of secondary committee and tertiary committee. • Water distribution training for proper water distribution. • Training in the field of cooperative, agriculture, agriculture mechanization and processing.
B	**Technical Indicators**	
B1	Canal operation & Canal maintenance	• 22 head-regulator operators (Dhalpa) are responsible for operation of canal. • Tertiary committee and respective users carry out operation of the system below tertiary head. • WUA have formulated the canal operation and maintenance plan. • A total of 20 tertiary canals have been constructed during this fiscal year (2072/073) • Rotational method of irrigation is less effective as each household of tertiary has no fixed duration of irrigation according to their land sizes. • Main canal runs continuously throughout the year except for the regular and emergency maintenance • Maintenance of the canal takes place in dry season i.e. 6 months duration • Dhalpa are responsible for removal of silt in entry level of main canal.

S.N	Particulars	Descriptions
		• Emergency maintenance including most of the regular maintenance is taken up after demands collected from jointly walk thru survey with WUA. • Staff of KIMD and WUA prioritizes the works according to the importance and budget availability. • WUA contribute 10 % (kind) of the total maintenance work. • WUA kept record of earthen type maintenance at the WUA office. • They have a record of cash and kind expenditure contributed for maintaining canal. • In the branch level, they have also initiated the collection of few amount of money along with the ISF for the maintenance of canal.
B2	Water management	• No major problem of water acquisition and water right; however, there is scarcity of supply of water during spring season. • In rainy season, whole command area is benefited by the system. • WUA and farmers get different training related to water management from IWRMP, which is very beneficial, them to know relation of plant, soil, water and different stages of irrigation for different crops. • Parcellary map was prepared but WUA still hasn't got copy of it. • The schedule for rotational water supply system was prepared. • Small V-notch and cut-throat weirs have been fabricated and installed for measurements on lower level canals in intensive water management pilot areas. • Daily water measurements were recorded in several section of canal. • Rating tables were prepared for most of the structures. • Discharge in the canal was calculated in the end of fiscal year by official staff and data was recorded in Kankai irrigation management division office.

S.N	Particulars	Descriptions
		• Completion of calibration works in many gates make farmers easier to understand the quantity of water they receive.
B3	Infrastructure development according to agreement	• ESI works consists of improvement and new construction of several structures from S0 to S16 branch canal in different location. • A total of 20 tertiary canals have been constructed in S17-S21 during this fiscal year (2072/073) • Works are mainly reshaping, lining, pipe outlets, footbridges, pipe culverts, cross drainage, village Road Bridge, road crossing, gabion works and gate repair and maintenance. • Improvement of service road and construction of culverts made easy accessibility for WUA Inspection, monitoring and controlling of water delivery. • Flow can be controlled easily due to maintenance of gates.
C	**Mitigation measures for social and environmental impacts**	
C1	**Social issues**	• The acquisition of land of overall canal alignment has already been done. • Due to the proper demarcation of land there is no such land related conflict for widening canal width, head regulator and other structure. • The WUA has a mechanism of providing the compensation for the loss of community resources and structures • Respective farmers have donated their land voluntarily for the new outlets and associated new tertiary canal. • With support from WUA, KIMD acquired some of the encroachment area of main, secondary and tertiary canals. • To hoist the status of women, backward group and vulnerable groups in society, capacity development of these groups through agriculture trainings, skilled enhancement trainings, and value add training in agriculture produce etc. is necessary. • There is no any gender discrimination in wage parity. Both are getting equal amount of NRs 400 as unskilled labour • There is proportionate participation of women, backward groups and vulnerable groups in the community
C2	**Environmental Issues**	• The focused group discussion with executive committee

S.N	Particulars	Descriptions
		reported that, the canal sections have been damaged by encroachment of people and animals into the canal • Burying animals have made holes and damaged in the canal section. • The changes in river morphology of Kankai and Kamal River have damaged the command area and the canals of the system • Gabion protection work, earthen embankment, bioengineering works had done by KIMD to mitigate damage of canal and command area by river morphology change. • In KIS, sediment has controlled at the main gate and flushing of sediment is carried out regularly to adjacent Sardarekhola • All the construction materials, methods and technologies are of general use. Therefore, D/S water quality is not changed. • Construction of permanent outlets controlled farmers diverting water to their fields by cutting and breaching the canal banks construction of Footbridges and VRBs across canals in different places made easy access for movement of wild life and people

CHAPTER 5: CONCLUSION AND RECOMMENDATION

5.1 Conclusion

IMTA in KIS has important role because of government financial constraints and poor management performance. WUA might play important role for the success of irrigation management transfer as WUAs performance is more appreciative. The performance of WUA can be good example for other projects.

Institutional capacity building:

The WUAs organization at main level is well maintained. The Main Committee WUA has a two storey well-furnished building with the well managed system of keeping signboard, office letter pad, office seal etc. beside main committee four Secondary have own building and 18 Secondary committee are using hired building. A regular meeting held once in a month, however; number of meeting can be organized as per requirements. WUA has maintained separate account for maintenance works and ISF collection. The main committee has three separate bank account at three different banks. It has performed regular internal and external auditing in each year. The major resource generation of WUA is ISF and the collection rate is found satisfactory as per target, which is very strong point for sustainability of the organization. Another important source of income is hiring excavator, tractor and hall renting etc. Dhalpa are used for canal operation in main and secondary canal. The salary for them is paid by KIMD office. It is very essential to increase the target of ISF collection in near future to reduce the government expenses and fulfill the IMTA objectives.

The training program and exposure visit to similar irrigation project in Nepal is very useful to the farmers. WUA has received sufficient information on role and responsibilities of water users, ISF collection and management, crop management, income generation, leadership development, account keeping etc. This type of interaction, discussion and sharing experience enhanced them for well management of the system.

Canal operation and maintenance:

The canal operation and maintenance plan was developed by KIMD and WUA. The COP is under implementation for all seasonal crops. A total of 20 tertiary canals have been constructed in S17-S21 during this fiscal year (2072/073). The main canal runs continuously throughout the year except for the regular and emergency maintenance of canal. The regular maintenance of the canal takes place in dry i.e. After ripening of wheat crop until start of summer rice. Emergency maintenance including most of the regular maintenance are taken up after demands collected from jointly walk thru survey with WUA.WUA has strong participation for maintenance of tertiary canal.

Water management:

In dry season, KIS has 7.74 cumecs and in wet season 10.4 cumecs discharge in river. In KIS, there is no major problem of water acquisition and water right; however, there is scarcity of supply of water during spring season. In rainy season, whole command area is benefited by the system. WUA and farmers of KIS get different training related to water management from IWRMP, which is very beneficial, them to know relation of plant, soil, water and different stages of irrigation for different crops. Parcellary map for KIS is prepared but WUA still does not get copy of it. There is rotational water supply system for the irrigation of land in the command area. In rainy season huge availability of water the WUA don't follow the rotation system but in spring season the committee follows the rotation for irrigation

Infrastructure Development:

The estimates prepared during IMTA for ESI part and DOI part have abundant contribution for infrastructure development in KIS to operate canal smoothly. IWRMP part, the farmer's contribution and Payable parts were completed; DOI contribution work of some packages is under construction. After completion of ESI A total of 20 tertiary canals have been constructed in S17-S21 during this fiscal year (2072/073).Improvement of service road and construction of culverts made easy accessibility for WUA Inspection, monitoring and controlling of water delivery. Agricultural productivity has increased; water logging area has reduced.

Mitigation measures for social and environmental impacts:

The SEMP was conducted whether the ESI activities will have negative impacts. There were no any major issues regarding to social and environmental impacts. Some of the areas were identified to minimize the impacts; the construction works to those structures minimizes these issues.

5.2 Recommendation

The following recommendation can be considered for the accomplishment of IMTA goal:

- Main committee and four secondary Committee of WUAhave their own building and 18 Secondary Committee are using hired building. The main committee maintain daily account and perform audit each year, it conduct regular meeting on 9th of every Nepali month that is chaired by the committee chairperson, It reflects that the committee is towards good governance and administration, however, lower tier of committee i.e. Secondary and Tertiary Committee should be strengthen for regular meeting conduction, maintaining account and auditing each year etc.
- In previous years there was not active participation of women in all committee of WUA but the General Assembly of WUA held on 2072/09/27 secured the active participation of women in executive committee. The assembly amended the constitution of WUA that include the regulation that every committee should have at least 33 % of women participation and the post of treasurer should be given to women. The provision of 33% female candidate according to irrigation regulation would also empower women towards leadership development, gender sensitization and awareness rising. For

the participation of Females in Executive Committee and their Capacity development WUA should conduct different training, workshop and exposure visits

- Coordination to other agencies like DADO, DFO, DSCO and other NGO/INGO is very important for capacity development of WUA, conduction of income generation activities for farmers, value add training and establishment of market center.
- Since Training is an import part of Capacity development WUA should conduct cooperative training, income generation and agriculture mechanization training that promote rise in income of WUA as well as farmers.
- WUA and users of KIS are very sensitive towards ISF collection's collection is very satisfactory as per target however; target may not sufficient for WUA in upcoming days as IWRMP will phase out and whole responsibilities must be abide by WUA. So ISF collection rate should be increased for sustainability of WUA.
- Additional ESI works should be completed with local participation and Canal operation and maintenance plan should be implemented from tertiary for the sustainability of canals.
- Although WUA has its own COMP and regular maintenance of canal takes place according to COMP but the emergency maintenance of secondary and tertiary canals should be performed as the demand of the user.
- Rotational method of irrigation is less effective as each household of tertiary has no fixed duration of irrigation according to their land sizes there for WUA should build a mechanism that helps canal runs continuously throughout the year**.**

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ANNEX: 1

Field Photographs

FGD with WUA, MC

Equipment's at WUA Office

FGD with Dhalpas

FGD with WUA Secondary Committee (S4)

FGD with WUA Branch Committee S19

FGD with WUA Branch Committee S20

KIS Canal in Command Area

Head Works in KIS

Section of Main Canal

Section of Main Canal

Divider of Canal

Siphon structure at DhauliKhola

ANNEX: 2

Questionnaire

Questionnaire the Performance Evaluation of WUA in Irrigation Management Transfer Program in Kankai Irrigation System

Basic information

Name of the respondents:

Gender of the respondents:

Caste and ethnicity:

Address:

Age:

Location of settlement:

Name of Irrigation System

Location of Irrigation System

Name of WUA:

WUA registration Date and Registration No:

Location and Address of WUA Office

Number of Household:

Number of WUA Members (Male and Female)

Major Cast/Ethnicity Distribution in Command Area

Average Landholding Size:

IMT Agreement Date:

IWRMP First Phase Completion Date:

Date:

Knowledge about WUA Office establishment and management

Do you have your own office building? If yes, type of building?

……
……
……

Do you use signboard, citizen characters status, office letter pad, receipt, voucher, office seal etc.? If yes how do you use them?

……
……
……

How many office Support Staff do you have in your organization?

SN	Name of Staff	Designation	Gender	Date of Joining	Monthly Salary

How do you maintain office Register (Minute, feedback, outgoing and incoming mails and WUA assets)

……
……
……

What is the system of filing of WUA documents (Constitution, Certificate, Memo etc.?)

……
……
……

Knowledge and perception on WUA Organization, good governance and administration

List of water users and irrigated land

SN	Name of the User	Total Land	Irrigated Land	Remarks

List of WUA executive Members

SN	Name	Designation	Membership Date	Roles and Responsibilities	Mobile No

Registration of WUA

SN	Name of Committee	Date of Establishment	Registered with	Date of Renew

What is the system of membership registration on the organization?

……
……
……

Do you conduct General assembly every year? If yes Latest General Assembly Date.

……
……
……

Do you have any Branch/Tertiary/ Subcommittees? If yes

SN	Name of Branch/Tertiary/ Subcommittees	Date of Establishment	Roles and Responsibilities	Remarks

Do you conduct regular meeting? If yes who is responsible to implement the decisions of meeting?

……
……
……

Do you have the system of planning, Implementing, Monitoring and Evaluation of Program? If yes how do you conduct them?

……
……
……

Knowledge and perception on WUA Resource Generation and Mobilization

Financial Situation of the Association

SN	Name of the Users Association	Bank Account Number	Account Type	Name of Bank	Current Balance

How do you Collect Irrigation Service Fee (ISF)?

Daily b) Weekly c) Yearly

…….Nrs/ Day, Week, Year

Total ISF Collection till date:

Do you have other Source of Income in WUA except ISF? If yes

SN	Source	Amount Received (Last year)

Where do you mobilize the income received by WUA?

……
……
……..

Do you have system of maintaining daily Account? If yes who is the responsible person of maintaining daily account (Journal, Ledger etc.)

……
……
……..

Do you perform financial audit every year?

……
……
……..

How do you collect Operation and Management Cost?

Cash b) Kind

SN	Total Cash Received (per year)	Total Kind (per year)
1		

Does the farmer contribute for system rehabilitation?

Yes b)No

If yes % of the total project Cost:

Do you have Dhalpa in your Organization?

a) Yes b) No

If yes ,

No of Dhalpa	Date of Joining	Salary (Per Months)	Remarks

Knowledge and perception on WUA Communication

Do you have system of sharing the information and WUA activities among the WUA and Water Users?

Yes b) No

If yes who shares the Information and medium of sharing information.

Do you share training knowledge with other water Users?

a) Yes b) No

If yes what are the process of sharing the Knowledge

Knowledge and perception on WUA Linkage Development

Do you have linkage and coordination with other organization?

a) Yes b) No

If yes

SN	Name of Organization	Address	Date of linkage Development	Purpose

Do you receive any support from other organization?

Yes b) No

If yes,

SN	Name of Supporting Organization	Date of Support	Types of Support

Knowledge and perception on Institutional building/ Capacity Development

Have you received any training during the project period?

a) Yes b) No

If Yes

SN	Name of Training Provider	Types of Training	Date	Location	Budget	No of Participants

Have you participated in any Exposure Visit during the project period?

Yes b) No

If Yes,

SN	Name of Organization	Date	Location of visit	Budget	No of Participant	Remarks

Knowledge and perception on Institutional building/ Capacity Development

Do you have a mechanism of Managing the conflict related to different issues in your organization?

Yes b) No

If Yes,

SN	Conflict Issues	Controlling Measures
1	Water rights related conflict	

2	Water allocation/distribution regulation and implementing related conflict	
3	Plan/schedule for rotational water supply system related conflict	
4	Land related Conflict	
5	Social Conflict	
6	Environment related conflict	

Knowledge and perception on Women's participation in irrigation.

9.1 Do you have minimum 33% female involvement in WUA executive Committee?

a) Yes b) No

If Yes,

SN	Name of Female Member	Position	Date of Joining organization

9.2 Do you have mechanism of same wage for same work for both male and female in your organization?

a) Yes b) No

If Yes,

……..Nrs/ Day ……..Nrs/Months

9.3 Percentage of women Participation in Meeting, training/Exposure Visit.

…… %

Knowledge *and perception on System Operation, Maintenance and Management.*

10.1 Do you have knowledge about types and numbers of structure and their function?

a) Yes b) No

If Yes,

SN	Types of Structure	Number of Structure	Function

10.2 Do you have Canal operation and Maintenance Plans (COMP)?

a) Yes b) No

If yes, how do you formulate Canal Operation and Maintenance Plan (COMP)?

……
……
……..

What is the duration on Canal Maintenance?

……
……
……..

Knowledge *and perception on Legal Aspect of WUA*

10.1 Do you have knowledge on Legal Aspect of WUA?

a) Yes b) No

If Yes,

SN	Legal Aspect	Knowledge of Respondent
1	Water Resources Act 2049	

2	Irrigation Policy 2070	
3	Irrigation Regulation 2056	
4	Water Resource regulation 2050	
5	Water Resource Strategy 2059	
6	National Water Plan 2062	
7	Financial Rules of GoN	

10.2 Do you have hard Copies of above documents?

a) Yes b) No

Do you have the system of amendment of WUA Constitution?

Yes b) No

If yes, under what condition the amendment of WUA takes place and what is the last date of amendment of Constitution

Condition of amendment of WUA Constitution	Date of Latest amendment

Knowledge *and perception on* formulation of WUA By-laws

11.1 Do you have knowledge on formulation of WUA by laws?

a) Yes b) No

If Yes,

SN	WUA By Laws	Respondents Knowledge and Perception
1	Administration	
2	Irrigation Service Fee	
3	Canal Operation, Maintenance and	

	Management	
4	Financial Regulation	
5	Water Allocation and Distribution	
6	Election Regulation,	
7	Resource Mobilization	
8	Share System	
9	Conflict Management	
10	Other if any	

12. Socio-economic Information

12.1Condition of Migration within 5 years

Number of Immigrant	Types of Migration	Cause of migration
Number of Emigrant	Types of Migration	Cause of Migration

12.2 Employment Status

No of Person employed			
Governmental	Non-Governmental	India	Overseas

12.3 Agricultural Status

% of People Involved	Main Agricultural Product	Traditional or Modern	Inputs	Total Production last Year

12.4 Educational Status

Literacy Rate	Types of Educational Institution Available

12.5 Population Status

Total No of HH:

Total Population:

Major Ethnic Groups:

1

2

3

4

5

6

7

Support of IMD/SMU

13.1 Do you receive Support of IMD/SMU?

a) Yes b) No

If Yes, Provide the following Information

Support for ADP Preparation	
Support for Annual Program	
Support for Training Material	
Training For TOT Condition	

Canal Operation & Maintenance and Watershed Management

A. Canal operation

What is the present condition of the Canal System?

……
……
…… (Photograph No :.....)

What is the system of Canal Operation, operations targets at different level of irrigation service?

……
……
……

What are the major functions of water conveyance, controlling and measuring structures?

……
……
……

What are the system water controlling and distribution structures in the organization?

……
……
……

Do you have Branch and Tertiary canals operation plan?

……
……
……

What is the system canal operation-at different water availability situation?

……
……
……

Do you operate Canal according to irrigation management transfer (IMT)?

……
……
……

How do you perform Normal and emergency canal operation?

Condition	Canal Operation System
Normal	
Emergency	

How do you communicate for canal operation?

……
……
……

Do you have WUA rules for controlling mal-operation of the canal and structures?

Yes b) No

If yes, what the rules for controlling measures

……
……
……

B.Canal Maintenance

Do you have Canal maintenance group?

……
……
……

Have you Prepared canal maintenance plan and operation schedule and implementation schedule?

……
……
……

Have you Prepared construction work plan and implementation schedule for earth work and structural works mobilizing labor contribution?

……
……
……

What are the Methods of works measurement and labor assessment?

……
……
……

How do you monitor the maintenance works?

……
……
……

What are the methods of examination of quality of construction materials?

……
……
……

How do you maintain tertiary canal for higher efficiency?

……
……

C. Water Management

What are the stages and methods of irrigation in Rice, Wheat, Maize and Potato?

……
……
……

How do you discharge measurement, Current meter, and float and weirs ratings?

……
……
……

How do you match supply and demands in different situations (water shortage, excess and normal period?)

……
……
……

How do you prepare water distribution schedule (proportionate and demand basis) in branch and tertiary canals, methods of water distribution?

……
……
……

How do you prepare water distribution schedule in branch and tertiary canals?

……
……
……

How do you prepare parcellary map?

……
……
……

How do you schedule Field irrigation from tertiary outlet?

……
……
……

15 Canal Operation & Maintenance and Watershed Management

What the condition of Infrastructures is as mentioned in the IMT agreement will be assessed thoroughly?

……
……
……

Mitigation measures for social and environmental impacts

Social Issues

Social Issues	Mitigation Measures
Loss of private land and immobile assets (including structures, tress, orchards, etc.) requiring involuntary acquisition for widening canal width, head regulator and other structures.	
Loss of community resources and structures	
Loss of source of income and lively hood	
Health (including HIV/AIDS) and safety aspects of the labor and local people	
Water rights - equity issue	
Elite capture in both decisions making and accessing project benefits	
Lack or inadequate consultation and participation	
Disparity in accessing project benefits	
Wage parity	
Issues relating to women, dalits (Schedule Caste), janajatis (Schedule Tribes) and other vulnerable sections	
Conflicts and disputes and grievance redress mechanism	
Other issues	

Environmental Issues

Environmental Issues	Mitigation Measures
Erosion and Slope stability	
Spoil Bank Management	
Unsustainable withdrawal of Water from Source (Surface/Ground water)	
(D/S requirement of river for Bio-Diversity/ Depletion of GW table)	
Excessive and unplanned quarrying of construction material	
D/S water quality	
Impediment of movement of wild life and people	
Air quality/ Noise pollution	
Aggradations / Degradation of river bed	
Change in river morphology/ outflanking	
Sediment intrusion	
Water logging and drainage hazards	
Disposal of construction spoils	
Loss of timber, vegetation and deforestation	
Loss of wild life due to project activities/ poaching/illegal fishing by labor	
Nuisance due to disposal from labor camp	
Any other issue	

Do you have any other Suggestions and Requirements?

……
……
……

Thank you

ANNEX: 3

IWRMP-IMT Agreement

नेपाल सरकार

सिंचाइ मन्त्रालय

सिंचाइ विभाग

र

कन्काइ जल उपभोक्ता संस्था

बिचको

सम्झौता-पत्र

सिंचाइ व्यवस्थापन हस्तान्तरण सम्झौता-पत्र

२०६६

सम्झौता-पत्र

जलस्रोत ऐन, २०४९ को दफा ११, सिंचाई नियमावली, २०५६, सिंचाई नीति, २०६०, जलस्रोत नियमावली, २०५० तथा जलस्रोत रणनीति, २०५९ र राष्ट्रिय जल योजना, २०६२ समेतको उद्देश्य र दिएको अख्तियारीलाई विचार गर्दै,

यस कन्काई सिंचाइ प्रणालीको विकास तथा व्यवस्थापन कार्य अझ वढि प्रभावकारी, समन्यायिक र दिगो रुपमा संचालन गर्ने उद्देश्यले नेपाल सरकारद्वारा संचालनमा रहेको यस कन्काई सिंचाइ प्रणाली जलउपभोक्ता संस्थालाई हस्तान्तरण गर्न तथा वुझिलिनका लागि देहायका सर्तको अधिनमा रही विभाग र संस्था तयार भएको अवस्थालाई समेत मध्यनजर गर्दै,

नेपाल सरकार, सिंचाइ मन्त्रालय, सिंचाइ विभाग (यसपछी "विभाग" भनिएको) र झापा जिल्लामा संचालन भैरहेको कन्काइ सिंचाइ प्रणालीको जल उपभोक्ता संस्था (यसपछि "सस्था" भनिएको) वीचमा तल उल्लेखित साक्षीका रोहवरमा विभाग र संस्थाका वीच यस सम्झौतामा हस्ताक्षर गरी एक/एक प्रति बुझी लियौं दियौं ।

१. परिभाषाः विषय वा प्रसंगले अर्को अर्थ नलागेमा

क) "विभाग" भन्नाले सिंचाइ विभागलाई जनाउदछ तथा यस शब्दले यस विभाग अन्तर्गतका सम्वन्धित कार्यालयलाई समेत सम्झिनु पर्दछ ।

ख) "सिंचाइ प्रणाली" भन्नाले कन्काई सिंचाइ प्रणाली, गौडै, झापालाई सम्झिनु पर्दछ ।

ग) "कार्य योजना" भन्नाले "अति आवश्यक संरचना सुधार (ESI) र संस्थागत विकास कार्य सम्पन्न गर्न तयार पारिएको कार्य सूचि सम्झिनु पर्दछ ।

घ) " जल उपभोक्ता संस्था " भन्नाले सिंचाइ प्रणालीका लागि दर्ता भएको जल उपभोक्ता संस्था सम्झिनु पर्दछ ।

ङ) "उपभोक्ता" भन्नाले सिंचाइ प्रणालीबाट सेवा उपभोग गर्ने किसान सम्झनु पर्दछ ।

च) "प्रणाली समन्वय समिति" भन्नाले दफा नं. २ अनुसार गठन भएको समिति सम्झनु पर्दछ ।

छ) "मुल नहर" भन्नाले मुल नहर तथा सो का संरचनाहरु जस्तै HR/CR, Culvet,outlet आदी समेत सम्झिनु पर्दछ।

ज) "अति आवश्यक संरचना सुधार" भन्नाले नहर हस्तान्तरण पश्चात संचालन योग्य बनाउन नगरी नहुने सुधार कार्य भन्ने सम्झिनु पर्दछ ।

झ) "मर्मत संभार" भन्नाले सालवसाली नहर संचालन योग्य बनाउन गर्नु पर्ने नहर तथा संरचनाहरु दुरुस्त राख्ने कार्य सम्झिनु पर्दछ ।

२. सिंचाइ प्रणालीको संक्षिप्त विवरण

एशियाली विकास बैङ्कको ऋण सहयोगमा सन् १९७० मा कन्काई सिंचाइ प्रणालीको निमार्ण कार्य प्रारम्भ गरिएको थियो । यसको निर्माण कार्य दुई चरण सम्पन्न गरिएको थियो । ५००० हेक्टरमा सिंचाइ सेवा उपलब्ध गराउनका निम्ति प्रथम चरण सन् १९७१ बाट शुरु भई सन् १९८१ मा सम्पन्न भएको थियो । ३००० हेक्टर सिंचाइ सेवा उपलब्ध गराउनका लागि सन् १९८१ मा शुरु भएको द्वितीय चरणको कार्य २००० हेक्टर मात्र सीमित भई सन् १९९१ मा सम्पन्न भएको थियो । बाँकी रहन गएको १००० हेक्टर कमाण्ड क्षेत्रमा अझै पनि संरचना निर्माण हुन सकेको छैन । यस प्रणालीको १२६ मीटर चौडाई भएको Diversion Weir भएको एउटा

हेडवर्क्स र गेगर बालुवा (Sediment) नहरमा प्रवेश नहोस् भन्नका लागि सेटलिङ बेसिन रहेका छ। मूल नहरको क्षमता १० क्यूमेक र ११.५ कि.मी.सम्म लाईनिङ नहर रहेको छ। यसमा २१ वटा शाखा नहर छन् र जसमध्ये केवल १७ वटा मात्र प्रशाखा तहमा विकास गरिएका छन् र बाँकी ५ वटा शाखाहरुको विकास हुन सकेको छैन। यस प्रणालीमा ५४ वटा उपशाखा र २०६ वटा प्रशाखा नहरहरु रहेका छन् । यसमा १४५ वटा प्रशाखा, २१वटा शाखा र एउटा मूल समिति सहितको जल उपभोक्ता संस्था रहेको छ। कमाण्ड एरिया भित्र सतासीधाम, शिवगंज, पाँचगाछी,महाभारा, धरमपुर, तोपगाछी र बैगुन्धुरा गरी सात वटा गा.वि.सहरु रहेका छन।

३. प्रणाली समन्वय समितिको गठन (SCC)

यस सम्झौताको बुदा नं. १ को च मा उल्लेखित समिति निम्नानुसार गठन हुनेछ।

३.१ समितिको गठन

१. डिभिजन प्रमुख, पु.सि.वि.डि.नं.,१	अध्यक्ष
२. जिल्ला विकास समितिको प्रतिनिधि-	सदस्य
३. जिल्ला कृषि विकास कार्यालयको प्रतिनिधि-	सदस्य
४. ज.उ.स. प्रतिनिधि-	सदस्य
५. ज.उ.स. प्रतिनिधि -	सदस्य
६. ज.उ.स. प्रतिनिधि -	सदस्य
७. ज.उ.स. मुल समितिको सचिव-	सदस्य सचिव

३.२ काम कर्तब्य र अधिकार

यस समितिको देहाय बमोजिमको काम कर्तव्य र अधिकार हुनेछ।

(क) कम्पोनेन्ट "डी" को कृषि उत्पादन सम्बन्धी कार्यक्रमको समन्वय गर्ने
(ख) स्विकृत वार्षिक कार्यक्रम र सम्झौता पत्रमा उल्लेख भए अनुसारको ज.उ.स.ले नगद वा श्रम वा जिन्सी वाट पुऱ्याउने योगदानको स्वीकृति।
(ग) संचालन र मर्मत सम्भार वार्षिक कार्य योजनाको स्वीकृति।
(घ) सहमति भए अनुसार कार्य भए नभएको विषयमा सुनिश्चित गर्ने।
(ङ) अनुगमन तथा मूल्यांकन प्रतिवेदनहरुको स्वीकृति गर्ने।

४. हस्तान्तरण हुने सिंचाइ प्रणाली र कार्य क्षेत्रः

४.१ यो सम्झौता अन्तर्गत कन्काई सिंचाइ प्रणालीको मूल नहर र हेड वर्क्सको जिम्मा विभागको हुने छ । सो भन्दा तलका शाखा/प्रशाखा नहरहरुको सम्पुर्ण जिम्मेवारी संस्थाको हुनेछ।

४.२ मुल नहर र हेड वर्क्सको मर्मत संभार र संचालनका लागि लाग्ने खर्च विभागले व्यहोर्ने छ। मुल नहर भन्दा तलका सिंचाइका संरचनाहरु शाखा/प्रशाखा नहर र अन्य संरचनाहरुको मर्मत संभार र संचालनका लागि लाग्ने खर्च संस्थाले व्यहोर्ने छ।

४.३ यो सम्झौता अन्तर्गतको सिंचित क्षेत्र ७००० हे. रहने छ। विष्तृत अध्ययन तथा सर्वेक्षण पश्चात यसको सिंचित क्षेत्रफल पुनः यकिन गरि निर्धारण गर्न सकिने छ।

५. सिंचाइ प्रणालीको हस्तान्तरण :

५.१ यस सिंचाइ व्यवस्थापन हस्तान्तरणका प्रकृयाहरु

क) सम्पत्तिको लगत (Assets Inventory) र सम्पती व्यवस्थापन योजना तयार गर्ने ।

ख) सिंचाइ संरचनाको अवस्थाको लेखा जोखा गर्ने ।

ग) मेसिन तथा उपकरणको लगत तयार गर्ने ।

हस्तान्तरण सम्झौता सम्पन्न भए पश्चात सिंचाइ प्रणाली (शाखा र प्रशाखा नहर) मा अति आवश्यक संरचना सुधार (ESI) तथा अन्य कार्य गरिने छ ।

५.२ बुदा नं. ५.१ बमोजिमको कार्य जनसहभागिता मुलक पद्धति अनुसार सहमतिका आधारमा संस्था र सिंचाइ विभागले कार्य संचालन गर्ने छन ।

६. संस्था संचालन कार्यविधि

६.१ संस्था कन्काई सिंचाइ प्रणाली जलउपभोक्ता संस्थाको विधानको अधिनमा रही एउटा स्वनियमित, स्वशासित, स्वचालित, स्वसहयोगी, स्वश्रोत संकलक तथा परिचालक र स्वनियन्त्रित संस्थाको रुपमा संचालन हुनेछ र विभागले संस्थालाई सहयात्रीका रुपमा अंगिकार गर्दै सिंचाइ व्यवस्थापन हस्तान्तरणका क्रियाकलापहरु संचालन गरिने छन् ।

६.२ सिंचित क्षेत्र भित्र जग्गा भएका उपभोक्ताहरु मध्ये जग्गा धनी, मोहीयानी लागेको जग्गाको हकमा मोही, करार बमोजिम जग्गा कमाउनेको हकमा जग्गा धनीले तोकेको प्रतिनिधि र सो वाहेक अन्य किसिमका जग्गाहरु खेति प्रयोजनका लागि उपभोग गरी रहेकाको हकमा सम्बन्धीत गा.वि.स. को सिफारिस सहितको यस्तो व्यक्ति संस्थाको साधारण सदस्य रहेन छन् । संस्थाको सदस्यको नामावली अनुसूचि १ बमोजिम हुनेछ र जग्गा धनीले जग्गा विक्री वितरण गरी आएमा साविकको जग्गा धनीको नाम स्वतः अनुसूचिबाट हट्ने छ र नयाँ जग्गा धनीको नाम रहनेछ ।

६.३ संस्थाको संचालन र सम्पुर्ण कार्यविधि बुदा नं. ६.१ अनुसारको विधानमा निर्धारण भएबमोजिम नै हुनेछ ।

६.४ संस्था आफ्नो क्षेत्र भित्र नहर प्रणालीको संचालन र व्यवस्थापन गर्न गराउन मुल समिति, शाखा समितिहरु र प्रशाखा समितिहरु संस्थाको विधान अनुसार पूर्ण रुपले अधिकार प्राप्त र जिम्मेवार संस्था रहने छ ।

६.५ संस्था पूर्ण रुपले संस्थाको साधारण सभा प्रति जवाफदेही हुने छ र यसले विभिन्न तहका समितिहरु मार्फत उनिहरु विच समन्वयात्मक तरिकाले काम गर्ने छ ।

६.६ संस्था आफ्नो क्षेत्र भित्रको जल उपभोक्ताहरुबाट सेवा शुल्क असुल गर्न पुर्ण जवाफदेही हुनेछ । असुल भएको सेवा शुल्कको रकम सिंचाइ नियमावली २०५६, अनुसूचि ३ अनुसार सम्पुर्ण रकमको १०% नेपाल सरकारको राजश्व कोषमा, ८०% संस्थाको कोषमा र १०% प्रचलित कानुन अनुसार हुने छ ।

६.७ संस्थाले प्रत्येक छ महिनामा आम्दानी खर्चको विवरण तयार पारी सम्बन्धित सिंचाइ कार्यालय मार्फत विभागमा पठाउनु पर्नेछ ।

६.८ संस्थाको आर्थिक कारोबारको लेखापरिक्षण आर्थिक बर्ष समाप्त भएको ६ महिना भित्र सम्पन्न गरि सो को प्रतिवेदन सिंचाई कार्यालयमा पठाइसक्नु पर्ने छ ।

७. लेखापरिक्षण र सार्वजनिक प्रकाशनः

२०.१ हस्तान्तरित संरचना धितो बन्धकमा राख्न वा बेचविखन, दानदातव्य, सट्टापट्टा वा सम्झौता वा अन्य कुनैपनि प्रकारले हक छाडी अन्य कसैलाई हस्तान्तरण गर्न पाइने छैन।

२०.२ संरचना नास्न, बिगार्न वा अदल बदल गर्न पाईने छैन । तर सम्बन्धित सिंचाइ कार्यालयको पूर्व स्वीकृतिमा आवश्यक मर्मत तथा सम्भार गर्ने प्रयोजनको लागि अदलबदल गर्न र पूनः प्रयोग गर्न नसकिने यन्त्र उपकरण लगायतका त्यसै राख्दा बिग्रन, नासिन सक्ने खालका अन्य बस्तु बेच विखन वा अन्य कुनै तरिकाले हस्तान्तरण गर्न सकिनेछ । सो कार्य गर्दा प्रचलित कानुन बमोजिम गर्नु पर्ने छ ।

२०.३ सिंचाइको पानीमा कमी आउने वा पानीको गुणस्तरमा ह्रास आउने कुनैपनि प्रकारको क्रियाकलाप गर्न पाइने छैन।

२०.४ अन्य कुनै व्यक्ति वा संस्थालाई संचालनको जिम्मा दिन पाइने छैन ।

२०.५ माथि उल्लेख गरिएका प्रतिवन्धात्मक सर्तहरु तथा संस्थाको विधान विपरित कार्य भएमा विभागले ज.उ.स.को कार्यकारिणी समितिलाई निलम्बन लगायत विघटन सम्मका कारवाहीहरु चलाउनका निम्ती संस्थाको साधारण सभा मार्फत पहल गर्नें छ । सो साधारण सभा पनि सो कारवाही चलाउन सक्रिय नभएमा विभागले सिंचाइ नियमावली २०५६ अनुसार कारवाही चलाउने छ ।

उपभोक्ता संस्थाका तर्फवाट

०६।६।२२

टंकनाथ ढुंगेल
अध्यक्ष

सिंचाइ विभागको तर्फवाट

०६।६।२२

मधुसुदन पौडेल
महानिर्देशक

साक्षीहरु :

१.नेपाल सरकार, सिंचाइ विभागको तर्फवाट				
क्र.सं	**नाम**	**पद**	**कार्यालय**	**हस्ताक्षर**
१.	श्री अनिलकुमार पोखरेल	उप महा निर्देशक	सिंचाइ विभाग	
२	श्री निरन्जनदेव पाण्डे	आयोजना निर्देशक	सिंचाइ तथा जलश्रोत व्यवस्थापन आयोजना	