

Enhancing Economic and Social Resilience of the Earthquake-affected Communities in Sindhupalchok District



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Mrs Bedlaxmi Shrestha, a member of Panchakanya Women Farmers' Group, Lishankhupakhar Rural Municipality, Ward No. 4

Photo: Kausila Rai, LI-BIRD

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Content

LI-BIRD's Response to Earthquake-affected People	1
Beneficiary Groups and Cooperatives	3
Collaboration Between Rural Municipality and Project	4
Enhancing Economic Resilience	5
Vegetable Cultivation and its Impact	7
Income from Potato Cultivation	14
Mushroom Cultivation for Making Money	17
Booming Goat Rearing	19
Poultry Farming	22
Enhancing Social Resilience	24
Preparation of Climate Change Adaptation Plan	24
Testing of Soil and Using Agri lime	27
Protection and Use of Water Sources	31
Plastic Pond	33
Collaboration with Cooperatives	35
Experience, Lessons Learned and Challenges	38

LI-BIRD's Response to Earthquake-affected People



Shelter prepared by the earthquake affected families for immediate use. Photo: Nirajan Pudasaini/LI-BIRD

The devastating Nepal earthquake of 25 April 2015 and the numerous aftershocks badly affected 14 districts of the country including Sindhupalchok causing people of these districts to lose their family members, houses, livelihood resources and assets such as crops, cattle, and many more. Many governmental/non-governmental agencies and international communities supported those families for relief and their rehabilitation. LI-BIRD was also involved in the support and did collaborate with several individual, organizations and donor agencies to provide food and relief materials to 15,465 families of 12 affected districts including 1,753 families of Sindhupalchok district in the first phase.

The rice seed that the farmers were ready to sow and seeds of other crops stored for the next season, along with seed storage structures, houses and agriculture tools were destroyed by the earthquake. The water sources and canals were also affected making it difficult to repair and bring water to the communities. This damage hugely affected the daily life of people as agriculture has always been the major source of livelihood for the majority of earthquake-affected families.

LI-BIRD continued supporting earthquake-affected families in different phases, which is still on progress. The third phase was not just limited to distributing seeds and agriculture tools to the affected families but also on helping them achieve sustainable livelihoods. Working in this approach, LI-BIRD

collaborated with many donor agencies to run a number of projects, including 'Enhancing Economic and Social Resilience of Earthquake-affected Community in Sindhupalchok (ESRS)', a project funded by Singapore's 'Mercy Relief' which worked on Ward No. 2, 3 and 4 of Lishankhupakhar Rural Municipality from January 2018 till the end of August 2020.

This publication is based on the project's concept, approaches and activities adopted to enhance economic and social resilience of the earthquake-affected families, achievements and learnings.



Vegetable diversity kit distributed by LI-BIRD to the earthquake-affected families in 2015.
Photo: Bishnu Dhakal (Left) and Niranjan Pudasaini (Right)/LI-BIRD.

Beneficiary Groups and Cooperatives



Local Disaster and Climate Resilience Plan preparation meeting. Photo: Kaushila Rai/LI-BIRD

The Ward No. 2, 3 and 4 of Lishankhupakhar Rural Municipality is heavily populated with the Tamang ethnicity. However, these Wards have a considerable population of Newar and other ethnic groups such as Brahmin/Chhetri and Dalits. To implement the ESRS project in these wards, 29 farmer's groups with 927 households were identified in the beginning, of which 296 households were randomly selected, and a household survey was conducted. According to the survey, 80 percent of households produce food that is enough only for sustaining six months in a year.

The project aims to improve the livelihoods of earthquake affected families through enhancing agricultural production and establishing functional collective marketing by mobilizing farmers groups and cooperatives. Hence, after a thorough assessment of the functional cooperatives in the area, United Cooperative Ltd. in Ward No. 2, Hrisyango Agriculture Cooperative Ltd. in Ward No. 3 and Harishiddhi Women Saving and Credit Cooperative Ltd. in Ward No. 4 were selected in the initial phase of the project to engage them in the project activities.

The members of the groups initially selected constituted 69 percent women, 86 percent Janjatis/indigenous, 8 percent Brahmin/Chhetri and 6 percent Dalits. The statistics show that the ESRS project is primarily working for the benefits of the indigenous women farmers of the marginalized groups.

Collaboration Between Rural Municipality and Project



Mrs Hemganga Moktan (Vice chairperson of the Lishankhupakhar Rural Municipality, right), and representatives of the project stakeholders during the annual review and planning meeting. Photo: Kaushila Rai/LI-BIRD.

The ESRS project is a good example of successful collaboration between Lishankhupakhar Rural Municipality and LI-BIRD. The institutional policy of LI-BIRD is to work in collaboration with all level of government to the maximum extent possible depending upon the nature and scope of the project. Hence the ESRS project team started consultation with ward and municipality authority from the very beginning of the project. Guided by the Local Government Operation Act, 2074, the Lishankhupakhar Rural Municipality authority also extended cooperation and support to LI-BIRD for smooth implementation of the ESRS project activities in the municipality.

As a first step of the project, an introductory meeting was conducted between LI-BIRD, donor agency representative, Rural Municipality Chair, Vice-Chair and Chairpersons of all three Wards to understand each other, introduce the project and identify areas for collaboration. Within a month of the meeting, the municipality authority provided approval for implementing the project in the Rural Municipality after which many activities were conducted for 32 months in direct collaboration with Rural Municipality in all three Wards. The municipality leveraged resources on soil testing and distribution of agriculture lime, construction of vegetable collection centre and its operation, preparation and establishment of Local Disaster and Climate Resilience Plan (LDCRP) and establishment and mobilization of Disaster Management Fund.

Enhancing Economic Resilience



Kalpana Khatri, chairperson of the Bhukti Farmers' Group from Lishankhupakhar Ward No. 3
Photo Shanti Jirel/LI-BIRD

The overall goal of the project was to enhance economic and social resilience of earthquake-affected households and communities in Sindhupalchok district. To achieve economic resilience, the project interventions were designed to increase income and employment opportunities by engaging earthquake-affected families in agricultural value chains.

The households and community-level capacity development activities were implemented to minimize the impact of climate change and disaster risk as a mechanism to enhance social resilience. Few indicators were set to measure the success of the project. A household survey which was carried out at the beginning revealed average household income from agriculture in a year to be NPR 30,577. The project aimed for an increment of income by 30 percent by the end of the project. To develop the strategy and to identify interventions to achieve income target, an expert team visited all eight communities of the selected wards and conducted discussions with the communities to find the opportunities, problems and challenges. Based on the discussion, the expert team provided some recommendations based on which project activities were designed and implemented.

Table 1: The potential income-generating activities, associated problems and challenges identified by the expert group through field visit and discussion.

S.N.	Identified potential activities	Problems and challenges to be addressed
1.	Vegetable cultivation	Unavailability of quality seeds (cauliflower, cabbage, beans, carrot, radish, garlic, onion, tomato, etc.), red ant and blight in tomato.
2.	Potato cultivation	Lack of quality seeds, blight disease, red ant, lack of seed storage place
3.	Goat rearing	Internal and external parasites, PPR, quality grass and breed, unmanaged shed
4.	Poultry	Quality feed and chicks, poultry disease and diarrhoea, attack of wild animals
5.	Shitake mushroom	Production technology, knowledge and materials
6.	Cardamom	Leaf blight and rhizome rot disease

Reference: *Inception Report, ESRS project 2018*

Vegetable Cultivation and its Impact



Jamuna Lama, a member of the Ujwal Women Farmers' Group from Lishankhupakhar Ward No. 2.
Photo: Shanti Jirel/LI-BIRD

Vegetable cultivation is being considered as a reliable source of income for the smallholder farmers of Sindhupalchok district. Finding a proper market for vegetable sales is not that challenging for the farmers of Lishankhupakhar Rural Municipality as Sindhupalchok is quite close to Kathmandu, the capital and biggest market of the country. Despite having such potential, the farmers have yet to transform their production to commercial level as in Dhading or Kavrepalanchowk districts. If the farmers, farmer's groups, cooperative, local government and non-governmental organizations work hand in hand, vegetable cultivation can be a source of prosperity for farmers of Lishankhupakhar. Keeping this in mind, LI-BIRD conducted several activities to promote vegetable cultivation in Ward No. 2, 3 and 4 of Lishankhupakhar during the project period.

Few farmers of Tamche, Sikre, Bulbule, Panchet and Tamakhubari of Ward No. 4; Sajhaban, Ghichet, Chiple and Wafal of Ward No. 3; and Golang, Dovan, Ghabrughyang, Tothi and Nardim of Ward No. 2 of Lishankhupakhar were already involved in vegetable production and marketing at the local level. Out of the 814 members who participated in vegetable cultivation and expansion of the area with support from the project, 281 belonged to 32 farmer's groups have been regularly cultivating vegetables in more than one *ropani* (500 sqm) area. The other 533 members who received training and seeds support have now been cultivating vegetables in a small area compared to others but earning a substantial income by selling vegetables (Table 2).

Table 2: The number of farmers regularly involved in vegetable cultivation in more than a *ropani* with support from the Project.

S. No.	Group name	Address	No. of members	Number of farmers		
				Women	Men	Total
1	Himshikhar Farmer's Group	Ward No. 2, Sundas Tole	26	2	1	3
2	Dhupi Chaur Farmer's Group	Ward No. 2, Dhupi Chaur	16	1	1	2
3	Ujjwal Farmer's Group	Ward No. 2, School Tole	26	4	1	5
4	Women Janajagan Farmer's Group	Ward No. 2, Usatpa	21	4	2	6
5	Ekjut Swasthya Mother's Group	Ward No. 2, Purano Ghyang	13	5		5
6	Namuna Farmer's Group	Ward No. 2, Golang	21	6	4	10
7	Tothi Farmer's Group	Ward No. 2, Tothi	20	3		3
8	Kamala Mai Farmer's Group	Ward No. 2, Chyauji	18	3	3	6
9	Nardim Farmer's Group	Ward No. 2, Nardim	8	3	1	4
10	Janajyoti Farmer's Group	Ward No. 2, Nargaun	34	2	2	4
11	Suryodaya Farmer's Group	Ward No. 2, Nigale	20	4	1	5
12	Juntara Farmer's Group	Ward No. 2, Dovan	35	7	4	11
13	Utkristha Farmer's Group	Ward No. 3, Ghichet	32	3	4	7
14	Buddha Swasthya Mother's Group	Ward No. 3, Gyawa Tole	53	9		9
15	Anamol Farmer's Group	Ward No. 3, Meldanda	25	1		1
16	Sakriya Farmer's Group	Ward No. 3, Thandai	14	3	1	4
17	Khadadevi Farmer's Group	Ward No. 3, Along	25	5	2	7
18	Chiple Farmer's Group	Ward No. 3, Chiple	39	14	17	31
19	Bhukti Farmer's Group	Ward No. 3, Bhukti	9	4		4
20	Chenan Gyalba Farmer's Group	Ward No. 3, Sajhaban	17		3	3
21	Laliguras Women Farmer's Group	Ward No. 4, Sikre	27	21		21
22	Alaichi Farmer's Group	Ward No. 4, Sikre	35	19	7	26
23	Him Shikhar Farmer's Group	Ward No. 4, Sikre	34	20	8	28
24	Makhmali Women Farmer's Group	Ward No. 4, Tamakhubaari	31	12		12
25	Panchakanya Farmer's Group	Ward No. 4, Tamche	31	31		31
26	Bulbule Farmer's Group	Ward No. 4, Bulbule	38	4	3	7
27	Setidevi Farmer's Group	Ward No. 4, Sajhaban	17	5		5
28	Sayapatri Women Farmer's Group	Ward No. 4, Gagar	18	5		5

29	Laligurans Farmer's Group	Ward No. 4, Panchet	36	1	7	8
30	Tara Farmer's Group	Ward No. 4, Ghyang Danda	33	2		2
31	Bhumi Farmer's Group Lama Tole	Ward No. 4, Lama Tole	26	2		2
32	Fulbari Farmer's Group	Ward No. 4, Mane Danda	16	4		4
Total			814	209	72	281

At a nascent stage of vegetable farming in Lisankhupakhar Rural Municipality, the farmers were provided with several training sessions that focused on the following topics to develop their knowledge and skills on technical aspects: nursery establishment, management and vegetable production, liquid manure and compost production and its use, disease and pest management and control. The training sessions were usually conducted in the farmer's field and the sessions were made practical. The farmers learned to establish nursery, prepare manure, cultivate vegetable in the plastic tunnel and control red ant and white grub. After the completion of training, the agriculture technicians also provided follow-up with technical support to the farmers in their fields and farmer's group meetings.

Table 3: Details of training organised on vegetable cultivation

S. No.	Topic of training	No. of training organized	Training venue	Training participation		
				Women	Men	Total
1.	Nursery Management and Vegetable Production	3	Chiple, Pyukharka, Nigale, Tamche	42	36	78
2.	Liquid Manure and Compost Preparation	1	Sikre	11	6	17
3.	Disease and Pest Management	3	Chiple, Pyukharka, Nigale, Khadichaur	41	35	76
4.	Commercial Awareness and Marketing Training	2	Sikre, Barhabise	15	46	61

It is quite challenging to find quality vegetable seeds in Nepal and farmers have to be dependent on the kind of seeds supplied by the companies as hybrid seeds are mostly imported. The farmers of Lishankhupakhar Rural Municipality also raised the concern of lack of availability of quality seeds to the project team. Thus, the project provided seasonal vegetable seeds and some agricultural tools. Based on the demand of the farmers for commercial vegetable production, seeds of cabbage, cauliflower, peas and beans, drip-irrigation set, sprinkler and chemicals for controlling red ant were provided.

Table 4: Details of seeds and materials provided by the project

S. N.	Seeds and materials provided	Details	Total quantity	Total number of farmers		
				Women	Men	Total
1	Cabbage seed	Green coronet/Green hero	2.54 kg	479	127	606
2	Cauliflower seed	Remy/Snow mystic	2.84 kg	470	131	601
3	Pea Seed	Sikkim local	1010 kg	476	141	617
4	Plastic tunnel	120 G.S.M. (12 ft length, 6 ft breadth)	44 no.	23	15	38*
5	Watering can	5 Lt capacity	80 no.	66	14	80
6	Drip Irrigation Set	100 Lt. drum and 6 lines pipes	14 set	10	2	12*
7	Dursban	Pesticides for controlling red ants	115 lt.	253	87	340

* **Note:** Some of the farmers were provided more than one set

Construction and operation of vegetable collection centre



A vegetable collection center located at Lishankhupakhar Ward No. 4, Sikre. Photo: LI-BIRD Photobank

To conveniently collect and market vegetables produced by the farmers, LI-BIRD, in collaboration with Rural Municipality and other organizations and community, made an effort to develop four vegetable collection centres, of which three have been established while one in Ward No. 2 is still in construction phase. The details about the process and establishment of these centres are given below and also presented in Table 5.

Sikre Agricultural Produces Collection Centre, Lishankhupakhar Rural Municipality, Ward No. 4, Sikre: The establishment of this collection centre was initiated with the support of NPR 2,30,000 in the beginning phase and NPR 1,50,000 in later phase by Prime Minister Agriculture Modernization Project with the formation of Vegetable Pocket Area Management Committee in March 2017. SABAL project also supported NPR 100,000 worth of bricks. But these supports were not enough to complete the collection centre, so LI-BIRD and Rural Municipality formed a Construction Committee and completed the construction process in June/July 2019. This collection centre is managed by Sikre Vegetable Pocket Area Management Committee. 96 farmers of three farmer's groups in Sikre have been producing seasonal agricultural produces, collecting and marketing them through this collection centre. The collection centre has collected and marketed 8.8-tons vegetables and 60-tons potatoes from June 2019 to mid-August 2020.

Chiple Agricultural Produce Collection Centre, Lishankhupakhar Rural Municipality, Ward No. 3, Chiple: In 2017, one of the programmes of an INGO supported to build bio briquette store but the store remained unused for a long time. Thus, on the request of Chiple Farmer's Group and Hrisyango Farmer's Cooperative, LI-BIRD and Rural Municipality collaborated to further renovate the structure and developed it as a vegetable collection centre. The collection centre is now being managed by Hrisyango Agriculture Cooperative Ltd. The potatoes and vegetables produced by about 80 farmers are collected in this collection centre. From June/July 2019 to 16 August 2020, 7.5-tons vegetable and 72-tons of potatoes have been collected and marketed through this centre.

Tamche Vegetable Collection Centre, Lishankhupakhar Rural Municipality, Ward No. 4, Tamche: After the intervention of ESRS project, vegetable production has been blooming in Tamche village. 31 farmers were involved in commercial vegetable and potato production, but since Sikre's collection centre was not feasible to them, they requested for another collection centre in their village. Finally, a new collection centre was constructed in December 2019 in collaboration with the Ward Office and LI-BIRD. This collection centre is being managed by Panchakanya Women Farmer's Group. The fact that it was constructed under the leadership of women and is run by them is also exemplary. Till now, 72-tons of potatoes have been collected and marketed by this collection centre.

Lishankhu Agriculture Produce Collection Centre, Lishankhupakhar Rural Municipality, Ward No. 2, Parangkhor: This collection centre's construction began in 2018 in collaboration with the Rural Municipality and LI-BIRD to cater 123 farmers of six farmer's groups and other additional farmer's production. However, the construction hasn't completed yet. In 2019, the Rural Municipality allocated some resources for it and is planned to be completed by managing the remaining resources by the end of 2020.

Table 5: Vegetable collection centre establishment and management

Name of the collection centre and address	Established date	Organizing responsibility	No. of beneficiary households	Cost of establishment in NPR (000)				
				LI-BIRD	Rural municipality	Community	Other sources	Total
Sikre Vegetable Collection Centre, Ward no. 4	August 2019	Vegetable Pocket Programme Management Committee	96	2,50	3,00	50	480	1,080
Chiple Vegetable Collection Centre, Ward no. 3	June 2019	Hrisyango Cooperative	80	150	50	50	460	710
Tamche Vegetable Collection Centre, Ward no. 4	June 2020	Panchakanya Women Farmer's Group	31	50	600	161	-	1,261

Lishankhu Agriculture Produces Collection Centre, Ward no. 2, Parangkhor	Under construction	–	–	150	500	100	–	750
Total			197	1,050	1,450	3,61	9,40	3,801

Vegetable cultivation is gradually becoming a regular source of income for the farmers of Lishankhupakhar. Previously, a few farmers used to cultivate vegetables in a small area and sell their produces in the local market at Shildhunga, but after the intervention of the project, farmers have been successful in collecting vegetables in collection centres and marketing them to the retailers of Khadichaur, Barhabise and Kathmandu. This has been possible after the farmers have had access to quality seeds, technical support and collection centres. However, since it took time during the project phase to establish collection centres, farmers also individually sold their vegetables to local markets or Kathmandu through personal contacts. Before the project interventions, limited farmers were selling vegetables but now the numbers have significantly increased with the support from the project. As mentioned in the data in Table 6, in April 2018-April 2019 period, the average production of fresh vegetable per household was 256 kg with income of NPR 8,520, whereas in April 2019-April 2020 period, the average household production increased to 318 kg with the average income of NPR 11,570.

Table 6: Sales and income from vegetable production

Vegetable	No. of farmers			No. of group			Sales (in kg)		Income (in NPR)	
	April 2018- April 2019	April 2019- April 2020	April 2020 -	April 2018- April 2019	April 2019- April 2020	April 2020 -	April 2018- April 2019	April 2019- April 2020	April 2018- April 2019	April 2019- April 2020
Cabbage	120	197	210	22	27	31	22,520	24,970	675,600	749,100
Cauliflower	150	202	225	22	26	31	13,5050	15,311	4,72,675	612,440
Beans/peas	83	131	409	17	27	35	1,880	7,290	65,800	2,91,600
Other Vegetables	252	216	300	35	30	35	26,658	21,150	9,33,030	8,46,000
Total	252	216	409	35	30	35	64,563	68,721	2,147,105	2,499,140
Average	–	–		–	–		256	318	8,520	11,570

Note: Records obtained from cooperatives.

Income from Potato Cultivation



Potato cultivation at Sikre village of Lishankhupakhar Rural Municipality, Ward No. 4. Photo: Kaushila Rai/LI-BIRD.

In accordance to the geographical context, potato is mostly consumed as a staple food, as a vegetable or as a cash crop for the farmers in Nepal, which is also true for farmers in Sindhupalchok. Having tastier and healthier potatoes compared to Terai, the farmers in high hills of Sindhupalchok have been earning income through potato cultivation since generations, and Kathmandu has always been a huge market for the farmers in Sindhupalchok. However, these farmers have been cultivating the same variety of potato for many years and the technique for potato cultivation hasn't improved much. Thus, the farmers realized that their potato production had been degrading over time. Finding a proper market for the potatoes was never a problem for them as middleman would come to the farmer's houses to buy potatoes. But even when retailers came to their place, the value of potato fetched lot less compared to the market price of Kathmandu.

To address such issues faced by the farmers of Lisankhupakhar Ward No. 3 and 4, LI-BIRD, firstly, provided training to 37 farmers on technologies on potato cultivation in collaboration with Potato Development Centre, Nigaale. Likewise, in the second year, LI-BIRD conducted training on the selection of quality seed and production technology, with participation of 17 members, including 9 women.

In order to increase the varietal diversity in the project area, released/registered and pipeline varieties of potato such as Janakdev, MS 42, Khumal Laxmi and Laynthe were tested. These varieties were compared to local Rojitha variety, which was being cultivated for many years. Even though the new varieties were better, the farmers still preferred Rojitha as some of the newer varieties were perceived white or less tasty.

As an effort to produce quality seeds of potato, pre-basic seeds of Kufri Jyoti, Khumal Upahar and Khumal Ujjwal in 2016 were obtained from Potato Development Centre, Nigale. Eight farmers of Chiple and Tamche grew these seeds and produced 368 kg seeds. In 2020, 1,600 kg seeds have been produced but the seeds will only be used for potato production for consumption in 2022. These activities have helped the farmers to gain knowledge on quality potato seed (tuber) production technology.

Facilitation for potato marketing

Even though there wasn't problem in finding a proper market for potatoes, the farmers found it difficult to sell them at a good market price. From 2019, the women farmer's group of Tamche started collecting potatoes in collection centre and sold them to Kathmandu instead of selling them to the middlemen at the community who used to buy them in their village. Likewise, Sikre Collection Centre has also started to collect and market potatoes, and Hrisyango Agriculture Cooperative is also



Farmers at Tamche village harvesting potato (left) and the potato ready to send to market at the collection center at Tamche (right). Photo: Kaushila Rai/LI-BIRD.

following the same. With the effort of this project, 457-tons potatoes were sold in 2019, and 232 tons in 2020 till August (Table 7). As a result of this initiative, farmers are quite encouraged as they can now sell their potatoes at a reasonable price.

Table 7: The Support and progress on group marketing of potato

Group/Cooperative, address	Details of support	Sales of potato (April 2019-April 2020)			Potato sales (April 2020-)		
		No. of farmers	Amount (ton)	Income (NPR)	No. of Farmers	Amount (ton)	Income (NPR)
Panchakanya Women Farmer's Group, Tamche	Weighing machine, Packaging sack, net and tag	31	120	27,60,000	31	91	3,639,808
Potato Pocket Programme Organizing Committee, Sikre	Weighing machine, packaging sack	96	280	7,620,000	96	69	6,896,900
Hrisyango Agriculture Cooperative Ltd., Wafal	Weighing machine, packaging sack	31	57	1,368,000	31	72	2,880,000
Total		158	457	11,748,000	158	232	13,416,709

Potato sales record up to mid August 2020.

Mushroom Cultivation for Making Money



Mushroom cultivation promoted by LI-BIRD in the project area. Photo: Nir Bahadur BK/LI-BIRD.

The practice of mushroom cultivation has recently increased in Nepal because it can be cultivated in a short period with a minimum investment in a small area and can be quite profitable, hence attracting smallholder farmers. LI-BIRD has encouraged the trend by providing technical support, mushroom spawns and other necessary materials. Through the ESRS project, five farmers are involved in Shitake mushroom cultivation and seven in oyster mushroom cultivation. Four farmers were able to earn some profit from Shitake mushroom in the first year and are expecting more profit in the coming years. While the farmers cultivating oyster mushroom were able to earn decent profit in the first year but could not continue their cultivation in the second year due to the Covid-19 affecting the supply of spawn.

Table 8: LI-BIRD's support and facilitation for mushroom cultivation and it's early achievement details

Type of mushroom	Community/Tole	Support detail	No. of farmers	Quantity (Logs, packets)	First year result		
					Production (kg)	Sales (kg)	Income (kg)
Shitake	Dumran, Naargaun, Chyauji, Dovan, Simpaal	Spawn: 175 kg Black plastic: 4 rolls, Drill machine: 5 no., Inoculation machine: 2 no., Inoculation tool: 3 no., Wax: 32.5 kg, Hygro metre: 2 no., and 3-day training	5	990 logs	140 (4)	92 (3)	46,000 (3)
Oyster	Lishankhu, Usatpa, Bhandang, Golang, Gyangdanda, Chiple	Spawn: 100 kg Black plastic: 6 rolls and 2-day training	7	334 packets	450 (7)	404 (7)	90,900 (7)
Total			12		590	496	336,900

Note: The data in the parenthesis indicate the number of farmers.



Shitake mushroom promoted by ESRS project. Photo: Nir Bahadur BK/LI-BIRD.

Booming Goat Rearing



Dil Kumari Shakya, a goat rearing farmer from Lishankhupakhar Rural Municipality, Ward No. 4.
Photo: Kausila Rai/LI-BIRD

Most of the farmers in Lishankhupakhar are involved in goat rearing as it is easy to rear in less investment with comparatively less issues in finding proper market. The household survey conducted by the ESRS project at the beginning in Ward No. 2, 3 and 4 revealed that 247 households (83%) out of 296 reported having at least one goat. Additionally, the survey showed yearly household earning of NPR 14,000, the value of stock goats of NPR 19,000 and six goats per household on an average. Though the income from goat was not much, it was one of the regular sources of income of smallholder farmers. There was a huge scope for improvement of goat rearing practices as farmers were not following proper care and management practices. In order to support goat rearing, the project carried out the following activities in phased approach.

Problem identification

Even though majority of the households reported having goats, farmers faced several issues such as lack of quality breeding buck, the prevalence of internal and external parasites, PPR disease, and lack of quality fodder and forage. The goat rearing farmers also expressed the problem of goat shed and lack of animal health-related services. Thus, keeping these issues in mind, ESRS project designed and implemented several activities.

Training and capacity building

Despite having enormous potentiality, the farmers of Lishankhupakhar were not able to commercialize goat rearing due to lack of basic knowledge on goat rearing. Thus, in 2018, LI-BIRD organized two-day basic goat rearing training to 89 farmers in 11 farmer's groups including 37 women. In 2019, another two-day training was organized to the 83 farmers as refresher. The courses included selection of goat breed, management of shed, fodder, forage, feed, identification and treatment of diseases and parasites, improvement of breed, etc. Additionally, commercially oriented 10 farmers were taken to an exposure visit to Bandipur Goat Research Centre at Bandipur, Tanahun and Thapa United Agriculture Farm at Aanbu Khareni in the same district. This exposure visit helped the farmers to experience different perspectives of goat rearing and provided the opportunity to interact and learn from well-experienced experts and farmers, helping them gain practical knowledge. Thanks to the trainings and visits, the farmers started growing improved varieties of forage and fodder, constructing a proper shed, buying improved breeding buck on a cost-sharing basis of project and community.

Fodder and forage management

There is plenty of forest in Lishankhupakhar which can be used for grazing goats. There is also diversity of fodder in the farmer's field such as *Badahar*, *Kutmiro*, *Dudhilo*, *Banjh*, *Nimaro*, *Koralo*, *Jhiginai* etc. However, these fodders aren't nutritious to them and are often provided to cows and buffaloes. This issue was discussed during the training and nurseries were established for growing producing saplings of nutritious fodder and forage species. With support from the project, two farmers from Ward No. 2 and five farmers from Ward No. 4 produced 18,000 saplings of Ipil-Ipil, 2,500 saplings of Mulberry and 1,000 saplings of *Rakta Kamal*. Among them, about 50% saplings were utilised by participants themselves and the remaining were distributed to the other goat rearing farmers in the village. Additionally, *Mendola* (30 kg), *Seteria* (12,000 sets), *Paspalum* (2,500) and Signal Slip (4,500) were provided to 160 goat rearing farmers. The farmers observed that the Ipil-Ipil was difficult to protect as it was loved by wild animals as well.

Breed improvement

The improved breed is important to have optimum production and income from livestock. If the mother goat and buck are of quality breed, then their offspring also will become healthy and grow well in a short time. In recent days, the popularity of the Boer goat is increasing and goat keepers prefer to use Boer goat buck with local Khari goat as mother. Based on the demand of the farmers of Lishankhupakhar, LI-BIRD provided 6 Boer and 4 Australian Beetle goats to 10 farmer's groups benefiting 180 households. Out of the total cost of NPR 4,23,000, LI-BIRD supported NPR 3,17,000 while the groups contributed NPR 1,06,000. The kids of the cross between local Khari and Boer were observed to be healthier, more attractive, had more weight and grew comparatively faster in a short period of time, and the farmers demanded crossing local breed with improved breeding bucks.

Shed improvement

Even though the majority of the farmers in Lishankhupakhar rear goats, majority of them did not have well-managed shed due to which the growth of the goats was not satisfactory and hampered expected income of the farmers. Thus, LI-BIRD supported NPR 25,000 to 30 farmers each (14 from Ward No. 2, 13 from Ward No. 3 and 3 from Ward No. 4) to build improved goat shed, where each farmer invested around NPR 35,000 themselves. The farmers of Lishankhupakhar have 12 goats on average ranging from 6 to 27 goats each and after improving the shed, the farmers have been able to take good care of their goats and it has been easier to provide fodder and feed to their goats. This has made them realize the importance of a proper shed and improved the goat rearing business in Lishankhupakhar.

Insurance

The goats have risk of suffering from PPR disease as well as internal and external parasites, which may cause death in some cases. This has resulted in the death of one or two goats or sometimes all the goats in a shed. Even though the farmers are made aware of these problems through training, they also need to do the insurance of their goats through the insurance programme initiated by the Nepal Government. Keeping that in mind, LI-BIRD facilitated and supported 144 goat farmers (66 from Ward No. 2, 78 from Ward No. 3) to provide insurance of 551 goats for the first time. LI-BIRD contributed to the insurance cost of NPR 86,710 (NPR 157 per goat) and the farmers contributed to the insurance cost of NPR 15,295 in total. The total value of 551 goats is NPR 59,57,000.

Table 9: Details of activities relating goat rearing

Participating group and address	Number of participating households					Number of improved variety of goat
	Training	Visit	Cattle shed construction	Seedling of grass	Insurance	
Ward No. 2: Chyauji Goat Rearing Group, Lishankhu Goat Rearing Group, Ujjwal Goat Rearing Group	35	4	14	56	66	3
Ward No. 3: Chiple Goat Rearing Group, Bhakti Goat Rearing Group, Ekata Goat Rearing Group	29	2	13	40	78	4
Ward No. 4: Laligurans Women's Group, Laligurans Goat Rearing Group, Women Agriculture Goat Rearing Group	25	4	3	64		3
Total	89	10	30	160	144	10

Poultry Farming



A poultry brooding center supported by the ESRS project at Lishankhupakhar Rural Municipality, Ward No. 4.
Photo: Nir Bahadur BK/LI-BIRD

Local poultry is an integral part of Nepalese rural life. Chickens are commonly consumed by Nepalese people on several occasions except by Hindi priest and brahmin ethnic group. As chickens are easier to rear, require less efforts and can be easily sold, it is quite popular in Nepal. However, due to soaring popularity of broilers and layers commercially in the villages, local poultry farming has been affected by it. Time and again, the poultry shed becomes empty due to cholera and sometimes the whole village becomes poultry less. That's why instead of consuming local *Sakini* chicken, villagers choose broilers and layers as it is easily available even in the villages. But, the demand of *Sakini* hasn't decreased yet. Due to *Sakini*'s scarcity, ESRS project promoted Australorp (quite similar looking to *Sakini*) and Giriraj. According to experts, these two breeds require the same feed and nutrition as required by *Sakini*, and have equal resistance to diseases unlike broilers and layers who require a large quantity of medicines and vitamins.

In order to expand Australorp poultry farming in Lishankhupakhar, the one-day-old chick was procured from Bhaktapur's Hatchery to Purna Bahadur Lama of Ward No. 3, Wafal, and Buddha Lama of Ward No. 4, Attarpur, for running a brooding centre. The project supported them with 14-day training and some materials to run the brooding centre. The first lot of chicks were brought in

January 2019, and by now Purna Bahadur Lama has nurtured and sold 10,000 chicks in 21 lots, while Buddha Lama has nurtured and sold 900 chicks in two lots. They had been doing well in this business but were quite affected by the lockdown caused by COVID 19.

Likewise, 24 poor families were supported with poultry farming training for an income-generating programme and were provided chicks of Giriraj and Australorp breed which was brooded for 28 days. Based on their capacities, they were provided with 542 chicks (6 to 50 for each member), in which some were provided completely free of cost, while others were provided with 50% to 75% grants depending upon the capacity of the members. Among them, 400 chickens were sold, 109 were used for home consumption, while 33 chickens died, with a total earning of NPR 485,050 (an average of NPR 20,000 per household).

Table 10: Summary of poultry promotion activities

Activity	Address of the activity	No. of participating farmers	Breed of chicken	Support provided by the project	Total chick production
Brooding Centre	Wafal	1	Giriraj	<ul style="list-style-type: none"> Brooding training: 14 days Materials: Hoover- 2, Heater- 2, Feeder Pot- 10 	10,200 (15 Jan 2019 to 12 April 2020)
Brooding Centre	Attarpur	1	Australorp	<ul style="list-style-type: none"> Brooding training: 14 days 300 of one-day chick 	900 (13 Feb 2019 to 16 July 2019)
Distribution of Chicks	Wafal, Sankhor, Langma, Chiple and Sundastole	21	Giriraj and Australorp	<ul style="list-style-type: none"> 542 of 28-day chick Two-day training 	-

Enhancing Social Resilience



Participants of the LDCRP preparation meeting at Lishankhupakhar Rural Municipality, Ward No. 2.
Photo: Nir Bahadur BK/LI-BIRD

The scope of social resilience is wide and can't be completed through one- or two-year's project. In this case, social resilience has been defined as the preparedness of the communities to avoid or manage future disasters and in occurrence of disasters, it develops an efficient network to receive support and reliefs. Thus, the project focused on the Ward level/Rural Municipality level Disaster Relief Plan Development and Execution. The project's activities and efforts on building social resilience are presented below.

Preparation of Climate Change Adaptation Plan

After the introduction of federalism and three-tier government structure in Nepal, Disaster Risk Reduction and Management Act, 2074 and Local Disaster and Climate Resilience Plan Guidelines 2074 were implemented. This Act and Guidelines have provided direction to develop and execute Local Disaster Climate Change Resilience Plan from Federal to local level. Based on this guidelines,

LI-BIRD collaborated with Lishankhupakhar Rural Municipality to develop 17 Community Disaster and Climate Change Resilience Plans at Ward No. 2, 3 and 4, and incorporated them with Ward level 'Local Disaster and Climate Resilience Plan', and facilitated to prepare Rural Municipality's 'Local Disaster and Climate Resilience Plan', which included all seven wards of the Lishankhupakhar Rural Municipality (Table 11).

Table 11: Community disaster and climate resilience plans prepared with facilitation of LI-BIRD

Area, ward and community where community disaster and climate resilience plan were developed	Major disasters and climate change impacts by geographical location
Lishankhupakhar Rural Municipality	Landslide, lightning, electric shock, wild animals, flood, wind, drought, outbreak of disease and insects in Crops
Ward No. 2: Golang, Dovan, Naar Gaun, Dardim, Sarghang, Hrisyango, Usatpa	Landslide, lightning, electric shock, wild animals, flood, outbreak of disease and insects in crops, wind, drought
Ward No. 3: Aalod, Chiple, Ghichet, Usidum, Gogane	Landslide, lightning, wild animals, electric shock, fire, outbreak of disease and insects in crops
Ward No. 4: Maane Danda, Bulbul Panchet, Sanjha ban, Saramthali, Sikre, Tamche	Landslide, outbreak of disease and insects in crops, outbreak of diseases in livestock, wild animals, drought, lightning, fire, wind and erosion

Source: Local Disaster and Climate Resilience Plan at Rural Municipality, Ward and Community levels developed in 2019.

Disaster-affected families benefitting from disaster management fund

In order to support the disaster-affected communities, 'Disaster Management Fund' was established by the Lishankhupakhar Rural Municipality in FY 2018/19 based on Local Disaster and Climate Resilience Plan Guideline 2074. In the first year, the Rural Municipality contributed NPR 1,550,000 while LI-BIRD contributed NPR 850,000. In FY 2019/20, the Rural Municipality contributed an additional amount to bring the total amount to NPR 50,00,000. A guideline has been developed to manage the fund, to support disaster-affected people, families and community. Table 12 presents the details of the support provided by the Municipality using the fund to various wards in FY 2019-20.

Table 12: Details of the beneficiary persons, family and community supported by the Disaster Relief Fund in FY 2019-20

Ward No.	Community	Main disaster/problem faced by the community/people	No. of beneficiary households	Details of the support received	Condition after the support
1	Thulo Dhading	Kidney fail	1	NPR 30,000	Treatment in progress
2	Dovan	Kidney fail	1	NPR 30,000	Treatment in progress
4	Tamche	Two water pumps were destroyed by lightning	33	NPR 1,69,500 support for water pump	A water pump was bought which has made the water supply easier.
5	Ghyang danda	Death due to bus accident	1	NPR 50,000 for final rites	Funeral rites and rituals was conducted.
5	Newar Gaun	Urinary bladder Cancer	1	NPR 30,000 for treatment	On-going treatment in Kathmandu
7	Thulo Pakhar	Landslide damaged the land adjoining the house, affecting the house itself.	4	NPR 75,000 support	The damaged walls are completely renovated.
	Singer Danda	Fire in house	1	1 Canvas and NPR 44,000	Since the fire destroyed all materials, food and clothes were bought.
	Thulo Pakhar	Transplant of heart valve	1	NPR 30,000 for treatment	Heart surgery was done and the patient is healthy.
	Siran Tole	Intestinal cancer	1	NPR 30,000 for treatment	After treatment, the person is healthy now.
	Danda Pakhar	Buffalo died unable to give birth.	1	NPR 15,000 for buying buffalo	A buffalo was bought
Total			45		

Testing of Soil and Using Agri-lime



Agri-lime distribution programme witnessed by the Chef Executive Officer of the Lishankhupakhar Rural Municipality.
Photo: Kaushila Rai/LI-BIRD.

One of the major issues in agriculture is mentioned as 'no soil testing' by the farmers most of the time. Farmers of the ESRS project area and the Municipality authority also raised this concern with the project team. Based on the demands of the farmers of Ward No. 2, 3 and 4 of, these three wards were divided into 23 blocks, from which four samples were collected from each block. The collected samples were individually tested for pH level/acidity, and amount of important nutrients, viz. Nitrogen, Phosphorus, Potassium and Organic matters. The result of the test is presented in Table 13.

The result shows that the soil of the majority of the places was highly acidic. Generally, soil of pH level 6 to 7 is favourable for the crop. But average pH level of the samples of Lishankhupakhar was found to be 4.5. Likewise, the Phosphorus level in the soil was found to be below the amount that is necessary for most of the places except Usatpa and Ninjel. Likewise, the majority of the places contained less amount of organic matters. However, there was a satisfactory amount of Nitrogen and Potassium in the majority of the places.

The result showed the necessity to use lime in order to improve the soil pH level, and cow dung and compost manure to increase phosphorus and organic matters in the soil. The farmers using the chemical fertilizers could use D.A.P. to increase the quantity of Phosphorus. However, it is very important to consult agriculture expert/technicians to apply the right amount of agricultural lime or D.A.P. in the soil.

Table 13: Soil test result of soil samples collected from various locations of Lishankhupakhar

Sample collected locations		Soil pH	State of main minerals			
Ward No.	Area/Community		Organic matters (%)	Nitrogen (%)	Phosphorus (mg per kg)	Potassium (mg per kg)
2	Mane Danda	4.14	1.23	0.13	15.13	65.26
2	Nardim	4.36	2.13	0.20	18.74	78.46
2	Golang	4.71	2.21	0.18	16.15	82.21
2	Nar Gaun	4.34	2.35	0.19	2.72	156.75
2	Dhupi Chaur	4.78	1.65	0.11	2.86	198.16
2	Chyauji	4.85	0.87	0.08	14.58	40.41
2	Patlang	4.58	3.05	0.25	12.96	69.78
2	Dovan	4.47	1.52	0.12	13.90	39.13
2	Usatpa	4.82	1.59	0.10	44.15	99.01
2	Tothi	4.67	2.41	0.20	6.68	87.15
3	Wafal	4.73	1.96	0.12	13.08	97.70
3	Chiple	4.81	2.74	0.25	8.26	80.39
3	Ghichet	4.48	1.19	0.18	1.35	90.36
3	Sajha ban A	4.56	1.88	0.17	4.05	98.04
3	Sajha ban B	4.58	0.94	0.13	4.09	86.26
4	Attarpur	4.43	0.89	0.18	4.27	133.94
4	Ninjel	4.47	1.05	0.20	22.26	85.76
4	Sikre A	5.07	2.13	0.28	9.10	122.10
4	Sikre B	4.97	1.79	0.29	3.39	236.10
4	Tamche	5.07	4.30	0.36	5.46	127.43
4	Piu Kharka	4.59	2.66	0.27	5.40	120.37
4	Pangchet	4.81	2.93	0.29	2.99	150.46
4	Saambet	4.98	3.62	0.36	10.47	155.46
Normal range		6 to 8	4 to 8	0.15 to 0.3	141 to 280	127 to 173

Note: Four samples were collected from each location and the result is the average of the different tests.

The result of the collected samples helped to guide LI-BIRD and Rural Municipality. Focused on the same, LI-BIRD worked on creating awareness to the farmers of the affected areas and organized agriculture lime distribution activity in collaboration with the Rural Municipality, in which the Rural Municipality contributed NPR 2,50,000 and LI-BIRD contributed NPR 3,00,000 to buy 60,000 kg of agriculture lime which was distributed to 673 farmers at the rate of 80 kg per *Ropani* (500 sqm) of land. The lime was used in 750 *Ropanies* (Table 14).

Use of agri-lime and its result

The amount of lime to be used in the field depends on the level of soil pH of the field and the crops to be planted after the appliance of the lime. Since it is difficult for farmers to calculate the right amount of the lime, it is recommended to use 80 kg lime per 500 sqm of land for two years. On this basis, the lime was distributed to 673 farmers in December 2019. Since the pH level of the soil were almost same across the locations, the farmers were recommended the amount of lime to be used and were suggested to cultivate vegetables and potatoes. Farmers used the lime and mixed it properly by ploughing after application 15 to 21 days prior to planting crops. It was observed that the soil was loose and fertile after the use of lime.

Table 14: Details of use of agricultural-lime in Ward No. 2, 3 and 4 of Lishankhupakhar

Area where Lime was used		Details of use of ari-lime		
Ward No.	Area/community	No. of farmers	Amount of lime (kg)	Area of the land (<i>ropani</i>)
2	Maane Danda	46	1430	17.9
2	Nardim	18	405	5.1
2	Golang	19	800	10.0
2	Naar Gaun	31	620	7.8
2	Dhupi Chaur	17	281	3.5
2	Chyauji	19	850	10.6
2	Putlang	10	880	11.0
2	Dovan	25	2720	34
2	Usatpa	20	495	6.2
2	Tothi	28	2645	33.1
3	Bafal	86	1859	23.2
3	Chiple	29	3275	40.9
3	Ghichet	31	1530	19.1
3	Sajha ban A	13	1040	13.0
3	Sajha ban B	26	2240	28.0

4	Attarpur	25	3000	37.5
4	Ninjel	14	800	10.0
4	Sikre A	39	9790	122.4
4	Sikre B	16	2750	34.4
4	Taamche	30	4900	61.3
4	Piukharka	29	4400	11.0
4	Pangchet	66	9370	117.1
4	Lamatole	36	3920	49.0
Total		673	60,000	750

Note: 1 ropani = 500 sqm.

The soil test and use of agricultural lime was a unique experience for the farmers of Lishankhupakhar. They were excited about the experience, which is detailed in Table 15.

Table 15: Farmers' experience with the use of agri-lime

Farmer using Lime	Remark
Bhola Ghyamcho Lama Ward No. 2, Dumran	This lime was an amazing thing. After the use, I didn't have to crush heaps of soil, and the maize grew really well. The inter-cultural operation was so easy.
Shanka Lal Tamang Ward No. 3, Chiple	Using agri-lime, the soil became fertile and loose, and the production of potato also increased.
Dawa Dorje Tamang Ward No. 4, Panchet	After using lime, I have realized that the soil gets loose and fertile, and it's easier to plough. The soil not using lime is hard. The maize grown in soil used lime turned green while the ones not used turned yellow. The production also increased by almost double.
Kamala Shrestha Ward No. 4, Tamche	The potato grown in soil that using lime was a lot better and require less effort for weeding and earthing up. I found that it's necessary to use lime and so I have planned to use the lime in remaining land as well.

Protection and Use of Water Sources



Donor representative and LI-BIRD staff observing water resource protection activity at Lishankhupakhar Rural Municipality, ward No. 2, Dumrang. Photo: Pitambar Shrestha/LI-BIRD

Sindhupalchok district has always been rich in water resource but due to the earthquake in 2015, the small sources have been affected, and traditional water sources are drying up. The scarcity of water has affected the lives of people and livestock causing majority of farmers to rely on rainwater for agriculture. There is not much hope for bigger and sustainable plans to manage water in local level from the government and other agencies yet. For the time being, the primary focus of the locals has been to clean, conserve and use the water sources nearby the villages and use water from small streams nearby through the means of pipes.

While drafting the Local Disaster and Climate Resilience Plan (LDCRP) in Lishankhupakhar Ward No. 2, 3 and 4, there was the demand for water source conservation and small irrigation management which were listed in the Community Disaster and Climate Resilience Plan (CDCRP) at community and ward level. But, the ESRS project didn't have enough resources to execute all the plans. So, after discussion with community and ward level committees, five plans were executed on priority basis. Among them, three activities were conducted in collaboration with the Ward Office. After the completion of this plan, 129 households are now benefitted from it. It has also become easier for the community to cultivate vegetable, rice and fruits in more than 300 *ropani* of land. In many places, access to drinking water for locals and cattle has also been possible.

Table 16: Details of small irrigation plan completed by collaborative efforts of LI-BIRD, Ward Office and community in Ward No. 2, 3 and 4 of Lishankhupakhar.

S. N.	Plan	Address	Total budget in NPR				No. of beneficiary households	Main use of water
			Rural municipality	LI-BIRD	Community	Total		
1	Dumraan Small Irrigation Plan	Dumran, Ward No. 2	135,000	70,000	15,000	220,000	22	Vegetable cultivation and rice bed in 120 <i>ropani</i>
2	Jimmlal Ghat-takhola Small Irrigation Plan	Ward No. 3, Langma	91,800	60,000	27,441	179,241	15	Rice, vegetable and potato cultivation in 60 <i>ropani</i>
3	Lambu khola Small Irrigation Plan	Wafal, Ward No. 3	–	72,250	64,855	137,105	24	Rice, vegetable and potato cultivation in 50 <i>ropani</i>
4	Sotre Khola Water Source Conservation Plan	Bulbul, Ward No. 4	70,000	40,000	10,500	120,500	50	Easy access to drinking water, use in home garden
5	Ghale Danda Small Irrigation Plan	Sikre, Ward No. 4	–	99,496	170,781	270,277	18	Cultivation of kiwi fruit and vegetable in 80 <i>ropani</i>
Total			296,800 (32%)	341,746 (37%)	288,577 (31%)	914,873 (100%)	129	

Note: 1 *ropani* = 500 *sqm*.

Plastic Pond



Plastic pond constructed at Lishankhupakhar Ward No. 3 with funding support from ESRS project.
Photo: Pitambar Shrestha/LI-BIRD.

Another alternative approach to manage water for the farmers of Lishankhupakhar was to construct a pond to collect wasted water or rainwater. For that purpose, LI-BIRD collaborated with the community to establish seven plastic ponds, which now serves 111 households in Ward No. 2, 3 and 4. With this effort, it has been convenient to manage drinking water, use water for the cattle and in the irrigation of home garden. These ponds were established with the recommendation of Community Disaster and Climate Resilience Committee.

Table 17: Details of plastic ponds established by collaborative efforts of LI-BIRD and community of Ward No. 2, 3 and 4 of Lisankhupakhar.

S.N.	Location and no. of the pond	Total budget in NPR			No. of beneficiary households	Main use of water
		LI-BIRD	Community	Total		
1	Dovan Ward No.2 (1)	25,000	15,000	40,000	10	Irrigation for fruit and vegetable cultivation
2	Ghareti Ward No. 3 (1)	25,000	27,000	52,000	9	Drinking water for livestock, management of home garden
3	Chiple Ward No. 3 (2)	60,000	50,000	110,000	14	Production of potato and fresh vegetables
4	Tamche Ward No. 4 (2)	60,000	60,000	120,000	60	Vegetable cultivation and drinking water for livestock
5	Sikre Ward No. 4 (1)	18,509	15,000	33,509	18	Irrigation for fruit and vegetable cultivation
Total	7	188,509	167,000	355,009	111	

According to Som Bahadur Lama (one of the users), nine farmers have grown 10 Muri (approx. 720 kg) potatoes after the establishment of plastic pond and also been able to cultivate vegetables for home consumption during the dry months. Before the intervention of the project, they had never cultivated winter potato.

Located at an altitude of approx. 2,100 m above sea level, Chiple village has water source enough only for drinking water. Even though the land is fertile, the farmers were unable to cultivate anything other than potato and mustard. After the establishment of two plastic ponds, 14 households have been able to save expense of buying vegetables by cultivating cauliflower, cabbage and broad leaf mustard.

According to Tamche's farmer Fattalal Shrestha, water was lifted from 200 m below to the village located 2,200 m above sea level. With the construction of plastic pond, it has been easier for the villagers to use waste water and rain water, helping them grow vegetables in 100 *ropani* land, and also for cultivating kiwi fruit.

Collaboration with Cooperatives



A meeting between donor representative, project team and Harisiddhi Women Saving and Credit Cooperative.
Photo: Kaushila Rai/LI-BIRD.

Cooperative or community-based organizations play an important role in bringing social and economic resilience in a community. It helps to develop a community from the grassroot level. When a community member becomes a member of a cooperative/organizations, they are provided with an opportunity to actively participate in cooperative/organization-related activities, helping them develop their skills, capacity and capability, also contributing towards the economic and social development. However, to be able to do so in sustainable way, the organization needs to be strong and positive and be guided by good governance, legislation, policy, rules and directives.

One of the objectives of Economic and Social Resilience Project was to develop cooperative-based value chains of agricultural produce. Hence, after analysing the capacity of available cooperatives, the project selected United Multipurpose Cooperative Ltd. at Ward No. 2, Hrisyango Agriculture Cooperative Ltd. at Ward No. 3 and Harisiddhi Women Saving and Credit Cooperative Ltd. at Ward No. 4. The project then conducted some project activities through these cooperatives. Likewise, the project also analysed the governance of the cooperatives to improve their organizational capacity.

Based on the analysis, different activities were conducted to improve the good governance of the cooperatives. The result of the changes found in those organizations are presented below.

Table 18: Governance and internal control system of cooperatives before and after

Name of the cooperative	Condition of the cooperative before the project intervention	Condition of the cooperative after the project intervention
United Multi-Purpose Cooperative Ltd., Ward No. 2, Lishankhupakhar (Female: 397, Male: 168, Total: 565)	<ul style="list-style-type: none"> • No. of Members: 315 • Financial and Administrative, and Credit Policy, only • Auditor selected by Management Committee • Details of Financial transaction done hand-written in Register • Account not used as by the rule of cooperative • Not Started agriculture related activities • Not quite active in establishing and mobilizing farmer's group • No business plan 	<ul style="list-style-type: none"> • No. of Members: 565 • Administration, Financial Management, Credit Policy, Saving Policy, Member Service Policy, General Assembly, Shareholders Policy, Election Policy, Risk Management Policy • Auditor selected by the General Assembly • Documentation of Financial Details in a Software • Use of Account • Start of Agricultural activities such as Seed Selling • Initiation of establishment and mobilization of farmer's group • Development of Cooperative business Plan

<p>Hrisyango Agriculture Cooperative Ltd., Ward No. 3, Bafal</p> <p>(Female: 103, Male: 95, Total: 198)</p>	<ul style="list-style-type: none"> • No. of Members: 114 • Only the cooperative act; no other policies • Auditor selected by Management Committee • Details of Financial transaction done hand-written in Register • Account not used as by the rule of Co-operative • Activities only limited to Savings and Credit • No business plans • No Bank Account • No Manager • Financial transaction done by Treasurer 	<ul style="list-style-type: none"> • No. of Members: 118 • Administration, Financial Management, Credit Policy, Saving Policy, Member Service Policy, General Assembly, Shareholders Policy, Election Policy, Risk Management Policy • Auditor selected by the General Assembly • Documentation of Financial Details in a Software • Use of Account as per the standard practice of cooperative, • Initiation of investment in agricultural sector and involved with farmer's group • Collaboration with Rural Municipality and organizations for agriculture materials distribution and agriculture produce marketing • Developed business plan • Started transaction in a bank • Manager has been recruited and now works under cooperative policies
<p>Harsiddhi Women Saving and Credit Cooperative Ltd., Ward No. 4, Attarpur</p> <p>(Female: 316)</p>	<ul style="list-style-type: none"> • No. of Members: 310 • Irregular Annual General Meeting • No Annual budget and financial plans • Selection of Auditor not according to the rules • No use of Char account • No commercial plan • No involvement in marketing agriculture produces 	<ul style="list-style-type: none"> • No. of Members: 316 • Start of regular Annual General Meeting; Change in Management Committee after a long time • Development of Annual Budget and financial plans • Auditor selected in General assembly • Use of account as prescribed for cooperative • Development of business plan • Marketing of agriculture produces

Experience, Lessons Learned and Challenges

Obviously, it is challenging for non-governmental organizations with limited resources to work in places like Sindhupalchok district, where the impact of the earthquake has been tremendous. During the project phase, many of the already desperate quake affected families had to wait a lot of their time to reconstruct their houses and the lengthy and demanding bureaucratic process for claiming their compensation with the government was adding up to their anxiety. A lot of their young family members were either abroad or in Kathmandu in search of jobs and better livelihood which meant the remaining ones were often too occupied with their domestic chores. Furthermore, in a scenario where these communities had been distributed with various relief materials by various agencies, both governmental and NGOs, in the aftermath of the disaster, the majority of local people seemed to be expecting continued such material support making it necessary but also quite tricky to convince them to invest such support in sustainable income-generating activities. This mind-set intertwined with the fact that a huge segment of the community actually hailed from a poor financial background made it difficult to persuade them to contribute either cash/kind or their participation in the project-related activities. Similarly, the agriculture technicians working for the project had to go to several working areas/farmer's home by foot, which really affected the pace of the work, and a lot of time was spent on getting things done. There was also the pressure and constraint to be extra efficient in achieving project goals because of the situation created by Covid-19. Despite these challenges, the project team has been successful in achieving the overall project goals. The following are the main lessons learned from the project:

Improved vegetable cultivation technologies and increased area

Before the start of 'Economic and Social Resilience' Project in Lishankhupakhar, a few farmers at Sikre and Tamche villages were involved in vegetable cultivation. They were selling their produces only in the nearby Shildhunga market or the cooperative. With the project implementation, there was an access to quality seeds, training and technical service at their doorsteps, which rapidly increased the number of farmers participating in vegetable cultivation. With the establishment of the collection centres by the project, and link with the market of Kathmandu, the vegetable produced at Lishankhupakhar is now sent directly to Kathmandu, which has greatly improved the



Mr. Wangel Lama of Lishankhupakhar Rural Municipality, Ward no. 2.
Photo: Nir Bahadur BK/LI-BIRD.

income of the farmers. The team also faced some challenges. The project implemented this activity in Ward No. 2, 3 and 4 of Lishankhupakhar Rural Municipality but experienced success as expected in Sikre, Tamche, Bulbule, Tamakhubari, Chiple and Panchet villages only. In other villages, there was an unavailability of adequate land suitable for vegetable, lack of human resource working in the vegetable fields, or an outbreak of red ants and white grub which affected the success.



Mr. and Mrs. Ek Bahadur Shrestha of Lishankhupakhar Rural Municipality, Ward No. 2. Photo: Shanti Jirel/LI-BIRD.

Growing number of goat

Due to the result of small efforts of the project to promote goat rearing, the small-scale farmers are actively pursuing goat rearing as a commercial profession. The number of goats in the shed of those farmers have gradually increased and along with it, their annual income as well. The participating farmers have developed fundamental knowledge and skills on goat rearing which has resulted to identification and promotion of nutritious grass for goats. There has been a significant improvement in goat shed management. The breed of goats has also become better after the distribution of improved breeding bucks. Likewise, there has been an introduction of

goat insurance. With this achievement, the lesson learned is that while conducting activities related to goat rearing or other livestock rearing among small farmers, it is necessary to incorporate several aspects as a package instead of just focusing on one aspect in order to succeed. Although the farmers have learned about several aspects of goat rearing through the project support, there are still challenges of internal and external parasites/other diseases, wildfire and wild animals that affect goat rearing.

Promotion of poultry

The project conducted some activities related to poultry farming with the aims of establishing some brooding centres, providing access to healthier chick to the interested farmers, and helping to improve income of the poultry farmers and the organizers of brooding centres. Three farmers were introduced to Giriraj and Australorp, which are identical to local Sakini and have similar taste, to run brooding centre. This helped improve the



Poultry brooding center supported by the ESRS project at Lishankhupakhar Rural Municipality, Ward No. 3. Photo: Nir Bahadur BK/LI-BIRD.

income of both the organizers of brooding centres as well as other poultry farmers. However, due to the demand of local broiler in the market, the brooding centres couldn't be continued as expected.



Oyster mushroom promoted by the ESRS project at Lishankhupakhar Rural Municipality, Ward No. 2.
Photo: Nir Bahadur BK/LI-BIRD.

Mushroom for making money

Mushroom cultivation, which was earlier limited and popular in urban areas only, is now slowly gaining popularity in villages as well. The project introduced mushroom cultivation to the village by providing spawn of Shiitake and Oyster (locally known as 'Kanye') mushrooms based on the demands of the farmers, and also conducted necessary trainings and provided materials for it. Even though it's done in small amount, farmers are regularly producing and selling Shiitake mushroom, and also the seasonal Kanye mushroom. It is important to understand that mushroom cultivation

not just helps improve the income of the farmers but also contributes towards improving family nutrition. Any kinds of farmers can produce mushroom provided that they give attention to the technical details. However, there is always the challenge of finding quality mushroom spawn.

Establishment and operation of collection centres

Farmers cultivating in small quantities are often discouraged by the hassle of selling their produces in the market. Small farmers have the similar problems of not being able to sell their produces in the village and to produce enough to sell in the big markets. The farmers of Lishankhupakhar also suffered from it. Thus, based on the demand of farmer's groups and cooperatives, the two collection centres, which were left incomplete, were completed by the project in collaboration with the Rural Municipality. Some of the farmers are now successful in producing fresh vegetables and potatoes to earn a better income. Yet, the work remains to encourage the farmers near



Vegetable collection center supported by the ESRS Project located at Sikre village.
Photo: Kaushila Rai/LI-BIRD.

collection centre to be involved in production in order to increase their income and improve their livelihood. Some middlemen who collect agricultural produces going door-to-door are affected by the establishment of collection centre, and they don't want such collection centres to run. Moreover, there are members of the collection centre who haven't yet understood the concept and sustainability of collection centres and still prefer dealing directly with the retailers. Finally and most importantly, there is a challenge of collection centre management issues, affecting the business. These learnings are important for the improvement of collection centres.



Members of Panchakanya Women Farmers' Group collecting vegetable at Tamche Collection Center. Photo: Kaushila Rai/LI-BIRD.

Collective marketing of agriculture produces

With the aim of increasing farmer's agricultural production and marketing them through the help of farmer's groups and cooperative, the project conducted various activities on vegetable cultivation, goat rearing, mushroom cultivation, poultry farming and potato cultivation to 35 farmer's groups. Even though there was satisfactory production at individual level from the farmers, the success rate from collective collection and marketing perspective wasn't as expected. Although there

were some activities of potato and vegetable collection and marketing, it didn't develop into a long-term activity. The main limiting factors are the short-term life of the project; the selected cooperatives still being in developmental phase as an organisation; the lack of trust of producing farmers towards cooperatives; and the already existing middlemen.

Collaboration between farmers, groups and cooperatives

If there is proper coordination between farmer's groups and cooperatives in a ward with other cooperatives in a Rural Municipality to collaborate, to produce and market agriculture products, it can help progress agriculture. However, the coordination is not always there between groups and cooperatives - and unfortunately there is as well unhelpful kind of



Project team assessing the capacity of Hrisyango Agriculture Cooperative. Photo: LI-BIRD Photobank.

politics involved. The activities of a group/cooperative are usually affected by the disharmony in the opinion, hampering the expected direction of the organization. During the project implementation, although three cooperatives were established, there were times when the farmer's groups and individual farmers conducted the activities themselves instead of through the cooperatives which affected the collaboration between the farmers, groups and cooperatives, hampered the impact and progress of the cooperatives.



Practical session of vegetable nursery establishment at Golang Farmers' group.
Photo: Nir Bahadur BK/LI-BIRD.

Use of agri-lime

If the soil is acidic, it is recommended to use lime. But it is difficult to know about the right amount of lime to use, the place to find the lime, its usage method and differences found after it's used. The farmers of Lishankhupakhar experienced various activities conducted around this by the project in collaboration with Lishankhupakhar Rural Municipality in Ward No. 2, 3 and 4. After the use of agricultural lime, the farmers found that the soil was loose making it easier for them to plough and for intercultural operation, which resulted in increase in production with the same amount

of manure and water, and management efforts made earlier. Since this was the first time LI-BIRD organized this kind of activity in a project, it plans to implement it in other places as well. However, there is the challenge of proper access to agricultural limes in many villages.

Water resource management and usage

In some places of Sindhupalchok, there is usual occurrence of natural disasters like flood and landslides due to excess water, while in other places of the district, water is scarce. Keeping that scarcity in mind, LI-BIRD provided support to conserve five water sources and construct small irrigations, which was the focus of Community Disaster and Climate Resilience Plan. This establishment made easier access to drinking water and irrigation possible to the people and livestock in many places. This has



A plastic pond constructed at Lishankhupakhar Rural Municipality, Ward No. 4.
Photo: Nir Bahadur BK/LI-BIRD.

also helped decrease the workload faced by the women and increase vegetable production. This suggests that if the agricultural project focus on water sources management in rural areas, then it helps in the success of the program. However, in many instances, after the end of the project, a lot of infrastructures built by the project are usually left unmanaged. The same fate might also be faced by the ones established by the project in Lishankhupakhar.



Preparation of CDCRP at Lishankhupakhar Rural Municipality, Ward No. 4, Chiple.
Photo: Kaushila Rai/LI-BIRD.

Collaboration between rural municipality and the project

LI-BIRD implements its every project in close collaboration and teamwork with local agencies. It was no exception in the Economic and Social Resilience Enhancement project. Teaming with the Rural Municipality, Community Disaster and Climate Resilience Plans were prepared in 17 communities and Local Disaster Resilience Plans were developed in three Wards. There was also a collaboration between LI-BIRD and Rural Municipality for establishing the Disaster Management Fund. Lishankhupakhar is one of the pioneering Rural Municipalities in Sindhupalchok

to establish Disaster Management Fund, which was established in February 2019 and has benefited 45 households till July 2020. Soil Testing and Agricultural lime usage and the repair and management of five water resources and small irrigations were also conducted in collaboration with Ward, Rural Municipality and the project. Even though the project and the Rural Municipality collaboration was for a short time, the impact of it will be long-term.

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