

## RESEARCH ARTICLE

## VALUE-CHAIN ANALYSIS OF GINGER SUB-SECTOR IN SOLUKHUMBU DISTRICT, NEPAL

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## ABSTRACT

Survey research was carried out on Value Chain Analysis of Ginger Sub-Sector in Solukhumbu district with an objective of finding the value chain of ginger in Solukhumbu district of Nepal. Household level data from 60 household from Necha-Salyan rural municipality and Thulung Dudhkoshi rural municipality were sampled using random sampling technique. Few Local traders, wholesaler and retailers were also interviewed. Average area under ginger cultivation was found 2.35 ropani. Average cost of production per ropani was Rs. 14450.38 and majority of production cost of the production was covered by seed. The productivity of ginger in study area was 8.22 Mt/ha which was lower than national average and higher than the district productivity. The average price of the fresh ginger was Rs. 85.63/kg and Rs.200/kg for the dried ginger. Price fluctuation, lack of proper market, white grub, rhizome rot, lack of road access were the major problems for ginger grower in Solukhumbu District. Despite many problems, ginger cultivation in the study area was profitable business with B/C ratio 2.37 and B/C ratio of dried ginger was 1.13. Most of the sampled farmers were involved in the farming for their livelihood. Improved cultivation practices with recommended variety, timely plantation and seed treatment, simple processing like cleaning, sorting and grading are of immediate need to generate additional income to the producer.

## KEYWORDS

Value Chain Analysis, Ginger Sub-Sector, ginger cultivation, plantation, seed treatment

## 1. INTRODUCTION

Nepal is an agro-based country. Agriculture contributes 28.9% of the Nepalese economy however two-third population is engaged in agriculture (MoF, 2016/17). Ginger production is mainly concentrated on small holdings in the mid-hills of Nepal. Nepal ranks third position for ginger production in global scenario (FAO, 2011-12). Keeping on view the production of ginger it is categorized as priority export potential sector (MoC, 2016). About 75% of ginger is traded fresh while rest 25% is traded as sutho (ANSAB, 2011). The major trading partner for the ginger produced in Nepal is India sharing 94% of fresh ginger export and 6% of processed ginger (Samarth-NMDP, 2014). Solukhumbu is a mountainous district ranging from 600 to 8848 masl with cultivated land area almost 92,000 ha. (DADO, 2071/072). Total area under ginger production in Solukhumbu is 85 ha with the production of 442 tons and productivity 5.2ton/ha. The production area has been increased by 10ha and the production by 47 ton than that of fiscal year 2072/73 (AKC/Solukhumbu, 2075/76). But the productivity of ginger is quite low in Solukhumbu district than average national product.

A value chain is the full range of activities and services required to bring a product and services from production to consumption or its end use (Kaplinsky, 2000). According to Value Links Manual (GTZ, 2007), a value chain is a sequence of related functions from provision of inputs to production, transformation, marketing and final sale to consumers. Value chain analysis is influenced by both internal and external forces. The internal forces are production, marketing etc. and external forces are technological, ecological, socio-economic, new industry trends and regulatory development (WBSCD, 2011). The promotion and increment in

agricultural production requires a close coordination between producers, processors, traders and retailers according to demand and supply (Swinnen, 2007).

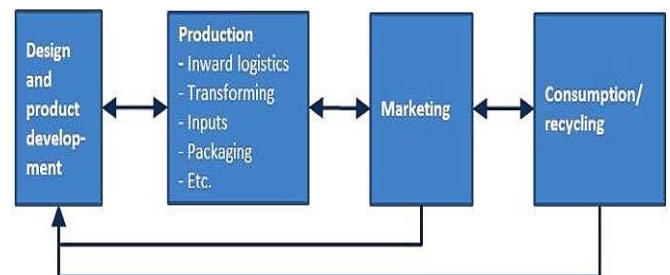


Figure 1: A simple value chain

Porter classified the value adding activities into classes presented in the figure. The activities are primary and support activities. Primary activities are further classified as product and market related activities and support activities are those related to infrastructure, technology, procurement and human resource management (Porter, 1998).

Agricultural marketing comprises of all activities from production to consumption like harvesting, grading, packaging, storing, price fixation, selling and buying with the involvement of actors like producers, traders, transporters, wholesalers, retailers and consumers (MDD, 1999). Value chain analysis can identify the contribution, the share of value added and risks bear by each actor involved. Fresh rhizomes with low fiber content

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but rich in aroma, pungency, fat and protein are preferred for green ginger purposes. Fresh rhizomes are also stored to be used as seed (Poudel & Timilsina, 2073).

Contributing nearly 25% of the total ginger trade, dried ginger (sutho) is the major value added product (ANSAB, 2011). Almost 99% of the total exported ginger is exported to India (ITC, 2010). Nepal enjoys free access to Indian market. Ginger price seems unpredictable however MoAD reports show the steady increase.

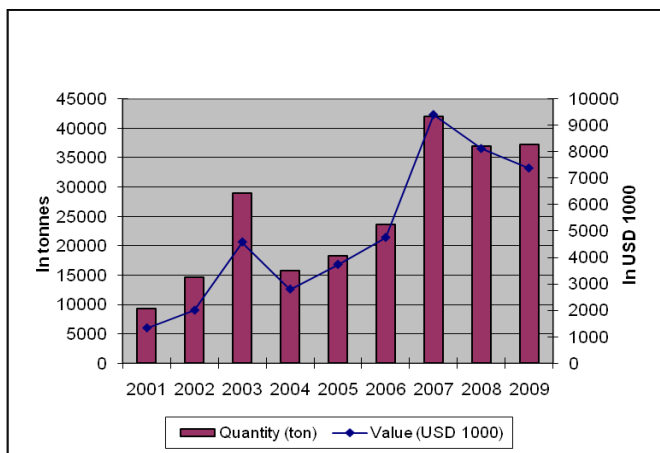


Figure 2: Quantity and value of ginger imported by India from Nepal  
Source ITC 2010

Lack of proper coordination between the organizations involved and various actors involved in value chain along with inefficient marketing channels and infrastructures has resulted in the huge gap in remuneration to farmers and cost to consumers. Involvement of a long chain of middle man has retained the margin to themselves and thus decreasing farmers' share. Only small value addition activities like cleaning and sorting, grading is carried out after fresh ginger is harvested. Farmers perform preliminary cleaning by removing soil and roots from rhizome. Depending upon the soil content in the product price deduction 2 to 8 Kg per sack of 50 kg from farmers is done by the local traders. Washing facilities are mostly owned by Indian traders where significant number of women is employed as laborers. Due to lack of washing facilities in Nepal, the Nepalese ginger has higher soil content and dirty look and thus it is not receiving better price. Besides, the exporters are facing problems during export (ANSAB, 2011)

## 2. RESEARCH METHODOLOGY

Major ginger production areas demarcated as the Ginger/Turmeric Zone of Solukhumbu district by PMAMP are the site of research. The Thulung-Dudhkoshi Rural municipality and Necha-Salyan Rural municipality and the nearby market were studied for this project.

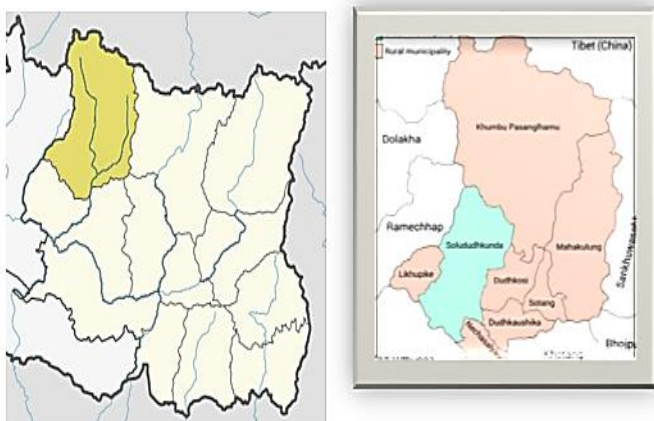


Figure 3: Study site of research

The respondents were randomly selected. Altogether 12%-15% of total population was taken as samples. Interview using semi-structured interview schedule were carried out for primary data. Different checklists were prepared to collect information from the local collectors, wholesalers and retailers. Production level economic details were collected with interview schedule taking farmers as the respondent. Information on marketing and other stages of value chain were taken with interview schedule. The primary sources of information were actors of the value

chain like input suppliers, producers, traders, service providers, key informants of related sectors. Primary data were collected by Key Informant Survey (KIS), Focus Group Discussion (FGD), Rapid Market Appraisal (RMA), Interview and Questionnaire Survey. Secondary information was collected from different articles, reports, journals, books and internet materials related to ginger production and marketing, and value chain approach.

The data obtained from the various activities conducted were entered using Statistical Package for Social Science (SPSS v19) and Microsoft Excel 2010. Descriptive analysis of the data with the help of statistical parameters like mean, frequency, percentage etc. was performed to get empirical finding from the research.

### 2.1 Socio demographic and economic variables

Variables like population distribution, family size, educational status, size of land holding, category of land etc. were analyzed by using simple descriptive statistics such as frequencies, percentage, mean, standard deviation.

### 2.2 Land category under ginger cultivation

The area under ginger cultivation of surveyed household were categorized into too small (ginger land up to 1.5 ropani), medium (ginger land from 1.5 to 4 ropani) & large (ginger land more than 4 ropani).

### 2.3 BC Ratio

Benefit cost analysis was done by calculating the total fixed cost, variable cost and gross return from the ginger cultivation.

$$B/C \text{ ratio} = \text{Gross return} / \text{total cost}$$

where, Gross return = total quantity ginger sold \* price per unit kg ginger.

$$\text{Total cost} = \text{variable cost} + \text{fixed cost (land)}$$

### 2.4 Marketing margin

The difference between the farm gate price and retailer's price is the marketing margin which was calculated by using formula.

$$\text{Marketing margin} = \text{retailer's price} - \text{farm gate price}$$

### 2.5 Producer's share

Producer's share is the price received by farmer expressed as a percentage of the retail price, i.e., the price paid by consumers. It was calculated by using following formula.

$$\text{Producer's share} = \text{Producer's price} / \text{Retailer's price} * 100$$

Where, Producer's price = farm gate price

### 2.6 Value chain analysis

The value chain describes full activities performed in order to bring produce or service from production to ultimate consumption through different phases of production and post-production operation. Existing value chain in the study area was identified. The cost of production and price paid during different phases was determined and margin to each actor was calculated. Similarly, the producer's share, marketing margin and price spread at each step was calculated for the chain in the study area.

### 2.7 SWOT Analysis

Strength, weakness, opportunities and threats (SWOT) related to ginger subsector were identified from the focus group discussion, interview and key informants. SWOT analysis is done for different stages of value chain i.e., at production stage, collecting/processing stage, and retailing stages. Information thus obtained from different actors in value chain was used in SWOT analysis.

## 3. RESULT AND DISCUSSION

Result obtained from analysis of gathered data are described in the following sub headings:

### 3.1 Socio-demographic analysis

Out of 60 sample household respondents, 42 were male and 18 were female. The study reveals most of the respondents were male.

Table 1: Distribution of the respondent by gender	
Sex of the respondent	Frequency
Female	18(30)
Male	42(70)
Sex ratio(F:M)	42.85

Figure in parentheses indicate percent Source: Field Survey, 2019

The mean and standard deviation of the age of respondents in surveyed area was found to be 45.35 and 11.316 respectively. Maximum and minimum age of respondent was 64 and 23.

Table 2: Distribution of the respondent by age				
Study Site	Maximum	Minimum	Mean	S.D.
Solukhumbu district	64	23	45.35	11.316

Source: Field survey, 2019

Ethnicity pattern was categorized as Brahmin, Chhetri, Janajati, Rai/Limbu and Dalit. The information shows that 33.3%, 16.7%, 5%, 45% and 0% respectively.

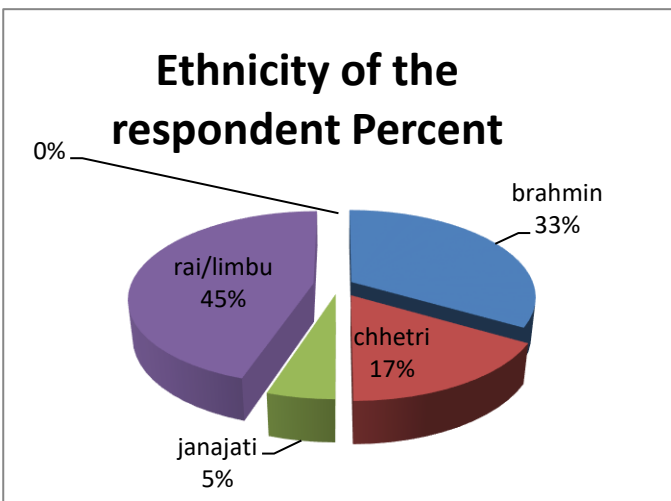


Figure 4: Ethnicity of the respondents

Education was categorized into seven categories. They were illiterate(can't read and write), literate (don't have any school education except informal education , primary level(up to grade 5), lower secondary level up to 8, SLC, +2/ certificate, bachelor. From the survey, 8.3% was illiterate, 20 % was literate who can just read and write and not got the formal education, 6.7% was primary level, 3.3% was lower secondary level, 30% was SLC, 18.3% was +2/Certificate level and 13.3% was Bachelor and above.

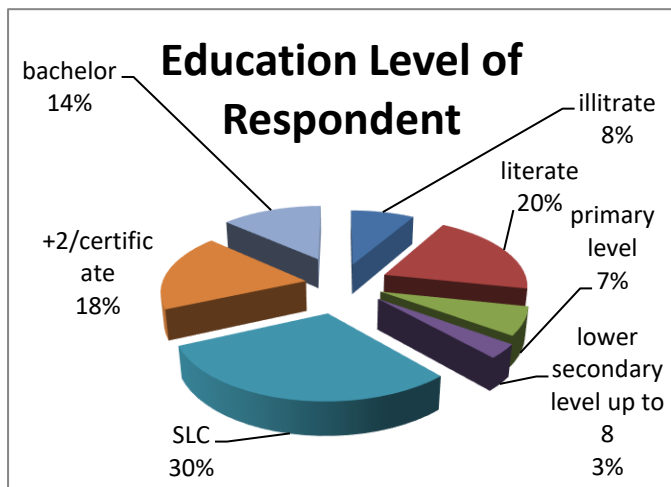


Figure 8: Education status of the sampled respondents

It was found that the 52% of the respondent's family members were male and remaining 48% were females. 58% of the people were economically active (16-59 years).

Table 3: Distribution of family size of the respondents		
Family Size	Frequency (N=400)	Percent
Male	208	52
Female	192	48
Economically active	228	58

### 3.2 Land Holding and area under ginger cultivation

Area of the respondent was categorized into upland and low land. Ginger cultivation area was noted below. Average land holding capacity of the respondents was found to be 22.48 ropani. About 2.35(10.45%) land was used in the ginger cultivation.

Table 4: Land holding and ginger cultivation area				
Land in ropani	Average	Maximum	Minimum	Total (Ropani)
Total land	22.48	65	3	1348.8
Ginger cultivation area	2.35	8	.5	141

Source: Field survey, 2019

### 3.3 Economic analysis of ginger Production

Economic analysis of Ginger cultivation includes cost of production, benefit cost ratio analysis of fresh ginger rhizome.

#### 3.3.1 Cost of production

Cost of production of ginger includes fixed cost and variable cost. Land cost is the fixed cost whereas input cost, labor cost and other miscellaneous costs are included in variable cost.

Cost of production of fresh ginger was found to be NRs. 13450.38 per ropani. Among all cost, land rent occupy 6.92%, input cost occupy 63.95% and labor cost occupy 29.120%. Out of total cost, seed rhizome covers 44.23% and FYM covers 17.64%. While Land preparation(bullock), land preparation(man), planting, manuring and mulching, weeding, harvesting, post-harvest activities(sorting, cleaning, washing, grading), packaging and other miscellaneous covers 5.8%, 5.5%, 5.2%, 4.04%, 4.37%, 4.1%, 0.6% and 3.46% respectively of the total cost of production. Production of fresh ginger was found to be 411.91kg and average loss is found to be 11kg (2.67%) in one ropani land. Production of one kg fresh ginger was Rs.35.08 is incurred.

Table 5: Calculation of cost of Production of fresh ginger rhizome (Rs/ropani)				
Description	Quantity	Unit	Rate (NRs)	Total amount(NRs)
Land rent	1	Ropani	1000	1000
Land ploughing	0.7	Bullock-day	1200	840
Land preparation	2	Man-days	400	800
Planting, manuring and mulching	1.88	Man-day	400	752
Weeding	1.46	Man-day	400	584
Harvesting	1.58	Man-day	400	632
Post-harvest activities( sorting, cleaning, washing, grading)	1.5	Man-day	400	600
Total(I)				5208

Cost of input:

Input	Quantity	Unit	Rate (NRs)	Total amount (NRs.)
Seed	86	In kg	74.33	6392.38
FYM	51	In Doka	50	2550
Packaging	4	Bora	25	100
Other				500
Total (II)				9242.38
Grand Total (I+II)				14450.38

### 3.3.2 Total revenue

Table 6: Total revenue from ginger cultivation				
Description	Quantity	Unit	Average price NRs	Total amount (NRs)
Production	411.91	In kg	85.63	35271.85
Loss	11	In kg	85.63	941.93
Production after loss	400.91	In kg	85.63	34329.92
Total Revenue(2-1)				34329.92

Source: Field survey, 2019

Ginger has various form of the value addition product. Sutho, ginger powder, ginger candy are the examples. Sorting, washing, cleaning and grading are the activities conducted for value addition. To produce 1 kg of sutho, 4.5 kg of fresh ginger was used. During sutho production process, about 2-3 % handling and drying loss occurs. Rs.230 was incurred to produce a Kg of Sutho. 15 % of the sampled farmer made Sutho.

### 3.3.3 Additional cost of production of Sutho

Table 7: Cost of Sutho production					
1.	Boiling/drying(411.91)	2.5	Man-day	400	1000
2	Firewood and other equipment cost	1	Lump sum	400	400
Total cost					1400

Total production of Sutho (in kg) from 1 ropani land 91.53

Loss in kg 2.28 (2.5%)

Net production after loss (Kg) 89.24

Cost per kg production of ginger (NRs.) 230

Source: Field survey, 2019

### 3.3.4 Benefit-cost ratio

Ginger has different value added form i.e Sutho, powder, candy etc. In my study site very few farmer were involved in the sutho making (20%). No any farmers were found to be involve in the powder and candy making. In one ropani area, B/C ratio was found to be 2.55 of fresh ginger, and 1.23 for the dried ginger.

S.N.	Particulars	Total cost/ropani	Gross revenue/ropani	B/C ratio
1.	Fresh ginger	14450.38	34329.92	2.37
2	Sutho(dried ginger)	21051.9	25879.6	1.23

\*Average price of fresh ginger was Rs.85.63 and price of the sutho was Rs. 290

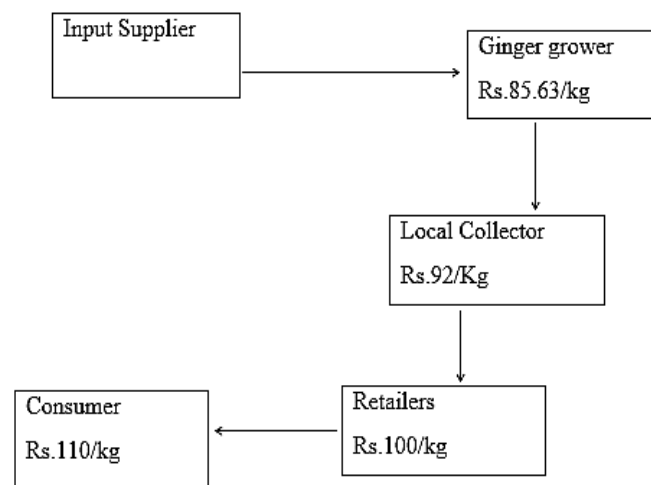
Source: Field survey, 2019

### 3.3.5 Market channel

Products from field to consumer level were taken through different channel. Different market channel with different price was seen during the study generally producers sell the ginger to the collectors and collectors are responsible to sell it to the wholesalers or retailers. There is no legal contract between producer and collector to supply the product but the collectors and traders made the agreement with the wholesalers to supply the product.

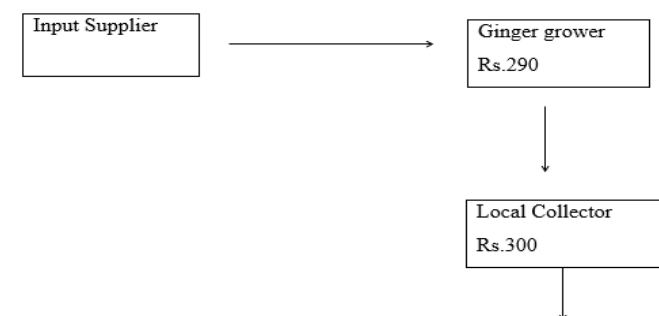
Market channel for fresh ginger in the study area.

According to this study, it is revealed that local collector purchased fresh ginger from growers on an average price at Rs85.63/kg and they supplied it to the retailer at price Rs92/kg on an average and then retailers supply the fresh ginger finally to the consumer at price Rs110/kg on an average. Since the price of ginger is not stable greater fluctuation is seen even within a year. Price of ginger depends entirely on demand in India and the whims of the Nepal-India border. During this year the production of ginger was limited. Hence, the Price of the ginger is high compared to the previous year. Despite the high demand, the supply of the fresh ginger was limited and Sutho making practices is very low.



### 3.3.6 Market channel for dried ginger (sutho) in the study area

Ginger is also traded in dried form and processed form. Dried ginger (sutho) is the major value added product of ginger which is made from fresh mature rhizome by drying so that it can be preserved for a longer period of time. Dried ginger required high labor cost for cleaning, drying and processing therefore producers only prepare sutho if market price for fresh ginger is comparatively low. Around 4-5 quintal fresh ginger is required to produce 1 quintal dried ginger. So price of dried ginger is high. From the study, we found dried ginger are collected by the local collector through ginger growers at price Rs.290/kg on an average and then supplied to the wholesalers at price Rs.300/kg on an average then wholesalers supply the dried ginger to consumer at price Rs.320/kg on an average. Because of high cost of production and low yield of fresh ginger in the study site, I found that most of the farmers are not willing to make sutho.



fluctuating every year. Like other agriculture product fresh ginger have market price during the off-season (July-August) and low in harvesting season (Nov-Dec). The given figure illustrates the price of trend of fresh ginger from 2072 -2076 in the study area. It was high during 2074/75, and low in the year 2072/73. In year 2075/76, the price of ginger was reached to Rs.110/kg.

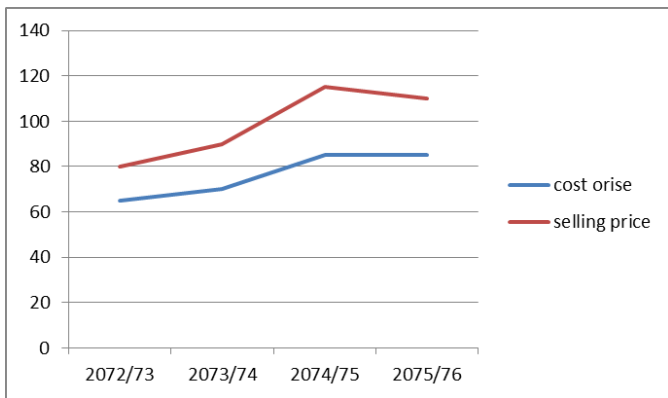


Figure 5: Price trend of the Ginger in different year

3.3.7 Value chain mapping

Value chain involved the three components, function, actors and enablers. The tentative flow of value chain map is illustrated below.



Figure 6: Value chain map of ginger in Solukhumbu district.

3.3.8 Function

The major function in value activities of ginger are input supply, production, collection, processing, trading and exporting. Seed rhizome, mulch and FYM are the common input for turmeric cultivation. Local collector collects farmer’s production which are supplied to the processor, wholesaler, retailer and consumer directly. In the farmer condition simple drying method is used for the Sutho making. They supply their product to the wholesaler of nearby districts. (Okhaldhunga, Udayapur, Mahatori etc).

3.3.9 Actors

**Input suppliers:** Most of the farmers use their own stored seed rhizome for the next season. Local varieties, improved (Bose) varieties are cultivating generation after generation. Mulching materials are the forest products of their community. Dried leaves of tree, banana stubbles, forage residue etc. are the major mulching materials. FYM and manure are by-product of livestock and farm animals. GOs and NGOs are providing subsidies for the farm shed management, small irrigation, agricultural tool, high-tech machinery (power tiller, tractors, trucks etc.).

**Farmers:** Farmers can be categorized into commercial and small-commercial and non-commercial on the basis of area and production of ginger.

Non-commercial farmers grow ginger only for the purpose of household

consumption and to share with neighbors. In Solukhumbu district, most of the farmers are non-commercial farmers. They cultivate ginger in the marginalized and barren unproductive land. The harvesting time is almost one year. Most of the farmers at Thulung Dudhkoshi Rural municipality fall under this category.

Small commercial- farmer grows the ginger in 1-2 ropani land. The purpose is not only household consumption but also to sell in near market and to earn money. Farmer from the Necha-Salyan rural municipality are fall under this category.

Commercial farmers grow their farm product for marketing and business purpose. Farmers from Necha- salyan rural municipality fall under this category. Usually commercial farmers supply their fresh ginger to local traders and processors value addition. Generally commercial farmers grow ginger more than 2 ropani of land.

**Local Collector:** Local collector/village trader collects fresh and dry ginger (Sutho) from farmer’s gate and perform value addition activity by cleaning, washing, grading, drying fresh ginger.

**Wholesaler/Retailer:** Wholesaler and retailer are the major distributor of fresh ginger (dried ginger too). They get the final product of processor and traders and sell to the consumer. Almost all the transaction of wholesaler and retailer in fresh from.

Enablers and Facilitators:

Enablers and facilitators provide support and service in value chain activities. Services, subsidies, training, technical support and market information system from service provides strengthens the value chain series work and linkage between actors.

In farmer’s level, PMAMP Zone implementation unit,(ginger/turmeric), Solukhumbu, AKC, agriculture-branch in rural municipality level, cooperatives, NGOs, INGOs are acting for the adoption of new technologies and technical and financial assistance. Co-operative are providing inputs like seed and buying their product at minimum support price or market price. PMAMP has been working in since 1 year and offering seed rhizome, mechanical tools and financial support to small and commercial farmers.

In trading and export level, PMAMP-zone implementation unit, AKC, local trader, cooperative etc. are working for the linkage between actors and stakeholders.

3.3.10 Marketing Channel

Solukhumbu is the mountainous district located north-east part of Nepal. Most of the markets are situated at headquarters of the municipality and rural municipality of the district. Major ginger producing farmers belongs to the Necha-Salyan rural municipality, Thulung Dudhkoshi rural municipality and Sotang rural municipality. Local/ village traders come in farmer’s gate to buy fresh and dry ginger, while farmers bring their products to co-operatives. Consumer directly come to farmer’s house for fresh ginger too. Jute/ plastic sacks are used for collection of products. Traders bring their product by using vehicle and perform cleaning, sorting, grading and drying. Local traders supply the ginger to the wholesaler of local, regional and national market, exporter and to retailer. And this chain ends at final consumer.

3.4 Value share of Turmeric

Field survey, 2019 reveals that the 59.56% of the total production was sold by and 15% was utilized for household consumption while 25.44% was stored for seed purpose and remaining consumer directly.

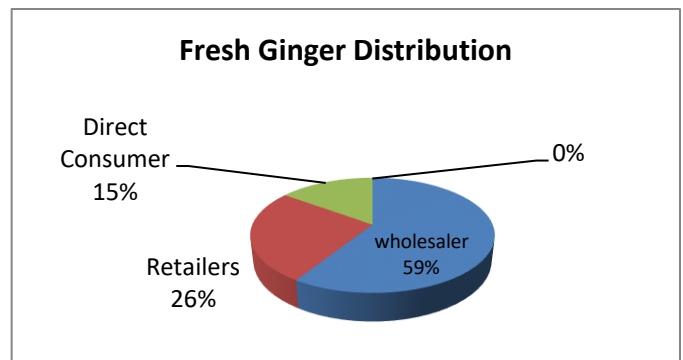


Figure 7: Distribution of fresh ginger Source: Filed Survey, 2019

Among total sold ginger, 59% sold to the wholesaler, 26% sold to the retailer and remaining 15% sold to the local consumer.

### 3.5 Market margin and Producer share of zone vicinity area

Efficiency of marketing system can be evaluated by the marketing margin and producer share. Lower marketing margin and higher producer share on retailer price indicates efficient market system.

Forms of	Farm gate	Retailer's	Market	Producer's
Ginger	price (Pf)	price (Pr)	Margin (Mm)	shares (Ps)
Fresh ginger	85.63	100	14.37	85.63
Dried ginger	290	310	20	93.54

Source: Filed survey, 2019

Farmers are performing value addition activity in case of ginger commodity by cleaning, sorting, grading, drying etc. Most of farmers were sold fresh ginger and some farmer sold Sutho. Maximum amount of the ginger was sold to the traders and some portion was sold to co-operatives and groups

### 3.6 Problem Ranking

In Solukhumbu district, there were several problems related to ginger production and marketing. Indexing /scaling technique was employed to priorities the problems. This method was implemented and explained below:

#### 3.6.1 Production Problem

Problems during production process were collected during pilot survey and major problems were priorities according to farmer's point of view and perception which are ranked and presented in table. On the basis of the survey study, white grub infestation was the major production problem followed by Rhizome rot infestation, unavailability of quality seed rhizome and input unavailability respectively.

Production Problem	Index	Rank
White grub infestation	0.88	1
Rhizome rot infestation	0.87	2
Post-harvest loss	0.543	3
Unavailability of the quality seed rhizome	0.393	4
Input unavailability	0.313	5

#### 3.6.2 Marketing Problem

Major marketing problems of ginger producing farmers faced are presented in the table below. The result shows that the price fluctuation at the harvesting time was the leading problem. Lack of the marketing infrastructure is the second most problem. Lack of roads to the rural farmers for transportation and marketing was also the one of the major problem in the study site. Similarly local collector, traders are the dominating on price fixing of ginger. Lack of market information system and poor linkage between stakeholders were also major problems of marketing prospective in study area.

Marketing problems	Index	Rank
Price fluctuation	0.953	1
Lack of marketing infrastructure	0.9133	2
Lack of road access	0.813	3
Traders dominance in price fixing	0.7466	4
Lack of market information system	0.2066	5

### 3.6.3 Post harvest problems of ginger

Post-harvest operation of ginger includes the activities that are performed after harvesting of ginger to till its marketing like grading, processing, packaging, storage of ginger. Farmers of Solukhumbu were facing various post-harvest related problems. Among them most important four post-harvest problems were taken for analysis and scaling was done on the basis of severity. In the study area lack of processing facility was the major problems with higher index 0.93 followed by storage facility, grading practice and lack of packaging materials with index 0.33 was found least problems of the area.

Problems	index	Rank
lack of processing facility	0.93	1
lack of storage facility	0.79	2
lack of grading facility	0.43	3
lack of packaging materials	0.33	4

### 3.7 SWOT Analysis

SWOT analysis provides knowledge about strength and opportunities in production and marketing of ginger subsector and also informs weakness and risk that helps in preparation and planning of business enterprise. Gathered information from FGD, KII and field survey, following situation was analyzed:-

Strength	Weakness
Requires relatively less investment for production.	Lack of improved varieties.
Announcement of organic farming village (No use of inorganic compounds in ginger).	Less priority of government.
Relatively less requirement of irrigation.	No application of fertilizer.
Locally available mulching material, manure and human resources.	Traditional farming practices.
Availability of local resistance variety against disease pest.	Lack of appropriate training.
Availability of marginal land and barren land for ginger cultivation.	No research activities.
Technical support from government and non-government organization, PMAMP- zone implementation unit, AKC rural municipality.)	Low productivity.
Transfer of technology in production unit.	Trader dominance in price determination.
Spice crop and also has high medicinal value.	Unknown actual market demand and supply.
Low postharvest and handling loss.	Communication gap between producers and processor.
High B/C ratio	
Opportunity	Threats
Research activities and varietal improvement program.	Degradation of landraces and local varieties.
Subsidy provision for small farmers and commercial farmers.	Emergence of new disease and pest.
Employment opportunity.	Trade depended on India market.
Eco-friendly. Cover crop.	Forest degradation and lack of mulching materials.
Reduce soil erosion. Import substitution.	
High demand from industries, companies and pharmaceuticals.	

#### 4. CONCLUSION

The climatic and geographic suitability of Solukhumbu especially in lower belt provides ample opportunity to the Farmers to grow ginger. The traditional way of ginger cultivation practices are common among the producer and most of them area using their own seed and variety for production. Various production, technical, post-harvest and marketing problems were faced by ginger producers during the cultivation. Ginger used for planting was mostly local type. Average cost of production for ginger per ropani was high where seed contributes the highest cost in average variable cost of production. Productivity of ginger in the study area was 8.22mt/ha which was lower than national average (11.96%) and district average(5.2mt/ha). Income source of the farmers was fresh ginger followed by dried ginger. Despite many problems, the ginger production in the study area was profitable (B:C ratio: 2.37) 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. Analyzing those problems in the study area, it was found that cleaning center, processing center and different industry of the ginger are of immediate need. No other value addition activities were adopted in the study area and very few producers were involved in making "Sutho".

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Vegetable production is the important part of the people residing in this area. It is the source of their income and helps in improving their living standard. It is found that women were involved in household activities and vegetable cultivation and male were involved in land preparation and marketing of the vegetable produce due to the low literacy rate of women which prevent them from involving the marketing and monetary activities. More than 70% were involved in commercial vegetables production from which 80% of total produce is used for selling purposes and remaining 20% were involved in vegetable production for own home consumption. They grows many winter and summer vegetables in their field and earn money by selling them in near market. Main problem was found to be low price of their produce followed by unmanaged market, lack of improved and hybrid seeds and many more. They expect from government for fulfillment of their needs by eradicating the problems from the root level.

Government should focus on making and implementing price stabilizing plans and policies to prevent the farmers from the pricing problems. Export promotion and import substitution programs must be carried out in this area and in other area facing the similar problems. Government should focus on eradication of illegal trading which had created negative impact to the farmers. Facility of transportation, communications, improved and hybrid varieties, access to market and marketing information must be provided to every farmers. Storage is another problems causing losses to the vegetable products. Government should carried out suitable irrigation schemes for the favorableness for increasing their production and storage facility to prevent the agricultural produces from being destroyed and losses will be reduced. Vegetable production is feasible here and many people were also involved in it, there is just a need of government focus on enhancing this sector and its proper marketing and motivating the farmers to continue vegetable production.

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