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A Report on Value Chain Analysis of Ginger subsector in Nepal



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A Report on

Value chain analysis of Ginger subsector in Nepal

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Abbreviations

ADO	Agriculture Development Officer
AEC	Agro Enterprise Centre
AIA	Acid Insoluble Ash
ANSAB	Asia Network for Sustainable Agriculture and Bioresources
ASTA	American Spice Trade Association
BIS	Bureau of Indian Standards
BMOs	Business Membership Organizations
CADP	Commercial Agriculture Development Program
CAA	Commercial Agriculture Alliance
CCI	Chamber of Commerce and Industries
DADO	District Agriculture Development Office
DAG	Disadvantage Groups
DDC	District Development Committee
DoA	Department of Agriculture
EU	European Union
ESA	European Spice Association
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistics
FGD	Focus Group Discussion
FNCCI	Federation of Nepalese Chamber of Commerce and Industries
FTEE	Full- time employment equivalent
GAPs	Good Agriculture Practices
GDP	Gross Domestic Product
GOs	Governmental Organizations
GRP	Ginger Research Program
На	Hectare
HH	Household
IC	Indian Currency
IFOAM	International Federation of Organic Agriculture Movement
ITC	International Trade Centre
ISO	International Standards Organization
JABAN	Jadibuti Association of Nepal
JAS	Japanese Agriculture Standards
MEDEP	Micro-enterprise Development Program
MoAC	Ministry of Agriculture and Cooperatives
MT	Metric Ton
NARC	Nepal Agricultural Research Council
NARDEF	Nepal Agriculture Research and Development Fund
NEHHPA	Nepal Herbs and Herbal Products Association
NGO	Non-government organization
NGPTA	Nepal Ginger Producers and Traders Association
NRB	Nepal Rastra bank
NRs	Nepalese Rupees

National Spice Crop Development Program
Nepal Trade Integration Strategy
Project for Agricultural Commercialization and Trade
Prevention of Food Adulteration
Plant Protection Directorate
Rural Economic Development Association
The Netherlands Development Organization
Trade and Export Promotion Centre
Terms of references
United Nations Development Program
United States Dollar
Value chain
Village Development Committee
Vegetable Development Directorate
Volatile Oil

Executive Summary

The Netherlands Development Organization (SNV) is an international development organization, providing advisory services for capacity strengthening of the local organizations working in various developing countries. Within smallholder cash crops sector, ginger has been identified as one of promising value chains for increasing income of smallholder farmers through improved production and value addition. Keeping in view of the priority accorded to ginger and its potential to contribute to rural poverty mitigation, SNV in collaboration with Vegetable Development Directorate assigned a task of value chain analysis to Asia Network for Sustainable Agriculture and Bioresources (ANSAB).

The main objective of this assignment is to analyze the current status of the ginger value chain and to provide sufficient insight into the activities of the chain actors, service providers and supporting institutions in it so that concerned stakeholders can provide support to upgrade the sub-sector to a more productive and effective sector with a mature role by the private sector. Specifically this study was concentrated in following points.

- Analyze broader market trend including cross-border trade (export and import) of ginger using secondary data;
- Present broader picture of the trade flow, by interacting with major traders in Naxalbari, Birtamod, Butwal, Bhairahawa and Nepalgunj;
- Generate details of value chain at production pockets in eastern and mid-western regions of the country through interaction workshop with district level VC actors and facilitating & supporting organizations in Ilam, Salyan and Surkhet; and
- Prepare a comprehensive value chain report.

Based on the total production volume, three development regions namely Eastern, Western and Mid-western were purposively selected as a sample of the study. Within the selected regions, primary information was collected through farmers field visit, focus group discussion, interaction with traders, processors and exporters in the major production corridors and pockets. To enrich this study secondary source of information was thoroughly reviewed. To validate the information, regional workshops at Birtamod and Nepalgunj and national validation workshop in Kathmandu were conducted.

Ginger is an important spice crop traditionally grown in the mid-hill areas of Nepal for cash income. The country produced 11.5% of world's total ginger production and became 4th largest producer in 2008. The production has made the country self sufficient for domestic consumption. Other major ginger producing countries are India, China, Indonesia, Nepal, Nigeria, Thailand, and Bangladesh. This sector contributes 0.59% of total export with export value of about NRs. 403 million in FY 2008/9. Total annual man-days required by ginger sector are estimated with 66,667 persons work for two months. About 75 % ginger is traded in fresh form and remaining 25% in processed form. Sutho (dried ginger) is major processed product of Nepal and farmers are making it in their traditional way. Other value added products are candy, powder, squash, pickles but their production share is very nominal. Due to its high volume and value in a unit area compared to competitive crops like maize, it has bigger impact on smallholder farmers.

The top ginger production districts of Nepal are Ilam, Salyan, Palpa and Nawalparasi. The national average yield of ginger is 11.96 MT/ha. Eastern Development Region has highest production volume (33.37%) and area of production. Birtamod, Dharan, Biratnagar, Hetauda, Birgunj, Butwal, Bhairahawa, Tulsipur, Nepalgunj, Dhangadhi, Mahendranagar and Kathmandu are the major market hubs of ginger in Nepal.

Nepal has mostly remained within the top ten position of world's biggest exporter of ginger throughout the decade. However, Nepalese ginger has not received good price. Almost all of the exports are to India with 99% of total export reported in 2009. Nepal enjoys free access to India's market, however, faces restrictive non-tariff barriers. Negligible quantity of ginger was also exported to USA, Bangladesh and Japan. There is a great export potential to other neighbouring countries like Pakistan and Bangladesh who are among the major importer in the world. There are incidences of import of ginger in Nepal especially during offseason. The major sourcing countries for Nepal are China and India.

The major markets hubs for the ginger in India are Siliguri, Kolkata, Gorakhpur, Lucknow, Kanpur, Bareli and Banarash. It is also reported that the export of Nepali ginger to Delhi, Amritsar and Jaipur markets.

In most cases the type of business relations between the various operational actors are of free market exchange. Contract farming is not seen in ginger. There is rare incidence of providing advance payment to the producer (Ghimire, 2009). The transaction patter in export market is mainly on commission basis where the commission agents charge 6-7% as commission. In totality, the governance of ginger value chain is buyer driven with minimum trust between various actors.

Major constraints

At input supplier level, inadequate knowledge on quality seed supplier and insufficient technical knowledge on plant protection measures are the major constraints. Similarly at production level, prevalence of rhizome rot disease; low productivity; traditional cultivation practices; traditional practice of seed production and storage; improper practice on post-harvest handling; limited collective marketing practices and low bargaining power; and minimum support from GOs and NGOs are the constraints. Further at processing level, lack of cleaning/washing facilities; inefficient processing technology; and insufficient skill and knowledge on processing are seen as major bottlenecks. Eventually at marketing level, low quality of produce; multiple taxes and unofficial payments during transportation; storage and processing facilities and collection centres; high custom clearance cost; access to limited markets; difficulty to get PFA test certificate; and limited access to finance are the major bottlenecks.

Untapped Opportunities

There are number of opportunities that can be tapped to boost this sector and can get benefit by the value chain actors. There is good demand of quality seeds and pesticides in ginger production area so that input suppliers have very good scope to work in this sector. At production level, potentiality to adoption improved post-harvesting practices; scope to increase area and productivity; proper harvesting and sell of mother rhizome during off-season; and establishment

of collection Centres at local level can add value to the producers. This study objectively looks at developing value added products in different value chain points of ginger for better market penetration and economic gain of the primary producers. Study found that product diversification has very good prospects with reliable market linkages. Similarly at marketing level, there is opportunity of value addition through cleaning, grading and sorting; scope of import substitution by regular supply; market diversification; employment for women and poor in primary processing centres if established; and also can increase the inward flow of foreign currency.

Future vision and recommendations

Ginger is of the important spices with good potential of employment creation and income generation. To address the pervasive poverty persisted in resource rich but economically disadvantaged rural areas, the government and non-government organizations working in ginger sector should focus their activities on following points.

- Work on Rhizome rot disease management;
- Facilitate to produce quality seeds & introduce high yielding varieties;
- Facilitate for quality production and post-harvest handling;
- Support to establish collection and storage facilities;
- Support to establish rhizome washing facilities;
- Create and strengthen producer group organizations;
- Entrepreneurship development and business planning for producer group organizations;
- Conduct exposure visit of the farmers;
- Support for product diversification;
- Declare Malneta -Salyan as a seed production pocket;
- Practice auction marketing in production pockets; and
- Support in branding, export facilitation and market diversification;
- Upgradation and accreditation of quarantine labs.

1. Introduction

1.1 Background

Agriculture in Nepal has long been based on subsistence farming, particularly in the hilly regions where peasants derive their living from fragmented plots of land cultivated in difficult conditions. The economic well being of Nepal is very closely bound to its natural resources arable land, water and forested areas. Although only comprising some 21% of land area, agricultural land is the major determinant of economic activities and the nation's socio-political identity; it provides employment opportunities to 66 percent of the total population and contributes about 36 percent in the GDP^1 . About 76% of the country's population living mostly in rural areas makes their livelihood through agriculture. Most of the agriculture households are smallholders. About 45% of the farming households have less than 0.5 ha of land and poverty among these households are widespread. Poverty is much more severe in rural areas (35%) compared to the urban areas (10%) (CBS 2004). Farming system remains primarily subsistenceoriented and only a small portion of farms use modern production units. Nepal agriculture's growth is constrained by poor infrastructures, weak institutions, and inadequate technical support for commercialization and supply chain development. In general, the prevailing weak agricultural growth is not sufficient to boost overall per capita income enabling economic transformation in the country.

There are about 700 spices in use all over the world and twenty countries actively engaged in the production and export of one or more of them. There are more than twenty spices in common use in Nepal and half of them are grown in Nepal too (GRP, 2009). Spice crops have significant contribution to raise the socio-economic status of the rural people, earn foreign currency and decrease environmental degradation (NSCDP, 2007). Spices are very popular in Nepalese cuisine and kitchen and the demand is in increasing trend. The major spices of daily use are ginger, large cardamom, cumin, coriander, pepper chilli etc. Among them, ginger and large cardamom are best known for export while other are produced in small quantity and also imported from other countries. India is the major trading partner for spices of Nepal and it shares 87 % in total trade value (Poudel, 2007).

The Netherlands Development Organization (SNV) is an international development organization, providing advisory services for capacity strengthening of the local organizations working in various developing countries. SNV Nepal works to enhance the capacities of meso level value chain service providers enabling them to provide more effective, efficient, and quality services to value chain actors. Within smallholder cash crops sector, ginger has been identified as one of promising value chains for increasing income of smallholder farmers through improved production and value addition. Keeping in view of the priority accorded to ginger and its potential to contribute to rural poverty mitigation, SNV is considering engaging in promoting ginger value chain from 2010. Therefore, SNV has provided an assignment to ANSAB to conduct a study on "Value chain analysis of ginger in Nepal" with production pocket studies

¹ <u>http://www.moac.gov.np/home/index.php</u>

concentrated on eastern and mid-western regions of the country and to prepare a comprehensive value chain report. For this study, there was guidance and needed supports of VDD.

1.2 Objectives

The main objective of this assignment is to analyze the current status of the ginger value chain and to provide sufficient insight into the activities of the chain actors, service providers and supporting institutions in it so that concerned stakeholders can provide support to upgrade the sub-sector to a more productive and effective sector with a mature role by the private sector. The study has covered VC actors, service providers and facilitating organizations, market, policy environment, chain structures and VC governance.

1.3 Methodology and working modality

1.3.1 Sample and Sampling design

The total population in ginger sector is very large; therefore sampling was necessary for the sake of study. Based on the total production volume, two development regions namely Eastern, Western and Mid-western were selected as sample of the study. Within the selected production regions, major production corridors and pockets were selected for primary information collection. For the eastern regions, because of the highest production potential, Ilam district in the Mechi highway corridor was selected. Similarly, in the Midwestern region, Gulmi-Palpa-Bhairahawa corridor and in mid-west region Dang- Salyan corridor, and Surkhet- Nepalgunj corridor were selected for obtaining information from primary chain actors. Representative traders, processors and exporters in the production pockets and nearby market hubs (Birtamod, Naxalbari, Butwal, Bhairahawa, Salyan, Dang, Surkhet, Nepalgunj, and Kathmandu) were consulted.

Major actors involved in Nepalese ginger value chain are considered as the population of the study. Specifically farmers (growing ginger with commercial purpose), traders (traders who add the value in product by cleaning, sorting, grading, packaging), exporters are assumed the population for this study. In case of processor, there are two categories namely Sutho (dry ginger) producers and the processor who process the ginger and make consumer products either by using only ginger or mixing with other products.

1.3.2 Data collection

Entire chain level information and data have been collected by the way of personal contact with related government agencies, associations, key personnel, development organizations and local NGOs. Among the government offices; Department of Agriculture (DOA)/Vegetable Development Division (VDD), Trade and Export Promotion Centre (TEPC), District Agriculture Development Offices (DADO) of respective districts are major sources of information. Likewise, required data were also collected from Agriculture Enterprise Centre (AEC), Rural Economic Development Association (REDA), Nepal Agriculture Research Council (NARC), National Ginger Producers and Traders Association (NGPTA), Jadibuti Association of Nepal (JABAN),

Ginger Cooperatives and other NGOs. The data related to international trade scenario were collected from the publication of Food and Agriculture Organization (FAO), International Trade Centre (ITC) and Nepal Rastra Bank (NRB). Figure 1 and the subsequent description presents the methods used to collect and validate the qualitative and trade related information.



Visit to the Production Sites: To know the ground reality of ginger producers, study team visited the production sites of Salyan (Malneta) and Surkhet (Ramghat) and interacted with producers, local collectors and road head collectors.

Focus Group Discussion (FGD): Three FGD events were organized at Ilam, Salyan, and Surkhet. The participants of FGD were farmers, local traders, district level traders, representatives of DADO, Chamber of Commerce and Industries (CCI), NGOs and various programs and projects. The participants of FGD were divided in three groups as farmers, traders and facilitating organizations. Farmers' group analyzed the present status of ginger cultivation, cost of production, constraints and opportunities of this sector. Similarly, traders' group also calculated the cost of goods sold and constraints and opportunities in the trading business. In the meantime, facilitating organizations analyzed the sector in terms of enabling environment of ginger sector of Nepal. At the end of group work, representatives from each group presented the findings and made concrete recommendation to upgrade the ginger sector.

Traders Meeting: Traders meetings were organized at Naxalbari (India), Srinagar and Kapurkot (Salyan), Ramghat (Surkhet), Bhairahawa, Butwal, Nepalgunj and Kathmandu. In the meeting, status and trend of ginger trade, major constraints faced and available opportunities to upgrade this sector were discussed. Possibilities of contract farming and inclusive business deals were explore, even though no concrete commitment was observed.

Regional Validation Workshop: Two events of regional workshops were conducted at Birtamod and Nepalgunj to validate the information collected from field visit, traders' interaction and FGDs of respective regions. Farmers, traders, DADOs, CCIs and development organizations of eastern development region were participated in the workshop of Birtamod. Similarly, the participants of mid-western development region including two directors (Vegetable Development Division and Mid-western development region) were participated in the workshop organized at Nepalgunj. In each workshop, the regional perspective of ginger value chain was presented and feedbacks and suggestions were collected from the participants.

National Validation Workshop: The findings of the study were validated through National Validation Workshop conducted in July, 2011 at Department of Agriculture, Hariharbhawan. There was active participation of the representatives of various government agencies, I/NGOs and private sector in the workshop. The feedbacks and comments obtained from the workshop are incorporated in the final report.

1.4 Scope of the work

The value chain study is nationwide with focus in production pockets concentrated on three regions of the country, i.e. eastern, western and mid-western. Specifically this study is concentrated in following points.

- Analyze broader market trend including cross-border trade (export and import) of ginger using secondary data.
- Present broader picture of the trade flow, by interacting with major traders in Naxalbari, Birtamod, Butwal, Bhairahawa and Nepalgunj.
- Generate details of value chain at production pocket in eastern and mid-western regions of the country through interaction workshop with district level VC actors and facilitating & supporting organizations in Ilam, Salyan and Surkhet.
- Prepare a comprehensive value chain report.

1.5 Limitations of the study

Ginger production area of Nepal is scattered from east to west of mid hill region of the country and it is difficult to cover all the region of ginger cultivation in this study. Therefore, owning to the current production trend and future potentials, mid-western, western and eastern development region of Nepal were purposively selected. Ilam from eastern and Salyan and Surkhet from mid western development region were selected as sample districts for Focus Group Discussion (FGD), which might adequately capture the nationwide scenario. Due to short period of study, it was impossible to understand detail information from each value chain actors therefore the secondary source of information is also used.

2. Value chain mapping

2.1 Overview on value chain of agriculture sector

Throughout the developing world, the relative importance of grains and other starchy staple crops is declining; while that of high value agriculture commodity is increasing. This transformation of agricultural sector has profound effects on the nature of the traditional agriculture supply channels. In particular, the growth in high value agriculture implies a greater need for close linkages between farmers, processors, traders and retailers in coordination with supply and demand (Swinnen, 2007). The lowering of barriers to the international flow of products and capital has progressively speeded up, and most developing countries are required to adjust to the demands of globalization. This poses both threats and opportunities to individual enterprises, to their workforces, and to governments with an active concern with welfare and growth (Kaplan and Kaplinsky, 1999). Globalization has changed trade, opening market opportunities and increasing competitive pressures on producers in developing countries. Local producers, in their interaction with local processors or exporters and international retailers have the possibility to acquire new skills and knowledge (Fromm, 2007).

The growth of high value agriculture, the development of industries for vertical coordination and other structural changes in agricultural supply channel present both opportunities and challenges for small farmers in developing countries. It creates opportunities for small farmers to raise their income by participating in the growing markets for high value agricultural commodities. At the same time, the changes pose challenges to small farmers because high value agriculture commodities often involve higher cost of production and greater production and marketing risks (Swinnen, 2007).

Understanding the value chain of agriculture commodity is very much important to plan and execute the program and to contribute the Nepalese overall economic development. As marketing, the relationship between producers and traders is also important in terms of value chain governance in natural resource sector. Massive changes are taking place in the geography of agricultural production in response to the creation of buyer-driven supply chains, governed by non-agricultural sectors and driven by global sourcing and advances in processing and transportation technologies (Vorley, 2001).

Both conventional and organic farmers face an increasingly challenging marketing environment. The commodity-based marketing system of the past is generally presented farmers with the choice of a few stable market outlets. Today, however, markets have become more diverse, fragmented into market 'niches'. As a result, farmers are finding that — on top of all their other hats — they need to become market strategists. Some of these farmers are therefore turning to alternative markets. Direct marketing, farmers markets, Community Supported Agriculture etc., are frequently mentioned as marketing alternatives. More recently, localized and ethical or "fair-trade" markets have also emerged as potential alternatives (DuPuis, 2006). To get the advantage from global trade, farmers should have the in depth idea on value chain and governance structure within it.

2.2 Value chain map of ginger subsector

The value chain of ginger is slightly different from east to west but the maps presented here is the representative of whole Nepal so that some of the adjustments are made. During mapping, firstly actors involved in this sector with their respective functions are listed and mapped accordingly. Secondly, the institutions that have been supporting this sector directly or indirectly are listed as enablers. The definition of each actor, flow of products within chain and the relationship between various actors are presented in the value chain maps of i) fresh ginger and ii) dried and processed ginger (Figure 2 and 3).

2.2.1 Functions

Major functions involved in this sector are input supply, production and local processing at farmers level; collection, domestic trading and exporting at traders level; and processing and manufacturing for value addition at processors/manufactures' level. The function of final processing and manufacturing is in limited form within Nepal. Some companies like Dabur Nepal, Gorkha Ayurved have been using ginger as an ingredient in their various products.

2.2.2 Actors

In a value chain, the actors include the value chain operators and the operational service providers together. Those functionaries who are directly involved in transaction or directly support the actors who involved in transaction are the VC actors.

Based on activities performed, the actors are classified as below.

1. Input suppliers: Input suppliers are those who provide inputs for the production of ginger. Seed, FYM and labour are the major inputs for ginger farming and are usually managed by farmers themselves. Pesticides, which are rarely used in ginger, are provided by agro-vets and chemical fertilizers are provided by fertilizer dealers existing in nearby market Centres of farmers. Government agencies and non-governmental agencies provide technical knowledge and inputs in some extent to the farmers; however, the flow of information and inputs is not satisfactory.

Figure 2 Value Chain Map of fresh ginger²



² Indicative number are calculated based on interaction with stakeholders



Figure 3 Value Chain Map of dried and processed ginger³

³ Indicative number are calculated based on interaction with stakeholders

2. Farmers: The term farmer usually applies to a person who grows field crops, and/or manages orchards or vineyards, or raises livestock or poultry. In this study, the term 'Farmer' refers to a person or his/her family members who have been growing and selling ginger and its products. Three types of farmers are engaged in ginger production: I) Small farmers with subsistence ginger production, II) Small commercial farmers characterized by small production volume but still targeting the market and III) Large-scale commercial production. The produce from small farmers generally does not enter the market or enters in a very limited quantity especially in the local retail market. Small and large-scale commercial farmers sell most of their produce to various market intermediaries. Farmers are also engaged in local processing of the ginger especially dried ginger (Sutho). There are 442 farmers' groups and 83 farmers' cooperative (excluding tea) in Ilam district (DADO, Ilam, 2065/66). Similarly 333 farmers' including 97 related to ginger and 38 cooperatives are existed in Surkhet district (DADO, Surkhet, 2065/66). It is also found that there is involvement of cooperatives in sample districts for the purpose of processing and product development. With the existence of 2964⁴ farmers' cooperatives in Nepal, it can be said that there is very good ground to work in group approach. Some farmers are also involved in production of organic ginger.

3. Local processors: Ginger is locally processed to produce dry ginger (Sutho), candy, pickles, squash, powder etc. Sutho, the main processed product at local level, is mostly processed by farmers themselves by using the traditional methods and sell to the road-head traders or national traders. More than 75% of the production is traded as fresh and almost 25% in dried form (ITC, 2007). Ginger candy, pickles, squash and other processed products are processed by local cooperatives in very few quantity and sold locally or some exhibitions. Though there is good scope of value addition in order to increase per unit price and create local employment, value addition (especially processing) is not a commercial practice in Nepal.

4. Road-head traders: Road-head traders are those traders who are located at road-head and collect the goods from farmers. Road-head traders are usually from the local community and conducts trading activity of various goods including retailing of grains and foodstuffs. Ginger is collected and stored until the truck load is collected. Sorting to some extent such as removing the decayed and spoiled ginger is done. Most of the ginger from road-head traders goes to exporters who supply to India and some quantity goes to National traders. In Ilam, the road-heads where major portion of ginger is collected are Jeetpur, Mangalbare, Biblate, Ilam municipality and Fikkal. In Salyan, Ghodcharu, Srinagar, Kapurkot are the major collection points. Similarly, Chhinchu, Ramghat, Birendranagar, Botechaur and Sallibazar are the main collection points of Surkhet. In Palpa, road-head traders are mostly stationed in Dumre, Aaryabhnajyang, Tahun, Batashe and Bhairbsthan.

5. National Traders: The traders who have been active in trade of ginger and its products in national market are called National Traders. They get goods both from cooperative and road-head traders. Besides supplying goods to national markets, they also supply to exporters and national processors/manufacturer. Sometimes national traders directly provide goods to Indian commission agents but the case is rare. They also sell ginger to local markets.

⁴ <u>http://nepali.deoc.gov.np/</u>

6. National processors/manufacturers: The firms which are engaged in producing ginger products and other products using ginger as one of the ingredients are termed as national processors/ manufacturers. There is evidence of ginger slices exported to US and EU markets from national level processors/ exporters. The products using ginger as an ingredient like Ayurvedic medicine and food items are sold locally to wholesalers or to wholesalers in India. Dabur Nepal, Gorkha Ayurved, Singh durbar Vaidyakhana, Male International and local spice companies are some of the examples of the processors and manufactures.

7. Exporters: The firms which have been doing export business of ginger and ginger products are regarded as 'Exporters'. Major part of the fresh ginger and dry ginger is exported to India while very small amount of ginger products are exported to overseas. Some exporters are also sending certified organic ginger to overseas countries.

8. Commission Agents: Most of the ginger exported to India initially goes to Indian commission agents (CA) who are based in major market hubs of India and border cities of Nepal. These commission agents usually take 6-7% as commission on the total sales amount. Depending upon the relationship with the exporters, payment of 50 to 70% is made by the commission agent during delivery of goods. Rest of the payment is paid once the goods are sold completely by deducting the commission.

9. Wholesalers: Wholesalers are defined as those who sell the goods to retailers, hotels, industries, and institutional users. The minimum quantity sold by wholesaler in Kalimati, Kathmandu market is 5 Kg at a time.

10. Retailers: They are the trader who sells get the goods from wholesalers and sell to end consumer.

2.2.3 Enablers and facilitators

In a value chain, the enabler includes all chain-specific actors providing regular support services or representing the common interest of the value chain actors. Functions at the enabler level include, for example, public research and technology development, agreement on professional standards, promotional services, joint marketing or advocacy and other support service providers.

Enablers in production and local processing functions:

For the farmers, District Agriculture Development Office (DADO), Nepal Agriculture Research Council (NARC), National Spice Crop Development Program (NSCDP), Spice development program under Vegetable Development Directorate (VDD) is working to develop and disseminate different technologies in ginger farming and processing. Similarly, cooperatives and farmers' groups are facilitating in collective selling of ginger. Microfinance institutions assist farmers by providing them loan. Some NGOs are involved in providing technical and financial assistance to cooperatives for local processing of ginger and producing products like ginger candy, ginger squash, pickles etc.

Enablers in trading and export functions:

In traders' level, Business Membership Organizations (BMOs) like Jadibuti Association of Nepal (JABAN), Nepal Ginger Producer and Traders Association (NGPTA), District Chamber of Commerce and Industries (DCCI) are supporting for business success. Agro Enterprise Centre (AEC) is working in the area of market development by providing market information, facilitation for market linkages, etc. Vegetable Development Directorate also facilitate in trading activities by providing processing technology and establishing collection centres. It also conducts regular monitoring and supervision of market and market data collection. At export level Plant Quarantine Office works on legal formalities before export, which is the government authority. Similarly, Trade and Export Promotion Centre assist in export of goods and also maintain the export data.

At higher level, some of the business enablers are Ministry of Agriculture and Cooperative (MOAC), Department of Agriculture (DOA), Federation of Nepalese Chamber of Commerce and Industries (FNCCI), Ministry of Commerce and Supplies.

The details on each enablers and facilitators are described in following headings:

2.2.3.1 Public actors and projects

Department of Agriculture (DOA): District Agriculture Development Office (DADO) operates under Department of Agriculture of the Ministry of Agriculture and Cooperatives and is functional in all 75 districts. DADO is the main point of activities related to agriculture of associated district. In ginger, DADOs are implementing various activities on ginger promotion which are mainly focused only at the production level. Group formation, technical advice to growers, technology demonstrations, and trainings are few of their activities.

Ginger and cardamom development section/Vegetable Development Directorate (VDD): The objective of this agency is to promote spices (improve production and productivity; promote export of spices, substitute spice imports and increase farmers' income). Collection and selection of varieties, technology generation, production and distribution of quality planting materials, providing training and technical know-how to the farmers are some of the key activities of this section.

Spice Development Centre, Panchkhal: In relation to ginger, the objectives of this centre areselection and seed production of high yielding ginger varieties. However, the access of farmers' to this service is currently lacking.

National Spices Crop Development Program (NSCDP): At national level this program has the mandate to conduct research works on ginger. It has recommended some ginger varieties (e.g. Kapurkot-1) and also produces breeders' seed.

Plant Protection Directorate (PPD): The PPD is designed as the Government agency responsible for the program implementation on the Plant Protection Sector and is responsible for

four national level programs- the office of Registrar of Pesticides, the Plant Quarantine Program, and Regional plant Protection Laboratories.

Nepal Agriculture Research and Development Fund (NARDEF): It has been funding various research and development projects conducted by government extension offices, NARC and different NGOs.

Nepal Agricultural Research Council (NARC/NGRP): Under the umbrella of NARC, National Ginger Research Programme (NGRP), Kapurkot, carry out research in explicitly ginger production, processing and storage technologies.

Trade and Export Promotion Centre (TEPC): TEPC is established under Ministry of Commerce and Supplies with the objective of promoting foreign trade in general and export trade in particular of the country.

Government projects:

Project for Agricultural Commercialization and Trade (PACT): The development objective of the PACT for Nepal is to improve the competitiveness of smallholder farmers and the agribusiness sector in selected commodity value chains in 25 districts supported by the project. There are three components namely agriculture and rural business development, sanitary and phyto-sanitary facilities and food quality management and project management, monitoring and evaluation.

Commercial Agriculture Development Project (**CADP**): CADP commenced operations in 2007 with the objective of reducing poverty in 11 districts in the Eastern Development Region (EDR) of Nepal. The Project aims to accelerate the process of agricultural commercialization in the EDR by building on earlier project initiatives, and responding to the needs of stakeholders by strengthening linkages and ensuring fair benefits to poor disadvantaged communities and women.

2.2.3.2 Non-government actors and projects

Asia Network for Sustainable Agriculture and Bioresources (ANSAB): Established in 1992, ANSAB is a civil society organization working in South Asia and headquartered in Kathmandu, Nepal. It is committed to biodiversity conservation and economic development through community-based, enterprise-oriented solutions. Since 2000, ANSAB has been providing market information of ginger collecting from various major market centres of Nepal and India. Apart from that ANSAB provides various supports to farmers, processors, exporters in production, business planning, processing, trading and export of the products.

Agro Enterprise Centre/Federation of Nepalese Chamber of Commerce and Industries (AEC/FNCCI): FNCCI has created AEC as an autonomous unit in September 1991. It has its own optimal guidelines, policies and program approval is given by a separate board comprising of FNCCI executive members, representative from District Chambers of Commerce &Industry, commodity associations, permanent invitees from various related government agencies and donors. The mission AEC is to expand and strengthen market oriented private sector driven agro enterprises in order to increase the value and volume of high-value products old domestically and internationally.

Nepal Ginger Producers and Traders Association (NGPTA): Established in 2062 B.S., NGPTA is working mostly in the facilitation activities for the trade of ginger. It involves 36 farmer group and 27 traders (mostly from eastern region) and planning to extend branches in 22 districts of Nepal.

Jadibuti Association of Nepal (JABAN): It was established in 2055 B.S. in Nepalgunj and is a association of traders and processors. As supporting organization to NTFP and spices, market information is providing regularly. Recently JABAN has established laboratory facility with Gas Chromatography (CG) machine in the support of government of Nepal.

Nepal Herbs and Herbal Products Association (NEHHPA): NEHHPA is established officially registering in the District Office, Kathmandu in the year 2002 AD. NEHHPA aims to provide a common roof to all the isolated herbal manufactures and traders, circulate the information of the herbal sector, develop marketing strategy, advocate for the rights of the traders and expand the criteria of herbal sector in the national and international level.

Micro-Enterprise Development Programme (MEDEP): It started in 1998 is a multi donor funded poverty reduction initiative implemented by the Government of Nepal with the technical and financial support of UNDP. The programme helps to improve the livelihood of the poor and excluded communities by creating various income generating opportunities through skill development trainings and support to establish small business enterprises. Specifically in ginger sector, MEDEP has transfer the skill to micro-entrepreneurs and entrepreneurs are producing and marketing various ginger products like candy, squash, powder, pickle etc.

Mercy Corps: Mercy Corps works in Nepal to help communities achieve greater prosperity, decrease social marginalization and to improve environmental sustainability. While integrating cross-cutting themes such as youth engagement, community participation, market strengthening, and social inclusion, Mercy Corps' projects aim to strengthen local agricultural economies and reduce risk of disaster. Mercy Corps designs its projects with the recognition that facilitating private, public, and civic sector partnerships is a key aspect of sustainability. Regarding ginger, it has been supporting the farmers and traders in eastern development region.

2.2.4 Policy framework

Trade policy 2009 has highly prioritized ginger and kept under highly potential export items group. It has also planned program for the commercialization of the farming of ginger. Under this, it has planned to provide capital, technology and seeds in cooperation with the concerned agency in the production pocket, ensuring markets for ginger, certification system and promotional programs, enhancing quality of dry ginger, trainings, assistance in processing and transportation.

The government has recently launched Nepal Trade Integration Strategy (NTIS) in June 24, 2010 with the objectives of strengthening trade negotiations, technical capacity of domestic non-tariff barrier and other business institutions, export capacity, and GON's capacity to coordinate and manage Trade-Related Technical Assistance and Aid for Trade. The NTIS has placed ginger along with tea, lentils, and cardamom to build a competitive export supply capacity by Good Agriculture Practice (GAPs), Integrated Pest Management (IPM) and Quality Management System (QMS) along with Third Party Certification (TPC) programs. For this, initially it is planning to launch internationally acceptable traceability systems based on GAP certification run through TPC for which it has suggested policy and regulatory development/reform. The possible timeframe suggested is 2 years. The report also claims of producing a new improved variety by the Ginger Research Centre/NARC suitable for Nepal's soil and climate that can maintain the "Bose" nature and quality of ginger. The strategy paper also has put high importance in value addition activities of ginger and proposed various actions on obtaining it.

Though, Nepal enjoys free access to India's market for ginger trade but faces restrictive nontariff measures. The exporters who export the product to India are facing the problem of unofficial payment and also equally hurt by the instable Indian government policy in agriculture commodity trade. Indian cities namely Gorakhpur, Lucknow, Siliguri are the major markets, have been creating problems in export of Nepalese ginger imposing import ban time and again in the name of PFA and quarantine, specifically when they have their own enough production (Ghimire, 2009)

3. Economic analysis

Ginger is an important spice crop traditionally grown in the mid-hill areas of Nepal for cash income. This sector contributes 0.59% of total export with export value of about NRs. 403 million in FY 2008/9 (TEPC, 2010). Total annual man-days required by ginger sector are estimated 2,000,000 with 66,667 persons work for two months (ITC, 2007). Due to its high

volume and value per unit area compared to competitive crops like maize, it has bigger impact on smallholder farmers. It can be easily grown in marginal and sloppy land across the country. All these comparative advantages and the existence of favourable climatic condition have attracted the farmers towards ginger farming (AEC/FNCCI, 2007).

3.1 Production

3.1.1 Domestic production scenario

According to the FAO, 2008, the international ranking of Nepal lies in 4th position after India, China and Indonesia in terms of global ginger production with 11.5% of world's production. In terms of production value, Nepal lies in 9th position worldwide. As per VDD report, ginger has the highest production and area covered among the spices of Nepal. The total area of ginger cultivation in FY 2008/9 was 17,665 ha and the total production quantity was 211,251 MT. Other spice crops like Large Cardamom, Chilli, Turmeric and Garlic are lagging behind the ginger both for production volume and area coverage.



Figure 4 Area and production of major spices in 2008/9

The statistics show that there has been a steady increase in production of ginger. The production and area in 2005/06 was the highest in terms of quantity and area. The following table illustrates the production status of ginger in Nepal in last decade.

Source: VDD 2009

Fiscal Year	Prod (MT)	Area (ha)	Yield (MT/ha)
2000/01	84,366	8,956	9.42
2001/02	87,909	9,189	9.57
2002/03	140,056	11,480	12.20
2003/04	150,593	11,830	12.73
2004/05	152,704	11,930	12.80
2005/06	232,992	18,515	12.58
2006/07	160,576	13,170	12.19
2007/08	161,171	14,007	11.51
2008/09	211,251	17,665	11.96



Source: MOAC 2008 and VDD 2009

Production pockets

The top ginger production districts of Nepal are Ilam, Salyan, Palpa and Nawalparasi. Figure 5 illustrates the major districts involved in ginger production in 2008/9. Ilam alone occupies more than 22% of the total national production and has more than twice the production of Salyan, the second top ginger producing district. The national average yield of ginger is 11.96 MT/ha. Ilam, Salyan, Palpa and Nawalparasi had yield of 14.8, 11.5, 10.4 and 9.4 respectively (VDD 2008/9).

Figure 5 Production and Area of major districts involved in production of ginger



Source: VDD 2008/9

Eastern Development Region has the highest share (35.37%) in terms of production volume and area. Western Development Region and Mid-western Development region have share of 22.07% and 20.32% production (VDD, 2065/66). During FGD, Malneta, Salyan is found most productive pocket with upto 30 MT/ha productivity.

Development region	Area of Pro (Ha),	oduction %	Production Volume (MT), %		Productivity (MT/Ha)
Eastern	5484	31.04	74731	35.37	13.64
Central	2177	12.32	23811	11.27	10.94
Western	5074	28.72	46644	22.07	9.19
Mid-Western	3504	19.83	42943	20.32	12.26
Far-Western	1430	8.09	23122	10.94	16.17
Nepal	17665	100.00	211251	100.00	11.96

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Table 2:	Production	, area and	productivity	y of ginger	in Develo	pment Regions

Source: VDD 2065/66

3.1.2 Types of ginger

There are two types of ginger varieties i. e. Nashe (which is rich in fibres) and Boshe (which has very few fibres). Kapurkot 1 is the variety released by GRP which is claimed to have less fibre and high productivity. The yield and quality of Boshe variety is considered better than Nashe varieties and also fetches higher prices. Nashe varieties, due to its high fibre contents are preferred as an ingredient of mixed spice and by spice industry for producing ginger powder. The fibre content of ginger is dependent on the type of soil and climatic conditions; therefore, Boshe varieties from one location when grown to other location can produce Nashe varieties. During study, this has been recorded in Ramghat, Surkhet where the Boshe varieties brought from Hetauda produced high fibred Nashe varieties

Most of the Nepalese ginger is of Nashe varieties. Farmers of Makawanpur region and Malneta have been producing less fibre containing varieties which fetch better price in market compared to fibred one. Traders meeting at Butwal found that the ginger produced in Hetauda and Damauli region has top quality then in Palpa region. Ginger of Dang region characterized by small, thin and dirty look with high fibre content is poorest quality which market value is one third less compared to the ginger from Hetauda region.

Box 1: Tips for Successful Ginger Cultivation

- 1. Due attention should be given to seed selection. Select healthy and vigorous rhizome for seed purpose
- 2. Grow high yielding ginger variety Kapurkot Aduwa 1
- 3. Seed treatment with Indofil M 45 (Mancozeb) @ 0.25% + Bavistin (Carbendazim) 0,1% solution prior to storage and planting is necessary. One hour dipping of ginger seed rhizome in solution followed by shade drying in the treatment process.
- 4. At least 3 years crop rotation is necessary. Growing finger millet or pole bean prior to ginger is beneficial to minimize rhizome rot disease and to increase yield.
- 5. Non-water logging condition is required. Make raised bed for water drainage and to reduce the disease severity.
- 6. Use of Timur dust in furrow @ 3 Kg/Ropani at planting time helps to minimize the rhizome rot disease.
- 7. Plant the ginger crop as early as possible starting from March on wards in mid-hills.
- 8. Fertilize with well rotten FYM @ 30 MT/ha and NPK @ 75:50:50 Kg/ha.
- 9. Compulsory mulching immediately after planting with available plant materials like dry pine, dry grasses, rice husk etc.
- 10. Weeding manually as per requirement is suggested.
- 11. Don't forget Rhizome rot disease caused by *Pythium spp* and *Fusarium spp* is very destructive for ginger. It may cause upto 75% yield loss. This disease is both soil and seed born in nature. To control this, first 5 points should be followed strictly.

Source: GRP, 2009

3.1.3 Cost of production

Ginger cultivation in Nepal is done mostly by traditional methods. The major components in production of ginger include Input costs, labour cost and land preparation cost. Transport cost is also incorporated in production cost as farmers usually have to take their produce upto roadhead. The cost of production is calculated on the basis of interview and focus group discussion made with farmers from Ilam, Birtamod, Surkhet, Salyan and Nepalgunj. From the data obtained, the average cost of production per kg is calculated to be Rs 18.08. The details of each cost is summarized below and presented in table no 3.

S N	Descriptions	Qty	Unit	Rate (Rs)	Total (Rs)
Α	Land Renting	20	Ropani	1000	20000
В	Inputs				
1	Seed	3.5	MT	30000	105000
2	Manure/Fertilizer	600	doko/sack	15	9000
3	Pesticide use	5	Kg	300	1500
	Total (Production Input)				115500
С	Labour				
1	Land preparation	40	man-days	200	8000
2	Ploughing	20	pair bullocks	500	10000
3	Labour for FYM application	40	man-days	200	8000
4	Mulch collection	40	man-days	200	8000
5	Plantation	40	man-days	200	8000
6	Weeding	60	man-days	200	12000
7	Crop harvesting	80	man-days	200	16000
8	Cleaning	40	man-days	200	8000
	Total (Production Labour)				78000
D	Transportation cost	12.5	per tone	1000	12500
	Grand total cost				226000
	Per Kg cost of production				18.08
Sumn	nary of the major costs			Per kg	Share %
Seed				8.40	46
Labour					35
Manure/Fertilizer					4
Pestic	ide			0.12	1
Other	S			2.60	14
Total				18.08	100

Table 3 Cost of production of ginger (National Average)

Source: Field Survey, 2010

Inputs cost: As the cultivation practice is traditional, farmers usually use inputs that are locally available. The cost of machineries (plough, spade, sickle etc) for cultivation is very nominal. Similarly, home-made organic manure (Farm yard manure and Compost) is mostly used rather than chemical fertilizers. The use of improved seed is also very rare and most of farmers are using locally available seed varieties. Pesticides are used during seed treatment in some production pockets but there is no practice of Bio pesticide use in ginger.

In ginger cultivation, the major part of the cost goes in seed with 46% of the total production cost. Usually, seed are being produced by farmers themselves and keep for next season plantation. Farmers keep 20 to 25 % of their production as a purpose of seed. New growers

purchase seeds from neighbouring farmers or from local market. In some cases, the seeds are brought from other areas for better productivity. The cost of seed is usually higher than the fresh ginger.

Among the other inputs manure/fertilizer incur 4% of total cost of production. The use of organic manure is more common. The farmers of eastern region mainly Ilam uses chemical fertilizer but in less quantity whereas farmers from western region mostly do not use any sort of chemical fertilizers.

Labour cost: Ginger farming in Nepal is very labour intensive. Hence, the share of labour cost in total cost of production is around 35%. Labour is mainly used for land preparation, ploughing, plantation, FYM/fertilizer application, mulch collection and application, weeding, harvesting and post harvest handling activities. During ploughing, farmers usually use bullocks. If the farmers do not have own bullocks or have shortage of it, they usually hire bullocks from others. The cost of a pair of bullock per day is normally Rs. 500. Mulch collection is done from surrounding area, farm or nearby forest and the cost mainly includes labour cost of transporting and laying it in field. In the post harvest handling, the rhizomes are separated from the stem and soil removed from rhizomes. There is absence of washing and grading practice at farmers' level.

In most of the cases, the family members are involved in providing the labour. Use of outside labour is mostly done by farmers with medium and big farms. Normally, the service charge of labour per day ranges from Rs. 150 to Rs. 250 depending upon the area. Due to aggressive seasonal migration of labourers to overseas work, it is becoming scarce day by day.

Transportation cost: This cost includes transportation of the product to local market or upto road-head where traders are located. The transportation is usually carried out by farmers themselves in backload.

Land renting cost: Normally, farmers cultivate ginger in their own land. If they have to rent the land, the cost will vary from places to places. The average land renting cost estimated is around Rs. 20,000/hectare and is included in the production cost.

3.2 Distribution of value addition

Fresh ginger is main traded ginger product and is harvested in main season or offseason (mother rhizome). Young ginger has mild flavour and has a pale, thin skin that requires no peeling. Fresh rhizomes with low fibre content but rich in aroma, pungency, fat and protein are preferred for green ginger purposes. Fresh rhizomes are also stored for to be used as seed.

The fresh ginger goes through only small value addition activities, mainly cleaning and sorting, after it is harvested. The cleaning activity starts from the farmers' level where preliminary cleaning is done by removing soil and roots from rhizome. There is normal practice of deducting 2 to 8 Kg per sack from farmers by the local traders depending upon the soil content in the product. At trader's level there is no practice of washing and cleaning within Nepal. The fresh ginger from eastern region is washed in facilities at Naxalbari, a nearest Indian town from

Kakarbhitta border. Such washing facilities are owned by Indian traders as well as Nepali traders and employ significant number of women as labourers. The washing and cleaning process is done in various steps which includes washing by placing in big pits, spreading in open area, drying by air circulation, and placing in fresh jute sack. No such washing practice was found in the west. Due to lack of washing facilities in Nepal, the Nepalese ginger are not receiving better price due to soil content and dirty looks. Besides, the exporters are facing problems including extra expenses during export. There is also equal chance of ban on export of ginger by India due to PFA issues.

The increase in the price value of ginger is varied from place to place due to differences in cost of processing, taxes, transportation, losses, custom clearance and profit margins. Based on the information received from various actors, the cost of goods sold from production till handing over to Indian commission agents/wholesalers are given in below headings. The average cost of production, calculated in table 3, is used for farm level cost.

3.2.1 Cost of Goods Sold (COGs)

Surkhet-Nepalgunj-Lucknow corridor:

Table 4 represents the cost of goods sold from Surkhet to reaching of end market, Lucknow

Production Cost	18.08	Marketing cost	3.86	Export Cost	4.96
Item	Cost	Item	Cost	Item	Cost
- Average cost of		- Input (sack, thread)	0.71	- Load and unload	0.58
production	18.08	- Weighing and packaging	0.36	- Custom (Nepal, India) - Transportation	1.70
		- Load and unload	0.58	(Lucknow)	1.60
		- Transportation (Nepalgunj)	1.00		
		- DDC taxes	0.25		
		- Other costs (misc)	0.12		
		Purchasing Price	25.00	Purchasing Price	32.00
		Total Road-head/district level			
Farm Level cost	18.08	cost	28.02	Total Exporter cost	35.88
Losses	-	Losses (3%)	0.84	Losses (3%)	1.08
Gross Margin	6.92	Gross Margin	3.14	Gross Margin	3.04
Sales Price 25.00 Sales Pr		Sales Price	32.00	Sales Price	40.00
				Commission agent	
				charge on sales price	7%

Table 4 Cost of production/value addition at different levels from Surkhet to Lucknow

Source: Field Survey

Farmers usually bear the entire cost of production. Mostly, farmers take their produce up to local collectors or road-head traders. In some instances, the local collectors go to farmers and procure the goods. In this case the transportation cost is borne by local traders. The price of ginger varies during various times. In offseason time i.e. May, June, July, the price is highest and usually mother rhizomes are sold in these months; whereas, during the main harvesting season i.e. November, December, January the price is lowest. During the study, the calculated average price received by farmers was Rs. 25/kg. On this basis, the gross margin received by farmers comes to be Rs. 6.92 per kg. Road-head traders and district traders bear the cost of marketing which is estimated to be Rs. 3.86. Usually, road-head traders supply goods to district/national traders who sell mainly to exporters or sometimes to Indian Commission Agents directly. Usually following marketing channel is observed.

Figure 6: Marketing channels of ginger trade



The cost of weighing and packaging is usually borne by road-head traders. Since the storage of the ginger is done only for few days by them, storage cost is not kept in consideration. Sacks are usually provided either by national traders or exporters. National traders or exporters bear the cost of transportation to market centres, various taxes and load/unload. Some exporters also keep their agents to bring goods from local traders to their places. It is also reported that the traders are forced to give donations to political party/affiliates and unofficial charges at check posts. Some loss is calculated during storage and transportation which is estimated to be 2kg/70 kg-sack and is usually deducted by purchaser.

Exporters usually receive goods at the border from where they transfers the goods from one truck to another Indian truck (the term is known as "Palti"). This reduces cost of load/unload compared to unloading in store and again reloading. The custom cost includes both official and unofficial cost which, according to traders, is estimated to be average of Rs. 17000 per truck. The exporters then transports the goods to a nearby city, usually Lucknow and sometimes to Delhi also, and handover to Indian Commission Agents. There is deduction in weight of usually 2 kg per 70 kg

sack by commission agents. Partial payment, about 50 to 70 % of the total value, is given at the time of product delivery and rest is provided after selling the goods. The Indian Commission Agents charges 6-7% as commission upon the sales of the goods.

Palpa-Butwal/Bhairawa-Gorakhpur corridor:

While passing ginger from production area of Palpa to Gorakhpur market, the cost titles are almost the same to that of from Surkhet to Lucknow. However, there are differences in DDC taxes payment, transportation and Custom clearance charge. In this marketing channel, the traders have to pay multiple DDC taxes at Palpa and Rupandehi and high custom clearance charge in Sunauli border. However, the transportation charge to Gorakhpur from Butwal/Bhairahawa is comparatively lower to that of Nepalgunj-Lucknow.

During the study at Butwal market, the price of ginger was varied from source to source. For instance, the price of ginger from Dang region was the lowest (Rs 20/Kg) and from Hetauda region was the highest (Rs. 30/Kg) while the price of ginger from Palpa region was in between. Producers are given 10% to 20% extra if cleaning was done properly.

Ilam-Birtamod/Dhulabari-Naxalbari corridor:

The distribution of value addition of fresh ginger from Ilam to Naxalbari is quite different from those of the western parts. The ginger from these areas goes through washing and cleaning at facilities in Naxalbari, India. The detail of the cost of production and goods sold from Ilam to Naxalbari is represented in the Table 5.

In this marketing channel, there is rarely clear distinction between district traders and exporters as the activities are interchanged. Most of the district traders of Ilam supply to exporters stationed at Dhulabari, Jhapa and Naxalbari, India and some of the district traders export directly to Naxalbari on their own cost. The ginger is washed and cleaned in Naxalbari prior to selling to commission agents and/or Indian importers/wholesale markets. Most of the ginger from Naxalbari goes to Kolkata and Silguri and occasionally to Delhi and Amritsar. There is also record of export to Bangladesh but is infrequent and in less quantity.

Production Cost	> 18.08	Marketing and Export cost	6.65	Processing Cost C).90
Item	Cost	Item	Cost	Item	Cost
				Cleaning, grading and	
- Average cost of		Input (sack, thread)	0.70	packaging cost	0.90
production	18.08	Weighing and sacking	0.36		
		Load and unload	0.47		
		Transportation (Naxalbari)	1.20		
		VDC taxes	0.07		
		DDC taxes (Ilam, Jhapa)	0.36		
		Municipality taxes	0.05		
		Custom (Nepal, India)	1.10		
		Purchasing Price	25.00	Purchasing Price	37.00
		Total Road-head/Exporter			
Farm Level cost	18.08	level cost	29.31	Total Processor cost	37.90
Losses	-	Losses (8%)	2.34	Losses	
Gross Margin	6.92	Gross Margin	5.35	Gross Margin	2.10
Sales Price	25.00	Sales Price	37.00	Sales Price	40.00
				CA commission on	
				sales price	7%

Table 5 Cost of production/value addition at different levels from Ilam to Naxalbari

Source: Field Survey

The major differences observed in these three routes of ginger supply were in the cost of taxes, custom clearance and transportation. The traders are facing multiple taxation system while transporting their goods from production area to market. Traders are paying unnecessarily extra tax while entering a new district. As per the information received, the trader while passing the goods from Ilam to Kakarbhitta has to pay about Rs. 0.26/kg in Ilam, Rs. 0.10/kg in Jhapa and Rs. 0.05/kg in Birtamod municipality. Similarly, in the western region, trader has to pay Rs. 0.30/kg in Palpa and 0.20/kg in Rupandehi as DDC taxes while bringing goods to Bhairahawa. However, the trader bringing goods from Surkhet needs to pay DDC tax only in Surkhet of Rs. 0.25/kg and is not charged in Banke.

Similarly, there is wide variation in the charge for custom clearance in Nepal-India border. The traders from Nepalgunj reported of paying Rs. 17,000/truck for custom clearance. Similarly, as per study, it cost Rs. 25,000 during export through Sunauli border and Rs. 11,000 from Kakarbhitta border for the custom clearance purpose5.

⁵ Based on interaction with exporters of Dhulabari, Bhairahawa and Nepalgunj

Box 2: Washing facility: Naxalbari, India

There are 8 washing facilities at Naxalbari owned by 4 Nepali and 4 Indian traders. The cost of building a facility is approx IC 500,000 for total capacity of 800 sacks (50 MT) per day. After washing, there is practice of shade drying by spreading for 2-3 days especially for mother rhizome which is harvested in rainy season. For main season rhizome, there is direct packaging after washing. Besides washing, sorting, drying and packaging is done in this center. The critical reasons to establish washing facility at Naxalbari by Nepali exporters are as follows;

- Availability cheap and efficient laborers
- Political stability in India compared to Nepal
- Easy access of Nepali vehicle upto Naxalbari
- Old market place and easy to make relations with Indian traders
- Cost of infrastructure, machineries and electricity is less
- More than 5 hours waiting in custom in case of direct export to Kolkata or other big cities

Source: Discussion with traders at Naxalbari, India

3.3 Value added products from ginger

Ginger is also traded in dried form and processed form. Dried ginger (Sutho in Nepali) is the major value added product and occupies nearly 25% of the total ginger trade (ITC, 2007). The traded quantity of processed form of ginger like candy, powder is negligible and only few are involved in the processing. Some of the major value added products from ginger are summarized as below.

Dried ginger (Sutho): Dried ginger or Sutho is second mostly traded product after fresh ginger. Dry ginger is obtained by drying of fresh ginger which can be preserved for longer time. Dried ginger is prepared from mature rhizomes which have developed full aroma, flavour and pungency, and harvesting is usually carried out at between eight to nine months after planting. For dry ginger making, cultivars with medium-sized rhizomes with high curing percentage are preferred.

The appearance, the content of volatile oil and fibre, the pungency level and a subjective assessment of aroma and flavour are important in the quality evaluation of Sutho. Cleanly peeled dried ginger in the whole form possesses the best appearance generally finds a place in the grocery trade. Lower grades of clean peeled, coated whole, split and sliced types are used for blending in the preparation of powdered mixed spices. All types may be used for oil distillation and oleoresin extraction, but the coated types are the most extensively used for these purposes.

Sutho is the traditional product of Nepal and farmers can prepare it by using their traditional knowledge. Comparatively, Sutho is prepared in western part of Nepal but there is minimum evidence of Sutho making in eastern Nepal. Due to unavailability of efficient technology of Sutho making in Nepal it is not cost effective and is difficult. Therefore, farmers are reluctant to

prepare Sutho and only prepare if market price for fresh ginger is comparatively low. Some processors, eg. cooperative of Palpa and Male International, have been using solar dryers for drying the ginger slices. However, the present solar dryers are not good enough to process big quantity. It is very essential to develop solar dryers with higher capacity or find other alternatives for drying process. Similarly, the processors are also not getting good slicer machine for making ginger. These factors have ultimately increased the cost of production of dried ginger making it less competitive. Most of the dried ginger is exported to India and occasionally to USA and Japan. Dabur Nepal is one the consumer of Sutho and sourcing it from Tulsipur (Dang) and Nepalgunj.

The price of Sutho is not so stable and greater fluctuation is seen even within a year. In the study year, the initial price of Sutho was recorded to be Rs 90/Kg but later reached upto Rs 320. The price is also highly dependable upon the type and quality of the Sutho.

Ginger Candy: Ginger candy is sweet and hot in taste. There are very limited processors producing the candy. It is mostly produced by microenterprises run by cooperative from ginger pocket area. During the study, such enterprises were observed in Salyan (Kapurkot), Surkhet (Ramghat) and Palpa. The major problem faced by candy producers is inefficient technology and high use of labourers. Apart from that the marketing activity is also very limited and is available only in few places. Producers are selling the candy in local market and some trade fairs, individuals visiting to the enterprises. Recently, a marketing company called Himalayan Naturals have successfully marketed the candy in departmental stores in Kathmandu. According to them, the market demand is high and there is greater scope of further market expansion.

Box 3: Bheri Livestock and Agriculture Production & Processing Cooperative. Ramhgat Surkhet

This cooperative was established in 2061 with an aim to increase the income of poor, women and marginalized members of the community. The cooperative is headed by Mrs. Tila Oli and having 77 women and 17 men members including 60 Dalit HHs. It has been producing various products from ginger (candy, squash, pickle and powder), turmeric, mango and guava. They have Rs. 1,700,000 as cash saving and assets of Rs 800,000.

Usually, from 6 Kg of fresh ginger only 1 kg of candy is prepared and waste materials can be used to prepare pickle and powder. The fibreless variety of ginger is considered best for the candy making. According to the cooperative, the cost of production including raw material, other inputs (sugar, salt, citric acid etc.), labour, packaging materials and transportation for 1 kg of ginger candy is about Rs.535 and the selling price they have kept is Rs. 600 per kg. In the study year, the cooperative was able to make profit of Rs. 9750 by making 150 kg of ginger candy. The enterprise was able to provide labour employment for 187 man-days while producing such quantity.

Ginger powder: Ginger powder is made by pulverizing dry ginger to a mesh size of 50 to 60. Ginger is ground to release the flavour, the finer the powder, the more readily available the flavour and readily dispensable in the matrix. The use of ginger powder is less in Nepal and there
are limited processors in producing ginger powder. Both Nepali and Indian ginger powder is commercially available in most of departmental stores of Kathmandu. There is good scope for import substitution in ginger powder.

Ginger paste: Ginger is usually made paste at household level for to use in curry and other foods. Ginger paste is commercially available in the market, especially in the departmental stores. Mostly the paste are imported; however, recently a Nepali company has also been supplying the paste in the market. With increase in promotion and good distribution, there is big scope for ginger paste enterprises.

Ginger oil: Ginger oil is produced commercially by steam distillation of freshly ground dry ginger. The yield of oil varies from 1.5 to 3.0% with an average of 2.0%. The oil obtained is a green or yellow mobile liquid which becomes viscous on ageing (Purseglove et al., 1981). Ginger oil can also be recovered by steam distilling fresh ginger peelings and the yield is 1.5 to 2.8%. According to ITC, 2007, the potential for producing ginger oil in Nepal is limited as quality of the Nashe variety (which is common type) is low because of high fibre content as well as the inadequate farming methods. This resulted in unpopular "earthy aroma" in the final ginger oil. During study, it is found that the traders of Nepalgunj distilled ginger once but did not find it profitable since the yield percentage was very low. This year, Education for Income Generation program of USAID is planning to do trial distillation of ginger at Surkhet and explore the market in USA.

Ginger oleoresin: Ginger oleoresin is obtained by extraction of powdered dry ginger with suitable organic solvents like alcohol, acetone and ethylene dichloride, etc. The yield, flavour and pungency of extracted oleoresin vary with cultivars, maturity of rhizome, choice of solvent and the method of extraction employed. Generally a yield of 3.9–9.3% with an average of 6.5% on dry weight of ginger is obtained. Ginger oleoresin has widespread uses as a flavouring agent in foods, beverages and medicines. Ginger oleoresin is preferred in these industries over natural ginger due to increased economic in use, more uniform flavour and concentration and lack of microbial contamination. In Nepal, there are very few industrial units available for oleoresin. Production of oleoresin may present a better opportunity for Nepalese ginger (which is mostly of low quality Nashe varieties) as it is less sensitive to the quality of produce and has widespread uses (ITC, 2007). Traders of Nepalgunj cited that the oleoresin has good market potentials but they need appropriate processing technology.

Ginger squash: Ginger squash is prepared by use of fresh ginger mixing with water and preservatives. However, the ginger squash has short life and damage quickly. The popularity of ginger squash is also very less and proper market linkages has not been created. Bheri Cooperative which also manufactures ginger squash and sells in local market and during various trade fairs. The cost price they have placed for 750 ml ginger squash is Rs. 70.

3.4 Income and employment

Ginger plays a significant role in the national income as it is one of the major spices exported. According to ITC data, Nepal exported ginger worth of around NRs. 403 million contributing

0.59% of total export in 2008/9. The data also reveals that there has been annual growth of 34% from 2004 to 2008. In the export potential assessment conducted by NTIS 2010, the overall export potential and socio-economic impact of ginger is categorized as medium. FGD at Ilam and Surkhet reported that the ginger has significant contribution in the household income of farmers. According to FGD Ilam, ginger contributes upto 30% of family income for those who have been cultivating ginger for commercial purpose.

Traditionally, ginger farming and drying occurs at the farm level, the sector is very labour intensive. By promoting the export of processed products, as well as the infrastructure necessary for processing, this sector could generate large opportunities for employment. The sector currently requires around 66,600 people for 2 months per year, which is estimated around 11,000 people as a full- time employment equivalent (FTEE) (ITC, 2007). Employment is also generated for post harvest handling, processing and marketing activities. Usually, the local traders employ 2-3 staffs where as the national level trader employs higher number of staffs. Labour is also used extensively for the weighing, packaging, load/unload and storage purposes. For 1 truck of ginger packaging and loading the estimated labour required are 6 people (FGD, Ilam). At Naxalbari, India, nearly 1000 man days employment generated from a single trader during season. Similarly, there is huge demand of labourers for ginger processing and making various products like Sutho, candy, pickles, squash and powder.

3.5 Pro-poorness and social inclusion

Participation of women: Women play an important role in the production of ginger. However, their involvement in market activity (especially in cash transactions) is very limited. They participate in plantation, weeding, harvesting and post-harvesting handling activities. In the eastern region, women are also employed to exporters for washing, cleaning and grading job. Similarly, there is dominancy of women participation in the value addition enterprises such as candy and For product development activities in local level.

Participation of Disadvantaged groups (DAGs) and poor: Ginger cultivation has become an attractive crop for poor farmers as the ginger has comparatively high value and greater scope of trading. Traders (local to exporter) mostly use the poor and DAGs as labourer for cleaning, grading, packaging, loading and unloading activities.

4. Market trends, competitiveness and value chain governance

4.1 Industry analysis

4.1.1 World Production of Ginger

Ginger is one of the important spices in world trade scenario with increasing trend of production. There has been increase of 39% of production from 2001 to 2009 (FAOSTAT, 2010). The major ginger producing countries are India, China, Indonesia, Nepal, Nigeria, Thailand, and Bangladesh. In 2008, the total production of ginger worldwide was estimated to be 1,605,444 MT with total area harvested of 421,336 Ha. India, China, and Indonesia were the top three producers during this year, producing 382,600 MT (23.8%), 328,810 MT (20.5%), and 192,341 MT (12.0%) respectively. In the same year, Nepal became the 4th largest producer in the world by producing 176,602 MT of ginger.



Figure 7: Worldwide ginger production status, 2008

Source: FAOSTAT 2008

4.1.2 World Export trade of ginger

In terms of export value and volume, ginger is one of the major trading spices in the world. The major exporting countries of ginger are China, Netherlands, Thailand, India and Nepal. The annual growth in value between 2005 to 2009 is 9 %. The export value was highest in 2008 (ITC, 2010). The table 6 provides the trade indicators of top 10 exporting countries in 2009.

According to this data, the total export quantity of ginger in 2009 was 491,408 MT with value of USD 406 million. China had a great dominance in export of ginger. It remained in top position in export quantity and captured 69.3% share in world export. Some of the major countries

importing Chinese ginger are Japan, Pakistan, USA, Bangladesh, Arabian countries, UK, Netherlands, Canada, Republic of Korea and Vietnam. The highest unit value (USD/MT) offered to Chinese ginger was USD 5000 by Suriname which imported only 3 MT whereas the lowest unit value offered was USD 305 by Vietnam. The average unit value calculated for Chinese export was USD 828. Nepal also imported 6110 MT of ginger which valued USD 3,578,000 from China at the average unit value of USD 586.

					Trade Indi	icators		
S N	Exporters	Value exported in 2009, USD '000	Qty exported in 2009, MT	Unit value (USD/ Unit)	Annual growth in value (2005- 2009), %	Annual growth in qty (2005- 2009), %	Annual growth in value (2008- 2009), %	Share in world exports, %
1	China	281637	340055	828	8	7	33	69.3
2	Thailand	24932	49808	501	32	48	-4	6.1
3	Netherlands	24649	17882	1378	20	24	15	6.1
4	Nigeria	12861	7364	1746			13	3.2
5	India	11499	8342	1378	-2	-10	9	2.8
6	Ethiopia	6599	10752	614	-3	10	6	1.6
7	Nepal	5211	26724	195				1.3
8	Brazil	3892	3952	985	-11	-20	-17	1
9	Indonesia	3391	7326	463	18	51	-20	0.8
10	Germany	2928	778	3763	-2	-4	-10	0.7
	World	406416	491408	827	9	8	20	100

Table 6:	Trade	indicators	of top	10 exporti	ng countries	s in 2009
I upic vi	IIuuv	maicators	or top	10 Capor G	ing countries	

Source, ITC 2010

The second biggest exporter in 2009 was Thailand occupying 6.1% share in world export. The Netherlands though is not a major producer of ginger became third biggest exporter hold similar percentage share to that of Thailand. The Netherlands usually imports the ginger from countries like China, Thailand, Brazil and re-exports mostly to European countries like Germany, France and UK. In 2009, the import quantity of The Netherlands was 20,384 MT and export quantity was 17,882 MT.

India though is one of the largest producers of ginger stands in 5th position. The export value of India is very nominal (less than 2%) compared to its combined quantity of production and import. The major countries who imports ginger from India are Saudi Arabia, USA, UK, Bangladesh and other European countries. Nepal also imported 186 MT from India valued USD 241,000 in 2009.

In the same year, Nepal remained in 7th position with export value of USD 5.21 million and hold 1.3% share in world export. However, in terms of quantity, Nepal stands in 3rd position with

export quantity of 26,724 MT. This is due to low value offered to the Nepalese ginger. According to ITC data, the average unit value offered to Nepalese ginger is USD 195 in 2009 which is second lowest unit value worldwide, the lowest being that of Ecuador with USD 137 which exported 292 MT only. India is a major destination for Nepalese ginger with 99% of total ginger exported to India in 2009. USA was another country which imported Nepalese ginger but the quantity was just one tonne.

4.1.3 World Import trade of ginger

The trend of world import is increasing steadily with a growth of 22% on the import value from 2005-2009. The average annual growth in value from 2005 to 2009 is 7%. Slight slack in import value was seen during 2006 and 2007; however, the growth continued afterwards. The major importing countries of ginger are Japan, USA, Pakistan, UK and Netherlands (ITC, 2010).

In 2009, Japan was the top importer in the world. It holds 18.9% share in world imports. The major countries supplying ginger to Japan are China, Thailand and Chinese Taipei. The trade indicators of top 10 importing countries in 2009 are presented in below table.

Pakistan, our neighbouring country, also imported nearly same quantity as Japan, but stood in third position in terms of value. China and Thailand are major sourcing countries with 99.5% share in ginger imports of Pakistan. Most of the ginger imported was for domestic consumption.

Another neighbouring country Bangladesh is also a major importer of ginger with total import of 46,376 MT in 2009 and was fourth largest importer. China is the major supplier and had 86% share in ginger import by Bangladesh in 2009. With annual growth of 100% in imported value and 32% in imported quantity between 2008-2009, Bangladesh remains the potential destination for ginger.

			Trade Indicators								
S N	Importers	Value imported in 2009, in USD '000	Quantity imported in 2009, MT	Unit value (USD/unit)	Annual growth in value 2005- 2009, %	Annual growth in qty 2005- 2009, %	Annual growth in value 2008- 2009, %	Share in world imports, %			
1	Japan	73433	65319	1124	-3	-6	-32	18.9			
2	USA	43194	42537	1015	8	6	-4	11.1			
3	Pakistan	32830	61544	533	7	9	6	8.5			
4	Bangladesh	30741	46376	663	41	32	100	7.9			
5	UK	24216	21687	1117	10	9	12	6.2			
6	Netherlands	24089	20384	1182	16	16	18	6.2			
7	Malaysia	21035	36020	584	12	10	31	5.4			

 Table 7: Trade indicators of top ten importers (2009)

8	Germany	15980	6311	2532	11	11	14	4.1
	Saudi							
9	Arabia	14899	20457	728	10	14	20	3.8
10	India	11528	42212	273	9	18	-28	3
	World	388518	470207	826	7	8	-3	100

Source: ITC 2010

United States and United Kingdom are also major importer of ginger worldwide. Another European country, The Netherlands is also major importer and remained in sixth position; however, as noted above, The Netherlands re-export to other European.

India is the tenth largest importing country in terms of ginger import value. However, in terms of quantity imported India imports similar quantity to that of second largest importer, the USA. The major ginger supplying country for India is Nepal with 37,244 MT supply in 2009 that accounted for 64% of total ginger imported value of India. There is a huge difference in the imported unit value offered to Nepalese ginger and Chinese ginger. Nepalese ginger are offered the lowest imported unit value of USD 198 whereas Chinese ginger enjoyed the highest imported unit value of USD 1192. Nepalese ginger are mostly exported in raw form without even a simple processing like washing and sorting. On the other side, Chinese ginger are comparatively superior in quality and have bigger, proportionate rhizomes with clean and waxy shine. Other major supplying countries to India are Ethiopia and Nigeria.

4.1.4 Requirements for export and quality assurance

In herbs and spices, there are two major international standards, those set by United States and those set by European Union (EU). Standards relying on the same general parameters also exist in those countries responsible for growing herbs and spices, for example the Indian Spice Board. These standards are influenced by those set by the major importing countries. There are various types of test which make up the range of international standards. Some of them are cleanliness, ash level, acid insoluble ash (AIA), volatile oil (V/O) determination, moisture content, microbial measures, pesticides level, mycotoxin levels and particle size.6

The American Spice Trade Association (ASTA) has established standards for Cleanliness Specifications in terms of permitted amounts of extraneous matter or filth, mould (visible), insects, excreta and insect damaged materials. It has become a standard for most exporting countries. Importing countries that do not have specified standards may use ASTA's specifications (FAO). Most producing countries have built up their facilities to meet the requirements as per ASTA Cleanliness Specifications.

⁶ Handbook of Herbs and Spices, Volume 1, K.V. Peter, Woodhead Publishing, 2001

Whole	Excreta,	Excreta,	Mould	Insect	Extraneous/Foreign
insects, dead	Mammalian	others		Defiled/Infested	Matter ⁷
by count	by mg/kg	by mg/kg	No more than 3%	6 mouldy pieces	% by weight
4	6.6	6.6	and/or insect infe	ested pieces by	1.00
			weight		

The US government specification for dry ginger and powder is as follows:⁸

Table 9: US government specification for dry ginger and powder:

Total	Ash	Acid	Insoluble	Moisture(%w/w)	Volatile	oil	Crude	fibre	Starch	min
(%w/w) r	nax	Ash	(%w/w)	max	(v/w) min		max (%)		(%)	
		max								
7		1		12	1.5		8		42	

EU member countries such as UK, Germany, and the Netherlands have their own specifications. But standards in Europe are typified by the standards set by the European Spice Association (ESA) which draw both on national standards and international standards issued by the ISO (International Standards Organization). The following table presents minimum quality standards for ginger set by ESA.

Table 10: Europ	pean Spice	Association (ESA) Minimum	Ouality	Standards	for Ginger:
Tuble 10. Luio	ocan opice	/	20/ 1/ 101110110	Quanty	otunidando	

Total Ash (%w/w) max	Acid	Insoluble	Ash	Moisture(%w/w) max	Volatile oil (v/w) min
	(%w/w	ı) max			
(ISO)	(ESA)			(ISO)	(ISO)
8	2			12	1.5

As per the ESA, the extraneous matter and foreign matter should not exceed 1% and 2% respectively; should be free from live and/or dead insects, insect fragments, and rodent contamination visible to naked eye. In microbial analysis, Salmonella must be absent in (at least) 25 gm of material, yeast and mould maximum upto 106/g and E. Coli maximum upto 103/g. The European Union has fixed limits for aflatoxin should not exceed 10 ppb in total.

To be sold as "organic", a product must be grown following organic agriculture practices and be certified by an accredited certification body. The International Federation of Organic Agriculture Movement (IFOAM) has established organic production, processing and trading standards, and

⁷ Extraneous matter includes but is not restricted to : stones, dirt, wire, string, stems, sticks, non toxic foreign seeds, excreta, manure, and animal contamination

⁸ Handbook of Herbs and Spices, P.A. Vasala, Kerala Agriculture University

tried to harmonize certification system worldwide. However, countries can have their own standards such as Japanese Agriculture Standards (JAS) of Japan, EU organic standards, US organic standards. To comply with organic standards and practices, the operator must document all farming and post-harvest activities including farm field map, field history, activity register, input records including purchase, output records including sales, harvest records, storage records, pest control records, movement records, equipment cleaning and labelling. All such documents must meet specific standards that are enumerated in directives issued by the certification agencies.

In the processing plant, the operator must present an "organic handling plan" that will show how contamination from prohibited materials and commingling with non-organic products will be prevented. This includes a detailed description of the process, receiving and storage of ingredients and finished products, cleaning and sanitation of the processing equipment, facilities pest management, and a documentary "paper trail" that must permanently record all of the above.

In India, the Bureau of Indian Standards (BIS) has AGMARK grading system for dry ginger and ginger powder. It categorizes ginger to different grades based on the size of rhizome, extraneous matter, lime content as calcium oxide and very light pieces.

4.2 Supply and demand, trends and prices

Ginger is one of the major agricultural crops and has the highest production and area covered among the spices of Nepal. The country produces 11.5% of world's total ginger production. The production has made the country self sufficient for domestic consumption. Ginger is also a major exported spice of the country and has mostly remained within the top ten position of world's biggest exporter of ginger throughout the decade. There are also incidences of import of ginger especially during offseason.

4.2.1 Export markets and volume

Nepal is one of the major ginger exporting countries worldwide. More than 75% of the total quantity of ginger produced is exported (ITC 2007). The data (table 11) reveals the steady growth in export till 2007 when it peaked to 41,731 MT valued at about 8.41 million dollars. However, the data do not account for the unofficial border trade with India, which is believed to contribute significantly to the total exports and varies greatly every year. The actual value of ginger exports is estimated to be 33% higher (ITC 2007). In recent years, Nepal is losing its ground in terms of exported unit value. Despite of high inflation prevailed within the country; the price offered to exported ginger has decreased from USD 321 in 2001 to USD 198 in 2008.

Year	World rank (value)	Quantity (MT)	Value (\$1000)	Unit value (\$/MT)	World price rate (\$/MT)
2001	6 th	9265	2973	321	728
2002	8 th	14692	3109	212	579
2003	8 th	18000	2853	159	917
2004	12 th	12926	2248	174	821
2005	10 th	18567	3343	185	1044
2006	8 th	29800	5368	180	1009
2007	4 th	41731	8416	202	924
2008	5 th	35941	7132	198	1266

Table 11 Export value, quantity, and unit value of ginger export from Nepal and World price rate

Source: FAOSTAT 2010

Almost all exports of ginger are to India with 99% of total export reported in 2009 (ITC, 2010). Nepal enjoys free access to India's market. However, it faces restrictive non-tariff barriers such as sanitary and phyto-sanitary barriers, import ban, non permit for Nepali vehicle, difficulty in getting PFA certificate etc. Figure 8 represents the trend of import of ginger to India from Nepal. The figure reveals the Indian import has peaked in 2003 and 2007. In 2004, there was a decline which was due to ban in import of ginger by India. The ban was reasoned for plant quarantine issue and later trade policy (NTIS 2010).



Figure 8 Quantity and value of ginger imported by India from Nepal

Source ITC 2010

In recent years, Nepalese ginger has faced decline in terms of unit value. The table 12 presents the imported unit value for Nepalese ginger by India from 2001-2009. The unit value offered in 2009 is the 2nd lowest value of the world.

Years	Unit Value (USD/ton)	Years	Unit Value (USD/ton)
2001	143	2006	201
2002	136	2007	223
2003	158	2008	220
2004	178	2009	198
2005	205		

Table 12: Imported unit value (CIF) of Nepalese ginger in India

Source: ITC 2010

Nepal sends both fresh ginger and dried ginger to India, however, the quantity of fresh ginger is too high than dried ones. The data from NRB suggest the export of fresh ginger to India to be NRs. 275.2 million, 541.3 million, 543.2 million and 335.1 million in consecutive fiscal year from 2005/6 to 2008/9. Similarly, the data also shows the export of dried ginger to be NRs. 49.2 million, 54 million, and 68 million in 2006/7, 2007/8 and 2008/9. The data reveals the great decrease in fresh ginger from 2007/8 to 2008/9 whereas there has been increase in export value of dried ginger in the same fiscal years.

Major market hubs in India for Nepalese ginger

India is a traditional market for Nepalese ginger and is vast and dynamic. Most of the trading occurs in the Northern part of India. The major markets for the ginger from eastern region of the country are Siliguri and Kolkata passes via Naxalbari. Ginger from mid-western and far-western region mainly goes to Gorakhpur, Lucknow, Kanpur, Bareli and Banarash. Some quantity of ginger is also exported to Delhi, Jaipur and Amritsar markets. Normally, Delhi market prefers the fibreless variety and other markets have the demand of both the types i. e with fibre and fibreless. Nepalese ginger mostly faces competition with Indian domestic production mainly from Cochin and Bangalore. Besides, it has to compete with other country produce especially from China, Nigeria, Myanmar and Ethiopia.

Processing during export to India: Sutho is the only processed product exported to India from Nepal. Apart from that, the ginger of eastern region is traded in India after washing at Naxalbari, India. In other regions, only simple post harvest handling activities like cleaning, sorting and varietal grading (Fibre, Fibreless) are adopted before export to India.

Export to other countries: There are few evidences of export of fresh ginger to Bangladesh from eastern region of the country. Despite of Bangladesh being a major worldwide importer, Nepalese ginger is not able to access the Bengali market. Bangladesh can be big potential market for quality ginger. Pakistan, the third largest importer of ginger worldwide can also be potential

destination. Due to tension and security issues between India and Pakistan, no transit route is provided to Nepal by India to reach Pakistan. Most of the export to Pakistan is done via Kolkata port to Lahore port.

Some exporting companies (e.g. Male International and Coffee Plantec) have exported dried ginger slices to USA and Japan; however, the quantity is negligible and infrequent. These countries demand highest quality product which is very difficult for to meet by Nepali exporters who lack the sufficient processing facilities. Besides, the transportation cost to USA is also comparatively higher for to compete. There are also few companies (eg. Annapurna Organic Agriculture Industries, Kanchanjunga Tea Estate) who are exporting organic certified ginger to third countries.

According to NTIS, the most attractive market for ginger is reported to be in Middle East and gulf. Similarly, South East and East Asia, SAARC and northern developed countries are ranked as 2nd, 3rd and 4th places according to attractiveness of market. Top 10 countries for export potential as per the report are India, Pakistan, Bangladesh, USA, Netherlands, UK, Malaysia, Germany, Yemen and Vietnam.

Process/formalities to export: For to get clearance at Nepalese Customs, an exporter or Custom Agents (CA) has to submit required documents including Phyto-sanitary certificate (PC) to the Nepalese Customs. After the consignment is checked and verified with related documents and payment of customs charges done, the CA or exporter is given clearance to export.

Most countries permit imports of plants and plant products only on the basis of a Phyto-sanitary Certificate (PC). Nepal's Plant Protection Act 1972 and Plant Protection Rules 1975 have made it mandatory to obtain PC for exporting plants and plant products. An exporter has to submit an application to Plant Quarantine Section (PQS) of Department of Agriculture along with supporting documents like income tax certificate, enterprise registration certificate and copy of customer's order. PQS has made arrangements to send its staff to the production site if it is necessary for examination of plants and plant products. If plants are found in healthy conditions, PC is issued by PQS. This service is also available from the seven plant quarantine offices located at the Customs Posts of Kakarbhitta, Biratnagar, Jaleshwar, Birgunj, Bhairahawa, Nepalgunj and Tribhuvan International Airport. No charge is levied for the issue of PC on export.

Simultaneously, for export to India, exporters have to get PFA test certificates from Indian authority. Exporters of eastern Nepal get PFA test certificate from Kolkata while exporters of other parts get it from Lucknow. Within Nepal, Nepali vehicles transport ginger then transfer to Indian vehicle at Nepali boarder and transport upto the final destination in India.

For export to other countries requires lab analysis to be done according to the standards of the importing countries. It can be done from Nepal Bureau of Standards and Metrology or from private labs.

4.2.2 Import situation and volume

Though Nepal is a major producer and exporter of ginger, it also needs to import the ginger in order to fulfil the domestic demand especially during off-seasons. The major sourcing countries for Nepal are China and India.

Nepal has been importing ginger from China (Tibet) for quite a long time. However, in recent years, especially in 2009, the export of ginger from China to Nepal has dramatically increased. The following table presents the export trend of ginger from China to Nepal.

The ginger from China is mostly fibre-less type and is neatly cleaned, waxed and properly packaged. The price of Chinese ginger is also comparatively higher than the native produce. Table 14 presents the quantity flow of ginger from China (Tibet) along with India and Bhutan to Kalimati market since 2000/01.

Years	Exported quantity, MT	Exported value, USD 1000	Exported unit value, USD/MT
2001	50	40	800
2002	0	0	-
2003	1548	484	313
2004	215	118	549
2005	321	156	486
2006	30	26	867
2007	208	235	1130
2008	1613	937	581
2009	6110	3578	586

Table 13: Export of ginger from China to Nepal

Source: ITC 2010, Comtrade 2010

Table 14: Import of Ginger from other countries to Kalimati market

Year	China (Tibet) India		Bhutan
2000/01	793.80	3.20	-
2001/02	17.00	-	1.00
2002/03	-	1.25	-
2003/04	238.69	-	-
2004/05	45.20	0.73	-
2005/06	3.00	-	-
2006/07	-	2.85	-
2007/08	-	42.50	-
2008/09	9.90	-	-
2009/10	152.00	11.00	-

Source: Kalimati fruits and vegetables market development board, 2010

Another country from where Nepal imports ginger is India. The quantity of ginger imported from India is comparatively small. However, the exported unit value from India to Nepal is relatively very high compared to what Nepal exports to India. The following table presents the scenario of exported quantity, exported value and exported unit value of ginger from India to Nepal from 2001 to 2009.

Years	Exported quantity, MT	Exported value, In USD 1000	Exported unit value, USD/MT
2001	15	9	600
2002	32	20	625
2003	107	65	607
2004	120	53	442
2005	5	4	800
2006	189	225	1190
2007	68	87	1279
2008	15	15	1000
2009	186	241	1296

Table 15 Export trend of ginger from India to Nepal

Source: ITC 2010, Comtrade 2010

4.2.3 Domestic consumption and price

Domestic consumption: In average 85% of the total production is estimated to be marketed by the producers either as fresh new rhizome or mother rhizomes. The producers retain 30-35% of the total production for seed purpose but at the later date part of this stock again enters the market (CADP, 2008). Ginger is consumed in most of the households as spice in foods. Some domestic manufacturers including pharmaceuticals use ginger in their products. Ginger is also one of the main ingredients in pickle industries.

Kathmandu is one of the major domestic markets for ginger. Most of the ginger is distributed from Kalimati Fruit and Vegetable Wholesale market in Kathmandu. The volume of trade from Kalimati market in various years reveals a decreasing trend in the quantity traded.

Year	Volume (MT)	Year	Volume (MT)	
2000/01	5784.27	2005/06	1695.92	
2001/02	4019.19	2006/07	2371.80	
2002/03	4526.87	2007/08	2278.80	
2003/04	3193.77	2008/09	1582.29	
2004/05	1656.50	2009/10	1807.87	

Source: Kalimati Fruits and Vegetable Development Board

Dhading and Makwanpur districts are big supplier of fresh ginger to Kalimati market. Ginger also arrives from Gorkha, Nuwakot, Sunsari, Kavre, Jhapa, Chitwan and Bhaktapur in reasonable quantity. Chinese ginger is also traded in Kalimati markets especially during offseason.

Markets like Birtamod, Biratnagar, Dharan, Inaruwa, Itahari, Rajbiraj, Lahan, and Siraha have total demand of around 4000 MT in 2007/8. The arrival at Birtamod market alone is about 279 MT. Dharan has arrival of 2775 MT out of which 30% is only consumed domestically (CADP, 2008).

Major market hubs (regional wise): The following table presents the major market hubs for the ginger according to the Development Regions.

S N	Development region	Major hubs
1	Eastern	Birtamod, Dharan, Biratnagar
2	Central	Hetauda, Birgunj, Kathmandu
3	Western	Butwal, Bhairahawa
4	Mid-western	Tulsipur, Nepalgunj
5	Far-western	Dhangadhi, Mahendranagar

Price trend: Ginger has an unpredictable market price. The national annual average price of ginger as reported by MOAC, show the steady increase. However, the price has been fluctuating. It has peaked during 2004/5 which later on reached to its lowest level on 2007/8. In recent years the price has been increasing and reached Rs. 51.48 in 2008/9.

Figure 9 National annual average price trend of ginger



Source: MOAC 2009

The data from Kalimati market shows the similar trend. Figure 10 illustrates the minimum and maximum price of fresh ginger in Kalimati Market in 10 years.



Figure 10 Price trend of fresh ginger in Kalimati market (Rs/Kg/)

Source: Kalimati Market Development Board

The price of ginger also varies between various seasons. As to the most of agricultural products, the price of fresh ginger is high during offseasons (June to August) and low in harvesting seasons (November-December). The monthly price trend of ginger in Kalimati market and Nepalgunj market are illustrated in following figures.

Figure 11 Monthly wholesale price trend of ginger in Kalimati and Nepalgunj Market (Rs/Kg)



Source: Kalimati Fruits and Vegetable Development Board and ANSAB

The mother rhizome gets a higher price than fresh ones as it is harvested during offseason.

4.3 Competitiveness of Nepali ginger

Nepalese ginger is superior in quality for the production of dried ginger, oleoresins or essential oils. But due to the lack of ginger processing facilities within the country, farmers have to sell their products in fresh form or traditionally dried form (Ghimire, 2009). The traditionally processed ginger comes to be inferior in quality than mechanically processed one and as a result, proper value addition has not been attempted within the country. Much of value addition work is done yet in border town of India. If any processing facilities are made available within the country, Nepalese ginger can compete in the world market. The existing traditional practice of processing and trading can be improved by few modifications such as sorting, grading, cleaning, peeling, drying & packaging, which could gradually improve the quality and value of the end product.

Ginger from Kochin, Assam, Guwahati and Uttarakhanda are major competitors of Nepali ginger in Indian markets. The physical apperance of ginger from those places are very attractive and clean which easily attracts the consumers. In global market, China is the leader in terms of export so that it can be regarded as the major competitor for Nepali ginger.

Most parts of nepal grow ginger organizally with traditional varieties. If Nepal brands and promotes Nepali ginger as organic and grown traditionally, then it will get the attention of international market niches and get premium price.

4.4 Value chain governance

The trading of ginger is mainly governed by Indian importers as about 99% of the total export goes to India (ITC, 2010). There is more complains of traders towards farmers in not cleaning and grading the product.

In most cases the type of business relations between the various operational actors are of free market exchange. The uncoordinated transactions ("arms-length" spot market relationships) are prominent among them. Contract farming is also not seen in ginger. However, there is some incidence where the Indian buyers have offered the national buyers some advance payment which is transferred down to local traders. There is rare incidence of providing advance payment to the producer (Ghimire, 2009). The transaction patter in export market is mainly on commission basis where the commission agents charge 6-7% as commission.

Due to lack of proper market information system and less bargaining power, the farmers are forced to sell their product as per the price offered by traders. Traders usually refer to Indian market for price fixation. In some cases there are conflicts among the trader and exporter regarding the payment issue and failure of keeping the commitment.

In totality, the governance of ginger value chain is buyer driven with minimum trust between various actors. Traders are always complaining that the farmers are providing quality product while farmers are blaming the traders for offering low price.

5. <u>Constraints and opportunities at each stage of the value chain</u>

5.1 Constraints

5.1.1 Input Supply

The major constraints identified at input supply level are described as below.

Inadequate knowledge on quality seed supplier: Seed is the major input component in ginger cultivation as it incurs around 50% of the cost of production. Most of the farmers are using local varieties and traditionally grown seeds. During this study, most of the farmers were asking about quality seed (high productivity, disease free and fibreless) suppliers and their location. It is found that there is occasional support from DADO and some projects for quality seed supply but not found reliable and well functioned seed supply chain in the study districts.

Insufficient technical knowledge on plant protection measures: Although there is high infestation of rhizome rot disease in most of the ginger producing districts, neither agro-vets nor farmers themselves have the knowledge on appropriate plant protection measures to manage it. Pesticides found at local level are seen not effective to control rhizome rot disease. Some locally developed organic pesticides claim of controlling the disease but its wider replication and commercial impact is not seen. Though Agro-vets are important actor of this value chain, they are neither trained on plant protection measures of ginger nor do they have reliable information on it.

5.1.2 Production

Production level constraints were collected from FGD, farmers' field observation and interaction with famers. The collected information on constraints was ranked through the participants of regional validation workshops conducted at Dhulabari and Nepalgunj. The major constraints at production level are as follows.

Prevalence of Rhizome rot disease: Rhizome rot is a complex problem caused by multiple factors. The disease is spread unintentionally by the use of infected seed pieces from the previous crop. This disease is found in almost all ginger growing areas of Nepal except Malneta, Salyan. For instance, most of the farmers of Ramghat, Surkhet, former major production pocket, already gave up growing ginger due to this disease.

Low productivity: Though Nepal is in better position in terms of national average productivity of ginger in the region, the yield variation is very high from place to place. Growing areas like Malneta, Salyan has very high yield percentage up to 30 Mt/ha which is more than double compared to the average productivity of Salyan district itself. Likewise, western and central development regions are low in productivity compared to eastern and far-western development regions of Nepal.

Traditional cultivation practices: Ginger farming in Nepal is predominantly traditional, rain fed and cultivated in marginal sloppy land with conventional practices resulted high per unit cost of production and low returns. Though, there are few researches in crop production and plant protection measures, farmers are still lagging behind to adopt the research findings.

Traditional knowledge on seed production and storage: Ginger producers are not adopting recommended seed production technologies. Normally, farmers select the seed from main crop they produce and keep for the next season in pit stores.

Practice on post-harvest handling: In order to make ginger competitive in market, post-harvest handing practices like cleaning, sorting, grading and packaging are regarded as pre-requisites. Those activities are simple and doable in farmers' level but the farmers are not practicing even those simple activities in their farm. There is not any ginger washing facility in Nepal though it is very simple and available in eastern border at, Naxalbari, India. The washed ginger is more competitive even in Indian market compared to non-washed.

Limited collective marketing practices and low bargaining power: Group increases the bargaining power to producers during procurement of inputs as well as selling the goods. It also helps to increase the volume of ginger at a time and decreases the transaction and transportation costs. Contrarily, most of the farmers do ginger marketing individually though there is existence of different formal and informal groups. Apart from that farmers are devoid of reliable and timely market information so that, they are losing the bargaining power with their respective buyers.

Minimum support from GOs and NGOs: Study shows that producers are not satisfied with the research and extension services provided by the government agencies. Some of the development projects implemented by government and development agencies are short lived and could not impact significantly at producer level where as the outreach of government extension services and infrastructure support is not adequate.

5.1.3 Processing

In the main season, Nepal is forced to export its products in least price while in off season, it has been importing ginger products with paying higher price. By processing activities, it can be made possible for the regular supply of ginger and its products to Nepalese market since processing can help to preserve the products for longer duration. Apart from that, value added products can generate the employment at local level and profit to the entrepreneurs can be increased. Some of the constraints at processing level are highlighted in this section.

Lack of cleaning/washing facility: From the fresh consumption market perspective, the quality of Nepali ginger is considered inferior to Indian and Jamaican ginger and improved varieties of other countries because of Nepal's high fibre content and dirty look (ITC, 2007). Due to the lack of washing facility, Nepali ginger is not cleaned properly and is unattractive resulting the lower market price.

Inefficient processing technology: Sutho (Dry ginger) is the major processed product made out of fresh ginger. Nepalese farmers are making Sutho by using their traditional skill which is labour intensive and tedious. Lack of ginger peeler and the mechanical dryer are the major post-harvest problem. Ginger Research Program (GRP) under Nepal Agricultural Research Council (NARC) at Kapurkot, Salyan is mainly responsible for addressing the problems on ginger. Hence, the GRP in association with Agricultural Engineering Division (AED) under NARC has attempted to develop a ginger peeler and a ginger dryer under Hill Agriculture Research Project (HARP). However, the result was not encouraging⁹. During this study, we also found other products like candy, powder and squash but they are also lacking the appropriate technology to maintain the self-life of the products and increase the efficiency of production.

Regarding processing technology, the technology on ginger slicing and drying was found one of the important constraints for the exporters at Kathmandu. Slicing and solar drying is labour intensive and is not suitable for mass processing resulting high per unit cost of production of sliced ginger (Rs. $250 / \text{Kg}^{10}$ of dried slice) and less competitive in global market.

Skill and knowledge on processing: Farmers of sample district are not aware about the improved technologies to process the ginger and make various products. They are relying on their traditional knowledge of Sutho making so that they are not getting anticipated profit.

5.1.4 Marketing

Low quality of product: Rhizome with low fibre content, having bigger and equal fingers and with clean and waxy appearance are considered of high quality in international market. The produce of Nepal mostly is high in fibre contents and not proportionate in shape. Besides, there is limited practice of proper cleaning, sorting and grading of ginger. Due to this, Nepalese ginger are less competitive in international market compared to Indian, Chinese and Jamaican ginger.

Multiple taxes and unofficial payments during transportation: As per the local selfgovernance act (1999), there is provision for raising taxes by the DDC from where the product has originated. However, various DDC along the way of transportation are charging taxes illegally. Similarly, many political groups and traffic police are charging money unofficially during transportation to export.

Storage and processing facilities and collection Centres: Ginger is a seasonal crop and perishable in nature. Due to the lack of storage facilities, traders are forced to sell the product immediately after collection from farmers. Similarly, there are limited collection Centres at production sites so that there are difficulties in handing the product properly. There is also absence of ginger washing facilities in Nepal which has resulted in low price in market due to its dirty appearances.

⁹ http://unapcaem.org/Activities%20Files/A20/8%20Nepal.pdf

¹⁰ According to Rameshwor Panta, Male International

High custom clearance charge: The actual formal cost of custom clearance per truck is Rs. 678 and Rs. 3200 in Nepali and Indian custom respectively but exporters are paying Rs. 4500 to Rs. 25,000 per truck from various custom points. Exporters who use Bhairahawa custom are paying highest cost while the cost of custom clearance is lowest in Kakarbhitta custom.

Access to limited market Centres: There are only few cases of ginger export beyond India. Bangladesh and Pakistan are promising countries in South Asia to export Nepalese ginger apart from India. To export ginger in those countries, it should be passed through India which has been creating many hassles during export. EU or US market have specific requirements which are not easy to meet.

Difficult to get PFA test certificate: Food safety analytical report is must to export ginger in India which is issued by Prevention of Food Adulteration (PFA) Authority. The certifying agencies are distantly located in state capitals like Lucknow, Kolkata so that it is difficult to get the certificate on time. During study it was noted that it takes 2-3 days from sample collection to getting pass for the truck. As the ginger is highly perishable, the time taken to get food safety analytical report is quite long.

Limited access to finance: Due to shortage of operational capital during ginger harvesting season, local traders need to get advance payments from their respective buyers. Because of this, traders need to sell their products as per the price offered by their respective buyers. There are always difficulties to get loan from commercial banks for ginger trading business.

Other constraints: Minimum trust in buyers' offered price, irregular supply by farmers, labour scarcity, volatile market price etc are other constraints faced by traders.

5.2 Opportunities

There are number of opportunities that can be tapped to boost this sector and are highlighted in this section.

5.2.1 Input supply

Good demand of quality inputs: There is good demand of quality seeds and effective plant protection measures from ginger farmers. There is clear scope to develop a seed supply chain that can benefit for this sector. Malneta, Salyan is one of the potential areas to develop as a seed pocket and link to the producers of ginger.

5.2.2 Production

Improved post-harvest practices: Cleaning, sorting and grading are the basic post harvest handling practices which can be easily adapted at farmers' level. Those simple post harvest handing practices can add value to the product and get more price by producers.

High scope to increase area and productivity: All the mid-hill districts of Nepal are suitable to cultivate ginger therefore there is huge scope to increase the area of cultivation. Similarly, there is still scope to increase productivity by introducing high yielding varieties and improved cultivation practices. Besides, the treatment and prevention of rhizome rot disease, a major disease in ginger, can help in increase of production and also will encourage farmers towards ginger cultivation.

Harvesting and sell of mother rhizome during off-season: There is practice of mother rhizome harvesting in eastern part of Nepal but not practiced by the farmers of central and western Nepal. The harvesting of mother rhizome can provide significant return in cost of production as it is sold in offseason when the market price is high. Nevertheless, proper care should be taken during mother rhizome harvesting otherwise disease infestation may increase.

5.2.3 Processing

This study objectively looks at developing value added products in different value chain points of ginger for better market penetration and economic gain of the primary producers.

Product diversification: It is found that departmental stores in Kathmandu are importing ginger products like paste, powder, slices mixed with vinegar etc. Apart from that there is also good demand of powder, pickles and dry ginger. If Nepalese processors can make those products, they will easily access the market and get more profit compared to selling in fresh form.

5.2.4 Marketing

Value addition through cleaning, grading & sorting: To make the products competitive in regional markets, simple activities like cleaning, grading and sorting can be done. There activities would be helpful to increase the shelf life of products and generate premium price in market.

Opportunity for import substitution: As Nepal is exporting fresh ginger in low price and importing value added products from regional and international market paying high price, there is opportunity to start value addition activities and substitute the imports. Apart from that, Nepal is also importing fresh ginger from China and that can be substituted by managing supply chain of ginger.

Market diversification: Most of the ginger from Nepal is exported to India. ITC data shows that about 99% of ginger was exported to India in 2009, however, per unit price of ginger in Indian market is too low compared to European and US market. According to ITC, the exported unit value (USD/MT) for Nepalese ginger in Indian market is USD 198 which is second lowest in the world.

A market diversification can be a good opportunity for Nepalese ginger. South Asian countries like Pakistan and Bangladesh are the 3rd and 4th biggest importers of the ginger worldwide and have imported unit value of USD 533 and USD 663 respectively. Similarly, Arabian countries,

United States, UK and Netherlands can be a very potential area for export of Nepali ginger as they have good demand of ginger with high unit value.

Employment for women and poor in primary processing Centre: In Nepal, there is lack of primary processing Centre. In the eastern region, the ginger from Nepal is processed in Naxalbari, a border town in India whereas no processing Centre is reported in western border. According to an exporter in Naxalbari, a single processing Centre can provide employment to 50 people for 10 months. Most of the workers in such processing Centres are found to be women and poor. Therefore establishment of such processing Centres within Nepal can generate employment for thousands of women and poor. Besides, the quality of ginger is also upgraded which will assist in increase of unit price.

Inward flow of foreign currency: Nepal being the fourth largest producer of ginger also enjoys being one of the biggest exporters. The export of ginger has contributed 0.59% in the total export in FY 2008/9 and has become one of the sources of foreign currency earning. Till date, most of the export is in India; however, the Nepalese ginger can also find its market in other neighbouring countries as well as abroad where the unit value is quite higher. Even trading with India, the Nepalese ginger can achieve increased unit price by becoming competitive with Indian and Chinese gingers with further processing and quality improvement.

6. Conclusion, Future Vision and Recommendations

This study has observed that the ginger is one of the important cash crops for marginal farmers of Nepal. This sector contributes 0.59 % of total export, directly linked with 200,000 farming households and number one spice crop in terms of export volume. For couple of decades, production volume, area and productivity of ginger have been ever increasing but there seems some downfall in export value in specific years. Study has found that this crop is very much market sensitive. India, which is the major market, has been creating problems in export of Nepalese ginger imposing import ban time and again, specifically when they have their own enough production.

There is predominance of traditional practices in cultivation and processing of ginger in Nepal. Sutho (dry ginger) is the major value added product and it is made with traditional methods. Apart from Sutho, farmers are making other products like candy, squash, pickle but their access is limited in the local markets. The value chain map for ginger sector of Nepal shows that there is heavy dependence of firms to Indian market for the final disposal of their products. The map also shows that there is minimum consumption of fresh ginger in local market and also low level of export with final processing to overseas market. In input supplier level also, there is not any specific firm to supports the ginger producers. In traders' level, there is always lack of specific service provider for this sector which could have been helpful to upgrade the firms. Study shows that the lack of 'Technology and technical inputs' and 'Storage facility' and primary processing Centres 'Access to market' and 'Access to finance' etc are the major barriers to upgrade this sector. Some of the farmers who are distantly located from the road have cited transportation as the major problem for upgrading their business.

Based on this study, the Nepal government's role is seen insufficient both for farmers and traders. Due to existence of informal practices during transport, traders are forced to pay double tax and unofficial payment during transportation and export. Therefore, Government of Nepal should develop the program and projects focusing on value chain level. Government should also facilitate the entrepreneurs for upgrading activities and support them to increase the competitiveness of the products. To get profit for from this sector, supports on product diversification, branding and market diversification are seen must.

Work on Rhizome rot disease management: Rhizome rot is the main disease being faced by ginger producers and is regarded number one reason for loss in production. Loss of around 30% ginger in field and during storage is reported to be due to rhizome rot disease (NTIS, 2010). It is prevailed throughout Nepal and many farmers have discontinued the cultivation due to the disease. The disease has various sources of infection mainly due to fungus. Due to this, rhizome become soft, new leaves turn yellow, close to the soil start rotting and finally dry up. The disease spread unintentionally by the use of infected seed pieces from the previous crop, although these may appear normal and healthy. GRP has emphasizing its research work on rhizome rot disease management of ginger however very little success has been obtained for controlling this devastating disease.

Therefore concerned authorities like GRP and Plant Pathology Division under NARC should focus research work to address the present problem and extension offices of DoA should disseminate the appropriate technology to control this problem. Since, the disease spreads easily by use of infected seeds from the previous crop, proper seed treatment and new variety seed can be a good measure of controlling the disease. Similarly, practice of uprooting and burning of infected plants and crop rotation can be a good solution. Awareness campaign and disease remedy such as seed treatment measures should be provided to the farmers and input suppliers.

Facilitate to produce quality seeds & introduce high yielding varieties: Most of the ginger produced in Nepal are with more fibre and are less competitive than fibreless varieties. Besides, Nepalese ginger varieties are mostly native and are cultivated traditionally. There are quality seeds available within some part of Nepal which can produce good rhizome fatty looks which are also sold in higher price in market. Similarly, the productivity of local seeds is comparatively low and is also prone to disease. Therefore, facilitation should be done to produce high yielding and disease resistant varieties of ginger seeds. For the purpose, activities should be conducted with joint collaboration of Nepal Agricultural Research Council (NARC) and development agencies like SNV and should be made easily available to farmers.

Facilitate for quality production and post-harvest handling: Improved cultivation practices with superior seeds, timely plantation and seed treatment can help to increase the productivity of ginger. Similarly, simple processing activities like cleaning, sorting and grading can generate additional income to the producers. Therefore producers should be trained on quality production and post-harvest handling practices so that they can get additional benefits.

Support to establish collection and storage facilities: Study found that local traders are collecting ginger from the famers of their surroundings and keep it in front of grocery shops until the truck load collected. There is not such facility Centre where farmers can deliver the product and trader can sort, grade and package easily. Therefore it strongly recommended to the government of Nepal and development agencies to support for building collection Centres in strategic collection points.

If we analyze the price variation in different months of a year, there is very high price, almost double, during offseason so that it is recommended to develop the technologies for storage at local level and invest to build cold storage facilities in major market hubs.

Support to establish rhizome washing facilities: Since Nepali ginger is dirty look, it is less competitive in market. Simple washing facilities like what study team found in Naxalbari India can be built within Nepal. Therefore, recommendation is to build washing facilities in Dhulabari, Jhapa and Dumre, Palpa in initial stage since traders are ready to do partnership in those places. Later on this practice can be replicated in other production and collection areas. Washing not only add value to the product but also creates employment for local people especially for women and disadvantaged group of people.

Create and strengthen producer group organizations: There are many groups in study areas formed by government offices and development agencies. Most of the groups are idle and some

of the groups and cooperatives are doing regular saving and credit activities. To involve the producer groups in marketing activities, there should be community-private-public partnership. It might be in the form of private limited or marketing cooperative.

Entrepreneurship development and business planning for producer group organizations: Due to the lack of entrepreneurial skill and business knowledge, farmers are unable to take farming as business. Therefore, there is need to capacitate farmers and producer group organizations on business planning and entrepreneurship development training. These types of training are will help them to develop business perspective and understand market dynamics. The trainings can be given by partnering with organization experienced in providing such trainings. Three toolkit modules on - Entrepreneurship Development, Business Planning and Local Resource Person - developed by ANSAB can be used for the purpose.

Conduct exposure visit of the farmers: Farmers of Assam, Bangalore and Cochin of India and China are well equipped with improved knowledge of ginger cultivation. This has caused the farmers from these areas to produce better quality ginger. Therefore, there is need to arrange an exposure visit of leader farmers to the production pockets of India and China.

Support to diversify the products: Product diversification can be targeted both for national and international markets. Since departmental stores of Kathmandu are importing ginger products, it is necessary to transfer the value addition technology to local level and link them to departmental stores, groceries and retailers. Though there is fair amount of dried ginger in international market, Nepali product is not competitive due to high cost of processing. At present, peeling and slicing of ginger is done manually. The solar dryer is also rarely used and the dryers are not designed for commercial purpose where huge quantity is required. This has resulted in increased cost of processing. Exporters are searching the technology of mechanical slicing and drying in large scale which should reduce per unit cost of production significantly. Therefore it is recommended to provide technology of ginger slicing and drying to the entrepreneurs. One of the best drying technology is that of Cochin which can be introduced in Nepal for better quality dried ginger. Also, the already available bleaching technology should be linked to farmers.

Similarly, few companies have recently started manufacturing the ginger candy, paste, and powder and supplying to domestic market. There is good demand of these products in the domestic market. Therefore, these companies can be capacitated with efficient technology and market promotion for increased production and sales as well as boost the import substitution of these goods.

Declare Malneta as a seed production pocket: Study showed that Malneta is very good pocket for source seed production so that it is strongly recommend to the government of Nepal to declare it as a seed production pocket. There is unmet demand of seed of Malneta type of ginger and farmers of Malneta are able to produce quality seed (less fibre, disease free) so that there is need to develop the linkage between demand and supply of quality seed. It is also recommended to the best practices of Malneta to other ginger production areas of Nepal.

Auction market: Ginger being a seasonal crop produces high volume in main season. To make the marketing systematized, government can introduce auction markets centres in many strategic places in order to meet buyers and sellers together and make transaction in transparent way.

Support in branding, export facilitation and market diversification: Nepal has unique position in international market due to less use of pesticide and crop grown traditionally. To get advantage from this uniqueness, government can set the Nepalese standard for export with systematic monitoring activities and enough support to exporters. For this purpose, Nepal can brand ginger as Himalayan product or organic product and explore the market niches where premium price can be charged.

Similarly, there is huge market potential of ginger in Bangladesh, Pakistan and Middle East, however the Nepalese exporters have limited access to these countries. With a visit of exporters to these destination markets, they will be familiar with the buyers' requirements and able to establish a good business relationship. Such type of exposure visits can be supported. Besides, facilitation can be provided for conduction of meetings with chamber of commerce of these countries and the buyers-sellers interactions for trust building and market diversification. It is also recommended to support in participation in international trade fairs and exhibition where Nepali exporters along with government personals can participate.

Upgradation and accreditation of quarantine Labs: Nepalese exporters are facing hassles in exporting due to PFA test. Therefore, quarantine lab should be upgraded and bilateral talks should be conducted in order to accredit Nepali lab with India. There is also need to enforce for implementation of sub article 6 in protocol 2 of Nepal India Bilateral treaty which mentions about the accreditation of certificate issued by Nepal in India.

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ANNEXES

ANNEX -I

Check-list 1: Meeting with Traders

<u>Value chain map</u>s

- Who are your major suppliers?
- What is the volume you are dealing?
- What are the major districts or collection centres you are getting products?
- Who are input suppliers (sacks) for your business?
- What are the services required (transportation, storage, labourers, advisory, legal, book keeping) and service providers?
- Who are your buyers and where they are located?
- What are the channels of marketing?

Description and quantification of primary actors – from input supplier, producers to consumers

Production and market costs and revenues

- What is the price of products (Fresh and Dried) in last five years?
- What is the selling price of ginger (Fresh and Dried)?
- What are the cost (transportation, labourer, sacks, storage, weight loss, communication, rent, DDC tax, unofficial payments and others)
- What is the mode of payment and transaction closure?

Value additions and profit margin of different primary actors

- What are the products you are dealing? eg. Fresh, Dry and Finish Product?
- What are the value addition activities (cleaning, sorting, grading, packaging) in your firm?

Income and employment

- How many family members are involved in this business?
- What is the type of proprietorship? (Sole, Partnership, Cooperative)
- How many labourers are required for one truck load?
- What is the wage rate of labourers?
- What is the type of business (Seasonal, year round, mixed with other business)

Pro-poorness and social inclusion

- How is the participation of women, Dalit, Janjati in trading business?
- Who are your labourers? Dalit, Poor, Women?

Enabling environment and supporting agencies

- Policy framework: What are the policy constraints?
- Public actors Supports from Government?
- Non-government actors and projects Supports?
- Business development associations, commodity associations, CBOs and cooperatives
- How is your participation in BMOs? What are the advantages to be in BMOs?

Market trends, competitiveness

- Domestic production, consumption and markets
- Import and export markets and volume
- Supply and demand, trends and prices
- Competitiveness of Nepali ginger

Value chain governance

- How is the market price and quality determined (with supplier and buyers? What is the mode of payment?
- How is the reliability of buyers' offered price?
- How do you verify the price of product?
- How do you decide the market?
- What are the major markets you are selling your products?
- Who is your major buyer (commission agent, manufacturer, exporters, traders)
- For how many years you are doing your business with your principal buyer?
- What are the barriers to enter in ginger business? Access to finance, License, Membership

Constraints and opportunities at each stage of the value chain

- What are the major constraints? (From the point of purchase to the sale)
- What are the opportunities in this sector? (Alternative market, value addition, organic trade etc?

Future vision and recommendations

- Future vision of the ginger value chain
- Recommendations of interventions to be undertaken
- List of selected ginger traders interested to collaborate with zinger VCD

Checklist 2: Meeting with Producers

Value chain maps

- How many products you are selling (Fresh, dry, others)?
- Who are the suppliers of packaging materials, seed, pesticides, fertilizer and manure?
- What is the volume of production?
- What are the major markets or collection centres you are selling products?
- Who are your buyers (commission agent, local trader, district trader or exporter) and where they are located?(major buyer, % of selling)
- What are the services required (transportation, storage, labourers, technical knowledge) and service providers?
- What are the channels of marketing?

<u>Description and quantification / Production and market costs and revenues / Value additions and</u> <u>profit margin of different primary actors</u>

- What is the area of production?
- What is the quantity of various inputs used? (Per hectare qty)
- What is the productivity?
- What are the varieties?
- What is the price of products (Fresh and Dried) in last five years?
- What are the cost (seed, manure, fertilizer, pesticides, labourers, packaging materials, storage, communication, unofficial payments and others.)
- Who determines the price of your product?
- How is the market price fixed?
- What are the products you are dealing? eg. Fresh, Dry and Finish Product?
- What are the value addition activities (cleaning, sorting, grading, packaging) in your firm?

Income and employment

- How many family members are involved in this business?
- How many labourers are required per ropani or ha?
- What is the wage rate of labourers?
- Who involve in production activities? (Male, female, children?)
- Who involve in marketing activities? (Male, Female?)

Pro-poorness and social inclusion

- How is the participation of women and Dalit, Janjati in ginger production?
- Is there participation of landless in production? If yes, how?
- Who are your labourers? Dalit, Poor, Women?

Enabling environment and supporting agencies

- Policy framework: What are the policy constraints?
- Public actors how is the supports from government agencies?
- Non-government actors and projects how is the supports?
- Commodity associations, groups and cooperatives
- How is your participation in groups and cooperatives? What are the advantages of participation?

Market trends, competitiveness and value chain governance

- Domestic production, consumption and markets
- Import and export markets and volume
- Supply and demand, trends and prices
- Competitiveness of Nepali ginger

Value chain governance

- How is the market price and quality determined?
- What is the practice of price fixation and mode of payment?
- What is the degree of reliability of buyers' offered price?
- How do you verify the price of product? or What is the source of MIS?
- How do you decide the market?
- For how many years you are doing your business with your principal buyer?
- How do you define the quality?
- What are the barriers to enter in ginger business? Access to market, Transportation, Access to finance

Constraints and opportunities at each stage of the value chain

- What are the major constraints?
 - Production, Marketing
- What are the opportunities in this sector?

Future vision and recommendations

- Future vision of the ginger value chain
- Recommendations of interventions to be undertaken
- List of selected zinger traders interested to collaborate with zinger VCD

Checklist 3: Meeting with Stakeholders

Value chain maps with description and quantification of primary actors – from input supplier, producers to consumers

- Who are major actors of ginger value chain (Input supplier, producer, processor, trader, exporter)?
- What are the numbers of various actors?
- What are the major production pockets/districts?
- What are the major collection and market centres?
- What are the supporting and facilitation organizations in ginger value chain?
- What is volume of production and per unit price?
- How is the situation of required services (Seed, fertilizer, pesticides, packaging materials)?
- How is the infrastructure supports (road, storage, collection centres etc)?
- What are the channels of ginger marketing from this region?

Production and market costs and revenues

- What is the price of products (Fresh and Dried) in last five years?
- What are the costs of production in various actors' level? (Seed, transportation, labourer, sacks, storage, weight loss, communication, rent, DDC tax, unofficial payments and others.)

Industry analysis /Income and employment

What is the contribution of ginger sector in local economy?
 Employment
 Income
 Participation
 What is the wage rate of labourers?

Value additions and profit margin of different primary actors

- What are the products made from ginger? eg. Fresh, Dry and Finish Product?
- What are the value addition activities in specific actor level? (cleaning, sorting, grading, packaging)

Pro-poorness and social inclusion

- How is the participation of women and Dalit, Janjati in ginger business?
- How is the involvement of poor and socially excluded group of people?

Enabling environment and supporting agencies

- Policy framework: What are the policy constraints?
- Public actors Supports from Government?
- Non-government actors and projects Supports?
- Business development associations, commodity associations, CBOs and cooperatives

Market trends, competitiveness and value chain governance

- Domestic production, consumption and markets
- Import and export markets and volume
- Supply and demand, trends and prices
- Competitiveness of Nepali ginger

Value chain governance

- How is the market price and quality determined (with supplier and with buyers?
- What is the practice of price fixation and mode of payment?
- Who determines the price product?
- How is the reliability of buyers' offered price?
- What are the major market centres of ginger from eastern Nepal (domestic and international)?
- What are the barriers to enter in ginger business? (Access to finance, market, economies of scale, technology, improved varieties)
- What is the frequency of MIS and how VC actors are getting market information?

Constraints and opportunities at each stage of the value chain

- What are the major constraints? (input to end market)
- What are the opportunities in this sector?

Future vision and recommendations

- Future vision of the ginger value chain
- Recommendations of interventions to be undertaken
- List of selected zinger traders interested to collaborate with zinger VCD

ANNEX –II

Constraints Ranking

Aggregate constraints ranking by participants from Regional Validation Workshop

S N	Constraints		Ranking	
1	Constraints at Farmer's Level	Nepalgunj	Dhulabari	
i.	Rhizome Rot disease	1	1	
ii.	Low yielding variety	6	2	
iii.	Traditional cultivation methods	4	2	
iv.	Low knowledge on seed production and storage	3	3	
v.	Insufficient knowledge on post-harvest handling practices	2	4	
vi.	Limited collective marketing practices	7	5	
vii.	Low knowledge on market information	5	6	
viii.	Minimum support from government and non government organizations	9	7	
ix.	Higher cost of transportation and insufficient collection Centre	8	8	
2	Constraints at Trader's Level			
i.	Multiple taxes to different DDCs, VDC and Municipality	5	1	
ii.	Unofficial payments during transportation	4	2	
iii.	Problem of storage facility	6	3	
iv.	Lack of primary processing facility	3	4	
v.	Limited access to finance	1	5	
vi.	Controlled market and barrier for new entrants	2	6	
3	Constraints at Exporter's Level			
i.	Low quality of product	1	1	
ii.	High custom clearance charge	5	2	
iii.	Multiple local taxation	3	3	
iv.	Lack of trust in buyers' offered price	2	4	
٧.	Access to limited market Centres	4	5	
ANNEX –III

List of people interviewed

SN	Name	Position	Address	
NGPTA				
1.	Narendra Kumar Khadka	Chairperson	NGPTA	
2.	Indra Budathoki	Secretary	NGPTA	
Naxalbar	i, India		·	
1.	Rajkumar Mararka	Exporter		
2.	Sanjeev Shah	Exporter		
3.	Khem	Exporter		
Ilam				
5.	Ram Bhawan Singh		DADO, Ilam	
Surkhet				
6.	Tila Oli	Chairperson/Farmer	Bheri Livestock and Agriculture	
			Production and Processing	
			Cooperative	
7.	Ganga Subedi	Secretary/Farmer	Bheri Livestock and Agriculture	
			Production and Processing	
			Cooperative	
8.	Bir Singh Bohara	Farmer	Ramghat, Surkhet	
9.	Khaga Bahadur Budha	Trader	Ramghat, Surkhet	
Nepalgu	nj			
10.	Rajesh Jain	Exporter	Simki Trade Centre	
11.	Tanka Prasad Sharma	Exporter	Gayatri Trade Centre	
12.	Akram Haluwai	Trader	Nepalgunj	
13.	Beni Gopal Tiwari	DGM-Herbs Division	Chaudhary Biosys (Nepal) Ltd.	
14.	Rabindra Nath Shukla	Advisor	JABAN	
15.	Puskar Kharel	Office Chief	JABAN	
Palpa				
16.	Ram Prashad Pokhrel	Trader	Dumre, Palpa	
Butwal				
17.	Ambika Prashad Barnawal	Trader	Ambika Prasad and Company, Haat	
			Bazar, Butwal,	
18.	Ramesh Kumar Barnawal	Trader	Haat Bazar, Butwal	
19.	Subesh	Trader		
20.	Krishna	Trader	Butwal	
21.	Nainanda Kafle	Trader	Haat Bazar, Butwal	
Bhairawa				
22.	Ganga Sagar Jaishawal	Trader	Bhairawa	
23.	Krishna Jaishawal	Trader	Bhairawa	
Salyan				
24.	Ram Milan Prasad Bishwokarma	Sr. ADO	DADO, Salyan	

25.	Govinda KC	Coordinator	Ginger Research Program, Kapurkot	
26.	Churna Bahadur Gharti	Trader	Kapurkot	
27.	Gyan Dev Gharti	Farmer	Dandagoun VDC, Malneta Dharkhani,	
			Salyan	
28.	Amar Budhathoki	Trader	Salyan	
29.	Topendra KC	Agrovet	Salyan	
Dang				
30.		Sr. ADO	DADO, Dang	
Tulsipur				
31.	Shiva Dayal Soni	Trader	Tulsipur	
32.	Om Prakash Dhakal	Trader	Tulsipur	

ANNEX –IV

List of participants in National Validation Workshop, Kathmandu

<mark>(Need to Add)</mark>

List of participants in Regional Validation Workshop, Birtamod

SN	Name	Position	Organization/Address
1.	Narendra Kumar Khadka	Chairperson	Nepal Ginger Producers and Traders Association (NGPTA)
2.	Puspa Lal Ghimire	Program officer	Asia Network for Sustainable Agriculture and Bioresources (ANSAB)
3.	Damoder Kanel	Advisor	SNV-Nepal
4.	Bibek Shrestha	Advisor	SNV-Nepal
5.	Kabir Ratna Sthapit	Marketing Officer	ANSAB
6.	Anup Lal Shah	Chief	District Agriculture Development Office (DADO), Dhankuta
7.	Arun Kumar Ghimire		Kakarbhitta
8.	Suman Dewan	Intern	SNV-Nepal
9.	Govinda Prasad Dhakal		CCI
10.	Mahendra Niraula	Director	Mechi Chamber of Commerce and Industries
11.	Bhisma Prasad Baidya	Chairperson	Ilam Chamber of Commerce and Industries
12.	Rajendra Chhetri	Sr. ADO	DADO, Jhapa
13.	Rajendra Kumar Malla	Sr. ADO	DADO, Ilam
14.	Lakhsman Bhattarai	Manager	Agriculture Product Market Management Committee, Dharan
15.	Dibesh Prasad Rai	Sr. ADO	DADO, Panchthar
16.	Rajendra Ghimire	Chairperson	Jhapa Chamber of Commerce and Industries
17.	Ashok Kumar Das	Sr. ADO	DADO, Sunsari
18.	Shah	Agriculture Ext. Officer	Regional Agriculture Directorate, Biratnagar
19.	Manoj Kumar Yadav	Technical Officer	Commercial Agriculture Development Program (CADP), Biratnagar
20.	Basanta Raj Aryal	Planning Officer	DADO, Morang
21.	Basanta Thapa		CADP, Biratnagar
22.	Dharma Raj Bohara	Department Manager	CAA, Jhapa
23.	Aryal	Manager	Gautam Buddha Ginger Producers' Association
24.	Tej Bahadur Rai	Chairperson	Gautam Buddha Ginger Producers' Association

25.	Shiva Prasad Neupane	Project Officer	Mercy Corps
26.	Nishan	Chairperson	Shrijansil Agriculture Cooperative Ltd.
27.	Shek Bahadur Rai	Farmer	Saule, Dharan
28.	Kalyan Khadka	Proprietor	Bikas Suppliers
29.	Raj Kumar Murarka		
30.	Arun	Proprietor	Kabeli Traders
31.	Raju Adhikari	Journalist	Nagarik Daily
32.	Bhim Nembang	Journalist	Nepal Television
33.	Amber Mukhia	Farmer	
34.	Dambar Kumar Rai	Chairperson	Agriculture Cooperative Ltd., Kolbung
35.	Madhav Niraula	Farmer	Ilam
36.	Kumar Aryal	Farmer	Ilam
37.	Dhurba Adhikari	Trader	Ilam
38.		Farmer	
39.	Umakanta Khanal	Jounalist	BBC

List of participants in Regional Validation Workshop, Nepalgunj

SN	Name	Position	Organization
1.	Narendra Kumar	Chairperson	Nepal Ginger Producers and Traders
	Khadka		Association (NGPTA)
2.	Puspa Lal Ghimire	Program Officer	Asia Network for Sustainable Agriculture
			and Bioresources (ANSAB)
3.	Damodar Kanel	Production Organization	SNV-Nepal
		Strengthening Advisor	
4.	Rajesh Kumar Jain	Advisor, JABAN	Simki Trade Centre
5.	Dr. Shyam Kishor Shah	Regional Agriculture	Regional Agricultural Directorate
		Director	
6.	Gopal Prasad Shrestha	Program Director	Vegetable Development Directorate
7.	Kamal Raj Gaire	Sr. Agriculture	District Agriculture Development Office,
		Development Officer	Surkhet
8.	Jay Bahadur Nepali	Office Secretary	Bheri Livestock and Agriculture
			Production and Processing Cooperative
9.	Ram Milan Prasad	Sr. Agriculture	District Agriculture Development Office,
	Bishwokarma	Development Officer	Salyan
10.	Padam Bhandari	Advisor	SNV Nepal
11.	Anantajibi Ghimire	Advisor	SNV Nepal
12.	Pratibha Limbu	District Coordinator	Winrock International
13.	Prabhal Shahi	Member CCI, Surkhet	CCI Surkhet
14.	Sharad Chandra	RAPC	EIG, Nepalgunj
	Shrestha		
15.	Ram Prasad Gautam	Horticulture Officer	District Agriculture Development Office,
			Surkhet
16.	Pradip Kumar	Member	CCI, Nepalgunj

17.	Gyan Dev Gharti	Farmer	Ginger Seed Production Group, Malneta,
			Salyan
18.	Ram Prasad Pokhrel	Trader	Palpa
19.	Pashupati Bashyal	Member	Ginger Cooperative

List of participants in Focus Group Discussion, Ilam

SN	Name	Position	Organization
1.	Narendra Khadka	Chairman	Nepal Ginger Producers and Traders
			Association
2.	Bhisma Prasad Baidya	Chairman	Ilam Chamber of Commerce and
			Industries
3.	Damodar Kanel	Advisor	SNV Nepal
4.	Bibek Shrestha	Advisor	SNV Nepal
5.	Kabir Ratna Sthapit	Marketing Officer	ANSAB
6.	Puspa Lal Ghimire	Program Officer	ANSAB
7.	Chandra Kumar Shrestha		Ilam Municipality-9
8.	Padam Prasad Acharya	Trader	Ilam Municipality-5
9.	Ananta Khatiwoda		Ilam Municipality-5
10.	Ratna Bahadur Koirala		Ilam Municipality-2
11.	Gyan Prasad Acharya	Trader	Ilam Municipality-3
12.	Dhan Bahadur Thapa		Ilam Municipality-3
13.	Durga Prasad Dulal		Maipokhari-2
14.	Tika Prasad Dulal		Maipokhari-2
15.	Chandra Prasad Bhattarai	Trader	Ilam Municipality-3
16.	Netra Gautam		Ilam Municipality-5
17.	Niraula		Ilam Municipality-4
18.	Lila Nath Gautam		Ilam Municipality-3
19.	Ram Bhawan Singh		District Agriculture Development
			Office, llam
20.	Talak		Agriculture Development Bank, Ilam
21.	Tulsi Rijal		CADP, Ilam
22.	Ananta Bahadur Rai		CAA, Ilam
23.	Dinesh Paudel		ICC, Ilam
24.	Nutan Dev Dulal		Ilam Chamber of Commerce and
			Industries
25.	Parshu Ram Sapkota	Farmer/Trader	Inapa, Ilam
26.	Radha Dhakal		Pashupati Nagar-9
27.	Indira Rai		Pashupati Nagar-9
28.	Binita Basnet		Ilam Municipality-3
29.	Dhan Maya Khatri		Ilam Municipality-3
30.	Amber Mukhiya		
31.	Shiva Kumar Aryal		
32.	Durga Devi Luitel		Ilam Municipality-4

33.	Kaushila Niraula		Ilam Municipality-4
34.	Agni Adhikari		District Development Committee, Ilam
35.	Bishnu Dahal		Women Awareness Association
36.	Januka Acharya		Ilam Municipality-5
37.	Raghunath Agrawal	Trader	Biplate
38.	Dwarika Agrawal	Trader	Biplate
39.	Devi Bhattarai		Ilam Municipality-4
40.	Keshar Shrestha		Ilam Municipality-9
41.	Damber Bahadur Rai		Kolbung 2
42.	Dhurba Adhikari		Godam-6
43.	Ama Aryal		Kolbung-2
44.	Mahendra Niraula		Mechi Municipality-1
45.	Indra Kumar Rai		Fikkal-3
46.	Indra Bahadur		Mechi Municipality-1
	Budhathoki		
47.	Rabin Shrestha	Trader	Inapa
48.	Nakul Ghimire	Trader	Golakharka
49.	Narendra Mahat	Trader	Golakharka
50.			

List of participants in Focus Group Discussion, Surkhet

SN	Name	Position	Organization/Address
1.	Basanta Gautam	Horticulture Officer	
2.	Tila Oli	Chairperson	Bheri Livestock and Agriculture
			Production and Processing Cooperative
			Ramghat, Surkhet
3.	Sima Sunar	Member	Bheri Livestock and Agriculture
			Production and Processing Cooperative
			Ramghat, Surkhet
4.	Kamal Sunar	Member	Bheri Livestock and Agriculture
			Production and Processing Cooperative
			Ramghat, Surkhet
5.	Dal Bahadur Sunar	Manager	Bheri Livestock and Agriculture
			Production and Processing Cooperative
			Ramghat, Surkhet
6.	Chandra Bahadur BC		Surkhet Koseli Griha, CSEBD
7.	Govinda Ghimire		Bulbule Agriculture Cooperative Ltd.
8.	Manoj Kafle		

ANNEX –V

Cultivation Practices

Ginger (*Zingiber officinale Rosc.*) belongs to Zingiberaceae family and propagated vegetatively. This is one of the important cash crops for marginal farmers and key export commodity of Nepal. The part in trade is rhizome which is thick and hard, laterally compressed, often palmately branched, pale yellow within covered with small distichous scales.

Climate and Soil

Ginger can be cultivated in most part of Nepal but the land located between 300 to 1600 m above sea level is regarded suitable of cultivation. The annual rainfall of 1500-3000 mm during growing season and dry spells before land preparation and harvesting is good for growth and high yield of the crop.

The temperature range favorable to its proper growth is 19-28°C and the temperature lower than 13 °C induces dormancy and higher than 32 °C can cause sunburns. Ginger grows in wide variety of soil but the ideal one is soil rich in humus, light, loose and friable, well drained and at least 30 cm depth. Crop performs best on medium loam with good supply of humus. The soil should be worked to a fine tilth otherwise the rhizomes will have deformed shapes. Rhizome growth is better in slightly acidic soils (pH 6-6.5) than neutral soils. It is sensitive to water logging, frost and salinity. It is tolerant to drought and wind. In Nepal, it is grown mostly in rain fed condition and intercropping with maize since it thrives well under partial shade.

Land preparation and Fertilizer

Ginger requires fine tilth soil and plowing is mostly done by using bullocks. Usually three to four times plowing is done during land preparation. Ginger is an exhaustive crop so requires reasonable amount of manure and fertilizers. Well decomposed cattle dung or compost at the rate of 25-30 MT/ha is recommended to apply at the time of planting. The recommended dose of inorganic fertilizers depends on the fertility of soil and organic manure used.

Seed rate

Seed rate depends on the size of seed, thickness, variety and method of planting. Disease and damage free seed with 50 to 60 gm, having minimum at least one sprouting eye is regarded as the best seed for propagation. Since Nepalese farmers are planting rhizome without cutting so that the seed rate is quite high. The seed rate ranges from 3 to 5 MT/ha depending on the size of rhizome planted.

Propagation

Propagation of ginger takes place from rhizome cuttings or whole rhizome. In Nepal whole rhizome is used as planting material so that cost of seed is very high. Three to four years crop

rotation is recommended to minimize the disease infestation and normally Finger millet and Pole beans are best to cultivate before planting ginger. During our study, it is found that the farmers are normally adopting three years crop rotation. The recommended row to row distance is 30 cm and the plant to plant distance in a row is also 30 cm. Seed treatment with fungicide is necessary to minimize the infestation of Rhizome rot disease.

Mulching

Immediately after planting the seeds, mulching is done which helps to maintain the soil moisture, enhance sprouting, enhance organic matter in soil and suppress the growth of weeds. Locally available materials like wilted or rotten green leaves of forest, rice straw, rice husk etc can be used as mulch.

Weeding

When mulch is properly applied, weeds are suppressed. Two weeding are generally given to ginger but it depends on weed intensity. During hoeing care should be taken not to disturb, injured or expose the rhizomes. In Malneta region, three to four weeding per crop is in practice.

Mother rhizome harvesting:

Mother rhizome removal, called bruni extraction is found common practice in eastern region but not in western part of the country. Almost all the farmers in eastern region harvest mother rhizome from May or June, i.e. when ginger crop attains 50 to 60 days age with 3-4 leaves. Farmers remove mother rhizome leaving the sprouted piece of rhizome in the soil. The removed mother rhizome is sold in local market with good price. This practice is believed to give proper space to the developing rhizome and although the quality of rhizome is inferior farmers get income due to off-season price advantage.

Main crop harvesting

The crop will be ready for harvesting after 7-9 months of planting and this is when the leaves begin to turn yellow and the stems start lodging. Harvesting is normally done by digging with spade and collected manually. Depending upon the usage, ginger is harvested at different times. For making candy ginger is harvesting in pre mature stage and while for seed purpose it should be fully matured.

Post harvesting

Rhizome is highly perishable and susceptible to soil borne fungi and insects, thus needs to be stored appropriately. The optimum condition for storage of fresh ginger is temperature of 7.5-10 degree C, relative humidity of 75% and storage period of 16-24 weeks.¹¹ Poor storage causes rotting, dehydration and sprouting. Separations of rhizome from shoot, removal of soil, selection

¹¹ http://tradejunction.apeda.com/market%20profile/MOA/Product/Ginger.pdf

of seed are the common practices of post harvesting at farmers level. Post harvesting activities like sorting, grading, washing and proper packing are mostly done at traders' level.

Insect and Disease

Major insects of ginger are white grub, stem borer, spice beetle, scale beetle etc. Rhizome rot is the major disease of ginger which is caused by *Pythium* and *Fusarium* fungus which is seed and soil borne disease. The preventive measures of this disease are as follows (K C, 2066 BS);

- Use seed with at least one eye, without disturbing the skin and healthy rhizome.
- Adopt crop rotation of 3 to 4 years and cultivate Finger millet or Pole bean before ginger cultivation
- Treat seeds with Indophil M 45 or Bavistin powder before storage.
- Maintain well drainage with raise bed of 10 to 15 cm.
- Use 100 Kg Neem or Mustard cak7e with 3 Kg Zanthoxylum powder during seed planting. (cultivation