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Efficiency of Water Users' Association of Lepcha Community in Construction of Irrigation Canal: Evidence from Rong Rural Municipality of Nepal

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Abstract: ***Lepcha tribe belongs to a minority and socially discriminated group in our society. The Government of Nepal as well as the local government has made various efforts to boost their socio-economic condition. However, despite the government's input, the Lepcha tribe hasn't fully been able to raise their economic status. Thus, this study is carried out to assess the efficiency of Water Users' Association of Lepcha Community in Construction of Irrigation Canal. The objectives of the study is to assess the socio-economic condition of the Lepchas and to analyse the factors influencing the efficiency of Water Users' Association of Lepcha community as a case study in Rong Rural Municipality of Ilam district, Nepal. This study is based on primary as well as secondary data obtained from field survey of 16 households in 2020. The Lepcha community of the particular study area are not economically stable however, they are hopeful that the canal they constructed will now raise their household income through agriculture. The efficiency of the WUA depended on a number of factors like their family income, their occupation, the technical assistance and support from Small Irrigation Programme and Rong Rural Municipality. It is recommended that the local government provide as many agricultural extension services to the communityto boost their crop productivity as just the construction of canal alone is not the only necessary tool for development of the study area.***

Keywords: Efficiency, Ilam, Lepcha Community, Water Users' Association, Rong

1. Introduction

Nepal is an agricultural country where most of the livelihood depends on agriculture. However, the topography, vegetation, rainfall pattern etc differs from place to place. The desired crops cannot be grown at times due to inconsistent pattern of rainfall. Inadequacy in rainfall, unevenness in the distribution of rainfall, growing of crops throughout the year etc are the factors hindering in agricultural development. Hence, in the context of Nepal, irrigation is very important for agriculture.

The difficult terrain and topography of Nepal is also a challenge in the sector of irrigation. In hilly regions, more water head is available but the command area is less and in Terai region (plain land), more command area is available but water head is less. Floods and landslides occurs in large number in Nepal which in turn causes damages to the existing irrigation structures.

The Lepchas, are the tribes of the Himalayas and are subjects of three countries - India, Nepal, and Bhutan. The Lepchas refer to themselves as "Rong", which means "the son of the snowy peak, the son of God" (Ghatak, 2005). Their language is an admixture of Nepali and Sikkims languages, which is very familiar with Indo-Chinese language. The Lepchas call their land "Nye Mayel Lyang" which according to their historical records was said to have spread over a large area of land starting from Arun, Tamor, and Koshi river(now in Nepal, in the west up to the Tagong La, Thong La, and Rudok river (now in Bhutan) in the East. In the north, the land included the Kanchanjunga, Gopmochi peaks and Chumbi valley (now in Tibet) and was extended up to Titiliya in the South in Bangladesh (Roy, 2005).

Lepchas are a part of a minority group which is socially excluded and discriminated. There have been multiple studies regarding the Lepcha tribe. I conducted this study after seeing their work ethic and quality of work despite belonging to a socially discriminated minority group. I have worked closely with them during my work in Small Irrigation Programme for the construction of "Jurekhola Hudai Lapchagaun Irrigation Project". I was the site supervisor and focal person for this project.

This paper tries to search the answer to the question of what the socio-economic conditions of the lepcha community is like. It also discusses the role of Lepchas in the construction of rehabilitation works of Jurekhola Hudai Lapchagaun Irrigation Project.

The general objective of this paper is to study the Efficiency of Water Users' Association of Lepcha Community in Construction of Irrigation Canal in Nepal. The specific objective of this paper is to study socio-economic as well as cultural condition of Lepcha Community and to assess WUA Efficiency in construction of their own public Irrigation Canal. The efficiency of this WUA was determined by socio-economic factors of that community such as gender, age, family income, ethnicity. So, the socio-economic factors and WUA's efficiency has been the major area of this research.

2. Literature Review

Definition of irrigation from www.dictionary.com defines irrigation as the artificial process of supplying controlled amounts of water to land to assist in growth and production of crops as per crop requirement in the absence, inadequacy or unevenness of rainfall. Small irrigation systems are defined as irrigation systems having less than 50 hectares of

irrigation area in the hills and mountains. Small irrigation systems are a must in the case of hilly regions of Nepal as the irrigation systems in hilly areas comprise of lesser command area and higher water head.

Efficiency can be defined, in a general sense, as a ratio to find the optimum level of work. Economic activities are generally represented by functions. Hence, efficiency rate can be defined as the ratio of the observed level to the optimum level in the functionally represented activities. When we take efficiency into the account as an economical aspect, we need to address efficiency components, its relationships between the other economical concepts, its measuring and the approach methods to these issues (Katuwal, 2021).

Abebe (2016) was conducted the case study of Arba Minch Zuria Woreda, Southern Ethiopia. The area lacks in-depth studies to identify the determinant factors that influence the use of irrigation water. In the study area it is also not well known to what extent the households using irrigation water were better than those who depend on rain-fed agriculture. Therefore, the study was focused on finding the determinants of small-scale irrigation practice and its contribution on household agricultural income. The total population in the selected three villages were classified into two types as irrigation user and non-user. The results show that sex of respondents'; household size engaged in the agricultural labor force and number of contact of respondents with agricultural development agents per month had significant positive effect on the use of irrigation water at 1% significance level. While education level and attendance on irrigation related training had significant positive effect on the use of irrigation water at 10% significance level. On the other hand, farm distance from the river and the main irrigation canal had significant negative effect on the use of irrigation water at 1% significance level. Out of the total Irrigation user household have harvested perennial crops more than two times and grown annual crops two times per year from the same farm. While out of the total irrigation non-users' household depended on only rain fed agriculture and have grown annual crops only one time per year from the same farm. Consequently, the independent sample test result showed that the irrigation user household obtained significantly larger mean annual gross agricultural income than irrigation non-user household at 1% significance level.

Frija, et al. (2008), on his article analyzes the efficiency of Water Users Associations (WUA) in the Cap Bon region (Tunisia) and studies its main determinants. The analysis is performed in two stages. First, the efficiency is measured via the nonparametric "Data Envelopment Analysis" (DEA) technique. The DEA models are constructed not only to assess the overall WUA efficiency but also to evaluate the management and engineering sub-vectors efficiencies separately through a mathematical modification in the initial DEA model. In a second stage critical determinants of efficiency are determined using a Tobit model. In this analysis the focus is on technical (characteristics of the irrigation area and network), organizational and administrative variables. Results show that average scale efficiency implies that many WUAs are not operating at an efficient scale. Subvectors efficiencies show that WUAs present better performances in maintenance activities than in management. The inefficiency found can furthermore be mainly attributed to the number of years of experience in operating a WUA. The scale inefficiencies are mainly due to administrative and organizational variables.

3. Method and Materials

This study was based on descriptive as well as analytical research design. Similarly, this study tried to explore the motivational factors on construction. Basic agriculture and socio-economic data of the project area have been collected through household survey, focus group discussions and interviews with key informants. Both primary and secondary data were used in this research.

The primary data was collected by interacting with different individuals from the selected respondents of lepcha community who were water users of the irrigation canal. The secondary data for this study were reviewing relevant documents available on internet, provided by various agencies, like Bureau of statistics. The qualitative data was analyzed qualitatively or descriptively and quantitative data was analyzed by using Statistical tools.

Data collection: The total population of Lepchas in Nepal (Ilam District, Panchthar District and Taplejung District) is 3, 445 (2011 census) and the total population of Lepchas in project site of Jurekhola hudai Lapchagaun IP is 56 residing in 16 number of beneficiary household.

A total of seven member of user group were interviewed. The interviews were semi-structured that addressed the challenges and opportunities of construction. A focused group discussion (FDG) was also conducted for data collection in which 7 executive members (chairperson, secretary, treasurer and members) from user group were involved. For analyzing key characteristics of socio-economic factors and their efficiencies in construction simple descriptive statistics was used.

The core of the research took place in the Lapchagaun, Rong-2 of Ilam district and included a collection of interviews with WUA members in this area as well as interviews with local authorities.

Introduction to the Study Area: Rong (Lepcha name) is a rural municipality out of six rural municipalities located in Ilam District of Province No. 1 of Nepal. There are a total of 10 municipalities in Ilam in which 4 are urban and 6 are rural. According to Ministry of Federal Affairs and Local Development Rong has an area of 155.06 square kilometres (59.87 sq mi) and the total population of thew municipality is 19135 as of Census of Nepal 2011.The surrounding places around this municipality are India in the east, northern and western part lies the Suryodaya Municipality southern part with Jhapa District. This rural municipality is formed by the merging of Shantipur, Kolbung, Erautar, and Jirmale. Jirmale, Erautar, Kolbung and Shantipur which previously were all separate Village development committee merged to form this new local level body. Fulfilling the requirement of the new Constitution of Nepal 2015, Ministry of Federal Affairs and Local Development replaced all old VDCs and

Municipalities into 753 new local level body (Municipality).The rural municipality is divided into total 6 wards and the headquarter of this newly formed rural municipality is situated in Kolbung (RRM, 2020).

4. Results and Discussions

In this section, the historical background of the Lepcha tribe is discussed and also gender, family income, ethnicity, cultural values are discussed as socio-economic condition of the study area site. Similarly, the WUAs' Performance Efficiency in Irrigation canal construction and its influencing factors is also discussed. Their future expectations of irrigation facility is also analyzed here.

4.1 Historical Background of Lepcha Tribe in Nepal

Meaning of the word Lepcha' The Lepcha' is the name given to the tribe by the Nepalese. In a Parbatiya dialect of Nepal 'Lep' means 'speech' and 'cha' means 'unintelligible' i. e. the 'Unintelligible' speaker. It is referred to as 'Lep-Cha' *br* 'Lepche' for not adopting the Parbatia language. It calls itself 'Rangpa` which means ravine dweller. Rong also means peak or mountain, (Tulsiram Sharma, 1970). Opinions differ about the original homeland of the Lepchas.' According to some historians, they are said to be of Tibeto-Burmese and Chinese origin. We are told that they came from Kailash parbat in Tibet.

Religion: The primitive Lepchas followed 'Bon' religion. They were worshippers of trees and other natural objects and ancestoral spirits. The concept of Bon - Thing or medicine man, believed to be the son of gods, is the most remarkable point in this primitive religion'. They expressed the idea of god by the word 'Rum'. They had the word 'Mung' to express demon, harmful to men. They believed in animal sacrifices like most of the tribals to propitiate the gods. Later, they came in touch with Buddhism, the religion which was made the state religion by the Namgyals. The religion practised by them now-a-days is a synthesis of Buddhism and Bonism(Nirash 1982). Some of their important religious beliefs like the idea of exorcising the sick with the help of the Thekyong-Tek and Nyekong-Tek priests who like Jhankaris and Ojhas of the Nepalese and Naga society, respectively, are foreign to Buddhism. The Lepchas of Sikkim do not go on pilgrimage like other Bhutias (Buddhists). The most sacred place for them is 'Phur-tsa-chu' i. e. hot water spring in west.

Family and Marriage: Rongpas or Lepchas have no joint family system. The women have equal rights with men. Female progeny is favoured. The women are respected and allowed to take part in community functions. The higher education is favoured among the willing. Marriage ceremony is simple and still as in their remote past based on the idea of dignity of labour, rather than the romantic alliances. A bridegroom in order to prove his worth has to render hard labour in the cardamom field at least for a year and before getting married is expected to live with the girl's parents. The bride price is claimed by the parents. The Lepchas who practiced polygamy in the remote past are gradually taking to monogamy. The number of wives a man maintained previously varied according to the number of fields; he was expected to take care of. This was not looked down upon by the society. This tradition is also preserved by the Lepchas of the inaccessible difficult area of the region called the 'Dzongu'.

Houses and Food habit of the Lepchas: A Lepcha house is known as "KAA DEN-MO-LEE". In literal translation 'KAA' means we 'DEN' where we spend our childhood learning the basics, 'MO' centre or main and 'LEE' means home.The Lepchas are still as in the remote past fond of roots, pork, toads, fish and corn. They are fond of rice also. They prefer pork fat to any other oil. Both men and women drink 'CHI', an intoxicant prepared from millet.

Lepcha Language & Scripts: The Lepcha language is very ancient, the language is highly developed and comprehensive that it can express anything and everything and for all purposes. According to Tamsang (2007), "…the Lepcha language is most copious; abounding in synonyms, antonyms, and homonyms and it possesses words to express every slightest meaning. It admits of a flow and power of speech which is most wonderful and which renders it capable of giving expression to the highest degree of eloquence…all the inconceivable diversity of trees…. variety of plants and flowers with which the forests are filled, the Lepchas can tell the names of all, and this nomenclature extends to beasts, to birds, to insects and to everything around them, animate and inanimate." The script existed much before the advent of Tibetans in the thirteenth century (Tamsang; 2007; Dahal; 1984).

Socio-Economic Structure: Originally, the Lepchas were hunters. They gradually started domesticating animals. Agriculture was also one of their main occupations. In the remote past they were the self-sufficient people, who were economically well off. They lived in closely knit community of their own.Their society is based on the system of equality.

We can say that Lepcha is a tribe of Himalayan range live at the North-East corner of Nepal. They reside at Ilam, Panchthar and Taplejung in Nepal. They are dispersed Nepal, Bhutan and India. Their language is an admixture of Nepalese and Sikkim's languages, which is very familiar with Indo-Chinese language.

4.2 Socio Economic Status of Lepcha Community in the study Area

The population density of Rong rural municipality is 120 individuals per square kilometers. Rong Rural municipality is one of the six rural municipalities located in the Ilam District. This beautiful rural municipality is well connected to the road networks and is easy to access. In the project site, all of the 16 households were from the Lepcha tribe and had a total population of 56 (Table 3).

Table 1: Ethnicity of the Study area

Ethnicity	Household number
Minorities	16
Dalit	0
Janajati	0

B/C/T & N	0
Total	**16**

Source: Field Survey, 2020.

Disadvantaged group (DAG) can be defined as the socially excluded or discriminated ones due to caste, ethnicity, gender, religion, location, and also economically poor. For SDC Nepal, people characterized as Disadvantaged are the groups of poor households (having income less than US $2 a day or food sufficiency less than 6 months), who at the same time, suffer from caste, gender or ethnic discrimination. The definition of DAG can be further simplified from the Venn diagram (Figure 1).

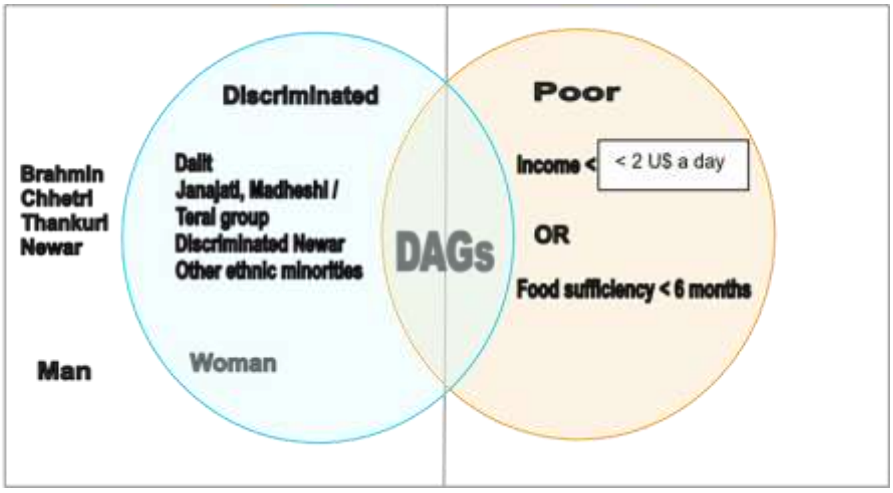

Figure 1: Venn diagram showing DAGs
Source: SIP Nepal, 2019.

In the figure 1, the Brahmin, Chhetri, Thankuri, and Newar community (social classification) and men(gender-wise classification) are not a part of discriminated group while the Dalit, Janajati, Madheshi, Terai group, Discriminated Newar, Other ethnic minorities like Lepcha, Chepang etc fall under the discriminated group. The DAG and non-DAG household numbers is given in Table 4 where number of DAG household is 9 and that of non-DAG household is 7. The DAG population is 43 and non- DAG population is 13 (Table 4).

Table 2: Distribution of Socio-econom ic Strata by DAG and Non DAG

Socio-economic Strata	Household number	Population
DAG	9	43
Non DAG	7	13
Total	16	56

Source: Field Survey, 2020.

If the command area to be irrigated is less than 0.5 ha, then the command area can be defined as small landholding. In the project, 6 households had small landholding while 10 households had medium landholding.

Table 3: Distribution of Land holding size

Landholding	Household Number	Percentage of Household
Small	6	37.5
Medium /Large	10	62.5
Total	16	100%

Source: Field Survey, 2020.

According to Table 3, the households that have the food sufficiency (from the command area) less than or equal to 6 months are 9 in number while the households having food sufficiency (from the command area) greater than 6 months are 7 in number (Table 4).

Table 4: Food Sufficiency distribution by month

Food Sufficiency	Household number
Less than or equal to 6 months	9
Greater than 6 months	7
Total	16

Source: SIP Nepal, 2019.

There is no caste system among the Lepchas. Their society is based on the system of equality. The only distinction that is noticed is made, keeping in view the region they inhabit and the religion they profess.According to Mr. Tindu Lapcha, chairperson of the Jurekhola Hudai Lapchagaun WUA, there are three types of group of Lepchas residing in their village of Lapchagaun, called "Lingdangmu Lapcha", "Sangdiyangmu Lapcha" and "Nembangmu Lapcha". Out of the household numbers, 50% of the households are Lingdangmu Lepchas, 31.25% are Nembangmu Lepchas and 18.75% are Sangdiyangmu Lepchas.

Table 5: Types of Lepchas of Lapchagaun, 2020.

Type of Lepchas residing in Lapchagaun	Household number	Percent (%)
Lingdamu Lapcha	8	50
Nembangmu Lapcha	5	31.25
Sangdiyangmu Lapcha	3	18.75
Total Households	16	100

Resource person: Mr. Tindu Lapcha, WUA Chairperson, 2020.

All of them follow the Buddhist religion. He also stated that they consider Mt. Kanchenjunga as their god. The Mt. Kanchenjunga is located in Taplejung district, Province 1 of Nepal which is the third highest mountain in the world. They worship Mt. Kanchenjunga during special occasions and ceremonies such as marriages, ancestral prayer rituals etc.

It is found that out of all the 16 households that benefit from the canal construction, 100 percent of users belong to the

Lepcha community, 37.5 percent users are small farmers i.e. their landholding in the given command area is less than 0.5 hectare. 56.25 percent of the household fall under Disadvantaged group (DAGs).

Agriculture in Lepcha Village: The present cropping intensity of the study area is 191.67 percent, which is mostly rain fed and partially irrigated. Unreliable supply of irrigation water and the lower input of the fertilizer has resulted in the very low production (yield) of the crop. The cropping pattern before the construction of canal showed that only partial irrigation was taking place in the site which is shown in Table 5. It shows the crops produced during monsoon, winter, spring seasons and crop produced perennially. Monsoon paddy occupied 3.6 ha of command area during monsoon, wheat occupied 3 ha, mustard oilseed occupied 0.3 ha, potato occupied 0.3 ha, winter vegetable occupied 0.1 ha during winter, maize occupied 3.9 ha during spring, and cardamom occupied 0.3 ha as a perennial crop. All of these crops were partially irrigated due to lack of proper irrigation systems, and inconsistent patterns of rainfall. Table 6 also shows the crop production or yield in metric tonne per unit hectare before the construction of canal.

Table 6: Cropping intensity and crop production before canal construction

Crops	Partially Irrigated (hectare)	Yield per hectare (metric tonne)
A. Monsoon		
i. Paddy Monsoon	3.60	2.40
B. Winter		
i. Wheat	3.00	1.60
ii. Oilseed (Mustard)	0.30	0.80
iii. Potato	0.30	4.80
iv. Winter Vegetables	0.10	5.50
C. Spring		
i. Maize Spring	3.90	1.20
D. Perennial		
i. Cardamom	0.30	0.40
Total Area	11.5	

Source: SIP Nepal, 2019.

4.3. Influencing Factors of WUAs efficiency on Irrigation Canal Construction

Jurekhola Hudai Lapchagaun Irrigation Project: Jurekhola Hudai Lapchagaun Irrigation Project (IP) is located in the Rong Rural Municipality, Ward Number 1, Lapchagaun of Ilam district, Province 1, Nepal. The longitude, Latitude and elevation of the command area is 88.0389^{o}, 26.852^{0} and 876m respectively. It is a project implemented by Rong Rural Municipality with the support of Small Irrigation Programme Phase I (SIP-I). The Small Irrigation Programme is a programme implemented by Government of Nepal in collaboration with Swiss Agency for Development and Cooperation. The overall expected impact of the programme is to increase agriculture income of the rural poor. The expected outcome is for the participating farmers to increase agricultural production to its full potential. Nepal's growth in Agriculture sector is low due to centralistic planning, limited year-round irrigation, lack of agricultural services and limited access to markets. So the program also intends to strengthen the institutional capabilities of the local government as well as the WUA.

The Jurekhola Hudai Lapchagaun IP is a rehabilitation of existing run-of-the-river gravity surface water irrigation scheme. It is a small irrigation scheme which means thast the command area to be irrigated by the canal is less than 50 ha. The total beneficiary household of this irrigation project is 16 out of which Disadvantaged Group household was found to be 9. All of the 16 households belong to the Lepcha Community. The total gross command area for the project was 8.09 Hectare (ha) and net command area was 6 ha. The length of the main canal was 913.16 metres with 4 number of branch canals whose total length is 584.73 metres. The total cost of the project was NRs 1, 385, 046.40 (Table 7).

Table 7: Cost sharing by Entity on canal construction

S No.	Entity	Percentage of Share	Contribution Amount(NRs)
1	Water Users	10	138, 504.64
2	Rong Rural Municipality	20	277, 009.28
3	Federal Government of Nepal	30	415, 513.92
4	Swiss Agency for Development and Cooperation	40	554, 018.56
Total		100	1, 385, 046.40

Source: SIP Nepal, 2019.

A Water Users' Association (WUA) was formed named Jurekhola Hudai Lapchagaun Water Users' Association that was responsible for the construction and maintenance of the project.

Photo 1 Initial soling on canal by Lepcha Water users

Jurekhola hudai Lapchagaun Water User Association (WUA): Jurekhola Hudai Lapchagau Irrigation Project is managed and operated by the farmers of the Jurekhola hudai Lapchagaun WUA. The Jurekhola hudai Lapchagaun WUA, Rong ward number 2, Ilam was established on June 2019 and is registered in the Rong Rural Municipality. The WUA is primarily formed to regulate and lead the construction work of the irrigation project. The WUA build, operate and maintain small irrigation systems. The WUA comprises of 9 members as given in table 8.

Table 8: Name List of Water Users' Association's Members

WUA Member Name	Gender	Ethnicity	Position
Tindu Lapcha	Male	Lepcha (Minorities)	Chairperson
Sher Bahadur Lapcha	Male	Lepcha (Minorities)	Secretary
Dhan Maya Lapcha	Female	Lepcha (Minorities)	Treasurer
Menuka Lapcha	Female	Lepcha (Minorities)	Member
Dasi Maya Lapcha	Female	Lepcha (Minorities)	Member
Mangal Maya Lapcha	Female	Lepcha (Minorities)	Member
Ganga Bahadur Lapcha	Male	Lepcha (Minorities)	Member

Source: RRM, 2020.

The members comprise of 44.4% of women, 100% of Lepchas, and it has representation of landholders from the head, middle and tail section of the command area. All the members are farmers involved in agriculture in their own lands.

The Lepcha comprised WUA, despite being a part of a socially excluded minority group, worked very efficiently in completing the irrigation project whose total cost was NRs 1,385,046.40. Their initial achievement was institutionalizing their water users group into a whole lawful association registered in the municipality office.

Photo 2 FInal work of SIngle Sided RCC Lining in the canal

They received a training regarding Quality Control and Institutional development organized by the Rong Rural Municipality along with the SIP technical team which I, myself was a part of. From the knowledge they gained from that training and also the back and forth conversations between me and the Lepcha Community, they were able to complete the construction work in 2 months. They were very hardworking and the quality of work is incredible even though it was a first time that, the Lepcha community led WUA, was the leading entity behind the management, construction, and co-ordination for the regulation and completion of the project.

The WUA exhibited immense leadership skills as they managed and regulated the skilled and unskilled labors, plumbers, helpers of their own community for construction. During the implementation of the project, the worldwide pandemic of COVID-19 caused lots of difficulties and delays, but the community never lost hope and their attitude towards the project was positive. They took necessary precautions against the corona virus and worked even in such harsh conditions of the pandemic. They bought and made arrangements for storage of materials like cement, sand, aggregate, pipes, rods, etc. The Lepcha community also contributed to 10% of the total project cost through kind. They worked in collecting, transporting and porterage of sand, aggregate and stones from the collection point to their project site as a part of kind contribution.

Table 9: The infrastructures made by the water users in the Irrigation project

Physical Facilities in the Irrigation Canal	
Intake	1 No
Foot Bridge	2 No
Outlet	4 No
Division Box	3 No
Single Side Lined RCC Canal	223 m
Double Side Lined RCC Canal	47 m
Canal Reshaping	539 m
Covered Canal (RCC)	35 m
Pipe Canal (HDPE Pipe)	45 m
Gabion Wall	20 m
Dry Stone Wall	10 m
Pipe Connection Chamber (RCC)	2 No
Village Road Bridge (RCC)	1 No

Source: SIP 2020

The WUA conducted a lot of works during the process. They built intake, gabion walls, single sided RCC lining, double sided RCC lining, foot bridges, outlets, division boxes, canal reshaping, covered canals, pipe canal, dry stone walls, pipe connection chambers, village road bridge (Table 9) .

As a registered WUA, they not only regulated the construction of the irrigation project but they were also equally involved to bring agricultural programs in their community through their WUA. The WUA coordinated and bought 200 kgs of potato seeds that the Rong Municipality was giving under 50 percent subsidy program. All the farmers of this project were benefitted from this subsidised program.

The irrigation project itself was a boom for the Lepchas of Lapchagaun as it provided them with employment opportunities. The project model was such that the farmers themselves had to work in making their own canal under the leadership of the WUA and the assistance from Rong Rural Municipality along with the SIP team. It was a win-win situation for the community as the irrigation canal of their community was being made and at the same time they were getting paid to construct their own canal.

Role of technical support and Local Government's Support on their performance: The technical team of SIP and the Rong rural municipality both played an important role in making this project a success. Site supervision, monitoring, visits were done on a regular basis. Trainings were organized by the municipality along SIP team for quality control and institutional development. Focus group discussions were held with the technical team and

appropriate measures were proposed for the site. The Rong rural municipality also did the final payment on time and assisted the WUA for its project implementation as well as provided agricultural services.

Observation

I worked as a Senior Technical Officer in SIP and this irrigation project was under my monitoring and supervision. I have been to the project site multiple times and have stayed in their household.

From what I have observed, I can say that the Lepcha community was extremely polite, kind and humble. They take their responsibilities seriously. They were very curious and responsive regarding the project and they wanted to make sure that the work that they do is subpar. Their dedication, hard work and mainly their humility is what made them stand out from other project scheme. They are incredibly courteous and well behaved. They make sure that any person coming to their home feels welcomed and taken care of.

During my discussion with the WUA members and focus group, they expressed how grateful they were for the irrigation project. A well rehabilitated irrigation canal meant that their agricultural production would rise and so would their economic condition. They discussed how ready they were to improve their agricultural practices now that water availability was year round. In short term positive impact of project, working in the irrigation projects as labors, the farmers earned some money for themselves but they pointed out how in the long run, they can increase their earnings by new and improved agricultural practices due to the availability of the irrigation canal.

The study found that they were able to complete the construction work in 2 months despite the adverse effects of COVID-19. They were very hardworking and the quality of work is incredible even though it was a first time that, the Lepcha community led WUA, was the leading entity behind the management, construction, and co-ordination for the regulation and completion of the project.

The study found that the efficiency of the WUA depended on a lot of factors. The WUA members comprised of active people from the working-age group (15-64 years in age). The Lepcha WUA members are very honest, and well-behaved in nature hence, this nature of theirs helped them to improve their performance. The female members of the WUA were also equally curious and participated in all project tasks. They were always involved during construction and training works. The trainings also contributed towards more participation from women which empowered them. The project was also very transparent in nature as the WUA organized public hearing, public review and public audit of the project. This step towards transparency made the community even more trusting towards the WUA. The transparency of the project from WUA was also one of the important factors that increased the community's participation. The technical support and assistance provided by the Rong Rural Municipality and SIP was also a determining factor to increase the efficiency of the Lepcha-led WUA.

5. Conclusions

Lepcha is a tribe of Himalayan range living at the North-East corner of Nepal. They largely resides at Ilam, Panchthar and Taplejung in Nepal. Despite being a socially excluded group, the Lepcha tribe showcased a hardworking and diligent attitude and the WUA led by the community strengthened their institutional capabilities by being a part of this project. They are capable to take lead in further more projects in the future. Even though the economic condition of this tribe residing in Lapchagaun was below average, they are now hopeful with agriculture as their main occupation because of the rehabilitated canal. While working in this project, they learnt and gained a lot of knowledge regarding RCC works and now they can be a part of other projects and work as a skilled labor.

The efficiency of the WUA depended on a number of factors like their own capabilities, their acceptance towards the project, transparency of the project, the technical assistance and support from SIP and Rong Rural Municipality, WUA members, women participation. It is recommended that the farmers of the Jurekhola hudai Lapchagaun IP receive as many agricultural extension services from the Rong rural municipality. It is also recommended that a crop-cut survey be organized in the project site's command area to find the increment in crop productivity and comparison should be done to the crop productivity before the construction of the irrigation canal.

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