ACTA SCIENTIFIC AGRICULTURE (ISSN: 2581-365X)

Volume 3 Issue 5 May 2019

Research Article

Value Chain Analysis of Ginger in Sunsari district of Nepal

Swikriti Pandey[1]*, Arjun Kumar Shrestha[2], Sameer Pokhrel[1] and Ashish Ghimire[1]

[1]*Bachelor Graduate, Agriculture and Forestry University, Nepal*

[2]*Professor, Department of Horticulture, Agriculture and Forestry University, Nepal*

***Corresponding Author:** Swikriti Pandey, Bachelor Graduate, Agriculture and Forestry University, Nepal.

Received: February 11, 2019; **Published:** April 10, 2019

Abstract

A study in value chain analysis of ginger in Sunsari district of Nepal was conducted during April-August, 2017 AD in ward no. 4 (Panchkanya), and 20 (Bishnupaduka) of Dharan, Sunsari purposively, as selected by the Prime Minister Agriculture Modernization Project (PM-AMP). The objective of study was to analyse the value chain of ginger so as to identify the existing processing, production and marketing situation of Sunsari. A total 50 producers among 500 ginger producers and 15 ginger traders from 3 major markets of Dharan viz. Agriculture Produce Market (APM), Palika Bazaar and Bi-weekly Vegetable Market were randomly selected. Semi-structured interview schedule was designed for both producers and traders and the survey was conducted by face-to-face interaction. Primary data were collected through survey, Focus Group Discussion (FGD) and Key Interview Survey (KIS). Results show that the ginger's value-chain status of Dharan was poor owing to negligible value addition activities. The ginger traded in Dharan was mainly imported from other districts of eastern region due to low volume of ginger production in Sunsari (which was consumed within the district). The ginger was then exported to India mostly through APM, Dharan. The trend of ginger cultivation was found to be decreasing due to rhizome rot, low and fluctuating market prices, lack of storage and processing facilities and poor technical backup. Although no value addition activities were adopted the producers expressed their willingness to invest on "Sutho" making if the opportunity was provided. The ginger sector could be commercialized by creating proper market policies and providing the proper technical backup. Establishment of processing and storage units would also largely aid in improving the value addition of ginger sub-sector in Sunsari.

Keywords: Ginger; Sunsari; Market; Value Addition; Market Price

Introduction

Nepal is predominantly an agrarian country where agriculture provides employment to 66% of the total population and contributes 33% to the total GDP of the country [1]. About 21% of total land area is cultivated although the total cultivable land of the country accounts for about 27.9%. Farming is mostly subsistence in the Nepalese household owing to fragmented land and low economic status [2]. Nepal is the fourth biggest ginger exporter in the world, with about 70% of domestic production exported to India [3]. As in 2072/073, ginger occupies 23885 ha with the production of 263140 mt [4]. Ginger is grown by an estimated 200,000 families in 5 zones of the country [5].

Sunsari district, one of the 75 districts of Nepal, is a part of Province No. 1 located in the eastern part of the country extending at an altitude of 500 to 3000 masl. About 65.04% of total land area of this district is cultivable with major production of rice, maize, wheat, pulses, oilseed crops, sugarcane, vegetable crops, jute, spices etc. Dharan is a Sub-metropolitan city in Sunsari district situated on the foothills of the Mahabharat range in the north with its southern tip touching the edge of the Terai region at an altitude of 1148 ft [6].

Ginger is an important spice of exportable commodity with good potential of income generation and employment creation [7]. However, the share of ginger in the total agricultural exports of Nepal is currently only about 3 to 4 % [8].

The scope of ginger production and marketing in Sunsari district has come to limelight only after the implementation of the PM-AMP project although, Dharan has been a centre market for ginger trading since long [9]. Ginger occupies 450 ha in Sunsari with the production of 4235 mt and productivity of 9.41 mt/ha. Wholesale traders have been performing trade of ginger from the hill areas of eastern region like Sunsari (Bishnupaduka), Dhankuta, Terathum, Panchthar, Morang, Sankhuwasabha, Bhojpur, Udaypur and Khotang which are subsequently exported to the Indian market [10]. Despite this, there are no recordings of the value chain status of the Dharan market or the inward and outward interrelationship of the stakeholders involved in this process. Dharan market is the major center for trading of ginger from the hilly areas of eastern region like Terathum, Khotang, Dhankuta, Hile, Taplejung, Morang etc to the Indian market [7]. About 8830 mt of ginger trading was conducted from the APM, Dharan itself in the year 2072/73 out of which 90% is exported to India [10]. In natural season products flood the markets substantially bringing down the prices.

Most farmers in Sunsari grow ginger in amounts that cannot be accounted for commercialization and is limited to the local markets. Majority of the farmers in the eastern region are small farmers and ginger farming can be a source of reducing poverty to these farmers in the current production and marketing scenario [11]. The problems for low quality ginger production leading to poor marketing is majorly caused by the factors like traditional methods of cultivation, seed storage and lack of technical knowledge [12]. The other major problem is the occurrence of the rhizome rot which accounts for loss of about 30% ginger in field and during storage causing farmers to discontinue cultivation [9]. The fluctuation of the market prices due to ban in ginger export by India in recent years has also created disappointment in farmers towards its cultivation [13]. Processing of any form is yet to be institutionalized in the eastern region. The lack of automated ginger peelers and mechanical dryers has led to reduced bargaining power among the farmers and traders of Nepal in comparison to their counterparts across the border. In this condition, value addition to the products is the only viable option that can add value to the farmer produce which fetches the higher price and lower the marketing risk [8].

Materials and Methods

Survey research design was used for the study. Bishnupaduka and Panchkanya of Dharan within the Sunsari zone as prioritized in the PM-AMP were purposively selected for the study purpose. Among 500 population (Panchkanya-200 and Bishnupaduka-300) size, 50 ginger producers (20 from Panchkanya and 30 from Bishnupaduka) and 15 traders including wholesalers and retailers of 3 different vegetable markets: Agriculture Produce Market, Palika Bazaar and Bi-weekly Vegetable Market, Dharan were selected randomly. Primary data were collected through the field survey, Focus Group Discussion, Key Informants Interview with the key actors of the research process as well as the concerned people of the DADO, Zonal Office, etc. Secondary data were collected through the review of different journals, articles, magazines, newspapers, related websites etc. Collected information and data was validated by triangulating via Key Informant Survey (KIS) and Focus Group Discussion (FGD). Semi-structured interview schedule was prepared and followed during the survey procedure to obtain the information of the value chain process in the particular area.

Field survey was conducted by interviewing ginger producers and traders using face to face interview method. Data were collected by reviewing various related journals, DADO profile, statistical year book of Nepal, articles on study of ginger subsectors etc. Based on the data obtained from above sources, information collected from the field survey and other means were coded, tabulated and analysed by using Statistical Package for Social Sciences (SPSS), MS-Excel and descriptive statistics.

Results and Discussion

Population distribution of sampled respondents (Producers and traders)

The total population of the 50 ginger growing household was found to be 255 out of which 50.59% were male and 49.41% were female (Table 1). The total family size of the 15 respondent ginger traders was found to be 80 out of which 53.75% were found to be male and 46.25% were found to be female (Table 2).

Description	Mean	SD	Minimum	Maximum	Sum
Family size	5.10	1.233	2	8	255
Number of male	2.58	0.992	1	5	129
Number of female	2.52	0.707	1	4	126

Table 1: Population distribution of the ginger producers in Sunsari, 2017.

Description	Mean	SD	Minimum	Maximum	Sum
Family size	5.33	1.345	2	8	80
Number of male	2.87	1.246	1	6	43
Number of female	2.47	0.743	1	3	37

Table 2: Population distribution of ginger traders in Sunsari, 2017.

Gender of the respondents (Producers and Traders)

Fifty respondents were interviewed among total ginger growing population of the Panchkanya and Bishnupaduka, of which 80% were male and 20% were female (Table 3). Among 15 ginger traders interviewed, 66.7% were male and 33.3% were female which indicated that male were involved in ginger trading than female (Table 4).

Gender	Frequency	Percentage
Male	40	80
Female	10	20
Total	50	100

Table 3: Gender of the ginger producers in Sunsari, 2017.

Gender	Frequency	Percentage
Male	10	66.7
Female	5	33.3
Total	15	100

Table 4: Gender of the ginger traders in Sunsari, 2017.

Source of living among ginger producers

Most of the sampled respondents (54%) were dependent on agriculture for their livelihood followed by abroad and agriculture (28%), as the trend of going abroad for employment purpose is increasing. People also seemed to pursue business (3%) and services (6%) along with agriculture (Table 5).

Source of living	Frequency	Percentage
Abroad and agriculture	17	28.0
Agriculture only	27	54.0
Business and agriculture	3	6.0
Services and agriculture	6	12.0
Total	50	100.00

Table 5: Source of living among ginger producers in Sunsari, 2017.

Farmer's category in accordance to land size and type of farming practiced

Farmers were categorized as small, medium and large in accordance to the landholding by using mean and SD. Farmers with landholding <9.85 ropani were categorized as small farmers, with 9.85-29.97 ropani as medium farmers and with >29.97 ropani as large farmers. The percentage of the medium farmers was found to be highest (64%) followed by large farmers (26%) and small farmers (10%) among the total sampled households. The data is represented in the Figure 1.

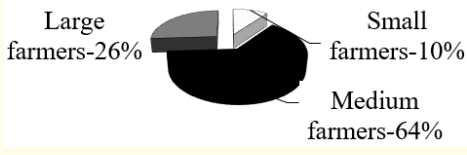

Figure 1: Farmer's category according to land size in Sunsari, 2017.

Only 4% of the ginger producing households was found to follow the irrigated type of farming. Most of the households (84%) followed rain-fed type of farming which indicated that their farming system was entirely dependent on rainfall. About 12% of the households partially irrigated their land.

Area distribution of the major cultivated crops

According to the data obtained through the interview schedule, maize was found to have the highest average area (13.12 ropani) followed by turmeric (6.59 ropani). Ginger ranked third, covering an average area of 2.47 ropani (Table 6).

Crop type	Mean	SD	Minimum	Maximum
Maize	13.12	7.05	1.40	30.00
Turmeric	6.59	5.94	0.00	20.00
Ginger	2.47	2.70	0.18	15.00
Rice	1.18	4.18	0.00	20.00

Table 6: Area of the major cultivated crops (in ropani) in Sunsari, 2017.

Ginger production status

Among 50 households interviewed, the total ginger cultivated land was found to be 110.63 ropani with the total production of 24580 kg of ginger. According to [14], the area of ginger in Sunsari was found to be 8530 ha with production of 4235 mt of ginger. The details of the production status of ginger in the study site are presented in the Table 7.

Description	Mean	SD	Minimum	Maximum
Total land area(ropani)	20.45	10.14	3.50	50.00
Ginger cultivated area (ropani)	2.21	2.01	0.18	7.00
Production of ginger (kg)	491.6	433.70	30.00	2000.00

Table 7: Production status of ginger compared to total land area in Sunsari, 2017.

Variety of ginger cultivated

The only certified variety of ginger in Nepal is Kapurkot Aduwa-1. Farmer's interview revealed that this variety had not been introduced in the study site yet. Two of the local varieties of the ginger were mainly found to be cultivated by the ginger farmers of the study site namely: Nase (fiber rich) and Bose (low fiber content). Farmers were found to cultivate Nase variety of ginger in abundant, amounting to 70% of total 50 ginger growing respondents and the remaining 30% were found to cultivate the Bose variety.

Reasons for cultivating ginger

All 50 ginger producers were asked to rank the reasons for cultivating ginger among the reasons listed in the interview schedule. The results are as follows.

Reasons for cultivating ginger	Frequency of Respondents						Index	Rank
	P1	P2	P3	P4	P5	P6		
Following the tradition	40	0	1	0	6	3	0.86	I
Higher income than other crops	7	39	1	3	0	0	0.83	II
Increasing market access	0	4	37	5	4	0	0.64	III
Easier than other occupation	3	4	7	34	2	0	0.57	IV
Marginal land can be utilized	0	3	4	8	35	0	0.42	V
Technical backup from GOs/INGOs	0	0	0	0	3	47	0.18	VI

Table 8: Reasons for cultivating ginger in Sunsari, 2017.

Where, P denotes the priority level of the producers. The weightage ranging from the 1 to 6 was provided to each of the listed reasons for cultivating ginger. Then, the frequency of respondents was counted according to the ranking order provided by them to each of the reason. The sum of the obtained frequency and weightage was then divided by the total respondents and maximum weightage number which gave the index value. The reasons are ranked in accordance to the obtained index value.

Cost of production (Input and labor cost)

SN	Descriptions	Quantity	Unit	Rate (Rs.)	Total (Rs.)
A	Land Renting	1	Ropani	10,000	10,000
B	Inputs				
1	Rhizome	200	Kg	40	8000
2	Fertilizer (Manure)	200	Doko	20	2000
3	Pesticides	½	Kg	3000	1500
	Total input cost				11,500
C	Labor				
1	Land preparation	4	Man	500	2000
2	Ploughing	1	Pair-Bullocks	1500	1500
3	Plantation	4	Man	500	2000
4	Weeding	8	Man	500	4000
5	Harvesting	5	Man	500	2500
6	Cleaning	4	Man	500	2000
	Total Labor cost				14,000
D	Grand total cost				35,500
E	Income	1500	Kg	40	60,000
F	Profit				24,500

Table 9: Cost of production of ginger in Sunsari, 2017.

Loss of about 5-7% of the total produce during harvesting, post-harvest storage and transportation was reported. Owing to the production of ginger in small scale, farmers did not invest huge sum in ginger cultivation. The inputs like fertilizers and machineries were found to be used in the negligible quantity. Hence, the credit demand in the ginger sub-sector was very low and managed by the farmers themselves.

Trends of ginger cultivation

The respondent ginger producers were asked if the cultivation of ginger in their household was increasing, decreasing or constant. It was apparent from the data of 50 households that the trend of ginger cultivation had decreased in 94% households, only 2% household had increased their cultivation and only 4% had constant cultivation over years (Figure 2).

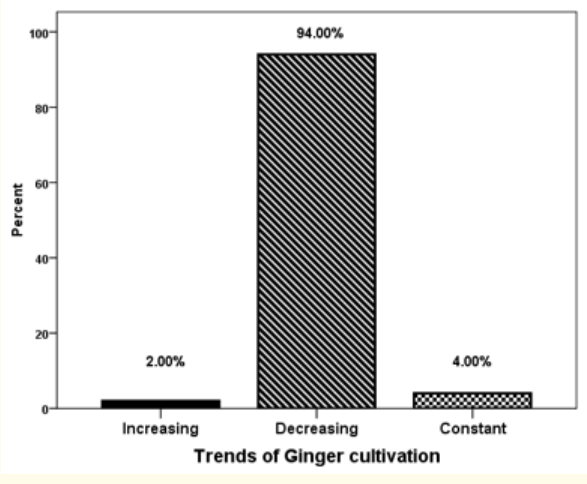

Figure 2: Trends of ginger cultivation in Sunsari, 2017.

Problems in production

The index value along with the rank is shown in the Table 10. All 50 ginger producers were asked to rank the problems in ginger production as listed in the interview schedule. The results are as follows.

SN	Problems	Frequency					Index	Rank
		P1	P2	P3	P4	P5		
1.	Rhizome rot	30	3	7	5	5	0.79	I
2.	Dry rot	28	4	0	8	10	0.72	II
3.	Availability of quality seed rhizome	25	5	0	5	15	0.68	III
4.	Post-harvest loss	10	4	6	10	20	0.49	IV
5.	Input Availability	4	7	5	4	30	0.40	V

Table 10: Problems in ginger production as ranked by ginger producers in Sunsari, 2017.

Where, P= Priority level. Each of the problems were given a weightage from 1-5 and then obtained frequencies were multiplied with the respective weightage. The obtained results were then added and then divided with the total number of respondents i.e. 50 multiplied by the highest weightage value i.e. 5 and then index value was obtained. The ranks were assigned in accordance with the obtained index value.

Satisfaction on production of ginger

All 50 of the interviewed ginger producers were asked to rank their satisfaction level on the statements of productions listed in the interview schedule. The satisfaction level were divided into 5 different categories as, SS=Strongly Satisfied, MS=Moderately Satisfied, U= Undecided, MUS=Moderately Unsatisfied and SUS= Strongly Unsatisfied. The satisfaction level along with the index value and rank is presented in Table 11.

SN	Statement on production	Satisfaction Level					Index	Rank
		SS	MS	U	MUS	SUS		
1.	Input Supply	25	5	0	5	15	0.68	I
2.	Access to Information	20	5	0	5	20	0.60	II
3.	Production	12	3	9	2	24	0.51	III
4.	Post-harvest Loss	10	4	6	10	20	0.49	IV
5.	Technical Support	6	12	5	1	26	0.48	V
6.	Market Price	4	7	6	4	29	0.41	VI

Table 11: Production satisfaction level of ginger producers in Sunsari, 2017.

Each of the statements were given a weightage from 1-5 and then obtained frequencies were multiplied with the respective weightage. The obtained results were then added and then divided with the total number of respondents i.e. 50 multiplied by the highest weightage value i.e. 6 and then index value was obtained. The ranks were assigned in accordance with the obtained index value.

Trader Type	Frequency	Percentage
Wholesale	7	46.67
Retailer	8	53.33
Total	15	100.0

Table 12: Types of ginger traders in Sunsari, 2017.

Types of ginger traders and business carried out

Among 15 respondents interviewed, 46.67% of the respondents were wholesalers and 53.33% were retailers (Table 12). The seasonal business of ginger was carried out by 33.33% of the traders who only dealt with fresh ginger and year round ginger business was carried out by 66.67% of the traders who dealt with both mother and fresh rhizome (Table 13).

Business type	Frequency	Percentage
Seasonal ginger business	5	33.33
Year round ginger business	10	66.67

Table 13: Type of ginger business in Sunsari, 2017.

Volume of produce dealt by the ginger traders

The average, SD, minimum and maximum amount of produce dealt (in kg) by the interviewed wholesale and retail ginger traders is given in the Table 14.

Type of traders	Mean (kg)	SD (kg)	Minimum (kg)	Maximum (kg)
Wholesalers	12,857.14	8538.85	1000	25000
Retailers	88.13	77.09	30	250

Table 14: Volume of produce dealt by the ginger traders in Sunsari, 2017.

All the traders (100%) dealt with the trading of fresh ginger.

Post harvest handling

The post-harvest activities performed by the ginger producers in the study area were removing mud. Only 5 producers carried out the washing and sun-drying of ginger. The mud content per sack of 50kg of ginger was found to be 7kg. Both ginger producers and traders had no proper knowledge regarding grading and packaging of the ginger produce and the activities were followed based on the quality of the rhizomes. The rotten, broken, injured, diseased and malformed rhizomes were sorted. The other basis for grading ginger rhizomes was separating the black and red rhizomes. After grading, the rhizomes were packaged either in sacks (60%) or doko (40%). The sorted ginger was packaged in plastic and jute sacks by traders. The major form of transporting the harvested produce was found to be the public vehicle esp. pickup vans (76% of ginger producers; charge Rs2/kg) or the personal vehicle i.e. motorcycle (24%). The use of transportation mainly depended on the road and weather condition due to the poor state of the roads in both the sites. Wholesalers were found to transport ginger rhizomes in trucks. Retailers transported the ginger by personal vehicles, hired vehicles (tempo or electric rickshaw) or the public transports like pickup vans and bus.

None among the 50 surveyed ginger producers were found to take measures for processing which is parallel to the information from Agriculture Sector Profile that highlights on the fact that processing of any form (even simple washing and packaging) is not yet

institutionalized in Eastern Region of Nepal [8]. Although, the ginger producers were found to be aware of the processed products of ginger like sutho, ginger candy, ginger oil etc, they seemed to supply only fresh ginger to the market. However, 100% of the ginger producers told that they were willing to process ginger as "sutho".

Major markets

The major market for collecting ginger from other districts in Dharan was found to be Agriculture Produce Market (APM). APM majorly dealt with the wholesale trading of ginger within Dharan and also exporting it to the Indian Market. Ginger produced within the Sunsari district was mainly sold by the farmers to the local vegetable market named "Palika Bazaar" and Bi-weekly Vegetable Market in Magalbarey, Dharan. In accordance to the distance feasibility, the farmers of Panchkanya were found to sell ginger to the local vegetable market while the households of Bishnupaduka were found to sell the produce directly to the consumers in the bi-weekly market of Magalbarey on Tuesday and Friday. Other small retailers were found to buy the ginger from the APM, Bi-weekly market or directly from the producers depending on the easiness of access. The 100% of the interviewed ginger producers were found to sell their produce to the Dharan Market. The major export of ginger to India was found to occur from the APM. According to the data provided by APM, Dharan, 90% of ginger is exported through the Siliguri, Jogbani and Gorakhpur. Among the 15 ginger traders interviewed, the share of ginger traded to the local market was found to be highest i.e. 66.67%. The traders that exported the ginger to the Indian market were 20% who were wholesalers and remaining 13.33% of the traders were involved in trading ginger in both local and Indian market.

Market channel

Market Channel No.	Market channel	Frequency	Percentage
1.	Farmers-Wholesalers-Retailers-Consumers	20	30.76
2.	Farmers-Retailers-Consumers	22	33.85
3.	Farmers-Consumers	16	24.62
4.	Farmers-Collectors-Exporter	3	4.62
5.	Farmers-Middlemen-Collector-Exporter	4	6.15
	Total	65	100

Table 15: Marketing channel of ginger in Dharan, Sunsari, 2017.

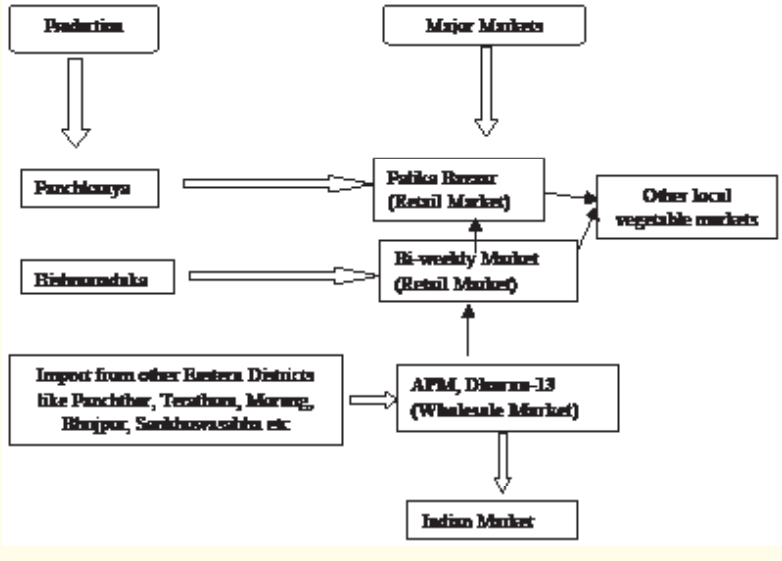

Figure 3: Market channel in Dharan.

Marketing problem (Producers and Traders)

The details of the marketing problems ranked by producers with frequency, index value and rank are presented in Table 16 and traders are presented in Table 17.

SN	Market problems	Frequency								Index	Rank
		P1	P2	P3	P4	P5	P6	P7	P8		
1.	Low market price of ginger	48	2	0	0	0	0	0	0	0.99	I
2.	Unawareness of market price information	0	20	5	18	5	2	0	0	0.72	II
3.	Lack of storage facilities	1	21	9	10	3	0	5	1	0.71	III
4.	Lack of processing facilities	0	0	18	9	8	12	3	0	0.57	IV
5.	Unorganized market	0	0	10	8	17	14	1	0	0.53	V
6.	Problem in selling	0	0	7	2	15	20	6	0	0.46	VI
7.	Lack of transportation	1	7	1	1	2	0	7	31	0.30	VII
8.	Quality issue	0	0	0	2	0	2	28	18	0.23	VIII

Table 16: Market problems as ranked by ginger producers in Sunsari, 2017.

Where, P= Priority level. Each of the problems were given a weightage from 1-8 and then obtained frequencies were multiplied with the respective weightage. The obtained results were then added and then divided with the total number of respondents i.e. 50 multiplied by the highest weightage value i.e. 8 and then index value was obtained. The ranks were assigned in accordance with the obtained index value.

SN	Problems	Frequency					Index	Rank
		P1	P2	P3	P4	P5		
1.	Low market price and demand	6	8	0	0	1	0.84	I
2.	Lack of storage and processing unit	8	0	0	0	7	0.63	II
3.	Low Quality	1	5	3	3	3	0.57	III
4.	Post-harvest Deterioration	0	1	10	4	0	0.56	IV
5.	Problem in transportation	0	1	2	8	4	0.40	V

Table 17: Market problems as ranked by ginger traders in Sunsari, 2017.

Where, "P" denotes, priority of the problems. Each of the problems were given a weightage from 1-5 and then obtained frequencies were multiplied with the respective weightage. The obtained results were then added and then divided with the total number of respondents i.e. 15 multiplied by the highest weightage value i.e. 5 and then index value was obtained. The ranks were assigned in accordance with the obtained index value.

Major suppliers

From the interview conducted on 15 ginger traders, it was found that, the major suppliers of ginger for wholesalers of Agriculture Produce Market(APM), Dharan were the farmers and collection centers of different districts like Khotang, Udaypur, Sankhuwasabha, Sunsari, Bhojpur, Dhankuta, Morang etc who provided 60% of the ginger while 40% of ginger was supplied by collection centers only. The interview among the retailers revealed that, retailers obtained 60% of the ginger supply from the wholesalers only, 30% of ginger was supplied to the retailers by the farmers only and 10% of ginger was sold by retailers who were ginger producers too and sold the produce in the local bazaar themselves.

The interview schedule among 50 ginger producers revealed that, the information on market price was provided by the local traders according to the prevailing market prices. No governing body was found to set the price for ginger in the market. The fluctuation of prices depended on the market demand, prices on Indian market and shortage or abundance of ginger supply in the market.

Price trend of ginger in past few years

The mean price of ginger in the year 2070 was found to be close to that of the maximum price of ginger in APM, Dharan i.e. Rs. 160 [10]. The price trend of ginger is represented in the Figure 4 [15].

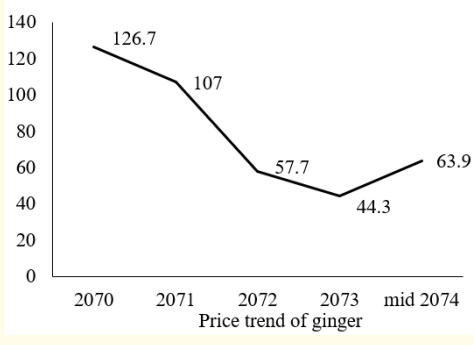

Figure 4: Price trend of ginger in Sunsari, 2017.

Conclusions

Ginger is prioritized crop in the PM-AMP under Sunsari district. The study site Bishnupaduka and Panchkanya are targeted for the production of ginger in Dharan. The climatic condition, history of production makes ginger the lucrative option as commercial crop. However, problems like low as well as fluctuating market price, uncertainty in the ginger price, lack of proper storage and processing facilities in ginger marketing and rhizome rot and lack of technical backup in ginger production has caused the ginger cultivation to decline dramatically over the years. The ginger producers were mostly found to be dissatisfied by the prevailing market prices of ginger, lack of technical backup and storage facilities in the area. So, this embarks an opportunity to motivate the farmers towards ginger cultivation by solving the issues of dissatisfaction among the producers. The study showed that, the ginger traded in Dharan is majorly imported from other districts like Bhojpur, Khotang, Terathum, Dhankuta etc as the volume of ginger produced within Sunsari is low enough to meet the local demands let alone export to India. The imported ginger is exported to Indian markets mainly through wholesalers of APM. No value addition activities were adopted in the study area yet but the producers were enthusiastic to invest on "Sutho" making if the opportunity was provided.

Bibliography

1. MoAD. Ministry of Agriculture Development (2016).
2. CBS. Nepal in Figure 2016. Central Bureau of Statistics. Kathmandu, Nepal (2016).
3. FAO Newsletter. Nepal's ginger farmers to be the winners in plans to expand international trade (Issue No.4). Nepal (2015).
4. Krishi Diary. Krishi Diary. Government of Nepal, Agriculture Information and Communication Centre (2074).
5. Vancura L., *et al*. "Opportunities for Nepalese Ginger and Derivative Products in Dubai" (2014).
6. DADO Sunsari. (2072/073). District Agriculture Development Programme and Statististical Booklet: A Review Fiscal Year 2072/073. Sunsari.
7. Nepal Ginger Profile. Nepal Ginger Profile 2016 (2016).
8. Nepal Ginger Profile. Summary Report on Nepal Ginger Profile 2016 (2016).
9. ANSAB. A Report on Value Chain Analysis of Ginger subsector in Nepal (2011).
10. APM Dharan. Details of Ginger Business in Agriculture Produce Market, Dharan from 2061/62 to 2072/73. Agriculture Produce Market, Dharan (2073).
11. Mercy Corps[US]. (2016).
12. ANSAB/NEAT. Value chain/market Analysis of Ginger Sub-Sector in Nepal (2011).
13. Nepal Economic Forum. A Special Issue on Migration and Remittance Socio-Economic Perspectives and Future Uncertainties (2017).
14. MoAD. Statistical Information on Nepalese Agriculture 2072/73. Agri-Statistics Section, Monitoring, Evaluation and Statistics Division, Ministry of Agricultural Development (2073).
15. PM-AMP. Prime Minister Agriculture Modernization Project (2016).

Volume 3 Issue 5 May 2019