



BEST PRACTICES

Strengthening Community Resilience in Mahottari and Dhanusha





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FOREWORD

The Sendai Framework for Disaster Risk Reduction 2015-2030 provides a focus on Risk-Sensitive Development of communities. This is about mitigating disaster impacts and reducing underlying drivers of risk, building back better after a disaster, and strengthening community and environmental resilience. We are focusing our efforts on accompanying communities during their own journey towards resilience. We seek to work holistically at reducing vulnerability and exposure, working closely with communities to enhance their resilience through a wide range of initiatives that reduce disaster risk and increase community skills, assets and incomes and supporting local action that stabilize the ecosystem. Caritas Nepal started Disaster Risk Reduction programme in Ratu River of Mahottari and Dhanusha districts and introduced different actions e.g. structural, non-structural mitigation measures, strengthen capacity and risk awareness, resilient livelihood, community based early warning system, earthquake safer construction practice and pro-mote conscious and sustainable management of natural resources to contribute to reducing people's vulnerability and strengthening the resilience of communities. The project has been funded by Caritas Germany and implemented by Community Development & Advocacy Forum Nepal, Mahottari.



We are pleased to release the Enclosed Best practice: Strengthening Community Resilience. This best practice review, identify and discusses the principle and practice of Disaster Risk Reduction, drawing on experience from our DRR Program in Ratu River. The descriptions and discussions are supported by case studies, which aim to give a sense of the range and diversity of the practical approaches that can be replicated and developed elsewhere. This publication serves as a tool for stakeholders -whether planners, advisors, extension agents, or development consultants from different sectors to include good DRR practices in the planning, design and implementation of similar development project.

On behalf of Caritas Nepal, I would like to thank the independent researcher/consultant Mr. Santosh Rasaily, the donor Caritas Germany, local and district level Government of Nepal, stakeholders; Caritas Nepal Disaster Management Department, the local partner Community Development & Advocacy Forum and nevertheless the communities themselves, who have helped to make this achievement possible.

Fr. Kirshna Bahadur Bogati
Executive Director
Caritas Nepal

FOREWORD

Community Development & Advocacy Forum Nepal (CDAFN), Bardibas, Mahottari was established on 2006 A.D. For the last 10 year, CDAFN had been working in the thematic area of Chure watershed conservation, climate change adaptation, mitigation, disaster risk reduction, earthquakes awareness, livelihood enhancement and community capacity strengthening in its command area (Mahottari, Dhanusha, Siraha and Sindhuli) in close coordination with Government of Nepal, INGOs, NGOs, Civil Society, local stakeholders (Municipalities and Rural Municipalities) along with active public participation.



To minimize the effect of climate change, the organization has its regular effort in soil conservation, forest conservation, flood and landslide control and promotion of the greenery. The organization activities are especially focused on the Ratu watershed area (Mahottari and Dhanusha). In addition to this, the effort of the organization is successful in protecting the 35,000 hectares of agricultural land from desertification. Under the vision of making river bank to a fruit orchard, the organization has a massive plantation of fruit saplings in 650 hectares of reclaimed land. All these activities are focused to eliminate the poverty and develop resilience capacity of the people of project sites.

Since 2009, there is a strong and continuous partnership between Caritas Germany/Caritas Nepal and CDAFN. These organization had been funding in activities like rainwater harvesting pond, underground irrigation canal, drinking water source conservation, torrent and gullies treatment, bioengineering and livelihood enhancement activities through different projects like 'Building Resilience of Vulnerable Communities in Ratu Watershed through Strengthening Disaster Preparedness', 'Climate Change Adaptation Measures in Mahottari & Dhanusha' & 'Strengthening Community Resilience in Mahottari and Dhanusha' with remarkable outcomes. In accordance, this book "Best Practices" consist of technologies, schemes and approaches which were successful for providing tangible benefits to the targeted groups. This book also consists of success stories and case stories of beneficiaries and villages being benefited from the Caritas Germany and Caritas Nepal's project activities. The presented technologies and approaches are the innovations of CDAFN. The main objective of the book is to wide spread project's experience and learning so that the proven technologies and approaches can be replicate in a wider area.

We extend our sincere gratitude to Nepal Government, Caritas Germany, Caritas Nepal, LIBIRD and CFUG for the financial support. In addition to this, we would like to thanks drinking water and sanitation committee, underground irrigation canal user groups, ponds conservation user groups, community and civil society. We express our special appreciation to all the project staff and executive committee of this organization who had devoted their hard work for the success of the project.

Thanks for the help and coordination.

Nagdev Yadav
President
Community Development & Advocacy Forum Nepal

FEW WORDS

This book entitled 'Best Practices' consists of best-proven technologies, schemes and approaches (along with their method, results, impacts and learnings) implemented under the project activities. This book also consists of the stories of beneficiaries depicting the change in their livelihood by the project activities. This book is a wonderful experience for me to gather the knowledge of climate change and its effect along with the mitigation and adaptation technologies. It was a pleasing experience to see approaches of disaster risk reduction with activities like water harvest ponds, raising of seepage canal for drinking an irrigation purpose, bioengineering and river bank farming etc. I found very delighted beneficiaries and seems to have a tangible change in their livelihood from the project activities. Beneficiaries have ownership feelings in all the infrastructures. I found intimate coordination between all the stakeholders during project implementation. Through this, I realize that the conservation activities and its sustainability depend upon the coordination among the stakeholders.

I would like to thanks project staffs who helped in my field visit for information gathering. I would like to acknowledge Caritas Germany and Caritas Nepal for the opportunity to craft their effort by my words. In the same way, my sincere gratitude goes around with local implementing partner CDAFN and its executive committee members. I would also express sincere thanks to all the characters of these books who provide information in a friendly environment. Hope the good practice and learning will be mainstreamed by stakeholder and will be replicated in the wider area. Thanks to all helping hands.



Santosh Rasaily, Author

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ABBREVIATIONS

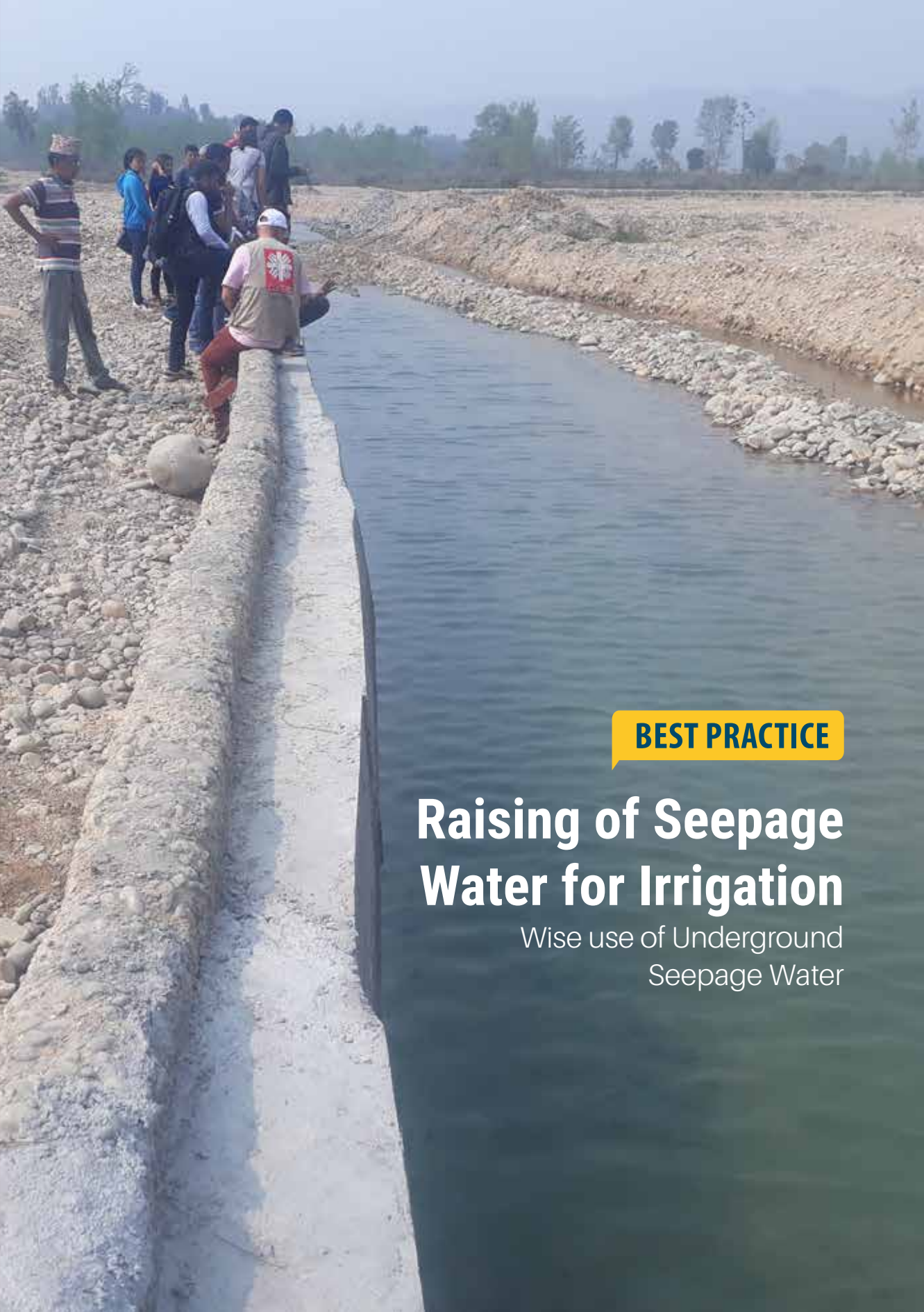
CARE	Cooperative for Assistance and Relief Everywhere
CDAFN	Community Development & Advocacy Forum Nepal
CFUG	Community Forest Users Group
DAP	Diammonium phosphate
DSCO	District Soil Conservation Office
DPAC	District Project Advisory Committee
EQ	Earth Quake
FYM	Farm Yard Manure
Ha	Hectare
HHs	Households
ICIMOD	International Centre for Integrated Mountain Development
IPM	Integrated Pest Management
LIBIRD	Local Initiatives for Biodiversity, Research and Development
LIP	livelihood Improvement Plan
MOP	Muriate of potash
MPAC	Municipality Project Advisory Committee
RCC	Reinforced Cement Concrete
RVT	Reservoir Tank
SCR	Strengthening Community Resilience
TU	Tribhuwan University
UNDP	United Nations Development Programme
WWF	World Wide Fund

A woman with dark hair, wearing a vibrant red sari with gold borders, is shown from the waist up. She is holding a large, shallow metal bowl filled with fresh green leafy vegetables. She is standing in a lush green field, and the background is slightly blurred, showing more vegetation. The lighting is natural, suggesting an outdoor setting during the day.

Project at a Glance

Strengthening Community Resilience in Mahottari and Dhanusha

'Strengthening Community Resilience in Mahottari and Dhanusha (SCR)' is a project of Caritas Nepal and Caritas Germany with implementing partner 'Community Development & Advocacy forum Nepal (CDAFN)', Bardibas, Mahottari. SCR project was designed with the objective of strengthening resilience of vulnerable community along the catchment area of the Ratu river through mitigation and adaptation approaches towards the effects of climate change. The project was conceptualized with the thematic area of disaster risk reduction, earthquake awareness, agroforestry and enhancing livelihood. It consists of the major activities like drinking water scheme, underground irrigation canal, bioengineering, construction of earthquake resilient building, river bank farming, fruit plantation, agriculture and goat farming. It was implemented in Dhanusha district (Mithilla Municipality) and Mahottari district (Bardibas and Bhangaha Municipalities). The project has made access of water for drinking and irrigation for 2,231s vulnerable HHs. 830 HHs are engaged in fruit plantation in private degraded & river reclaimed land. With the vision of converting river bank into fruit orchard, 15,740 numbers of fruit saplings were planted in 205.5 hectares of degraded land. The bio-engineering activities were conducted in 68 gullies and torrents (sub tributaries of Ratu River) among 103 depending upon priorities. In 68 gullies and torrents, 42 are stable whereas other are controlled to some extent. By this activities, 673 hectares of agriculture lands in project sites are protected by landslides, floods and siltation. 432 HHs are engaged in saving and credit activities and income generation activities. In conclusion, project was successful in strengthening resilience of beneficiaries through reducing disaster and involving them in the income generation activities.



BEST PRACTICE

Raising of Seepage Water for Irrigation

Wise use of Underground
Seepage Water



Raising of Seepage Water for Irrigation

Introduction

Nepal is an agricultural country with 80% of its population dependent on agriculture. But Nepal has inadequate progressive development on agriculture due to lack of proper irrigation system for farming. Still, 60% of agriculture land is under rain-fed farming. Among the available irrigation facilities, most of the farmers depend on indigenous canals. For an indigenous canal, water bodies (river, small torrent, and stream) are considered as a source for water. Most of the indigenous canals are linked with non-perennial water sources. In such cases, there is sufficient water in the rainy season, but during the dry season, there is no water for farming. As a result, people have to take only one harvest and leave the land fallow during the dry season. The Chure range of Nepal consists of such types of non-perennial water bodies. The indigenous canal which has non-perennial water bodies as the source has its own demerits. During the rainy season, it needs fodder and forages to divert the flow of the water current to the indigenous field canal which creates dependency of people towards the forest. In addition, there is loss of water in the canal through percolation and

seepage. There are also chances of entry of the flood through the indigenous field canal. In the dry season, such indigenous canals are non-functional (in case of non-perennial water sources) due to lack of water.

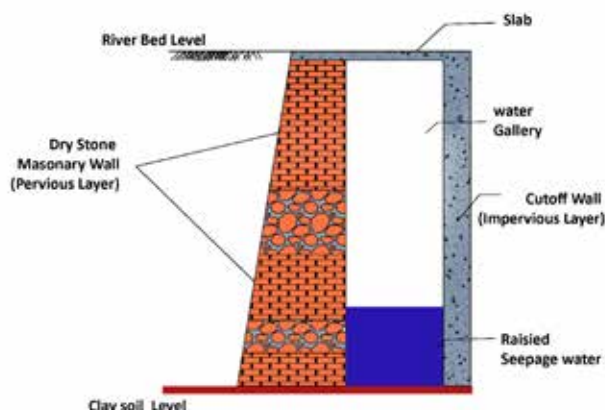
For the remedy to all this problem, the concept of underground seepage canal was innovated at Ratu River (non-perennial river) in Rajabas village by the CDAFN, Bardibas. Initially, this concept was piloted in Rajabas and after the success, it was replicated in other villages (Lota, Dudhpani, Kalapani, Chure, Patu, Bisambar and Bahunmara).

This underground seepage canal has become a boon to the people of Chure who generally depend on the non-perennial water bodies and rain for irrigation. Such types of canal collect the seepage water in a water gallery and divert it towards the field canal. Although there is no water in the water bodies the seepage water gets collected in the underground water gallery which is enough for the irrigation during the dry period.

Methodology

The soil profile of the river bed is distinct which makes the possibility of an underground canal. The soil profile consists of sand, silt, grit and gravels which is pervious to water. From 7 to 8 feet below the bed level, there is another layer of clay soil which is impervious to water. The water gets seepage through the bed level up to this clay level. The availability of clay soil below 7 to 8 feet depth from the river bed level is the main key foundation for the construction of the underground canal.

This underground canal is like a water gallery, made under the river bed at the level of clay soil. This canal consists of two parallel walls constructed at the clay soil level perpendicular to the ground. The first wall is called a drystone machinery wall which is pervious to the water whereas another wall is cut of the wall which is impervious to water. Between these two walls, the parallel gallery is formed with the width of 75cm. The water can easily pass through the machinery wall but cannot pass through the cut of the wall. The main function of the machinery wall is to pass the seepage water from the catchment into the water gallery. Thus,



Cross section of underground canal

the pass seepage water cannot further seepage out through the cut off wall. As a result, the seepage water gets collected and is raised up. From the top, at the river bed level, the underground canal is cover by fixed and some portable slabs. The underground canal is connected to the field canal where the raised water from the underground canal is channelized to the field canal. In this wasy, the seepage water is collected in the underground canal and is further channelized to the field canal for the irrigation purpose.



Key Users

After successful piloting of the underground canal in Rajabas, this technology has been scaled out in different villages of the Chure range (Mahottari and Dhanusha) in the corridor of the Ratu River. 1615 households from 9 villages are being benefited by such type of canal. These 9 canals are successful for irrigating 784 hectares of land throughout the year.

S.N.	Name of Underground Canal	HHs	Total area being irrigated (Ha)
1	Kalapani Canal	125	72
2	Rajabas School Canal	86	55
3	Bahunmara Canal	123	76
4	Patu canal	250	233
5	Chure Irrigation Canal	8	55
6	Sigyahi Irrigation Canal	800	130
7	Parsai Irrigaion Improvement	40	13
8	Bisambar Irrigation Canal	95	88
9	Lota Irrigation Canal	88	62
Total		1615	784

Key Results

This canal has made availability of water throughout the year for irrigation. Farmers who were compelled of having only one crop (rice) are now growing three crops (rice-wheat- rice) in a year. This has increased the crop index by Thrice. Similarly, the area of crop cultivation has also been increased contributing to food security. People used to migrate during the dry season for earnings. But now migration has been controlled and people are engaged in agriculture during the dry season as well. The activities of agriculture are increasing which has hiked the job opportunity as agriculture labour. People do not have to use fodder and forage to divert the flow of water in the field which has reduced the deforestation and drudgery of people. The underground water is also used for other household activities like bathing and washing clothes and dishes.

Impact

This innovation has a miraculous impact on the agriculture sector. This increase in the crop index, cropping area, and productivity has significantly contributed to food security. Peoples' livelihood condition has been improved through good harvest from agriculture. People have a way of mitigation to the drought condition. This innovation has also reduced human interference with the forest of Chure resulting in environment and biodiversity conservation.

Lesson Learnt

People knew that although there no water in the river bed during dry season, there is seepage water at a certain depth. This seepage water can be raised by the construction of the underground canal. During flood, sand and gravels get aggregated in the underground canal. So, some of the slabs should be portable so that it can be removed and debris can be cleaned. The main core of this innovation is the amount of seepage water. To make this innovation effective, plantation along with the bioengineering and rainwater harvest mechanism should be implemented in the upper stream which results in holding of rainwater in larger catchment area providing the regular seepage water in the canal. This innovation needs to be mainstreamed and applied in the non-perennial river of Nepal.

STORIES OF CHANGE



"I do not like to remember my past. It was very hard for us as farmers. In the name of irrigation facilities, we had an only old earthen indigenous canal. Out of 0.96 acre, I used to cultivate only 0.4 acre of land due to lack of water for irrigation whereas, in drought condition, we used to leave the whole field barren. There used to be a dispute among the villagers for the issue of irrigation. Almost all the field in village used to remain barren during the dry season. Production was insufficient for our family of 9 members. I had to go for labour activities for income. But after the construction of the canal, we all villagers have sufficient water through the year. This canal has enhanced the relation among villagers as they manage the water in a well-coordinated way. I have started cultivating in my 0.96 acre in every season. After water availability, I had started poultry and goat farming in small scale which has supported my income."

- Nar Maya Bhujel, Bahunmara, Mithila-11, Dhanusha

"It was impossible for us to irrigate field in the dry season also a nightmare for irrigating field in the rainy season. In the rainy season, forage and fodder were used to divert the flow of the Ratu River towards the field canal. Villagers especially, women had to go forest for the collection of the forage and fodder. Flood used to sweep away all the forage and fodder and we have to collect forage and fodder again. The repeated action of forage and fodder collection had created human interference in the jungle which had increased the chances of wild animal's encounters. After the construction of this miraculous underground canal, we do not need forage and fodder to divert the flow towards our field canal. The more surprising part is that even in drought season there is a sufficient amount of seepage water being collected for the irrigating crops. Previously, the flood had entered from the indigenous canal but the underground canal is flood-smart too. Though I had 1.5 ha of land, I was like landless as there was not enough water for irrigation, but now I take three season crops in a year."

- Shyam Bahadur Ale, Rajbash, Bardibash-03, Mahottari



"Where there is source there is a way. After construction of the underground canal, we had sufficient amount of water for different income generational activities. In initial days, we had to wait our turn for irrigating our land. If there was no rain, there used to be insufficient water for irrigation resulting in poor yield. I used to have only 1,100 kg of paddy in 0.75 ha of the land but now I harvest about 3,000 kg. Water had led life to prosperity. Even I started growing wheat in the dry season which was not practised previously. I had started to grow diverse kinds of vegetables like pea, chilli, onion, garlic, cauliflower and many more vegetables. Now the harvest is more than enough for my family. I sell different vegetables in Chure Market. Annually I save about NRs. 20,000 which will help in my children's education in the future."

- Komal Babu Thapa, Chure, Mithila-11, Dhanusha



"I had not heard about the underground canal. When I heard about it, I could not believe it. But when I saw one of the canals in Rajabas, then I realized the mechanism. I was more than happy to have one of them in our village. We actively participated in the construction of the underground canal. In previous days, we used to pay levy to another village for the water. After the construction of the underground canal, we get rid of such types of levy. I cultivate rice, wheat, maize, mustard, potato in my 0.8 acre of land whereas in previous time I was confined to rain-fed rice cultivation only. The canal has provided us with the opportunity for growing two seasons rice which was impossible in previous days. In addition to cereal, I am also growing different vegetable in high advance technology under green net and plastic mulching. I am selling surplus cereal and vegetable and save about NRs. 30,000 in a year."

- Sukra Bahadur Thokar, Lota, Mithila-11, Dhanusha

Stepwise Photo of Sep Under Ground Canal Rajabas, Mahottari



Stepwise Photo of Lota Under Ground Canal Lota, Dhanusha



A young girl with dark hair, wearing a green long-sleeved shirt, is drinking water from a public tap. She is holding her hands under the running water. The background is a blurred natural setting with trees and foliage. The tap is white with a yellow filter attached to the spout. The water is clear and flowing. The girl is looking directly at the camera with a slight smile.

BEST PRACTICE

Raising of Seepage Water for Drinking Purpose

Wise Use of Seepage Water
Adaptation to Drought



Raising of Seepage Water for Drinking Purpose

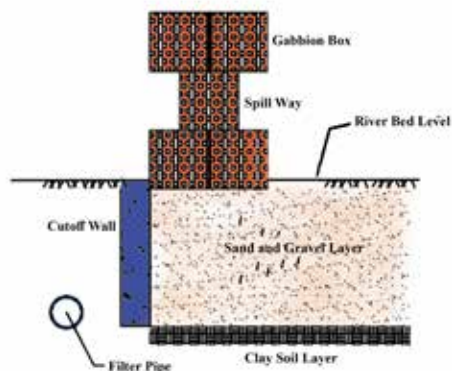
Introduction

It is needless to say that water is the most precious liquid in the world. We cannot imagine life without water. Nepal is the 2nd richest country in freshwater resources in the world. It is sardonic to say that scarcity of drinking water is one of the biggest problems in Nepal. Deforestation, unplanned settlement, lack of protection of water resources and adverse climatic condition are the reasons for the scarcity of drinking water. In Nepal, many people are affected by water-borne and water-related diseases due to the use of unsafe water. Lack of safe drinking water is a hindrance for the all-round development of people.

In Nepal, the Chure range is considered as the storage for the rain-water which plays pivotal role for the groundwater in Terai region. Among the water bodies, Ratu river is one of the major water bodies in Mahottari and Dhanusha districts. Heavy deforestation, excavation of gravels and soil, increase in unmanaged settlements and effect of climate change has negative impacts on these water bodies. In the

Chure area of Mahottari and Dhanusha, people have problem of drinking water in both rainy and dry seasons. During the rainy season, people are obliged to use unsafe water due to flood by which people were highly vulnerable to water-borne disease. During the dry season, shrinkage of water sources has created a critical condition to fetch the water for drinking water especially for the female group. Even children have to quit school in the search of water. With regard to this problem, raising of seepage water has been a unique and innovative way which has assured the availability of pure drinking throughout the year. Although there is no water in the water bodies, sufficient amount of fresh water is collected in the intake through filter pipe. This concept works for the collection of pure drinking water during flood as well. This concept was initially piloted in Bohore torrent in Bhaunmara village of Dhanusha district which resulted in the successful supply of adequate water in all seasons. Later on, it was disseminated in Chure, Dudhpani, Rajabas and Bhapsi of Mahottari and Dhanusha districts.

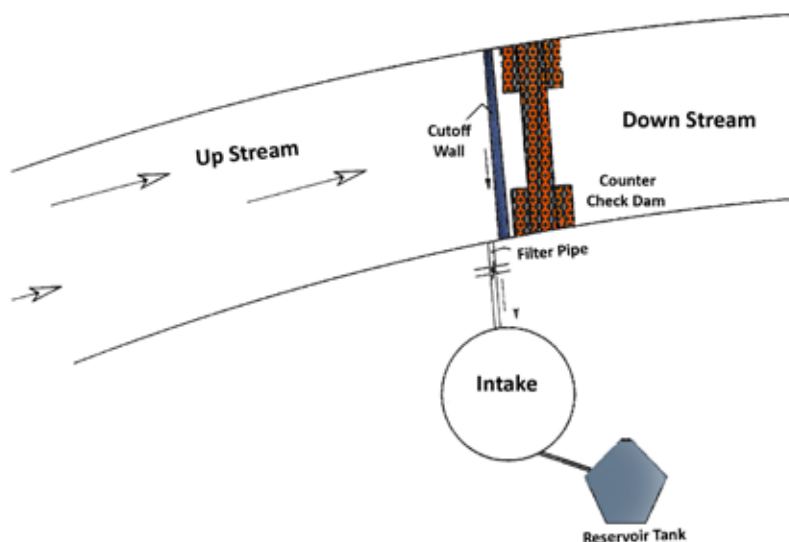
Methodology



Cross section of collection seepage water

The working mechanism of raising of seepage water for drinking is similar to that of the underground canal. In the underground canal, the collected seepage water is channelized to the field canal whereas in this case, the collected seepage water is passed through the filter pipe than to intake and finally to the Reservoir Tank

(RVT). For this mechanism, it also needs water bodies with a soil profile having clay soil at 7 to 8 feet below the riverbed. At this depth, a cut off wall is constructed across the river perpendicular to the flow of water. As this cut of the wall has to bear a heavy load of flowing water, a counter dam is constructed just after the cut off wall. For the flow of the excess water during the flood periods, spillway is constructed above the counter dam. The cutoff wall breaks the flow of seepage water which gets collected in beneath. The seepage water thus is raised around the cut off wall. The raised water passes through the filter pipe which helps to filter the collected seepage water. Filtered water is then passed in the intake which works as a temporary collection of the filtered water. The water is then passed to the RVT through the gravity flow which is shown in schematic diagram given below. Thus, water from the RVT is distributed in the village through the distribution pipes. RVT and intake consist of the wash way pipe which helps in cleaning of the tank which is necessary in every six months.



Schematic diagram of collection of seepage water

Key Users

Initially, this raising of seepage water for drinking purposes was first piloted in Bhorae torrent for making availability of water in Bahunmara village, Dhanusha. This innovation was successful in collecting 50,000 liters of drinking water per day. This method was felt to be scaled out in the project area having similar problems. Now, there are 6 such drinking water scheme reserving one lakh fifty-five thousand litres benefiting 616 HHs.

S.N.	Name of Drinking Water Schemne	Storage of Water Volume (Ltr)	HHs
1	Bahunmara Drinking Water Scheme	50000	118
2	Rajbash Drinking Water Scheme	25000	217
3	Bhapsi Drinking Water Scheme	25000	86
4	Chure drinking Water Scheme	25000	85
5	Dudhpani Drinking Water Scheme	25000	79
6.	Patu Drinking Water Scheme	5000	31
Total		155000	616

Key Results

1,55,000 litres of waters get collected daily in different reservoir tanks. There is easy access to drinking water in 616 households of 6 different villages. The problem of scarcity of drinking water has been eradicated with this scheme. In the rainy season, despite flood in water bodies, this mechanism helps to collect the seepage water which is safe for drinking. This water even helps to minimize the risk of water borne disease. After easy access to drinking water, female has enough time to engage in social activities, group meetings, household activities, take care

of children and guide them in their studies. They are also utilizing the water and spare time in income-generating activities like vegetable farming, poultry and animal husbandry.

Impact

Water leads to prosperity which has been shown by the Bahunmara village. After being water sufficient village, one house one tap approaches were implemented by Mithila municipality. In addition to this, every house of Bahunmara is declared as environmentally friend house. Similarly, in other project sites, where this scheme is implemented, the local government is planning for one house one tap approach. This scheme has created great impact on the development of resilience to the drought. It has reduced the incidence of water-borne disease. It has saved sufficient time for a female to strengthen themselves in economics and social aspect. The availability of water has also created good sanitation habit in people and children.

Lesson Learnt

Raising of the seepage water has been one of the innovative ideas to make easy access to drinking water in the region of the Chure range. The water collected through this technology is pure for drinking. For the effectiveness of this technology, the amount of seepage water should be increased by increasing the water holding capacity in the catchment area. This can be done by plantation and bioengineering approaches. Climate change has direct effect on water sources resulting in shrinkage of the water. Conservation of water resources through plantation is utmost important to save water for the future.

STORIES OF CHANGE



"The life was very much tedious before the construction of community water tank. Initially, we used to walk 30 minutes from house to collect water from the stream. Collecting water 6 to 7 times a day was really painful. I had to invest about half of my days in bringing water from the stream. Due to lack of time and scarce water, there was a problem in personal hygiene of my family. Due to lack of time, the involvement of the income generation activities was never thought. After the construction of a community water tank, life is in ease. I have sufficient time to care for my children. I have started cow farming and vegetable farming. Even I am working in the ward office. The water tank has spared a lot of time which is being utilized in personal development and strengthening capacity."

- Yagya Kumari Kunwar, Chure, Mithila-11, Dhanusha

"The life of villagers in Bahunmara was wearisome without the facility of water. Before the sunrise, fetching of water early in the darkness was really scary. There was a risk of snake and scorpion bite. Shrinkage of water sources had made more difficulties in availability for water. In the rainy season, the flood had added problem by polluting the water sources. There was an incident of the death of one of my neighbours by cholera. The incident was a nightmare for all the villagers. Involvement of the women in income generation activities was not even imagined. But after the formation of the reservoir tank, we have water for 24 hours. Every house in this village has a tap. Every house in this village is considered as an environment-friendly house. Nowadays, most of the women are engaged in income generation activities. I am even involved in vegetable farming and poultry farming. The availability of water has changed the lifestyle of women in Bhanumara."

- Sudha Karki, Bahunmara, Mithila-11, Dhanusha





"For the collection of water, we used to dig in Ratu River and collect water. After an hour, the pit used to get dried out and we could see ant moving in the pit. Then we had to dig another pit. We had to repeat these activities every day. Later on, we villagers started bringing water from Parsai village. We had a frequent dispute regarding the water issue with Parsai villagers. After the formation of intake in our own village (Panni Urri stream), we are now water independent. We have sufficient water for drinking, cattle rearing and vegetable farming. Scarcity of water in the past has made me realized the value of water, so I reuse the grey water by collecting in a plastic pond. Vegetable farming has been easy for us due to the availability of water. I generally send vegetable to my relatives staying in the city area."

- Sita Budhathoki, Rajabas, Bardibas-03, Mahottari

"You can see happiness around the village but past the past scenario was different. In our village (Bhapsi), there was only one well as a source of drinking water. We had to stay in line waiting hours for a bucket of water. We had a tank in a village but it got functionless after shrinkage of the water sources. Children were assigned for water collection and sometimes even they missed the school. After the activities of water source protection by the Caritas/CDAFN, the tank came into the function. Now there is sufficient amount of drinking water. There is a tremendous time for us to participate in a group meeting and other different income generating activities."

- Ganga Magar (Left), Bhapsi, Bardibas-01, Mahottari



Stepwise Photo of Drinking Water Scheme of Bahunmara, Mithila-11, Dhanusha



Scale Out of The Scheme of Drinking Water And Source Protection in Project Area



Intake Preparation, Dudhpani, Dhanusha



RVT, Dudhpani, Dhanusha



Water Source Conservation, Chure, Dhanusha



RVT, Chure, Dhanusha



Water Source Conservation, Bhapsi Mahottari



Renovation of Water Tank, Bhapsi, Mahottari



Water Source Conservation, Pani Urri Mahottari



RVT, Patu, Mahottari

A photograph of a rainwater harvest pond. The pond is a calm, greenish-brown body of water in the middle ground. In the foreground, there is a grassy bank with some rocks. Behind the pond, there is a dense line of green trees and bushes. A single, tall, thin tree stands out on the right side of the tree line. In the far background, a small building with a solar panel array on its roof is visible. The sky is blue with scattered white clouds.

BEST PRACTICE

Rain Water Harvest Pond

Harvesting Water to Use in Need



Rain Water Harvesting Pond

Introduction

Climate change is a burning issue and its effects have not spared any element related to livelihood. The effect of climate change has a major impact on rainfall pattern. Nepal, whose economy is based on rain-fed agriculture, has a challenging situation due to such erratic rainfall. In Nepal, there is 80 % rainfall in the rainy season with 3.5% in winter, 12.5% in pre-monsoon and 4.0 % in post monsoon. This kind of erratic rainfall has not only affected the agriculture sector but also has created vulnerability of water-related disasters like flood, landslide and severe drought. The Chure range of Nepal is most vulnerable to such type of erratic rainfall. Most of the people from the Chure range have upland for agriculture which is totally based on rainfall with no other alternative of irrigation. In upland, people grow millet and maize which production is totally based on ample amount of rainfall. The erratic

rainfall has affected on the production of these crops. The Chure range consists of numerous micro watersheds like torrents, stream and gullies which have been major challenges in the present context. Too much rain during the rainy season causes flash flood along with landslides, agriculture land cutting and sedimentation of the debris in lower stream. The deposition of such debris causes raise of river bed which increase the risk of flood. Similarly, in the dry season, such micro watershed lacks water which increase the risk of forest fire and decrease options of livelihood.

A torrent called "Jarayo" had also created a similar problem in Rajabas Village. To adapt with these challenges, the project had converted Jarayo torrent to rainwater harvesting pond. Now, there is adequate amount of harvested rainwater which is a major source of irrigation in the upland area of Rajabas.

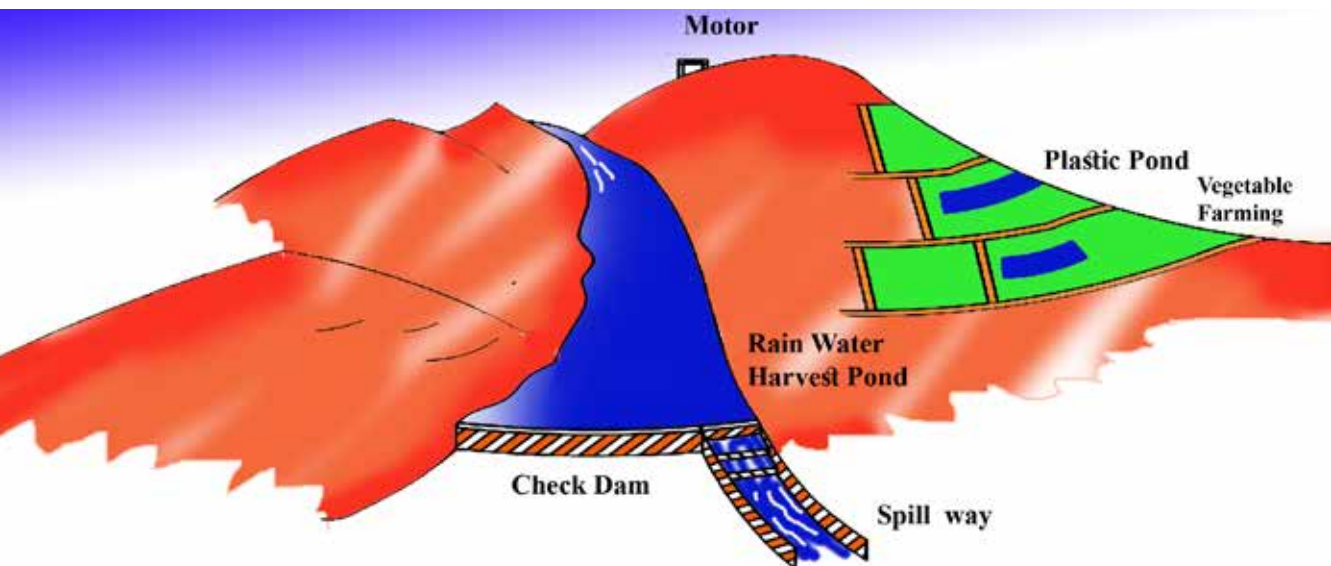
Methodology



Catchment of the pond

The runoff harvesting pond was constructed between the upland (farm land) and community forest in Jarayo torrent, Rajabas. The elevation of Jarayo torrent (Subtributary of Ratu river) is 480 meter from sea level which is located at the outer of Jarayo torrent (Tributary of Ratu river). The catchment area of the jarayo torrent is 2.7 ha which include forest area.

For the consturcition of pond, Jarayo torrent was dug out by creating a huge ditch with a depth of 9 meters, length of 57 meters and with an area of 5.2 acres. Then to hold the water, dam was constructed with a height of 3.8 m, width of 7.6 m and length of 45.8 m. It has capacity to hold about 4 million liters of water. During heavy rain, there was a huge amount of water (more than the capacity) accumulated in the pond creating pressure in the dam. The spillway was constructed at an end of the pond with a dimension of 31.3 m length, 5 m width and 3 m height. Thus, the heavy rain was collected in the ponds which can be used during the dry season. The water from the pond is being lifted and distributed to other water-holding structures (Plastic ponds and tanks) in farmland. The water from the ponds and tanks is being used for irrigation in the field through the sprinkle and drip irrigation system.



Schematic diagram of the Rain Water harvest

Key Users

The pond was targeted for the people of Rajabas, especially of Mathilo Tole. There are about 125 HHs who are using the water of ponds for irrigation in 60 hectares. Due to the massive use of water from pond, harvested water became limited for irrigation. "Pani Urra-stream" was identified as another perennial source of water for the Pond. Water from Pani Urra is being brought and dropped in the pond through a pipe with gravitation flow. Now people of Rajabas have enough water to initiate water-based earning. Pond along with the irrigation channelization has become a center for the learning for the national and international organizations working in disaster risk reduction, watershed management, and agriculture.

Key Result

The flood of Jarayo has been eliminated along with control of landslide, agriculture land cutting and sedimentation in downstream. The problem of chronic drought has been solved as there is available for 4 million liters of water in the pond. The risk of forest fire and crop failure has been reduced with adequate water. In addition, there is a regular flow of water from the Pani Urra in the pond to facilitate intensive irrigation. Vegetable farming has not been imagined but it came true by the construction of the pond. People have started cultivating high-value crops, especially vegetables. In the initial condition, people used to buy vegetables, but now they are growing, consuming and even selling the surplus vegetables. This pond has even been a center for quenching thirst of different animals and birds.

Key Impacts

Such kinds of ponds are multi-purpose with numerous benefits. This Jarayo water harvesting pond has created great impact both in environment along with livelihoods. The problem of too much water and too less water has been addressed by this concept. Flood, landslide and the problem of drought have been controlled with an increase in resilience to water-related risks. Along with risk reduction, such pond has provided different livelihood options such as duck, fish and vegetable farming. This type of pond controls the creation of new rills and gullies formation. This pond has created great relief for the downstream village "Marka" who used to face the problem of annual flash flood and debris deposition. Such pond helps in holding of rainwater and recharges the groundwater table. Due to this visible impact, local government has scaled out this concept in nearby villages.

Learning

Series of rain water harvesting ponds are the indispensable need in the Chure range which helped to manage the watershed. These type of ponds help to hold the rainwater and prevent the formation of new rills and gullies. Such ponds help in the control of landslide and cuttings and also reduce the risk of the flood. It also reduces the risk of chronic drought. Such kind of ponds have both economic and environmental benefits. Such ponds even play a pivotal role in the recharge of the groundwater. By learning from this pond, 25 youth from Kalapani have constructed a series of ponds (4 in number) and are having monetary benefits through fish farming.

STORIES OF CHANGE



"I have 0.4 acre of land in this dry upland. In initial days, there used to be no water source for the irrigation. We used to cultivate only finger millet and maize. If there was rainfall, we had sufficient amount of harvest, if there was no rain, we had no enough food. My husband is a carpenter. From his income, I was hardly able to run my family. After the construction of the rain water harvesting pond, we have a sufficient amount of water to irrigate our lands. After availability, we are growing different kinds of vegetables. This pond has created a splendid situation of vegetable farming. Now, I am selling surplus vegetables of around NRs. 8,000 which I am saving for my future purpose."

- Hira Maya Rana, Rajabas, Bardibas-03, Mahottari

"Vegetable cultivation was just a matter of imagination for us. Lack of irrigation facilities and extreme drought was a hindrance for the vegetable cultivation. We were limited in finger millet and maize cultivation. After construction of the rain water harvesting pond, the imagination of the vegetable farming came into reality. For the precise use of the harvested water, there is the availability of sprinkle and drip irrigation. From the sprinkle irrigation, I am cultivating cauliflower, chilly, cabbage, brinjal, cucumber, onion and many more depending upon the season. On average I save about NRs.15,000 in a year by selling surplus vegetables. The pond is like an oasis in this dry hill. Thanks to Caritas/CDAFN."

- Baburam Karki, Rajbash, Bardibas-03, Mahottari



"Being farmer, it was very hard for me to see a barren field of 0.4 acre. There were no alternatives for farming. We used to broadcast finger millet on the mercy of rain. If there was sufficient rain, we had a good harvest otherwise we had to go for labor activities to city area for income generation. After the construction of rainwater harvest ponds, I bought a water motor to pump water up to my field. With a lot of hope, I started cultivating cabbage and cauliflower. I had a good harvest which I sold in the city area and earned about NRs.5,000. This income boosted me for vegetable farming. Now I am growing cabbage, tomato, chili, cauliflower, beans, cowpea and different types of cucurbits depending upon the season. After the availability of water, we are learning different technology of vegetable farming like tunnel farming, IPM, drip irrigation, FYM preparation. I am planning for the off-season vegetable farming. Annually, I sell vegetable of about NRs. 20,000. This pond has become a way of earning for me."

- Man Bahadur Bhattari, Rajbash, Bardibas-03, Mahottari



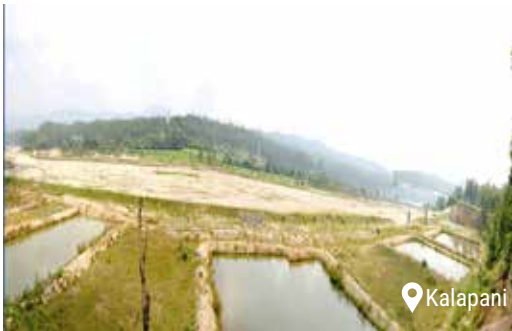
"In the dry season, there was scarcity of water in the village. Forest and village were at a high risk of fire. In the rainy season, there used to be flood in the Jharayo torrent. The construction of a pond in the torrent was a noble idea for us. In previous days, merchants used to barter vegetable with maize in ratio of 1:3. But now we have our own vegetables. Our village used to be a vegetable deficient village but now it is the vegetable surplus village."

- Ramu Koirala, Rajabas, Bardibas-03, Mahottari

Stepwise Picture of Jharayo Water Harvesting Pond



Scaled Out Water Harvesting Pond by Stakeholders



A photograph of a dense, green forest. In the foreground, there is a low, rustic stone wall made of irregular, light-colored stones. The wall appears to be part of a larger structure, possibly a dam or a retaining wall, and is surrounded by thick vegetation. The background is filled with tall, slender trees and a thick canopy of green leaves, with some sunlight filtering through. The overall scene is a natural, wooded area.

BEST PRACTICE

Bioengineering: A Smart Way for Watershed Management

Cost effective for the control of
Flood and landslide



Bioengineering: A Smart Way for Watershed Management

Introduction

Ratu watershed is one of the major watersheds in the Mahottari and Dhanusha districts. It originates from Pathiparan, Mahottari district, and ends in the southern Indian border with a length of 67 km. This watershed is a major source of livelihood for the people living in its catchment area. There are altogether 103 torrents as sub tributaries of the Ratu river which determine the water volume and span of the Ratu river. The effect of climate change along with deforestation has aggravated the life conditions of the people living in the catchment area of the Ratu river. In absence of forest, the rain water directly falls on the barren hills creating rills which in the long-run converts to gullies. These gullies are later on converted into torrents. Previously, the flash flood had created side cutting of the agricultural land widening the span of the torrent the flood swept gravels and sedimented the debris in the middle and downstream raising the river bed which increased the risk of the flood. In addition to this, the flood in major torrents and the Ratu river even had swept many houses, disturbed drinking water sources and agricultural canals.

On the other side, during dry season, there used to be no water in the torrents with no other option for livelihood.

Considering the problem, concept of bio-engineering was incorporated in the project activities by Caritas/CDAFN in the affected area. Bio-engineering is use of small-scale engineering structures along with the vegetation to produce a technical solution to protect the environment and to improve the controlling measure for the environment hazards like landslide, flash flood, land cuttings and sedimentation of debris.

Methodology

Bio-engineering is combination of the engineering models and biological tools. The engineering structures helps in harvesting run-off water, slowing down water current, controlling soil erosion, land cutting and sedimentation whereas biological vegetation instantly provide strength to the engineering structures. In long-term, this vegetation has similar function to that of the engineering structures. Bio-engineering consists of the following approaches:

1) Control of open grazing: This is prime step in the bio-engineering approaches. The stall feeding of cattle help in the control of over grazing and promote the natural growing grasses. This type of naturally growing grasses help to hold the soil profile, prevent the flow of soil and gravel and slow down the velocity of the rain water.

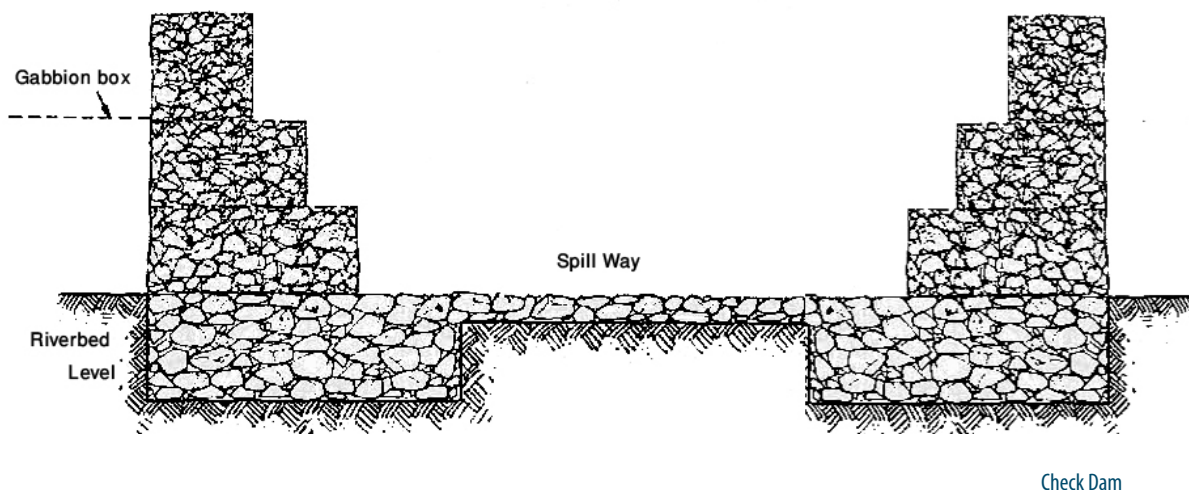
2) Engineering Structures: Generally, there are three major structures named check dam, spur and runoff water harvest structures. Check dams are made across the torrents which help to settle the debris and prevent land cutting. It consists of gabion box and spill way. The gabion box prevents the flow of debris and side cutting whereas spill way helps to check the flow of the debris and allow the flow of excess water. The spurs are made in the side of the river and torrents which helps to slow down the current and give a proper direction to the water current

and prevent the side eroding. Runoff water harvest structures are generally elevated RCC structures across the torrent which helps to block the flow of the water, slow the velocity of the water current and deposit the debris.

3) Vegetation: Vegetation has the most important role in bio-engineering. Bamboo, Napier, Boom grass, Vetiver, Stylo, Imperata and Saccharum are the major vegetation used in the bio-engineering. The vegetation gives strength and durability to the engineering structures. They also prevent direct contact of the rain water and soil and control the velocity of runoff water.

Key Result

Out of 103 torrents, the approaches of bio-engineering were successfully implemented in 67 torrents. Among the 67 torrents, 42 of the major torrents (e.g. Panikholsi, Bagkholsi, Perwinge, Padehri, Bahune, Mahadev, Patu, Rakase, Mati, Mijar, Gangate, School, Bishambar,



Gargare, Khahare, Sukhe Jhora, Arne, Jarayo Jhora, Darwane torrents) are well settled. Kalapani, Lota, Parshaidhap, Dudhpani, Bisambhar villages are free of disaster like landslide and floods. With the activities of bio-engineering, 673 hectares of agriculture lands is protected. 3670 households are safe against the major torrents in the upper stream of the Ratu rivers. There is availability of forage and fodder which enhance goat farming.

Impact

The bio-engineering activities in 67 torrents has controlled the event and frequencies of landslides and land cuttings. The disturbance of the canal and drinking water sources has been controlled by the bio-engineering activities. The spur, check dam and water harvest structures along with vegetation help to control the amount of debris being deposited in the lower stream which ultimately control in raising of the riverbed. The controlled in the raising of the riverbed ultimately reduce the risk of flood. The bio-engineering activities on 67 torrents has also enhanced the water holding capacity in upper stream which has ultimately reduced the risk of flood in the Ratu river and enhance the water recharged system. The Ratu river which used to have 1900 meter of span in Rajabas has now reduce to 200 meter after the approaches of bioengineer.

Lesson Learnt

For the bio-engineering activities, control of the open grazing is indispensable need. Without the public participation we cannot imagine the control of any torrent. Local people should be included in the prioritization, need identification, planning and implementation process which helps to develop feelings of ownership. The materials for the formation of the gabion box should be of highly quality so that it remains durable for long period of time. The construction of the engineering structures (Spur, check dam) should be technically sound so that structures will not be dislocate by the water currents. Use of the local materials (like stone and gravels) in construction of the gabion box make it sustainable and cost effective. Vegetation (Bamboo, Broom Grass, Napier, Vetiver and Stylo) should be extensively used for the control of torrent or river. To manage a watershed, conservation activities should be concentrated in upper stream. It needs 7 to 8 years of continuous conservation and bioengineering activities to manage a watershed like Ratu river.



STORIES OF CHANGE



"Panikholsi is one of the major sub tributaries of the Ratu river situated in Bardibas Municipality. It used to be one of the major destructive torrents in Bardibas-1, Mahottari. Initially, the flash flood torrent used to cut the land and deposit debris in the habitation area. It had affected directly 1,734 households whereas 3,050 households were indirectly affected. It used to obstruct the Mahendra highway through the debris deposition. Due to the flood and debris deposition, the settlement was about to shift to a new area. After the implementation of the bioengineering approaches in the Panikholsi, there is a drastic change in the vicinity. Caritas/ CDAFN has constructed 4 different check dams, 4 rain water harvest dam and planted about 4,500 saplings of bamboo, 1,500 saplings of broom grass. In addition to this, with the objective of income generation, mango sapling plantation was supported in 5 hectares of reclaimed land. Now the problem of flood and land cutting with debris deposition has been controlled. The span of Panikholsi has been changed from 180 m to 10 m. The affected area is full of bamboo and broom grass. Now the flood-prone vicinity has changed into a beautiful place to reside."

- Chudamadi Pokherel, Ward Chairperson,
Bardibas-01, Mahottari

"In our village, there is Mahadev, Manki, Gyawa, and Lamidada Torrents. Among these torrents, Mahadev torrent used to be one of the major torrents with the problem of destructive flood. I still remember the destructive flood in 1998 A.D. In that year, due to the nightmare of the flood, 20 households were forced to migrate to a safer place. The flood in Mahadev torrent had swept away about 15 hectares of agricultural lands. The flood had also aggravated drinking water source, forest area and canal sources. In my case, 0.25 acre of my land was cut and 0.4 acre was being deposited with the flood's debris. The moment was painful for me. We were excited with a hope as we heard about the project of Caritas/ CDAFN related to bioengineering. The project constructed 23 check dams of 6 meter in Mahadev torrent with 100 meters of the side wall. We supported the project activities with cash and kind contribution. We were supported with sapling of bamboos, Napier, and broom grass. With the activities of bioengineering, the torrent is well settled now. The Mahadev torrent which had a span of 80 meters has now converted into 8 meters. Among the 15 hectares, 6 hectares has been reclaimed which is now suitable for agriculture activities. Now, the threat of flood and landslide is story of the past. By this approach, Dudhpani village is now resilient to flood and landslide. Thanks to Caritas/CDAFN."

- Bhoj Bahadur Baruwal, Dudhpani, Mithila-11, Dhanusha



"The Lota torrent of length 4 km used to be a destructive torrent during the rainy seasons. The torrent had affected about 84 HHs and 30 hectares of lands. We still remember the flood on 1998 A.D which had swept away 2 houses. The flood even swept 4 hectares of agricultural lands. 22 acres of my agriculture land was swept away by the same torrent. I had to take a loan and work on daily wages to get out of these sufferings. After the implementation of the project, at the very first we were made aware about the conservation of the forest. The project started awareness campaign on open grazing free zone. We supported this campaign and started stall feeding for cattle. The project had supported in construction of 23 check dams and plantation of 200 bamboo sprouts, 3,500 broom grass. The torrent which used to be of 55 meters is now reduced to 10 meters and is now one of the settled torrents. We even had heavy rain on 2016 A.D but there was no flood on this torrent. Through the activities of the project, we learnt that deforestation leads to disaster whereas conservation of forest and bioengineering approaches help in a multidisciplinary way to reduce the natural disaster."

- Sunbir Magar, Mithila-11, Dhanusha



"Bag torrent is one of the major torrents in Patu Village. It starts from Patu village and get mix in Panikholsi torrent. The flood of 1993 and 2003 A.D had affected 67 hectares of agricultural land. 173 households around this torrent were highly vulnerable to the flood. The Caritas/ CDAFN had constructed 36 check dams with the plantation of 700 bamboo sapling, 8000 broom grass and 3,000 fruits (Mango and Litchi). After these approaches, the span of the torrent has reduced from 35 meters to 10 meters. There is now enough forage, fodder and firewood. The availability of forage and fodder has enhanced goat farming in the village. Thanks to the Caritas/ CDAFN."

- Devi Prasad Ghimire, Patu, Brdibas-3, Mahottari

Before and After Pictures



Runoff water harvest pond, Perwinge torrent (Before)



Vegetation on runoff water harvest, Perwinge torrent (After)



Runoff water harvest pond , Pani Kholi (Before)



Vegetation on runoff water harvest pond , Pani Kholi (After)



Landslide on Pani Kholi (Before)



Control of landslide Pani Kholi (After)



Budhuwa Torrent, Khairmara (Before)



Budhuwa Torrent, Khairmara (After)

Before and After Pictures



Dam of Ratu River, Rajabas(Before)



Vegetation on Dam of Ratu River, Rajabas(After)



Ratu River, Aapghachi, Mithila-11, Dhanusha (Before)



Ratu River, Aap ghachi, Mithila-11, Dhanusha (After)



Kalapani, Bardibas-3, Mahottari (Before)



Kalapani, Bardibas-3, Mahottari (Mahottari)



Bamboo plantation in Patu (Before)



Greenery in Patu (After)

A group of approximately 15 women and one child are sitting on a large blue tarp spread on the ground in front of a traditional house with a thatched roof. The women are dressed in colorful saris, and the child is in a red and white patterned dress. They appear to be engaged in a community meeting or a group activity. The house behind them has a wooden ladder leaning against it, and the scene is set in a rural environment under a clear sky.

BEST PRACTICE

Strengthening Community Resilience through Group Approach

Effective Approach
for Behavior Change



Strengthening Community Resilience through Group Approach

A group is a set of people with common interest gathered together in a common platform for the collaborative and coordinated action to achieve the common goal. A group approach is the best way to disseminate any technology, knowledge and bringing behavior change in a wider area in a short period of time. Group approach helps group members to participate, to see and to practice the given technology which is an effective process of learning.

There is high geographical diversity in Mahottari and Dhanusha districts consisting of Chure, Bhabar and Terai. There is even high diversity in the ethnic group in these districts. There is a high number of dalit communities in these regions ranging from 51.2 % to 63.13 % (Caste-based Discrimination in Nepal, 2009). In context to Human Development Index, Mahottari (0.38) rank in 7th lowest district and Dhanusha (0.43) rank in the 20th lowest district of Nepal. (Nepal Human Development Report, 2014-UNDP). Lack of education, discrimination on caste basis and unemployment have aggravated the condition of the people of this region.

Caritas Nepal and Caritas Germany in coordination with implementing partner CDAFN had implemented different income generation activities along with trainings in the project sites with the objective of strengthening the capacity through group approach. The goal of this approach was to ensure the community's capacity to manage the given resources for income generation and strengthen them to collaborate and coordinate with the local government for the resource leverage. To strengthen the capacity, most of the activities were concerned with vegetable, goat, mushroom farming along with saving and credit activities. Communities were empowered to develop their Livelihood Improvement Plan (LIP) which guides them to act in the future. Group approach was a participatory approach to strengthen the capacity of local people for the socio-economic development and environmental benefits.

Activities

- 1) **Training:** Orientation on group formation, minute preparation, and group management were provided to develop a strong local institution. Training on nursery management, mushroom cultivation, seasonal vegetable farming, IPM, botanical pesticide preparation and seed to seed were provided to enhance the income generation activities.
- 2) **Group Meeting:** The group meeting was found to be most effective to strengthen the capacity and empowerment of local women. They have a provision of group meeting once in a month. In the meeting, women learned how to present themselves in mass and deliver their words. It had become a platform to discuss the socio-economic and environmental problem. This meeting helped the group in problem identification and discussion of the problem to find an effective solution and planning of new activities. This platform also helped to develop linkage among the stakeholders for resource leverage. Group meetings along with minutes helped to develop the formal social institution. Moreover, this had been a common platform to develop mutual relation among different caste and religions.
- 3) **Agriculture Activities:** After being access to the water, groups were oriented and provided with the seasonal diversity kits (including 10 types of vegetable seeds) and were technically guided in vegetable farming. They were also supported with the materials required for the preparation of botanical pesticide. In addition to this, improved cow shade was constructed as demonstration which facilitate collection of cattle urines for botanical pesticide. IPM demonstration plot was created to disseminate different IPM technology. Group members were also provided with spawn for the mushroom cultivation. This was liked by the female as they consider it as an easy way of earning. In flood reclaimed land, group members were technically guided for river bank farming.
- 4) **Goat Farming:** In Madeshi community, goat farming was introduced among the group members. The project had supported 1 goat for each group member. In addition to this, every groups were provided with a breeding buck. Revolving fund were provided for buying goats. They were also provided with different supports like mineral blocks, deworming and vaccination.
- 5) **Saving and Credit:** It was a new activity introduced in the group. The group members developed the habit of saving for the future purpose. They generally save about NRs.50 to 100 per month. Till the date, there is NRS. 11,34,677.00 with an average saving of NRs. 2,626.56 per member and NRs. 7,55,645.13 per group. This amount was utilized as a loan (on nominal interest) by group members for the income generation activities like poultry, mushroom cultivation, pig rearing, goat rearing, cattle rearing and grocery shop.
- 6) **Revolving Funds:** The concept of revolving fund had been supportive for the group members. Each and every group on an average was provided with NRs. 20,000 as revolving funds. This amount was given to the group members on the basis of economic condition to start new activities for the income generation.

Key Users

On the basis of the demand of the groups, vegetables and goats farming groups were formed in the project sites. There are altogether 432 members in 15 income generation groups in project sites whose details are mentioned in the table below.

S.N.	Types of Income Generation Group	Total Groups	Total Members
1	Vegetable Farming Group	11	327
2	Goat Farming Group	4	105
Grand Total		15	432

Key Results

Group approach was found effective to strengthen the capacity of female communities to plan and implement the income generation activities. Similarly, this approach helped group members to know about local government programs and capacitated them to advocate their right for the matching funds. Groups were able to use the resources to generate income through vegetable, mushroom and goat farming. They can run saving and credit activities and can utilize the revolving funds for the income generation. Till the date, there is a collection of NRs.11,34,677 under saving and credit with average saving of NRs. 2626.56 per member. Income generation activities directly helped the financial stability of the members. Groups had prepared their own LIP which will help them to sustain and develop the programs in coordination with local government in future. Women, who never had participated in a public meeting had now started participating and put forward their views with a confidence.

Impact

Group approach has created a marvelous impact in the field of agriculture, economic, social and personal development, especially in the females. They have built up their confidence level to express their opinion in a mass. The habit of saving money for the future purpose had been developed. Saving and credit activities have eradicated the problem of high interest from money lender. Knowledge of vegetable farming and goat farming has ensured food and nutritional security. Integration of IPM in agriculture has environmental benefits and health benefits. This approach also developed the linkage of the group members with the local government. Sustainability of the group has been developed through the regular meeting, saving and credit activities, revolving funds, and LIP. A common platform had been created where a member from different caste can act together and abolish the caste discrimination in society.

Lesson Learned

Nepal has a male dominant society where financial right and role of taking major decision are inherent to male. Involvement of female in income generation activities is indispensable for them to increase their financial access which in turn helps to enhance their role in taking decision. To build a prosperous society, the empowerment of women is an indispensable need. For the dissemination of knowledge and bringing change in behavior, group approach was successful. For the sustainability of such group-based activities, it should be registered in local government and should be linked with cooperatives.

STORIES OF CHANGE



"My husband 'Binod Chaudhary Bhumiyar' is a farmer. Earning from farming was not sufficient to run a house smoothly due to large family (number of 7). Expenditure on children's education is hiking day by day. I was desperately looking for a way to earn and help my husband. Caritas / CDAFN helped me to find an effective way by suggesting about goat farming. I got chance to be a member of goat farming group named: Adharsa Income Generation Group and I also received breeding buck. I took a loan of amount NRs. 10,000 from revolving fund and bought a goat. Different kind of training on goat farming added energy in me for goat farming. My happiness rose to ecstasy when my goat gave birth to 3 kids. After growing them up, I sold them in NRs. 36,000 and utilized the earnings in my daughter marriage. My husband supports me in my activities. At present, I am rearing 6 goats which are now ready for sale. After selling them, I will save the amount for the study of my children. I will continue goat farming because I found it profitable."

- Sumitra Devi Bhumiyar, Sangrampur, Bhangaha-06, Mahottari

"I was happy to be a member of Juntara Income Generation Group. I have 1.2 acres of land for farming. My husband has a petite job. The earning from the job and production from the field was enough for our family (4) to survive. But it was hard to gather money for education and medical expenses. Previously, I took a loan of NRs. 50,000 in a high rate of interest and started poultry farming but I did not get success due to lack of experience. I made a decision that I will never rear chicken again. But after being a member of group formed by Caritas/CDAFN, they inspired me to start poultry farming again with loan from the revolving fund. I took NRs. 20,000 from the group as a loan under the provision of revolving fund which has a nominal rate of interest. I reared 200 chickens and utilized the poultry house which was useless for 3 years. Chicken grew well and I had a net profit of NRs. 40,000. I paid the loan of the group from the earnings. This time, I added 200 more chicken again. I found my way of earning. I am saving the income in my group which will ensure the bright future for my children. In addition to this, the enumerator of the project had taught us many new things regarding our self-development. The enumerators of the project oriented me to run the group. They taught me to prepare a minute, to maintain the record of saving and calculate interest. Now I can run both family and group smoothly."

- Rama Majhi, Patu, Bardibas-03, Mahottari



"This village(Patu) is inhabited with minorities group called Majhi. Due to poverty and ignorance, we Majhi are far behind than others. We generally did not have the habit of saving for the future. As Caritas/CDAFN implemented a project in this village we got a chance to learn about many new things. SCR project has oriented us on the way of income and methods of savings for the future. The project has also formed an income generation group named: Kakarbhitta Income Generation Group, where we are taught about the way of utilizing the local resources for generating income. I personally had a lot of benefits being in the group. I took a loan of NRs. 10,000 under the provision of revolving funds at a nominal rate of interest. I bought a baby buffalo in NRs. 8,000 and after rearing for 6 months, I sold it in NRs 20,000. I paid the loan. I again bought a small baby buffalo and I am planning to sell it in this Dashain. In addition to the monetary profit, we have many more social benefits as well. This group approach has created a bonding among us. We learned to write our name and introduce ourselves in meeting and forum. Previously, we female from Majhi group used to engage in alcohol preparation, but nowadays we are engaging in income generation activities like vegetable farming, buffalo rearing, mushroom cultivation, etc. Thank you Caritas/CDAFN."

- Shyam Maya Majhi, Patu, Bardibas-03, Mahottari



"In Madesh (Terai belt of Nepal), Females are still considered to serve in the kitchen. Female are not allowed to go out for earnings. After the implementation of the SCR project of Caritas/CDAFN in our community, it has brought a change in perception of Madeshi female. SCR project has facilitated us strengthening our capacity through group approach. We are being directed for income generation through different activities and encouraged for saving. We used to be abused by the money lender with high rate of interest. The approach of saving and credit has facilitated us with a loan in the nominal rate of interest. In my case, our family used to have a small grocery in the village and another one in the market area of Jamuniya. The grocery of the market was comparatively very small than the other. I was looking way to extend. I took a loan of NRs. 10,000 for extending my shop at Jamuniya Market. I look after my grandchild and run the shop. In Jamuniya market, we had a daily transaction of NRs. 1,600 to 2,000 with a profit of NRs. 300 to 500. I save the amount in Sarsawati Goat Farming Group. I also rear goat and I found it very profitable Business. In the previous year, I sold 2 goats for NRs. 15,000 and this year I sold one goat for NRs. 10,000. I am very much happy with the earnings. The project has shown the way for Madeshi female for easy earning."

- Susila Devi Saha, Jamuniya, Bhangha-06, Mahottari

Activities Under Group Approaches



Nursery Training



Monthly Meeting



Vegetable Seed Distribution



Preparation of Biopesticide 'Jholmol'



IPM Demonstration Plot



Group Vegetable Farming



Drip Irrigation



Mushroom Substratum Preparation

Activities Under Group Approaches



Seed to Seed Training



Mushroom Training



Capacity Building Training



Saving and Credit



Use of Revolving Fund- Pig Farming



Use of Revolving Fund- Grocery Shop



Use of Revolving Fund- Goat Farming



Use of Revolving Fund- Mushroom Farming

BEST PRACTICE

Consolidated Activities for Awareness of Earthquake

Preparedness for safety





Consolidate Activities for the Awareness of Earthquake

Introduction

Disaster never comes with pre-information. Powerful earthquake on 25th April, 2015 has proved this statement. Nepal was struck by an earthquake with a magnitude of 7.8 with epicenter at Barpak, Gorkha district. An authoritative earthquake demolished most of the villages, traffic routes and cultural monuments, with a death toll of some 9,000, over 22,000 got injured, and more than 600,000 private houses and almost 20,000 school classrooms were destroyed.

While seeing the history of Nepal, there is an occurrence of a powerful earthquake in every interval of 80 to 90 years. Nepal lies towards the southern limit of the diffuse collisional boundary where the Indian plate underthrusts the Eurasian plate, occupying the central sector of the Himalayan arc. The Indian tectonic plate, moving north at about 45mm a year is pushing under the Eurasian plate beneath the Himalayas. The catastrophic earthquake of 7.8 Richter Scale in Nepal occurred because of two converging tectonic plates: the India plate and the

overriding Eurasia plate to the north. When the stress on the edge overcomes the friction, there is an earthquake that releases energy in waves that travel through the Earth's crust and cause the shaking that we feel. Nepal is at the zone of high risk, lack of awareness, weak structures, lack of pre and post preparedness facilities and poor economy of the people has hiked the vulnerability to the earthquake.

SCR project had implemented different integrated activities for the mass awareness about earthquake, way of preparedness before, during and after the earthquake. People do not have knowledge of the occurrence of the earthquake and possess traditional thinking. Most of the death casualties in the earthquake were due to the collapse of weak building. SCR had mostly focused its activities in scaling out earthquake resilient building and preparedness.

Activities

- 1) **Mason Training:** The training was organized for the masons of the project site in order to advance their knowledge of earthquake resilient building. In training, masons were theoretically and practically orientated with the techniques of construction of earthquake resilient building. They practiced construction of earthquake resilient column, with proper orientation of rings, preparation of proper foundation, orientation of plinth beam, sill beam, lintel beam and orientation of "T" and "L" band etc.
- 2) **Earthquake Resilient Demonstration Building:** The prime objective of this building was to create awareness and provide a glimpse of the earthquake resilient building among the people of project sites. The participants of mason training were utilized in the construction of the demo building. The project had constructed 2 demonstration building in Chure, (Mithilla-11, Dhanusha) and Kabilasha, (Bhangaha-01, Mahottari). Another one more building is under construction in Bhagwatipur (Balwa-11, Mahottari).
- 3) **Earthquake School Session:** Children are considered to be more vulnerable during the earthquakes and other disasters. With the objective of creating awareness among the children, the school session was conducted in 6 schools for the student of standard 9. There were altogether 10 EQ session, where students were taught about the cause, pre and post preparedness of EQ. They were also oriented on "what we should do" and "what we should not do" during the earthquake. Similarly, they were also made acquainted with different other disasters. They were guided for the preparation of the school disaster preparedness plan.
- 4) **Mass awareness:** For a mass awareness of earthquake, different activities were conducted. The street drama was performed in place in which characters portrayed about the preparedness of EQ and what we should do during and after the earthquake. There were 9 street dramas in the main market areas in the project sites. In 25th April, on the celebration of earthquake day, the project conducted rally displaying informative display cards. Information regarding the EQ as a jingle was broadcasted on air through



3 FM (Radio Bardibas, Radio Sungava, Radio Darpan). 30 awareness hoarding boards were hanged in 28 important and visible places. All the activities were directed for the spread of the information and awareness regarding the earthquake.

- 5) **Sensitization Workshops:** Different kind of sensitization workshops were conducted at a different level for awareness about the earthquake. Sensitization workshop was conducted in every group, ward level, and municipality level. In the workshop, participants were oriented about the cause, preparedness about EQ and were also acquainted with the building code.

Key Beneficiaries:

Activities of thematic area “earthquake awareness and preparedness” have a wide level of audience and beneficiaries. The mass awareness activities had a wide level of awareness in Dhanusha and Mahottari district. Demo building created awareness on building code for the villagers.

Key Results

All the activities conducted under the earthquake awareness and preparedness theme were integrated to produce a remarkable result. 63 well-trained masons were prepared at the local level who are delivering their learnings in the construction of earthquake resilient buildings in the project sites. It was recorded that after the training, 615 earthquake resilient buildings were constructed by the trained masons. School session had played a pivotal role in creating awareness and preparedness in 413 students of 6 schools. 6 school preparedness plans were prepared by the school students in coordination with the project.

Impacts

People still believe in superstition that earthquake is the result of sins of human and furiousness of god and goddess. This theme had created awareness on the concept regarding the occurrence of earthquake. The activities of mass awareness and different level workshops were successful in changing the people's perception. The workshop on EQ awareness for key person helped to mainstream the preparedness plan and sensitized for implementation of building code. The mason training was effective for the technicians in building earthquake resilient buildings. These trained masons are operative to disseminate the EQ resilient building.

Lesson Learnt

Preparedness is the only way to be safe from the earthquake. An earthquake-prone country like Nepal, awareness regarding the preparedness (before, during and after the earthquake) is indispensable to minimize the possible death casualties in the future temblor. Weak and non-earthquake resilient building are the major cause of the demise, so it is a prime need to mainstream the building code. Production of well-trained mason is necessary to disseminate the EQ resilient building. Disaster management course should be included in the school course which will help students to be responsible towards society during the disasters.

STORIES OF CHANGE



"Natural disasters occur suddenly without any prior information. Knowledge regarding disaster management can help to reduce losses to some extent. As we know, in any kind of disaster, children are the most vulnerable because they are not physically and mentally strong as compared to adults. The knowledge regarding disaster management is very much fruitful to the school students as it helps to identify possible disasters in their locality. In addition to this, this course also helps them to make responsible towards society during the time of disaster. The students were quite excited with the course of earthquake awareness. We usually have an introduction part of the disaster in regular courses which is not enough. Caritas / CDAFN conducted school session about earthquake and helped them to develop plans of preparedness (before, during and after the earthquake). Disaster management and developing of preparedness plan should be included in the regular school course."

- Kedar Koirala, Principal, Shree Deurali Higher Secondary School, Bardibas-03, Mahottari.

"I was totally unknown about the earthquake. Tremor of 25th April, 2015 was my first experience of an earthquake. During the earthquake, I went vacant and could not think of anything. I ran towards my father. He took me out of the house. Everyone was in awful condition. Thanks to god, there were no human casualties. When I heard that there will be an extra session of earthquake and its preparedness, I was more than happy. I found the course very much interesting. I learnt about the causes of the earthquake. I also knew what we should do and what we should not do before, during and after the earthquake. In addition to this, I also learned about other possible disasters in brief. I found the disaster subject very much interesting as it is directly linked with the prevention of casualties and death. In the future, I will be studying about disaster management."

- Megan Subedi, Shree Rashtriya Saraswati Secondary, Kalapani, Bardibas-03, Mahottari



"I have been working as a mason for 22 years. I was unknown about the earthquake resilient building. After the earthquake on 25th April 2015, I heard about it but had no idea regarding its construction. I got the opportunity to learn about the construction of the earthquake resilient building in mason training organized by Caritas/ CDAFN. The training was effective for us. The practical session made us practically sound regarding all the techniques required for the EQ resilient Building. We learnt to make a foundation, plinth beam, lintel beam, sill beam etc. After the training, we realized that up to now we were constructing graveyard instead of house. Nowadays, wherever we work, we convince people for a construction of the EQ resilient building. There is the only difference of 25 to 30% extra cost for the preparation of EQ resilient building compared to simple building."

- Narayan Bahadur Thapa, Rajabas, Bardibas-03, Mahottari



"Previously, I was unknown about the earthquake. Earthquake of 2015 was my first experience. When I asked my parents, they told me it was the effect of god curse. After the school session, I knew about the cause of the earthquake. I convinced my parents that the cause of earthquake is due to the friction of the plate under the earth rather than god curse. From the school session, I gathered knowledge regarding what we should do and we should not do before, during and after the earthquake. We were also able to prepare school disaster preparedness plan under the assistance of our teacher. We also look forward to incorporate such type of courses in our daily courses."

- Kajol Kumari Singh, Shree Laxmi Secondary School, Hattisarwa Bhangaha-06, Mahottari

Activities of Awareness to Earthquake



EQ Resilient Demo Building, Chure, Dhanusha



EQ Resilient Demo Building, Kabilasa, Mahottari



Mason Training



Practical Session in Mason Training



Mason Sharing Meeting



EQ Awareness Drama

Activities of Awareness to Earthquake



Awareness Training to Key Person



EQ preparedness Planning Meeting



EQ Awareness School Session



Speech Competition of EQ Awareness



EQ Awareness Rally



Prize Distribution

A smiling woman in a colorful sari is carrying a large basket of fresh green leafy vegetables on her head. She is standing in a field with trees in the background. The text 'BEST PRACTICE' is overlaid on the image in a yellow box.

BEST PRACTICE

River Bank Farming and Fruit Plantation

Approaches of Changing
River Bank to Fruit Orchard



River Bank Farming and Fruit Plantation

Introduction

A Part from different aspects being affected by climate change, impact on rainfall pattern has been a hard-hitting challenge. Both excess and deficient rainfall tends to create serious disruption with widespread socio-economic impact. In Nepal, there are about 6000 rivers with drainage area of 1, 91,000 sq.km. The annual report of Department of Hydrology (2016) depicted that there was about 80 % rainfall in the rainy season, 3.5 in winter, 12. 5% in pre-monsoon and 4.0 % of rainfall in post monsoon. This type of uneven distribution of rainfall pattern has created a threat of flood and landslide to the household living nearby the river. Annually, on an average, the flood and landslide cause death of 309 people, destruction of 7570 houses and affects 5,627 hectares of lands. A study related to land degradation in 2004 had shown that there were around 0.4 million hectares of agriculture land that had been converted to riverbank. Among that, 0.226 million can be reused for agriculture with appropriate technology.

Ratu river is the major water body in Mahottari and Dhanusha district. This river has been both sources of livelihood and source of water-related disasters (flood and land cutting). The flood of Ratu river in 1977 and 2001 has aggravated the life condition of people living in its catchment area. Flood of the Ratu river on those years has displaced more than 1500 families, and more than 100 hectares of land were swept converting it into the riverbank.

To strengthen the flood victim of Ratu in middle stream (Bhangaha municipality), Caritas and CDAFN had incorporated mitigation approaches to flood including riverbank vegetable farming and fruit plantation. Riverbank farming is farming in the flood affected area (land being deposited by sand and debris) with appropriate vegetable species and plant species.

Methodology

Riverbank farming and plantation of fruits sapling is slightly different than farming in normal soil. We should especially select vegetables from the Cucurbits family (watermelon, musk melon,

cucumber, bottle guard, sponge guard, bitter guard, pumpkin, snake guard and pointed guard, etc.) as it requires short time period for harvest.

In case of land preparation, it does not need tillage operation as required in normal farming land. There are two methods of land preparation named: pit system and trench system. In the pit method, a pit is made of 1-foot depth and diameter. Similarly, in the trench method, a long trench is made with a depth of 1-foot. The pit and trench are filled with loam soil, compost, farmyard manure in equal ratio. The seed are germinated first in artificial condition before sowing. For germination, the seeds are soaked in water for 24 hours which are then dried in shade. After that, they are packed in a leaf of pumpkin and kept in a warm place like a heap of compost, grain storage or under blankets. This action helps the seeds to germinate within 2 to 3 days. The germinated seeds are sown at a depth of 15 cm and the pit is mulched with straw. The seed sown by this method helps to emerge the seedling in 4 to 5 days of sowing. The seed also can be germinated in a poly pot in a tunnel and can be transplanted. To avoid the damage of insect (cutworms, cricket and mole cricket), powder of malathion should be broadcasted at the rate of 5 gm per meter square.

Riverbank consists of sandy soil which does not have good nutrient content. For good production, there should be an appropriate application of balanced fertilizer. During the pit preparation, the basal dose is applied which is composed of 2-3 kg compost, 10 gram urea, 25 gram DAP, 15 gram MOP, 2 gram borax and 2 gram zinc. The top dress consists of 15 gram of urea which is applied by making a solution in 1 liter of water. The solution is drenched after 1 month of plant transplantation. The vegetables can be harvested within 4 to 5 months.

In case of fruit plantain, 1 to 2 years old fruit sapling (Mango and Litchi) are planted in space of 10 meters apart in a pit of 1 foot depth and 1-foot diameter.

Key Users

The flood on 1977 and 2001 had affected Bhangaha Municipality including Sangrampur, Meghnath, Goranna, Kabilash. Hundreds hectare of lands were swept away resulting in the conversion of agricultural land into riverbank. For quick returns, the affected land was used for river bank farming. With long term vision of renovating riverbank to the fruit orchard, massive fruit plantations were done in those villages.

Key Result

The river bank farming was very much effective approach in adapting with the flood. 42 households are doing river bank farming in 8 hectare with good income by selling vegetables. The unused land after the flood has now become a source of income and food. In the same way, 234 hectares of reclaimed land has been utilized for the plantation of 17668 number of fruit saplings (mango, litchi and lemon) by 830 households. The remaining space under the plantation is also being utilized for vegetable farming.



Location	Area in Bigha	no of plants	Dalit HHS	jnajati HHS	BCN HHS	Total HHS
Sangrampur	153	12240	25	60	7	92
Kabilasha	24	1600	11	49	5	65
Meghnath Goranna	18	1200	5	12	6	23
Sangmtole, South Tole	10.5	700	8	23	6	37
	205.5	15740	49	144	24	217

Impacts

After the destructive flood of 1997 and 2001, the possible option of livelihood was collapsed. More than 100 hectares of agricultural land were affected by the flood. The riverbank farming and fruit plantation have been the effective way to adapt to the effect of flood. This approach was successful to retrieve the livelihood back. Riverbank farming has become a source of income for 42 affected households. Similarly, this has also supported them for their nutrition and food security. Soon after the flood, many victims were forced to go abroad for earning but now most of them have started farming in their own field by which the out-migration has been reduced. Conversion of riverbank to fruit orchard is a unique concept as it does not need regular tillage operation as other farming. In the future, the fruit plants will promote greenery, prevent soil erosion and be a source of income.

Learning

This riverbank farming and plantation are the effective approaches to adapt to the effect of flood. If the riverbed and riverbank farming is done in a technically correct way, it can be a good source of income. In Nepal, there are about 0.4 million hectares of the riverbanks and riverbeds. Among them, 0.2 million hectares are suitable for vegetable farming. Utilization of such riverbank and riverbed can fulfill the vegetable demand of the country. Plantation of fruit plant in river bank has multidisciplinary advantages. It should be promoted on a large scale. For the good production, the ratio of male and female flower should be regulated by the spray of ethylene. The vegetable like cucumber, muskmelon, watermelon, pumpkin, etc. should be turned fortnightly as the fruits touching the ground gets white due to the absence of the light.



STORIES OF CHANGE



"We were affected by flood continuously for 3 years since 1971 A.D. The repeated action of the flood had converted our productive land into sandy land. I used to have 3.5 hectares of agriculture land where I used to grow paddy, wheat, maize, and lentil. The harvest used to be more than enough for my family of six. The flood in 1971 A.D swept away my paddy field leaving nothing behind. I even had to sell a piece of land for the study of my children. After the flood, we had to live a very hard life. When Caritas/ CDAFN introduced us about riverbank farming, we were very happy to know that farming could be done even in our flood affected land. We started riverbank farming and fruit plantation under the supervision of the project team. I was happy to see the vegetables growing. Now I am doing riverbank vegetable farming in 10 acres and fruit plantation in 1 hectare of land. I do not need to buy vegetables. I see greenery in my field which fascinates me. Previously, I did not like to step in my sandy land but now I spend most of my time there. I have a hope; in the near future the fruits plants will be major source of income. I am planning to make fruit storage house and involve myself in wholesale marketing. I am readily waiting for that moment."

- Jasar Yadav, Sangrampur, Bhangaha-06, Mahottari

"We were happily living good life in Parsa village. We used to do farming in 2 hectares of productive land. Flood of 1997 A.D. swept our 1 hectare of land leaving sand everywhere. During that harsh time, my husband-Uttim Hujedar had gone abroad for earning. After the flood, the affected land was useless. As we heard about the group formation for plantation and vegetable farming in our affected land, we had new hope. We got involved in Ratu river Fruits and Plantation Group. We received the training and fruits sapling and seed of vegetables. Now I am doing riverbank farming in 1.2 acres of land and fruit plantation in 1 hectare. To facilitate the irrigation, Caritas/ CDAFN had also supported us for deep bore. We, all member of the group use the same water for irrigation. My husband now is not compelled to go abroad for earning. We work together in the riverbank. We sell vegetable for about NRs. 20,000 to 30,000 in a season. During the flood, there was sorrow throughout the village. We hardly cooked food but did not like to eat due to the distress of the village. But now there is happiness everywhere. Most of the useless lands are being used in plantation and vegetable farming. Thanks to Caritas/ CDAFN."

- Hema Devi Hujedar, Parsa, Bhangaha-06, Mahottari



"I still remember the flood of 1997 A.D. It has devastated most of the field throughout the village. After the flood, its effect was more frustrating. The flood left no hope for livelihood. Out of 2 hectares of land, our 1.5 hectares of land was swept away. We had to do small hold business and my husband (Sudeep Kumar Singh) had to go neighboring country for earning. Staying alone in the absence of husband during the time of scarcity was more painful. After the field study, Caritas/CDAFN team suggested me to join the vegetable and plantation group. I was happy to receive fruit saplings and vegetable seeds. I had planted fruits plant (mango and litchi) in 2 acres and doing vegetable farming in 1.2 acres of the riverbank. I use a motor to lift the water from the nearby stream for irrigation. I and my husband spend most of the time in the riverbank. My husband said that it is far better to live with family and work on own land rather than going abroad. Now we sell vegetables in the market with worth NRs 20,000 to 30,000 in a season. We are investing it in our daily expenses and study of our child. We have a bright future because we are sure that in the coming future, fruits will be our main source of income."

- Tarjan Devi Singh, Parsa, Bhangaha-06, Mahottari



"The Flood on Ratu river perverted me from landlord to landless. I was living a prosperous life with farming activities in 2.6 ha of the cultivable land. I used to grow paddy, wheat, and lentil and always had good harvest which was more than enough for my family. The flood had shown no mercy devastating my blooming life in no time. My cultivable land was swept away depositing sand everywhere demolishing the hope of livelihood. The most difficult moment for me was when I forcefully had to discontinue the education of my nephew. For livelihood, I even started going abroad as seasonal labor leaving wife and nephew. After the implementation of the project, I planted mango, litchi, and lemon in about 1.5 hectares of lands. I even practice multistoried farming approaches for growing vegetables like pointed guard under the growing fruits trees. Now I don't have to buy vegetables; rather, I sell vegetables in the nearby market and earn about NRs 50,000 in a season. I am saving certain amount of money for the study of my grandchild. My riverbank farming is considered to be the best and many visitors from different organizations arrive here for a visit. I feel happy when villagers say "No flood can make him poor; after all, he is born to be rich."

- Ram Narayan Singh. Parsa, Bhangaha-06, Mahottari

Activities of River Bank Farming and Fruit Plantation



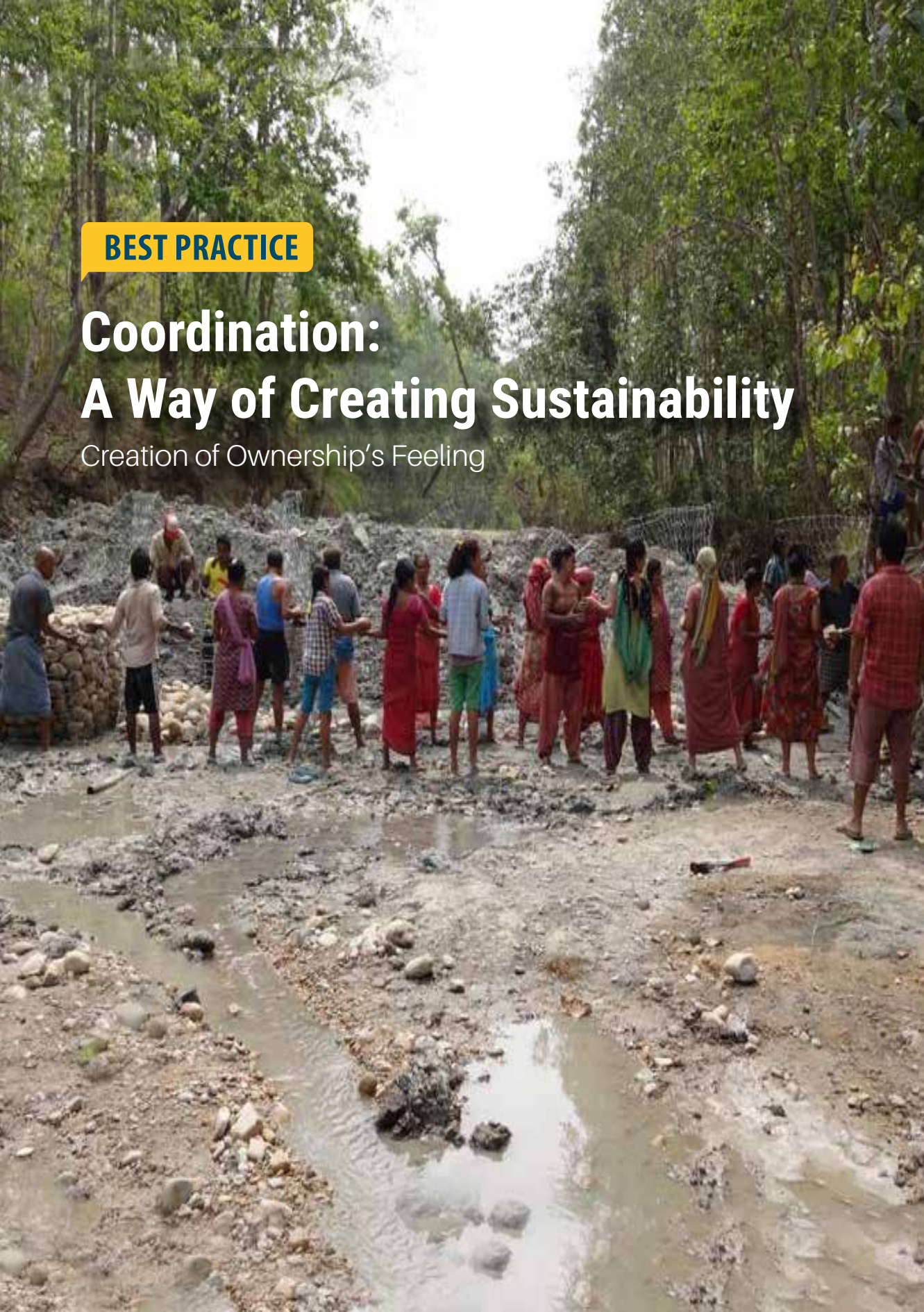
Activities of River Bank Farming and Fruit Plantation



BEST PRACTICE

Coordination: A Way of Creating Sustainability

Creation of Ownership's Feeling





Coordination: A Way of Creating Sustainability

Coordination is a mechanism of working together for a common interest. SCR project had been addressing coordination and collaboration as a core working mechanism. In the present administration scenario, collaboration and coordination have been a major indispensable part for the success of any project. From the initiation of the SCR project, implementing partner CDAFN has played a pivotal role to develop strong collaboration with all the possible stakeholders (CFUG, Community, Local government, Ward, Municipalities, Citizen Society and LIBIRD).

At the initial condition, the project was designed through the problem assessment with the approach of local community participation. The project was designed with fix thematic area where the community could design the activities based on their need. After the project initiation, inception workshops were conducted at the district level and community level sharing about the project information to stakeholders.

Coordination With Community

To strengthen the capacity and for the sustainability, local people were trained to construct undergrounds canal, ferro cement tank, water harvest ponds and bioengineering structures (gabion box, spur, check dam). Local community peoples were used for problem identification, problem prioritization, activity identification, and budgeting. After the construction committee was formed and they were made responsible for all the transaction and construction. Project assured the control of quality and provide the technical guidelines. The community was also strengthen to gather the matching fund from related wards and municipalities. To develop a legal scenario, contract was signed between project and community and other stakeholders providing matching funds. After the completion of the construction activities, the user's committee was formed and was made responsible for the

effective management of the structures. This approach helped to build transparency and develop the ownership feeling among the community.

Coordination With Stakeholders

All the stakeholders are responsible for the development of a community and mutual efforts among them can create environment ensuring development. The project had been ensuring coordination and collaboration among stakeholders through different workshops, meeting, field visit, inception workshop, District Project Advisory Committee's (DPAC) field visit, Municipality Project Advisory Committee's (MPAC) field visit and district level stakeholder coordination meeting.

Matching Funds

Matching funds is one of the key needs to increase the quantity and quality of the design activities. The coordination and collaboration with government stakeholders, CFUG group

and local community helps to gather matching funds. In activities design by SCR project, there is 24.14 % of total investment from SCR project, whereas project was successful in collecting matching funds with municipalities (15.29%), Community Forest Users Group (18.78%) and community (48.79%).

Field visit and Knowledge Sharing

The activities of Caritas/CDAFN in Ratu watershed has been one of the best models. It has been a learning center for different organization working in the sector of environment and climate change. Riverbank farming, rain water harvest, bioengineering and raising of seepage water for drinking and irrigation purpose has been a major point of attraction to the visitors. Government delegation (President Chure Conservation Program), Save the children, United Mission to Nepal, TU, WWF-Hariyo Ban and ICIMDOD had visited the project sites.



Scale Up and Scale Out

Activities

All the coronation activities help in scaling up and out of the good practices from the different stakeholders. High level travelling seminar including members from the house of representative of the province (1,2,3), Mayor and ward chairperson were conducted in the project site for the two times. Members of house of representatives has ensure to incorporate project's good practices and learnings into policy formation. Similarly, field visit of government stakeholders (District Soil Conservation Office, Irrigation Division Office, Ward Chairperson) had scale out our practices in other areas as well. As output, rain water harvesting ponds have been replicated in nearby villages under the financial support of DSCO and Wards. Similarly, the underground canal of Rajabas under the project has been extended by the Irrigation Division Office. The project learning was shared with CARE and the good practices of the project will be now replicated in Khageri watershed.



Impact

Coordination among all possible stakeholders is a key for the success of any projects. This coordination and collaboration helped in the collection of matching funds. Direct involvement of the beneficiaries in project activities helped them to build capacity and develop technical manpower locally. This also had developed a feeling of ownership community. Coordination and collaboration with other stakeholders resulted in scaling out of the project. All this approach of coordination and collaboration will result in the sustainability of the activities initiated by the project.

Learnings

Government stakeholders are the permanent service provider for the community in every sector. So, coordination of the community to the government stakeholders is a prime need to develop follow up and sustainability of the project outputs. This project has leaning that it needs long term project to work in a watershed for tangible outputs. Involvement of community in problem identification, activities identification and implementation help to create ownership feelings. Conservation activities should be linked with income generation which helps in the involvement of local people in conservation activities.

Glimpses of Field Visit



Monitoring by former Preseident Dr. Ram Barran Yadav



Travelling Seminar



Coordination with Tribhuwan University



Monitoring by Funding Partners



Field visit by Save the Children



Stakeholders Coordination Meeting



Field visit by WWF



MPAC Visit

VERDICT OF STAKEHOLDERS



"We are impressed by the work of Caritas/ CDAFN. Activities of water source protection, drinking water, underground water and bioengineering are successful model for the conservation of Chure. We have been coordinating with this project from the initial stage. During different field visit, we can see the tangible benefit to the community. We will put our effort for scaling out of all these learnings and good practices."

- Bidur Kumar Karki, Mayor Bardibas Municipality, Mahottari

"It is good to have Caritas/ CDAFN's project in our municipality. This project has really contributed in women empowerment through group approaches. In addition to this, river bank farming and fruit plantation has brought change in flood affected area. We are collaborating with this project in different way. We have direct collaboration with this project during the construction of EQ resilient building. We are ready of all kind of funds and coordination in future as well."

- Sanjeeb Kumar Saha, Mayor, Bhangha Municipality, Mahottari



"Mithilla -11 is the most vulnerable ward with the habitation of marginal People. Caritas/ CDAFN has contributed in reduction of the flood and landslide through bio engineering and rain water harvest technology. Raising of Seepage water is innovative idea of CDAFN which has ensured food security. The approaches of watershed management in the Ratu river is one of the best and successful models. The effort of bioengineering from the project has protected 3 schools in our Municipality. All the efforts for the Chure conservation and strengthening capacity of local communities are highly admirable. Thanks to Caritas/ CDAFN."

- Hai Narayan Mahato, Mayor, Mithilla Municipality, Dhanusha



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