*International Research Journal of Social Sciences*_____ ISSN 2319–3565
Vol. **13(3),** 5-13, July **(2024)** *Int. Res. J. Social Sci.*

Impact of the COVID-19 Pandemic on the farming community of the Ilam District in Nepal

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Available online at: www.isca.in, www.isca.me
Received 13th March 2024, revised 6th May 2024, accepted 17th June 2024

Abstract

Socioeconomic impacts have increased due to public health crises in Nepal during the COVID-19 pandemic in Nepal. Lockdowns and travel restrictions have placed rural farming communities in unprecedented hardship. People who depend on growing and selling crops in Nepal's mountainous districts like Ilam are mostly under economic pressure due to disruptions in their product supply chains. Research Objective: To investigate the major challenges faced by farmers in the Ilam district who depend on cash crops growing and selling during the COVID-19 pandemic. Published articles on the impact of COVID-19 on agricultural production in Ilam were searched and reviewed. Data were collected through closed-ended questionnaires during field visits, supported by telephone interviews with respondents. The research methodology includes a systematic approach to review the literature, conduct field surveys, collect data, analyze information, and draw meaningful conclusions. COVID-19 has highlighted the importance of strengthening preparedness and adaptation capacity in rural areas. Developing contingency plans, diversifying crops, investing in low-carbon agriculture, and promoting sustainable agricultural practices can help communities better cope with shocks and uncertainties in the future.

Keywords: Cash crops, community, COVID-19, farming, Ilam, rural farming.

Introduction

The COVID-19 pandemic has caused disruptions in transportation and logistics, leading to difficulties in delivering agricultural supplies such as fertilizers, pesticides, and machinery to farmers in the Ilam district. This disturbance has affected crop yield and quality. Movement restrictions, infection fears, and containment measures have led to labor shortages in many agricultural areas, including Ilam. Commercial crops such as tea and cardamom often require a lot of labor for activities such as planting, pruning, and harvesting.

Lack of available labor and market access has led to reduced output and potential losses. Ilam district in the eastern mid-hills of Nepal. Most small farmers in the Ilam district own small plots of land and a small number of livestock. In addition to growing and processing orthodox tea, Ilam is also known for growing potatoes, producing milk, cardamom, ginger, broom, and small round chili. Panoramic views with greenery on the slopes of the region attract tourists.

The scope of the study is also to examine the impact of the pandemic on different sections of smallholder farmers in the Ilam district. Ilam district of Nepal is known for its agricultural activities, including the cultivation of various crops. Some of the major crops grown in the Ilam district include orthodox tea, cardamom, ginger, broom, and habanero (small round chili, locally known as Akbare khurasani). Ilam is also famous for milk production.

Literature review: Wasti et al. observed that farmers did not grow vegetables because they could not sell them at the market. They returned to growing grain. More than 16% of farmers reported not having enough labor to cultivate their land, and most affected farmers attributed this to movement restrictions due to COVID-19.

Some farmers prefer to cultivate their land with family labor or people from their village to respect social distancing rules rather than hiring day laborers from neighboring villages. Policies aimed at limiting the spread of COVID-19, combined with reduced travel during the pandemic, could negatively impact the harvests of already vulnerable smallholder farmers, and the situation could exacerbate food insecurity in the next agricultural season[1].

A report published in Khabarhub commercial crops are more popular among farmers in the Ilam district compared to the subsistence crops[2]. In addition to formal tea cultivation, Ilam is also famous for six major food crops non-food cash crops such as potatoes, cardamom, ginger, red pepper, and milk, and non-food crops such as broom that bring money to farming households.

Cardamom, tea, and ginger, once widely exported, saw a decline in the last financial year. Decreased production and problems in exports resulted in a decline in product sales to foreign countries, according to those observing the agriculture sector.

A report published in Everest Times, stated that cardamom prices have decreased. Birtamod, a commercial town in the Jhapa district situated in the plains, neighboring the Ilam district in the plains, sells large quantities of cardamom at 24,000 NPR (186 USD) per maund (37 kg)[3]. Cardamom/Mound was trading at Rs 26,000 ($201.55) on the same market just a week ago. Cardamom entrepreneurs say prices have dropped this year due to low demand for cardamom.

Cardamom is an important export crop classified as a spice. Its bark has a strong camphor flavor with a smoky character derived from the drying method. Originating in the Ilam district of Nepal, it extends from 765 m to 1,675 m above sea level among the hills of 51 districts of Nepal. More than 80,000 households are involved in growing and processing cardamom across Nepal. It is estimated that more than 6.44 billion tons of cardamom are produced on arable land spread over 16,000 hectares.

Nepal ranks first among the world's top three cardamom-producing countries with a market share of 52%. India (37% share), and Bhutan (11% share) are two other top-ranking countries in cardamom production. However, the productivity of cardamom in Nepal is 500 kg/ha, which is well below the world average. Productivity of the same in India is 2000 kg/ha[4].

Global ginger production in 2015 was estimated at 2,479,000 MT (MT), with India being the top ginger producer with 790,000 MT. Global ginger exports have increased by about 7% annually over the past nine years. China is the world's largest ginger exporter with a 72% market share. Nepal is the world's fourth largest ginger producer after India, China, and Indonesia, with an annual production of about 245,000 tons. The Department of Commerce ensures the effective implementation of NTIS by supporting the program. A trade body, the Nepal Ginger Producers and Traders Association (NGPTA) has received further support in terms of product diversification, international market access, capacity building, and political advocacy.

Participation in trade fairs and business-to-business meetings gives potential ginger exporters a presence in the international market. The spread of the new corona virus and the lockdown in Eastern Nepal have severely hindered the export of Nepalese agricultural products to India. Indian markets are closed during the peak export season due to the closure of border crossings between Nepal and India. April and May are the peak season for agricultural exports.

This time, the Indian market also slowed down due to a new variant of the corona virus. When problems arose in India, Nepalese agricultural products could not find a market and had to be delivered at lower prices. Not only cardamom but also ginger is no different. Harvesting of cardamom and other types of ginger is at its peak but production is almost zero[5].

Nepal is the world's third-largest producer of ginger. Nepali ginger is known to be organic and high quality because it is low in oil and fiber. Nepali ginger is mainly exported to India, but some exporters sell their products to Japan and the Arabian Peninsula. The United States, Britain, and Australia buy ginger from Nepal. In total, Nepal produces more than 250,000 tons of ginger, of which more than 50% of the total production is exported. It is estimated that about 200,000 households are involved in ginger production in Nepal. Geographical presence Ginger is produced in more than 65 districts of Nepal. Ilam, Jhapa, and Sindhupal chowk in eastern Nepal are some of the major ginger-producing regions in the country. Non-tariff parameters India is the largest importer of ginger from Nepal[6].

Recently, additional efforts have been made to build the capacity of ginger producers in eastern Nepal, including the Ilam district. A project, namely, Ginger Competitiveness Project - Strengthening Sanitary and Phytosanitary Capacity for Nepal's Ginger Exports through Public-Private Partnership, with a total cost of USD 1,173,694, was implemented in Eastern Nepal and focused on poverty alleviation in the Ilam district and the Panchthar district by enhancing ginger development. It will improve the value chain and facilitate public-private cooperation to improve the quality and added value of exported ginger, thereby helping reduce poverty for 4,000 households in the project area[7].

In a research paper on the technical efficiency of ginger production on a sample of 100 ginger producers in the Ilam district Khatiwada & Yadav mentioned that the average technical efficiency was 67.8%, which showed that ginger produced in Ilam was effective enough[8]. This reflected that efficiency can be improved by addressing the variables. The coefficient is positive for seeds and studies show that ginger production is positively elastic with changes in inputs.

Therefore, farmers should be encouraged to increase the number of seeds and fertilizers like Farmyard Manure (FYM) to improve productivity. This could be achieved by providing easy access to quality seeds through subsidies and providing training on how to make FYM fertilizer and compost using local materials. Empirical evidence showed that variables such as education and training levels are negatively correlated with technical inefficiency. Additional training programs could be implemented for large-scale ginger producers to improve agricultural techniques and increase technical efficiency. The study encouraged futurists to focus on factors that influence technological inefficiencies, such as cooperative membership, ginger acreage, and seed subsidies. These factors were important from a policy-making perspective.

Nepal exported brooms worth NPR 2.5 billion in the last five years. Brooms were mainly used to make brooms and are exported from Nepal to India, Bangladesh, and other Asian countries.

The broom plant was found mainly in central and eastern Nepal. It was also one of the main sources of income for farmers in districts like Taplejung, Ilam, Panchthar, Tehrathum, and Dhankuta. Farmers planted brooms on riverbanks where there was no more land for other crops, not only to avoid landslides but also to generate income. Paper and biogas were produced from brooms and biogas is made from dust. Local authorities encouraged the cultivation of gorse for commercial purposes. Brooms did not require regular fertilization after planting. The same plant could be in production for 15 to 20 years without much care or maintenance[9].

Dairy farmers in the Ilam district earned NPR 5 billion annually. Ilam was one of the major milk-producing districts, producing 123,740 tons of milk per year. Milk output of 2073/074 BS increased by 1.8% over the same period last year. Milk production increased after farmers switched to commercial cattle farming. Increased reliance on livestock, increased government investment improved livestock production through artificial insemination (AI), and improved animal nutrition all contribute to increased milk production. More than 55,000 farmers in the district raise cattle and buffaloes commercially, earning more than NPR 4.7 billion from milk sales.

The dairy industry, cooperatives, and several factories stored milk produced in rural areas of the county to produce a variety of dairy products. Ilam exported milk products to commercial towns such as Japa, Itahari, Biratnagar, and other areas in the region[10].

According to the Office of Provincial Livestock Service, Ilam produced more than 600,000 kilograms of cheese each year. In addition, Ilam was also popular for hardened cheese locally known as chhurpi, which was exported to the United States and Europe. Ilam produced 300,000 kilograms of chhurpi products are produced each year. More than a dozen private and public cheese factories were in operation[11].

Chapagain et al. explained the commercial value of Akabare chili showing that it offers great export opportunities to international markets[12]. Akabare chili pepper supply chain analysis was conducted in the Ilam district to evaluate strategies to make Akabare chili pepper agriculture and industry a viable business. To achieve this, efforts are needed to enhance the competitiveness of each actor in the supply chain, improve product quality, promote economies of scale, and bring more profits to development lasting.

The growing demand for fresh dried powders and pastes in India, Bhutan, Tibet as well as domestic and foreign markets created an opportunity for the Nepali market to grow Akabale chili on a commercial scale. To implement such a large-scale farming system, it is necessary to promote the production of organic Akabare chili and ensure adequate support for the market. Considering the diversity and yield potential of the available genetic resources, the production, marketing, and utilization of Akabare chili in Nepal remained largely unexplored.

According to Chapagain, Nepal's annual tea exported are worth about NPR 3.25 billion. However, exports are expected to decline significantly every year. Tea importers from the US, Germany, China, Japan, France, the Netherlands, etc. visited tea plantations from March to April and placed orders. However, there were no such visits to tea factories and no orders were placed due to the novel corona virus infection. Farmers did not even harvest the first crop of the season because the government imposed a nationwide lockdown. It was estimated that about 10,000 farmers were affected by the COVID-19 pandemic[13].

Travel restrictions and lockdowns affected all stages of the food supply chain, including food production and distribution in Nepal. The supply of milk and vegetables on the market was interrupted, forcing farmers to give up milk and vegetables. This led to high prices, black markets, and product shortages in the local market.

Millions of farmers gathered to plant food and harvest seeds during the rainy season as the government urged people to respect quarantines and limit public gatherings. Containment measures helped the government defeat the virus, but if small farmers' farming, harvesting, and distribution patterns continued to be disrupted, hundreds of thousands of people will lose their livelihoods and entire countries would suffer a setback in their livelihoods[14].

Methodology

This study was based on a literature review, field research, key informant surveys, and focus group discussions. Several field implementation results, processes, methods, and policy studies were also summarized. The quantitative data were collected in the field maintaining all the parameters of restriction in the COVID-19 period. The closed-end questionnaire forms were filled by the researcher on the spot as well as through telephonic conversations taking the safety measures and convenience of the respondents into account.

Data were collected in the online mode from the respondents representing the government officials.

The researcher collected primary data through field surveys. This study included a stratified sample of 400 samples selected from a representative subset of the population for data collection. The population was into subgroups, or strata, based on characteristics such as age, gender, and region, and randomly sampled each stratum.

Sample Design: A stratified sample ensures that subgroups or strata of a given population are each adequately represented within the whole sample population of a research study.

Table-1: Population of the geographical area of the study.

Name of the Municipality	Population Census 6/22/2011	Population Census 11/25/2021	Difference in population in 10 years	Annual rise/decline in population
Ilam Municipality*	49,330	50,085	(+) 755	(+) 0.99%
Sandakpur Rural Municipality*	16,065	15,444	(-) 621	(-) 1.04%
Suryodaya Municipality*	56,957	54,727	(-) 2230	(-) 1,04%
Rong Rural municipality*	19,135	17,367	(-) 1768	(-) 1.09%
Chulachuli Rural Municipality	21,413	23,157	(+) 1,744	(+) 0.93%
Deumai Municipality	32,386	30,969	(-) 1417	(-) 1.04%
Mai Municipality	33,210	30,732	(-) 2478	(-) 1.07%
Maijogmai Rural Municipality	21,064	19,131	(-) 1933	(-)1.09%
Mangsebung Rural Municipality	18,534	16,810	(-) 1724	(-) 1.09%
Phakphokthum Rural Municipality	22,160	19,706	(-) 2454	(-) 1.11%
Total population of Ilam District	290,254	278,128	(-) 12,126	(-) 1.04%
Total population of Nepal	26,494,504	29,164,578	(+) 2,670,074	(+) 0. 92%

*Geographical study area

In this study, stratified random sampling of age, gender, geographical location of residence, education, employment, and socioeconomic status is collected. Such sampling was chosen to ensure the study that subjects from each subgroup are included in the final sample, whereas simple random sampling ensures that subgroups in the sample are equally or proportionally represented.

Stratified Random Sampling: Out of 10 municipalities of the Ilam district, 4 municipalities namely Ilam Municipality, Sandakpur Rural Municipality, Suryodaya Municipality, and Rong Municipality were chosen to collect the sample with a proportional stratified random sampling method. These four municipalities are the home of a population of 137,623, which is equivalent to 49.5% of 278,128**,** the total population of the district.

This process of classifying a population into homogenous units is a sampling technique that minimizes selection bias while being representative of the population. In proportional stratified random sampling, the size of each stratum is proportional to the population size of that stratum when examining the entire population. Different subgroups accurately represent the entire population while using Stratified random sampling as a tool.

To conduct stratified random sampling, define a population, divide it into subgroups, choose a sample size, and draw a random sample. Implementing stratified random sampling with probabilistic sampling methods provides advantages such as sample diversity and diversity, small variance, and similarity. Researchers define layers based on common characteristics or attributes that meet their research objectives.

Sample size: The following formula assumes a 95% confidence level and p = 0.5 are assumed for the equation below[15]:

$$n = \frac{\mathrm{N}}{1 + \mathrm{N}(e)^2}$$

n = sample size, N = population size = 137,623, e = acceptable sampling error= 0.05

$$n = \frac{137623}{1 + 137623(0.05)^2}$$

n = 398.841

According to above equation, the sample size required is 398.8., Statistical methods used: SPSS 25 is a sophisticated, professional programming application used to collect, display, and analyze data. Analysts who collect large amounts of data from market research and need to classify and categorize that data can use SSPS. The software offers attractive charts and various visualizations to assist clients in their research, ensuring complete and accurate data collection from measurable information.

Statistical Techniques Used: SPSS 25 is a progressed and expert programming application that is utilized to aggregate, see, and examines information. Analysts who have accumulated a ton of data from market examining and need to sort out and break down that data they can utilize SSPS. The software gives clients appealing charts and different visualizations to help in their investigation and to ensure that they can accumulate spotless and exact data from their measurable information.

Table-2: Stratified Sample of the respondent from the General public.

Stratified group	Subgroup	Number	%
Gender	Male	288	72.00%
	Female	112	28.00%
Age	25 to 40	158	39.50%
	41 to 60	219	54.75%
	Above 60	23	5.75%
Educational attainment	Illiterate	4	1.00%
	Unskilled Literate	183	45.75%
	Vocational Training	27	6.75%
	Undergraduate	163	40,75%
	University level	23	5.75%
Residential address	Rural	337	84.25%
	Urban	63	15.75%
Employment status	Employee	22	5.50%
	Farmer	261	65.25%
	Self-employed	22	5.50%
	Social worker	64	16.00%
	Student	31	7.75%
Household size	3 to 5	237	59.25%
	6 to 9	140	35%

Data Analysis and Interpretation: Organizing, analyzing, and interpreting data, and making inferences and generalizations are necessary steps to get a meaningful picture from the raw information you collect. Data analysis and interpretation involves objective material and its subjective responses, accompanied by a desire to derive from the data specific meanings that are relevant to the problem. Data analysis is the examination of tabular material to determine inherent facts and meanings. The key is to decompose existing complex elements into simpler parts and put those parts together into new arrangements for the purpose of interpretation. Data were analyzed and statistically processed.

Table-3 provides information on the perceptions of survey respondents by gender regarding regular annual income from crops such as ginger, cardamom, milk, and tea leaves. Among the respondents, 36.5% of men and 32.1% of women answered, "less than NPR 100,000." The chi-square value was 2.529, which was not significant. This means that there is no significant relationship between gender and survey respondents' perception of their annual income status from cash crops.

The Table-3 also provides information on the perception of survey respondents based on their age regarding regular annual income from cash crops such as ginger, cardamom, milk, and tea leaves. Most participants answered, less than NPR 100,000. The chi-square value was not significant at 5.771. This means that there is no significant relationship between the age group and survey respondents' perception of regular annual income from crops such as ginger, cardamom, milk, and tea leaves.

The Table-3 also provides information on the perception of survey respondents based on their education level regarding regular annual income earned from crops such as ginger, cardamom, milk, and tea leaves. Most respondents answered "NPR 100,000-NPR 400,000" as their regular annual income from cash crops. The chi-square value was 18.474, which was significant at the 0.10 level. This means that there is a significant relationship between education level and survey respondents' perception of regular annual income from cash crops such as ginger, cardamom, milk, and tea leaves.

Table-3: Regular annual income from cash crops like ginger, cardamom, milk, tea leaves, broom grass, etc.

		Less than NPR 100000		NPR 100000 - NPR 400000		NPR 500000 - 1000000		More than NPR1000000		No comment		Chi-Square value	p-value
Gender	Male	105	36.50%	83	28.80%	42	14.60%	52	18.10%	6	2.10%	2.529	0.639
	Female	36	32.10%	30	26.80%	16	14.30%	28	25.00%	2	1.80%		
Age	25 to 40	49	31.00%	44	27.80%	24	15.20%	37	23.40%	4	2.50%	5.771	0.673
	41 to 60	82	37.40%	62	28.30%	33	15.10%	38	17.40%	4	1.80%		
	Above 60	10	43.50%	7	30.40%	1	4.30%	5	21.70%	0	0.00%		
Residential address	Rural	116	34.40%	99	29.40%	47	13.90%	68	20.20%	7	2.10%	1.928	0.749
	Urban	25	39.70%	14	22.20%	11	17.50%	12	19.00%	1	1.60%		
Employment status	Employee	4	18.20%	11	50.00%	2	9.10%	5	22.70%	0	0.00%	16.57	0.414
	Farmer	92	35.20%	74	28.40%	41	15.70%	48	18.40%	6	2.30%		
	Self-employed	13	59.10%	3	13.60%	1	4.50%	5	22.70%	0	0.00%		
	Social worker	20	31.30%	17	26.60%	10	15.60%	15	23.40%	2	3.10%		

Table-3 also reveals the information regarding perceptions of participants in the survey based on residential addresses and regular annual income from cash crops like ginger, cardamom, milk, and tea leaves etc., it was found that most participants in the survey i.e., 34.4% of rural area and 39.7% from urban areas responded in less than 1 acre. The chi-square value was found 1.928, which was insignificant which means there is no significant association between the residential address and perceptions of participants in the survey regarding regular annual income from cash crops like ginger, milk, tea leaves, etc.

The Table-3 also describes the information regarding perceptions of participants in the survey based on employment status about regular annual income from cash crops like ginger, cardamom, milk, and tea leaves, etc., it was found that most participants in the survey i.e., 50% of employees responded in NPR 100000-400000 whereas 35.2% farmers, 59.1% Self-employed 31.3% social workers, and 38.7% other responded in less than NPR 100000. The chi-square value was found 16.565 which was significant at 0.10 level, which means there is a significant association between employment status and perceptions of participants in the survey regarding regular annual income from cash crops like ginger, milk, tea leaves, etc.

The Table-3 also explains the information regarding perceptions of participants in the survey based on household size of family about regular annual income from cash crops like ginger, cardamom, milk, and tea leaves etc., it was found that most participants in the survey i.e., 32.1% (3-5 family members), 40% having 6-9 family members and 39.1% having 10 and above family members responded in less than NPR 100000. The chi-square value was found to be 5.693, which is not significant. This means that there is no significant relationship between family size and the survey respondents perception of regular annual income from the crops such as ginger and tea leaves.

Table-4 reveals the information regarding perceptions of participants in the survey based on gender about the impact of COVID-19 on regular income from cash crops, it was found that most participants in the survey i.e., 42.7% of males and 43.8% of females responded in 25% losses. The chi-square value was found to be 2.853, which was insignificant. This means there is no significant association between gender and the perceptions of participants in the survey regarding the impact of COVID-19 on regular income from cash crops.

The Table-4 further depicts the information regarding perceptions of participants in the survey based on age about the impact of COVID-19 on regular income from cash crops, it was found that most participants in the survey i.e., 44.9% from 25-40 years age group and 42% from 41-60 years age group and 39.1% of the above 60-years-age group responded in '25% losses. The chi-square value was found to be 2.764, which was insignificant. This means there is no significant association between the age group and the perceptions of participants in the survey regarding the Impact of COVID-19 on regular income from cash crops.

The Table-4 also shows the information regarding perceptions of participants in the survey based on educational attainment about the impact of COVID-19 on regular income from cash crops, it was found that most participants in the survey i.e., 50% illiterate, 41.5% literate, 37% with Vocational training, 45.4% undergraduate and 43.5% with university level responded in '25% losses. The chi-square value was found to be 9.130 which was insignificant. This means there is no significant association between educational attainment and the perceptions of participants in the survey regarding the impact of COVID-19 on regular income from cash crops.

Table-4: Impact of COVID-19 on regular income from cash crop.

		100% loss		50% loss		25% loss		No loss		No comment		Chi-Square value	p-value
Gender	Male	56	19.40%	89	30.90%	123	42.70%	5	1.70%	15	5.20%	2.853	0.583
	Female	18	16.10%	41	36.60%	49	43.80%	1	0.90%	3	2.70%		
Age	25 to 40	27	17.10%	53	33.50%	71	44.90%	2	1.30%	5	3.20%	2.764	0.948
	41 to 60	43	19.60%	68	31.10%	92	42.00%	4	1.80%	12	5.50%		
	Above 60	4	17.40%	9	39.10%	9	39.10%	0	0.00%	1	4.30%		
Residential address	Rural	61	18.10%	111	32.90%	144	42.70%	5	1.50%	16	4.70%	0.642	0.958
	Urban	13	20.60%	19	30.20%	28	44.40%	1	1.60%	2	3.20%		
Employment status	Employee	3	13.60%	8	36.40%	8	36.40%	1	4.50%	2	9.10%	10.03	0.865
	Farmer	51	19.50%	88	33.70%	107	41.00%	3	1.10%	12	4.60%		
	Self-employed	2	9.10%	6	27.30%	12	54.50%	1	4.50%	1	4.50%		
	Social worker	13	20.30%	18	28.10%	31	48.40%	0	0.00%	2	3.10%		
	Other	5	16.10%	10	32.30%	14	45.20%	1	3.20%	1	3.20%		

The Table-4 also reveals the information regarding the perceptions of participants in the survey based on residential address impact of COVID-19 on regular income from cash crops, it was found that most participants in the survey i.e., 42.7% from rural areas and 44.4% from urban areas responded in less than 1 acre. The chi-square value was found 0.642, which was insignificant which means there is no significant association between residential address and the perceptions of participants in the survey regarding about Impact of COVID-19 on regular income from cash crops.

The Table-4 also describes the information regarding perceptions of participants in the survey based on employment status about the impact of COVID-19 on regular income from cash crops, it was found that most participants in the survey i.e., 36.4% employees, 41% farmers, 54.5% Self-employed 48.4% social workers, and 45.2% other responded in 25% losses. The chi-square value was found to be 10.028, which was significant. This means there is significant association between employment status and the perceptions of participants in the survey regarding about Impact of COVID-19 on regular income from cash crops.

This Table-4 also provides information on survey respondents' perceptions based on household size regarding the impact of COVID-19 on their usual cash crop income. Most of the survey respondents (36.7%) had 3-5 family members, 52.9% of them had 6-9 family members, and 47.8% had 10 or more family members, resulting in a loss rate of 25%. The chi-square value is 11.534, which is significant at the 0.10 level. This means that there is a significant relationship between household size and survey respondents perception of the impact of COVID-19 on regular income from commercial crops.

Table-5 reveals the information regarding perceptions of participants in the survey based on gender about the status of the sale of milk during the first lockdown, it was found that most participants in the survey i.e., 29.5% male responded with It was normal whereas 36.6% of female responded in Sale dropped down by 50%. The chi-square value was found 3.998, which was insignificant. This means there is no significant association between gender and the perceptions of participants in the survey regarding the status of the sale of milk during the first lockdown.

The Table-5 further depicts the information regarding perceptions of participants in the survey based on age about the status of the sale of milk during the first lockdown, it was found that most participants in the survey i.e., 31% from 25-40 years age group and 31.1% from 41-60 years age group responded in Sale dropped down by 50% whereas 30.4% of the over 60 age group responded in It was normal. The chi-square value was found to be 3.435, which was insignificant. This means there is no significant association between the age group and the perceptions of participants in the survey regarding the status of the sale of milk during the first lockdown.

The Table-5 also shows the information regarding perceptions of participants in the survey based on educational attainment about the status of the sale of milk during the first lockdown, it was found that most participants in the survey i.e., 50% illiterate responded, 'Sale completely stopped', 30.6% literate and 33.1% undergraduate responded in 'Sale dropped down by 50%' whereas 51.9% with vocational training responded in 'It was normal'. The chi-square value is 13.726, which is significant at the 0.10 level. This means that there is a significant relationship between education level and survey respondents' awareness about the state of milk sales during the first lockdown.

This Table-5 also includes information on the perceptions of survey respondents based on their residential address regarding milk sales during the first lockdown. It was found that most survey respondents, 30% in rural areas and 31.7% in urban areas, people answered that "sales have decreased by 50%". The chi-square value was 1.085, which was not significant. There was no significant relationship between home address and survey participants' perceptions of milk sales during the first lockdown.

The Table-5 also provides information on the perceptions of survey respondents based on employment status regarding milk sales during the first lockdown. It was found that most of the survey participants were 36.4% employees and 34.4% social workers. Answered "Sales decreased by 50%" while 29.1% of business men, 31.8% of self-employed people, and 35.5% of others answered, "It's normal". The Chi-square value was found to be 7.267, which is not significant. This means that there is no significant association between employment status and survey participants' perception of the status of the sale of milk during the first lockdown.

The Table-5 also explains information regarding survey respondents' perceptions based on household size regarding the status of milk sales during the first lockdown. It was found that most of the survey participants i.e., 30.8% having 3-5 family members and 31.4% having 6-9 family members answered, “Sales decreased by 50%” while 30.4% have 10 or more family members answered, “It's normal”. The chi-square value was 4.028, which was not significant. This means that there is no significant relationship between household size and survey respondents' perceptions of the milk sales situation during the first lockdown.

Results and Discussions

The impact of COVID-19 in rural areas of Nepal's Ilam district has been significant and varied as stated below in a general overview of the effects. The pandemic has disrupted agricultural activities in Ilam. Farmers face challenges in sourcing agricultural inputs such as seeds, fertilizers, and pesticides due to transport disruptions and supply chain disruptions. This affects crop production and productivity.

Table-5: Status of the sale of milk during the first lockdown.

		Normal		Sale dropped down by 25%		Sale dropped down by 50%		Sale completely stopped		No comment		Chi-Square value	p-value
Gender	Male	85	29.50%	58	20.10%	80	27.80%	65	22.60%	0	0.00%	3.998	0.262
	Female	34	30.40%	17	15.20%	41	36.60%	20	17.90%	0	0.00%		
Age	25 to 40	45	28.50%	27	17.10%	49	31.00%	37	23.40%	0	0.00%	3.435	0.753
	41 to 60	67	30.60%	42	19.20%	68	31.10%	42	19.20%	0	0.00%		
	Above 60	7	30.40%	6	26.10%	4	17.40%	6	26.10%	0	0.00%		
Residential address	Rural	100	29.70%	66	19.60%	101	30.00%	70	20.80%	0	0.00%	1.085	0.781
	Urban	19	30.20%	9	14.30%	20	31.70%	15	23.80%	0	0.00%		
Employment status	Employee	4	18.20%	5	22.70%	8	36.40%	5	22.70%	0	0.00%	7.267	0.839
	Farmer	76	29.10%	55	21.10%	75	28.70%	55	21.10%	0	0.00%		
	Self-employed	7	31.80%	4	18.20%	6	27.30%	5	22.70%	0	0.00%		
	Social worker	21	32.80%	9	14.10%	22	34.40%	12	18.80%	0	0.00%		
	Student	11	35.50%	2	6.50%	10	32.30%	8	25.80%	0	0.00%		

Farm workers are in short supply due to COVID-19 restrictions and contagion fears. Many of the migrant workers who normally do seasonal agricultural work have returned to their hometowns due to unemployment and travel restrictions. This labor shortage will affect farms, especially in critical stages such as rice planting, harvesting, and post-harvest activities. The Ilam farmers face challenges in accessing credit and financial services during the pandemic. The COVID-19 has raised health and safety concerns among farmers. Precautions such as social distancing, wearing masks, and good hygiene must be taken, resulting in additional costs and challenges for farms. The illnesses of farmers and their families also affect their ability to work effectively and manage their farms.

Conclusion

The impact of COVID-19 in rural areas of Nepal's Ilam district has provided important lessons. The lesson learned during the pandemic was that there is a need to build resilient and self-sustaining local food systems. Investing in diverse and local agricultural production can help ensure food security in times of crisis. COVID-19 has also pointed out the importance of diversifying income sources in rural areas, and the importance of prioritizing health and safety measures in agricultural practices. The need to improve access to finance and credit for rural farmers has been noticed as the pandemic has left a serious impact on the farmers dependent on cash crops. Improved financial services, such as affordable insurance and credit options, can help farmers manage risk and invest in agricultural operations. Increasing financial inclusion can provide a safety net in times of crisis and support farmers' long-term resilience. COVID-19 has highlighted the importance of building preparedness and coping skills in rural areas. This information will guide policymakers, farmer organizations, and community leaders in developing strategies to improve the resilience of rural communities in Ilam and the surrounding areas both in times of crisis and in the long run.

References

1. Wasti, K., Christian, P., Grewal, G., Balantrapu, T., & Batmunkh, O. (2022). Rural farmers in Nepal hit hard with COVID-19. End Poverty in South Asia.
2. Khabarhub (2020). Eight new languages discovered in Nepal. https://english.khabarhub.com/2020/27/144714/ accessed 2020-11-29
3. Chapagain, B. (2017). Ilam's dairy products thriving as gift items. My Republica. https://myrepublica.nagariknetwork.com/mycity/news/ilams-dairy-products-thriving-as-gift-items
4. MoICS. (2023). Large Cardamom. Government of Nepal Ministry of Industry, Commerce and Supplies. https://www.moics.gov.np/en/product_detail/12
5. New Business Age (2022). Cardamom Price Drops. New Business Age. https://www.newbusinessage.com/Articles/view/16501
6. TEPC (2023). Major Export Product. Nepal Trade Information Portal, Trade and Export Promotion Centre, Ministry of Inidustry, Commerce and Supplies, Govt of Nepal. https://nepaltradeportal.gov.np/web/ guest/ major-commodity
7. Pangeni, R. (2016). Hidden interests said to be behind ginger wash plant lying idle. My Republica. https://myrepublica.nagariknetwork.com/news/hidden-interests-said-to-be-behind-ginger-wash-plant-lying-idle/
8. Khatiwada, D., & Yadav, P. (2022). Technical Efficiency of Ginger Production in Ilam District of Nepal: A Stochastic Production Frontier Approach. *Advances in Agriculture*, (1), 3007624.
9. New Business Age (2023). Nepal Exports Broom Grass

worth Rs 2.5 Billion in 5 Years. New Business Age. https://www.newbusinessage.com/Articles/view/16773

10. Republica (2017). Ilam produces milk worth Rs 5 billion. My Republica. https://myrepublica. Nagarik network.com/ news/ilam-produces-milk-worth-rs-5-billion/
11. Chapagain, B. (2017). Ilam's dairy products thriving as gift items. My Republica. https://myrepublica.nagarik network.com/mycity/news/ilams-dairy-products-thriving-as-gift-items
12. Chapagain, T. R., Timsina, K. P., & Shrestha, K. P. (2011). Supply chain analysis of Akabare Chilly (Capsicum annuum L. var cerasiforme Irish): A case of Ilam district of Nepal. *The Journal of Economic Concerns*, 2(4), 99-113.
13. Chapagain, B. (2020). Tea industry falls prey to COVID-19. My Republica. https://myrepublica.nagariknet work.com/news/tea-industry-falls-prey-to-covid-19/
14. Poudel, K., & Subedi, P. (2020). Impact of COVID-19 pandemic on socioeconomic and mental health aspects in Nepal. *International Journal of Social Psychiatry*, 66(8), 748-755.
15. Islam, M. R. (2018). Sample size and its role in Central Limit Theorem (CLT). *Computational and Applied Mathematics Journal*, 4(1), 1-7.