MARKETABLE AND MARKETED SURPLUS OF HORTICULTURE CROPS IN NAGALAND: A COMPARATIVE STUDY OF MOKOKCHUNG AND WOKHA DISTRICTS

By

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Submitted

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DECLARATION

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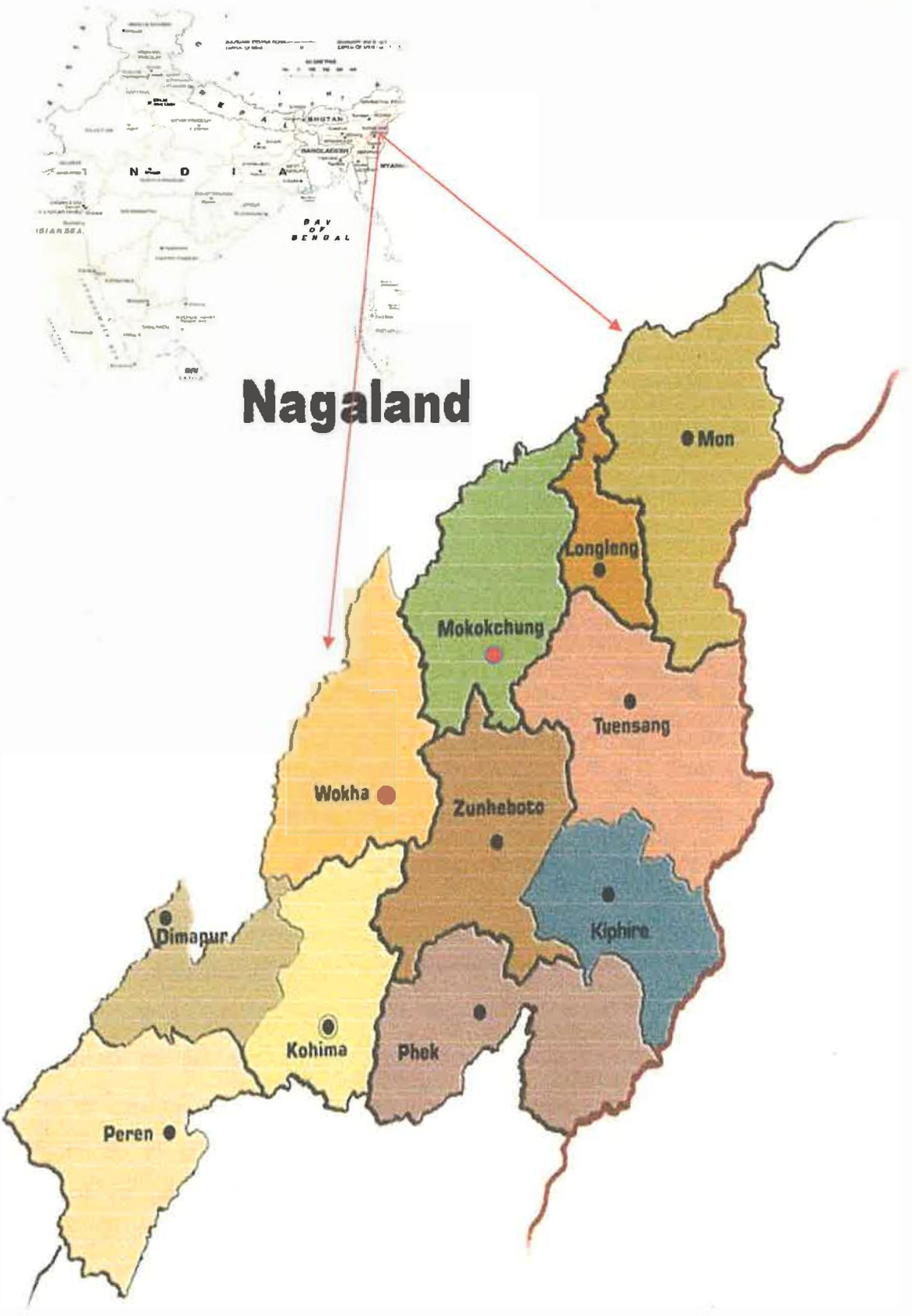
LIST OF ABBREVIATION

AMA	American Marketing Association
APA	American Psychological Association
C	Celsius
CGR	Compound Growth Rate
CIH	Central Institute of Horticulture
COE	Centre of Excellence
CSO	Central Statistical Organization
F	Fahrenheit
FAO	Food and Agriculture Organization
GoI	Government of India
GSDP	Gross State Domestic Product
ha	Hectare
hh	Household
HQs	Head Quarters
kg	Kilogram
MLRM	Multi Linear Regression Model
mm	Millimeter
MT	Metric Ton
N	Number of observation

NA	Not Available
NER	North East Region
NGO	Non Governmental Organizations
NHD	National Horticulture Database
NHTA	Naga Hills Tuensang Area
NIC	National Information Centre
NPC	Naga People Convention
NSDP	Net State Domestic Product
NSS	National Sample Survey
PCA	Primary Census Abstract
PCNSDP	Per Capita Net State Domestic Product
PYO	Pick Your Own Operation
q	Quintal
SHGs	Self Help Groups
SHN	Statistical Handbook of Nagaland
SPA	Special Plan Assistance
sq.km	Square Kilometer
TFC	Thirteen Finance Commission
TRC	Terrace Rice Cultivation
TWPR	Total Work Participation Rate
WRC	Wet Rice Cultivation

STUDY AREA

MAP 1



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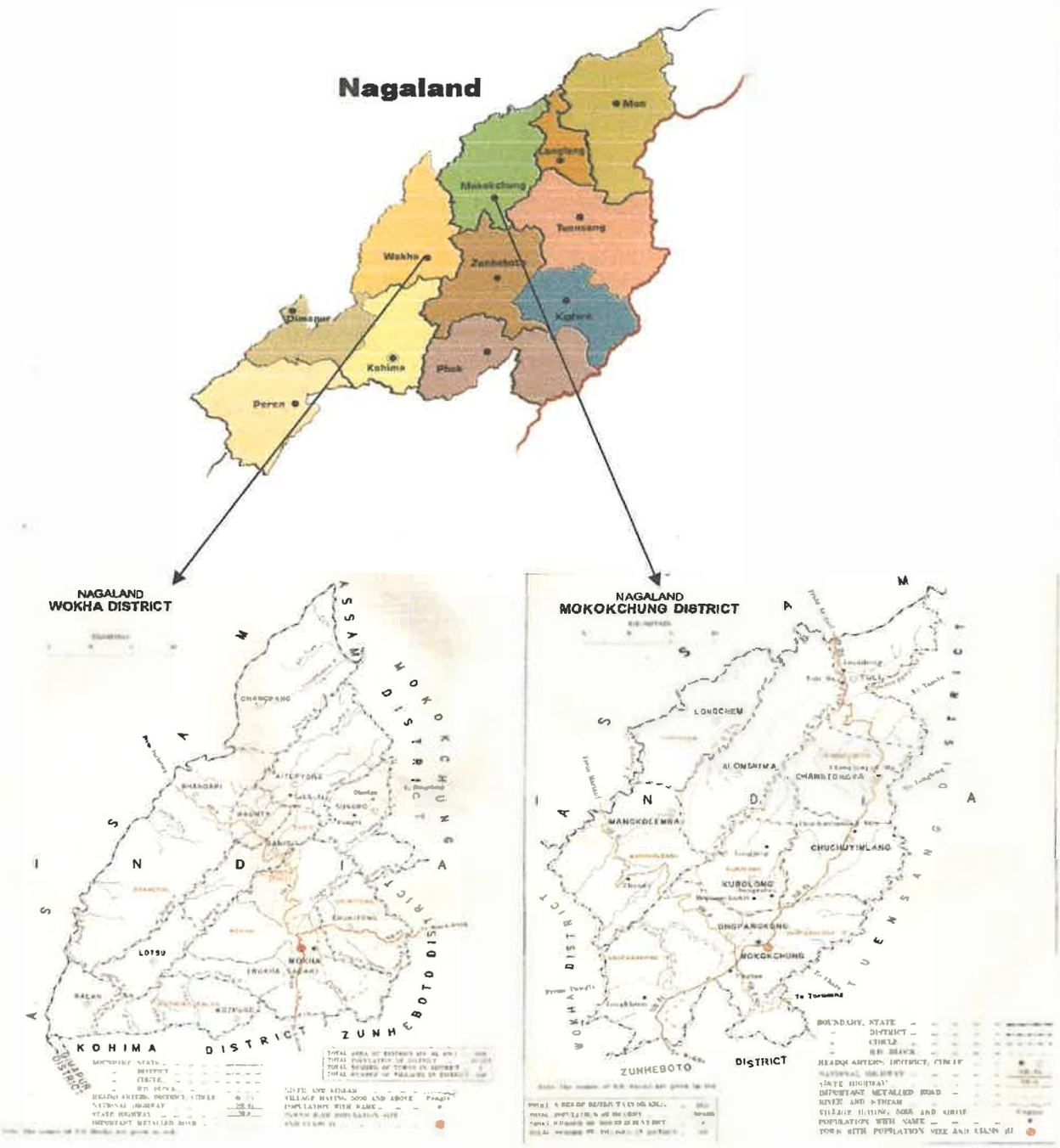
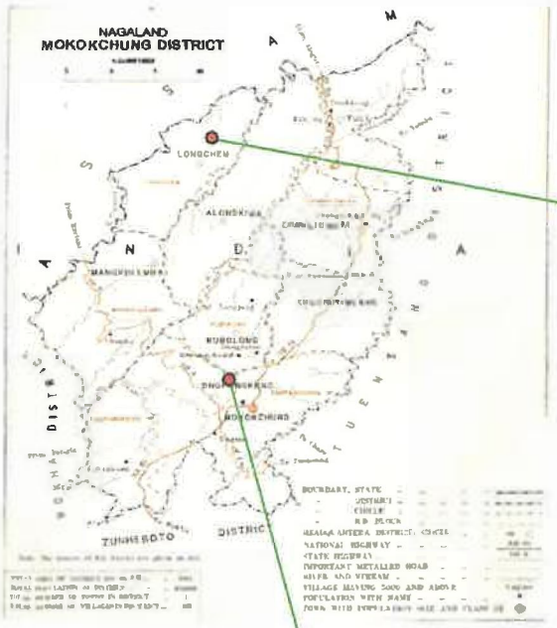
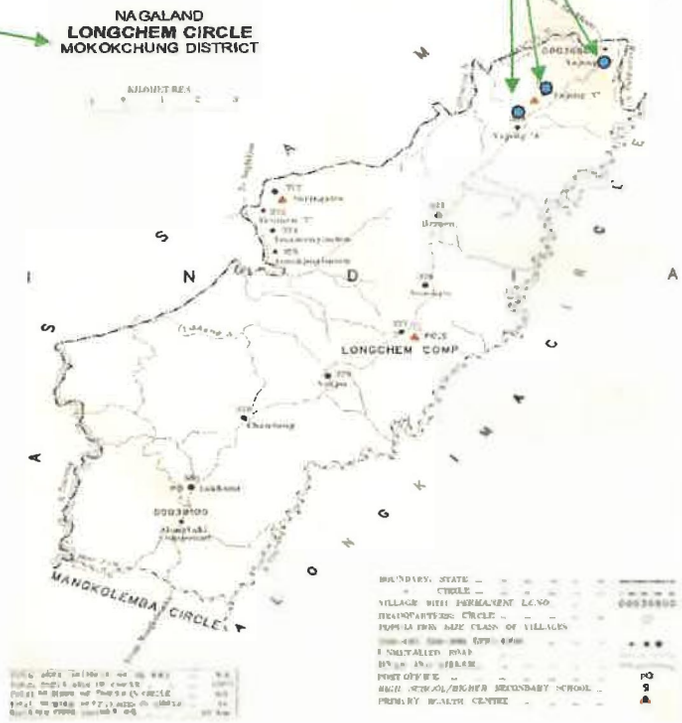


MOKOKCHUNG DISTRICT



Yajang Village

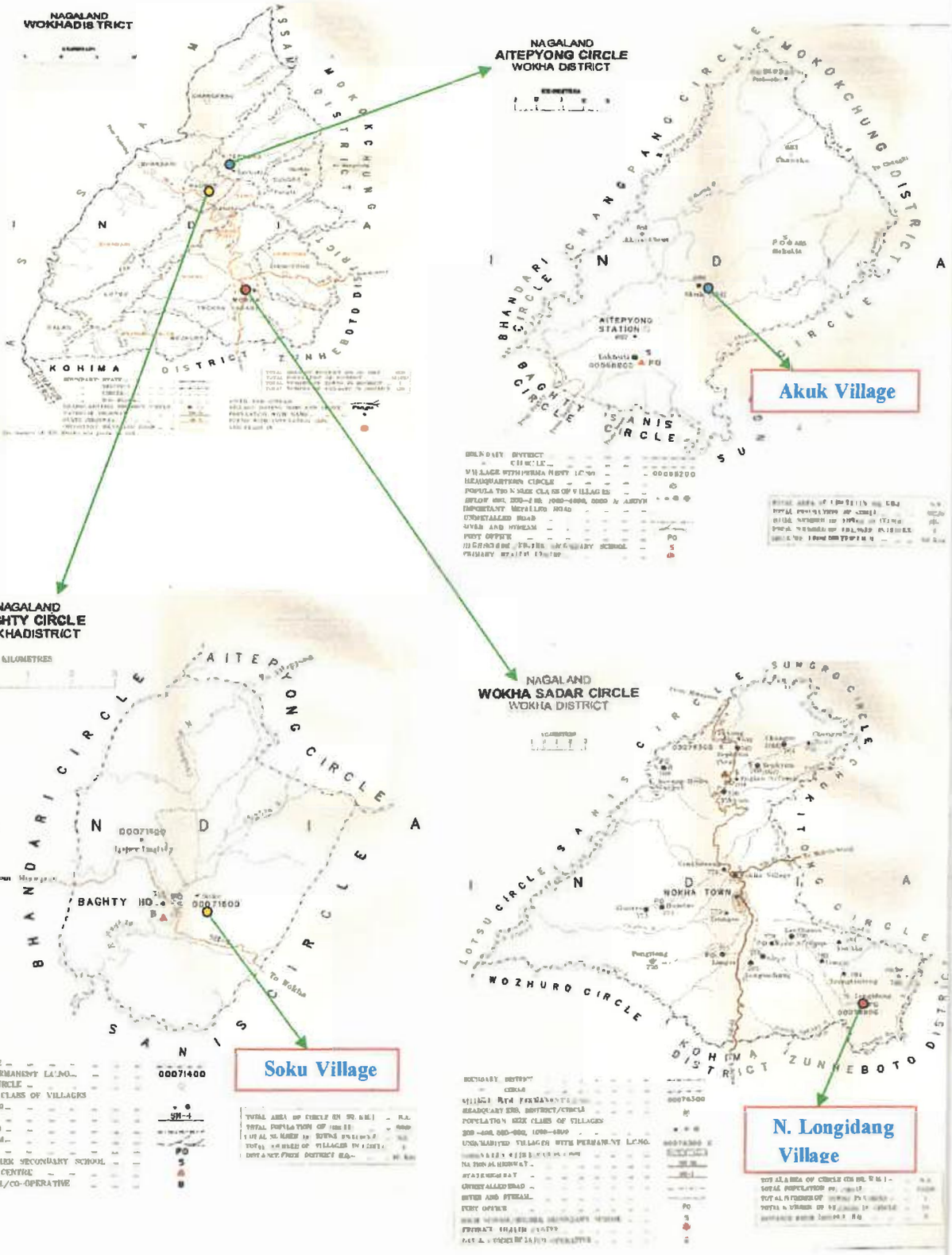


Longkhum Village

Longsa Village

WOKHA DISTRICT

MAP 3



CHAPTER I

INTRODUCTION

CHAPTER I

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The economy of the North East Region (NER) in India is predominantly agrarian comprising agriculture and horticulture. Horticultural crops which includes fruits, vegetables, floriculture, medicinal and aromatic plants, and plantation crops, spices etc. has traditionally been an important activity in this region. Over the years horticulture has grown from a kitchen-garden kind of activity into an organized area of agriculture. Since horticulture provides higher return per unit of land and generates higher employment, development of horticulture helps in alleviating the economic conditions of the people. Diversification into horticultural crops is becoming attractive for many farmers in North East Region in general and Nagaland in particular in recent years. Production of fruits and vegetable crops has grown faster than that of cereal crops albeit from a much lower base.

Marketing is as critical to better performance of horticultural crops as farming itself because of its nature of perishability, seasonality and bulkiness. Although considerable progress has been achieved in technological improvements in horticulture by the use of a high-yielding variety seed, chemical fertilisers and plant protection measures, the rate of growth in farming has not attained the expected levels. This has been largely attributed to the fact that not enough attention has been given to marketing facilities and services in NER region as well as the State of Nagaland. The marketing condition in Nagaland is largely unorganized and dominated by private traders and market efficiency of horticultural commodities has been highly fluctuating consumer price and small share of consumer rupee reaching to the farmer-producer. In this context, this study attempts to analyse in-depth the status of marketable and marketed surplus of horticultural commodities and marketing conditions and its efficiency, alternative marketing options

and their suitability to suggest ways and means to promote an effective, efficient and integrated horticultural marketing system in the State of Nagaland.

1.2 CONCEPTS AND DEFINITIONS

Horticulture – The word Horticulture is derived from the Latin word *"hortus"*, meaning garden and *"cultura"*, meaning cultivation[1]. So, horticulture literally means garden culture or cultivation of garden plants. Horticulture is the branch of agriculture that deals with art and science intensively growing plants for human food and non-food uses and for personal or social needs. However, it is quite impossible to give an exact definition of horticulture; nonetheless, significant answer on the concept, definition, scope and application of horticulture can be find from the writing of various authors in the field. **Janick (1972)**[2], defined, "horticulture as the branch of agriculture concerned with intensively cultured plants directly used by man for food, for medicinal purposes, or for esthetic gratification". Similarly, the **Louisiana State University (2011)**[3] has defined, "horticulture as the science and art involved in the cultivation, propagation, processing and marketing of ornamental plants, flowers, turfs, vegetables, fruits and nuts". It is unique among plant sciences because it not only involves science and technology, but it also incorporates art and principles of design. And **University of Minnesota (2011)**[4] has defined, "horticulture is the art and science of plant production for beauty and utility... Rather than stable crops, horticulture focuses on value added, luxury crops". From these definitions, the following general conclusion can be made on what horticulture is:

- Horticulture is a branch of plant agriculture and is both a science and an art. As an art, it incorporates the marketing and principles of design (as in landscaping)
- It deals with high valued crops (ornamental, medicinal and nutritional)

[1] Wikipedia (2014). *Horticulture*. Retrieved on 12th October 2014 from http://en.wikipedia.org/wiki/Horticulture and http//www.cropsreview.com/what-is-horticulture.html

[2] Janick, J. (1972). *Horticulture Science* (2nd Edition.), p.586. San Francisco: W.H. Freeman and Company.

[3] Louisiana State University (2011), what is/career? Retrieved on 12th October 2014 from http://www.horticulture.lsu.edu/whatis.html

[4] University of Minnesota (2011). *what is horticulture*? Retrieved on 12th October 2014 from http://www.horticulture.umn.edu/ProspectiveStudents/What/index.htm

- It includes vegetables, fruits and nuts directly used by man for food; flowers and ornamental plants for aesthetic or visual enjoyment; and those used for medicinal purpose.

Horticulture crops include fruits, Vegetables, flowers, plantation crops, Spices, condiments, Medicinal and Aromatic crops etc. In addition to these, Horticulture also deals with growing of perennial trees for shade and landscaping. Further, horticulture also deals with the utilization of horticulture produce and improvement of horticulture crops. Hence, based upon the crops dealt and also their purpose and utilization, the branch of horticulture is sub-divided into the following for convenience:

Table 1.1: Main branches of horticulture

Branches	Description
Olericulture	It deals with production and marketing of vegetables
Pomology	It deals with production and marketing of fruits
Floriculture	It deals with production and marketing of floral crops
Arboriculture	It deals with the raising of perennial trees meant for shade, avenue or ornamental purposes
Turf Management	It deals with production and maintenance of turf grass for sports, leisure use or amenity use
Landscape Horticulture	It includes production, marketing and maintenance of landscape plants
Post-Harvest Physiology	It deals with post harvest handling, storage, marketing, processing and preservation of Horticultural crops

Marketing: To increase production, output must be marketed at a rewarding price on the part of the farmers. Commercialization of farm requires development of market-orientated production then sale of subsistence surpluses and this in-turn depends on product-orientation to meet market demand and on the removal of marketing constraints. As the urban populations expand farmers have the extra responsibility of feeding not only the rural market but also the growing distant urban markets. The farmer, therefore, has to take on commercial and marketing skills. Marketing is the process that bridges the gap between the producer and the consumer. The product-market chain is a two way process

in which produces flow from the rural areas into the cities and money and market information should flow back[5]. Financial viability where prices rarely regulated in horticultural farming depends much upon business and marketing skills of the farmer's and technical expertise.

Marketing implies a series of activities involved in moving the product from the point of production to the point of consumption involving time, place, form and ownership utility. Marketing has been defined as, "the performance of all business activities involved in the flow of goods and services from the point of initial agricultural production until they are in the hands of the ultimate consumers"[6]. **American Marketing Association** (AMA) defined, "marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large"[7].

Marketing is a critical business function for attracting customers. From a societal point of view, marketing satisfies the needs and wants between a society's material requirements and its economic patterns of response through exchange processes and building long term relationships. It is the process of communicating the value of a product or service through positioning to customers. Marketing can be looked at as an organizational function and a set of processes for creating, delivering and communicating value to customers, and managing customer relationships in ways that also benefit the organization and its shareholders[8].

Marketing can be defined as: "*Marketing involves finding out what your customers want and supplying it to them at a profit*"[9]. This definition emphasizes two

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[5] Horticultural Marketing–A resource and training manual for extension officers (2013). Retrieved on 2nd September 2013 from http://www.fao.org/docrep/s8270e/s8270e01.htm.

[6] Kohls, Richard L. (1967). *Marketing of Agricultural Products*, p.1. London: MacMillan Company.

[7] Definition of Marketing (2013). Retrieved on 2nd September 2014 from http://www.marketingpower.com/AboutAMA/Pages/DefinitionofMarketing.aspx.

[8] Wikipedia (2013). *Marketing*. Retrieved on 2nd September 2013 from http://en.wikipedia.org/wiki/Marketing

[9] Dixie, Grahame (2005). *Horticultural Marketing, market extension guide*, p.2. Rome: FAO.

important points. *First*, the whole marketing process has to be customer oriented and the producers must supply customers with what they want. *Second*, marketing is a commercial process and has to provide all the participants with a profit sustainable business. It involves identifying buyers; understanding what they want in terms of products and how they want to be supplied; operating a production-marketing chain that delivers the right products at the right time making enough profit to continue to sustain, and the other definition is "*The series of services involved in moving a product from the point of production to the point of consumption*"[10] and this definition emphasizes that marketing is a series of inter-connected activities from production till consumption.

Marketing system is dynamic and involves continuous change and improvement. Consumers are interested in getting what they want at the lowest possible price while producers are interested in getting highest possible price from the sale of their products[11]. The market intermediaries involved in various marketing process are also governed with profit motives. The suppliers who survive and prosper are the ones with lower cost, more efficient and can deliver quality products while those suppliers with high cost and poor quality cannot adapt to market changes are often pull out of business[12].

One of the most important factors in determining the success of any fruit and vegetable farming enterprise is marketing. "*Marketing of the produce is very important as far as horticultural produce is concerned*," said **Chadha**[13]. Marketing includes all the operations and decisions made by producers. These decisions range from determining the most marketable crops for production to best deliver quality produce to the consumers at a profit. However, contrary to popular belief, marketing does not begin after a crop is produced. Instead, marketing alternatives need to be considered even before production

[10] Dixie, Grahame (2005). Ibid., p.3

[11] Prasad, J. (1989). *Marketable surplus and market performance* (1st Edition), p. 28. New Delhi: Mittal Publication.

[12] Dixie, Grahame (2005), Ibid., p.3

[13] K.L.Chadha, former Deputy Director General (Horticulture), Indian Council of Agricultural Research (ICAR) and President of Horticultural Society of India during his visit to Punjab Agricultural University (PAU), June, 2012, Retrieved on 13th October 2014 from http://timesofindia.indiatimes.com/city/ludhiana/Horticulture-holds-a-great-importance-in-agriculture-says-President-of-Horticulture-Society-of-India/articleshow/14796919.ems

takes place[14]. Fruit and vegetable growers have numerous alternatives for marketing fresh produce. Understanding each alternative make them more advantageous for different types of producers. Quantity to be grown, location of the grower, time for marketing and qualities of the produce are few important factors to consider when choosing a market or combination of markets to use. Fruit and vegetable marketing alternatives are classified as direct or non-direct markets. Direct markets involve producer interaction with consumers on a one-on-one basis. This include pick-your-own operations[15], roadside stands, community supported agriculture and farmers markets. Non-direct markets involve producer interaction with market intermediaries. The non-direct markets include terminal market firms, shipping point firms, processors, cooperatives, brokers, and retailers.

Efficient marketing infrastructure such as wholesale, retail, assembly markets and storage facilities are essential for cost-effective marketing, to minimize post-harvest losses and to reduce health risks. Markets play an important role in rural development, income generation, food security, market linkages and gender issues. Planners need to be aware of how to design markets that meet a community's social and economic needs and how to choose a suitable site for a new market. In many cases sites are chosen that are inappropriate and result in under-use or even no use of the infrastructure constructed. It is also not sufficient just to build a market: attention needs to be paid to how that market will be managed, operated and maintained[16]. In most cases, where market improvements were only aimed at infrastructure upgrading and did not guarantee maintenance and management, most failed within a few years[17]. In modern marketing, the horticultural produce has to undergo a series of transfers or exchanges from one hand to another before

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[14]Hall, Charles R. & Palma, Marco, A. (2014). *Vegetable Resources*, Chapter II: Marketing. Retrieved on 2nd September 2013 from http://aggie-horticulture.tamu.edu/vegetable/guides/texas-vegetable-growers-handbook/chapter-ii-marketing/

[15] Pick-your-own operations (PYO) are a type of direct marketing outlet where consumers come to the farm and harvest fruits and vegetables themselves. It is often preferred by consumers who like to select fresher, higher quality produce at lower prices.

[16] White, John Tracey (2003). *Planning and Designing Rural Markets*. Rome: FAO.

[17] Marocchino, Cecilia (2009). *A guide to upgrading rural agricultural retail markets*. Rome: FAO.

it finally reaches the consumer. This is achieved through three[18] important marketing functions namely:

- **Assembling (concentration)** –The operation concerned with the assembly and transport of produce from the field to a common assembling area or the market.

- **Preparation for consumption (processing)** – The produce may be sold, as obtained from the field, or may be cleaned, graded, processed and packed either by the farmer or village merchant before it is taken to the market. Some of the processing is necessary for the conservation of quality.

- **Distribution (dispersion)** – It involves the operations of whole selling and retailing at various points. By a series of indispensable adjustments and equalizing functions, it is the task of distribution system to match the available supplies with the existing demand.

1.3 MARKETABLE SURPLUS AND MARKETED SURPLUS

The marketable surplus plays a significant role since it determines the pace of economic development; therefore, an increase in production must be followed by increase in marketable surplus for economic development of the country. Unlike subsistence crops, horticulture crops are mostly marketable and home consumption of fruits and vegetable in comparison to total production is negligible because of its perishable nature. Often the term 'marketable surplus' is confused with 'marketed surplus', but the distinction has been admitted between the two. "Marketed surplus is the quantity that is actually made available to the non-farm sectors of the economy after meeting farms requirement for family consumption, needs for seeds and feeds, payment in kind or gift to labours, artisans, carpenters, blacksmith, mechanics, landlords and other social and religious payments". Whereas, marketed surplus is "the quantity that is actually made

[18] Agricultural marketing (2011). Retrieved on 20th October 2011 from http://www.indiaagronet.com/indiaagronet/Agri_Marketing/AgriMark.htm.

available for sell in the market by the producers/farmers irrespective of his requirements for family consumption, farm needs and feeds, and all other payments in kind".

The relationship between marketed surplus and marketable surplus may be more, less or even equal depending upon the condition of farmer and types of crops they grow. Firstly, marketed surplus is more than marketable surplus when the farmers retain only a small quantity produce than his actual requirement for family, feeds and payment. This is a case of distress or forced sale. Under this condition, small or subsistence farmers buy from the market in the later part for farm consumption. The situation is more worst again when the price is low as low price means large quantity will be sold to meet his cash needs. Secondly, marketed surplus is less than marketable surplus when the producers retain part of surplus to get higher price in the later period because of its better retention capacity or this holds true if the producers substitute one crop for another either for family consumption or feeds. Thirdly, marketed surplus is equal to marketable surplus when the producers retain either less or more to his requirements. This case holds admittedly mostly for perishable commodities.

1.4 STATUS OF HORTICULTURE IN NAGALAND

India is bestowed with a varied agro-climatic which is highly favorable conditions for growing a large number of horticultural crops such as fruits, vegetables, aromatic and medicinal plants and spices. The total area under horticultural crops in all India is 23.7 million ha, of which it produced 268.8 million MT during the year 2013 (see Annexure I). Out of 488, 522 ha of total cropped area; approximately 54.66 percent of the land is under agriculture and about 7.14 percent of the area under commercial crops. The total area covered by the horticulture crops has been estimated at 83,552 ha, which is about 17.10 percent of the total cropped area. Similarly, the agro-climatic condition in State of Nagaland is excellent for growing all types of fruits, vegetables, flowers, spices; aromatic and medicinal plants, plantation crops, etc., ranging from temperate to tropical crops under rain fed conditions. The fruits grown in the state range from tropical and sub-tropical fruits like citrus, pineapple, banana and mango to temperate fruits like apple, pear

and strawberry. The state has rich diversity of different vegetable crops and the major vegetables grown in the State are sweet potato, cabbage, tomato, colocassia and other leafy vegetables. Among the flowering plants anthurium, roses, lillium, alstromeria, heliconia, and zantedeschia are introduced in the State. Ginger, chilli, garlic and onion are major species grown in the State while coffee, cashewnut and Arecanut are major plantation crops. However, no systematic and accurate data available on area and production of different horticulture crops in Nagaland, and the estimates made by various source also vary.

1.4.1 Area, Production and Productivity of Major Horticulture Crops

There has been a significant increase in area and production of horticultural crops in Nagaland, NER and All India during the last two decades and two years (Table 1.2). It is observed from the table that area, production and productivity of fruits in Nagaland increased during the period of 1991-92 to 2012-13 by 6.34%; 11.21%; and 4.52% respectively. The Compound Growth Rate (CGR) for fruits in the State is revealed to be higher than NER and All India CGR. Similarly, in case of vegetables, the area increased by 3.67 percent, production increased by 3.6 percent while productivity declined by 0.06 percent annually during the period.

Although area and production of vegetables in Nagaland increased during the period, the growth rate in yield was showing a negative trend; this may be due to adoption of traditional low yielding varieties, lack of technology and out dated tools and implements resulting in low productivity. During the period, the increase in productivity was recorded to be eminent in All India comparing to Nagaland and NER. Likewise, during the last three years area and production of spices in Nagaland increased by 9.42 percent and 0.66 percent while yield showed a negative growth by 8.34 percent during the period (Table 1.3). The trend of area, production and productivity of major horticulture crops in Nagaland shows, the CGR of area and production was highest against fruits followed by vegetables. Figure 1.1 and Fig. 1.2 below depicts area and production of

fruits and vegetables in Nagaland from 1991-92 to 2012-13 respectively, and Fig. 1.3 depicts the area and production of spices in Nagaland from 2010-11 to 2012-13.

Table 1.2: Area, Production & Productivity of Fruits and Vegetables in Nagaland, NER and All India from 1991-92 to 2012-13

(Area - '000 ha, Production - '000 MT, Productivity - 'MT/ha)

Crop		1991-92	2001-02	2010-11	2011-12	2012-13	CGR (%)
Nagaland							
Fruits	A	5.2	25.0	18.2	33.7	37.2	6.34
	P	9.2	302.0	151.3	347.7	276.0	11.21
	Y	1.8	12.1	8.3	10.3	7.4	4.52
Vegetables	A	8.2	26.3	10.7	33.0	26.0	3.67
	P	66.9	286.0	79.4	222.6	207.7	3.60
	Y	8.2	10.9	7.4	6.7	8.0	-0.06
North-East Region							
Fruits	A	203.6	287.1	411.9	455.0	484.4	2.75
	P	1576.7	2608.7	3432.1	4157.3	4434.1	3.28
	Y	7.7	9.1	8.3	9.1	9.2	0.55
Vegetables	A	329.3	383.1	416.4	462.2	478.4	1.17
	P	2933.3	4094.4	4405.2	4838.4	5406.9	1.92
	Y	8.9	10.7	10.6	10.5	11.3	0.75
All India							
Fruits	A	2874.5	4010.2	6383.0	6704.2	6982.0	2.81
	P	28632.0	43000.9	74877.6	76424.2	81285.4	3.32
	Y	10.0	10.7	11.7	11.4	11.6	0.46
Vegetables	A	5136.7	5016.7	8494.6	8989.6	9205.2	1.84
	P	53852.0	70546.7	146554.5	156325.5	162186.6	3.50
	Y	10.5	14.1	17.3	17.4	17.6	1.63

Source : Indian Horticulture Database, 2013

Note : A – Area, P – Production, Y – Yield, CGR – Compound Growth Rate

Table 1.3: Area, Production & Productivity of Spices in Nagaland, NER and All India from 2010-11 to 2012-13

(Area - '000 ha, Production - '000 MT, Productivity - 'MT/ha)

State/NER/All India		2010-11	2011-12	2012-13	CGR(%)
Nagaland	Area	7.5	9.8	9.8	9.42
	Production	38.5	39.2	39.2	0.66
	Yield	5.2	4.0	4.0	-8.34
NER	Area	185.7	190.9	198.9	2.28
	Production	598.7	648.7	627.6	1.64
	Yield	3.2	3.4	3.2	-
All India	Area	2940.4	3212.5	3075.9	1.64
	Production	5350.5	5951.5	5743.5	2.28
	Yield	1.8	1.9	1.9	1.96

Source : Indian Horticulture Database, 2013

Figure 1.1: Area and production of Fruits in Nagaland, 1991-92 to 2012-13

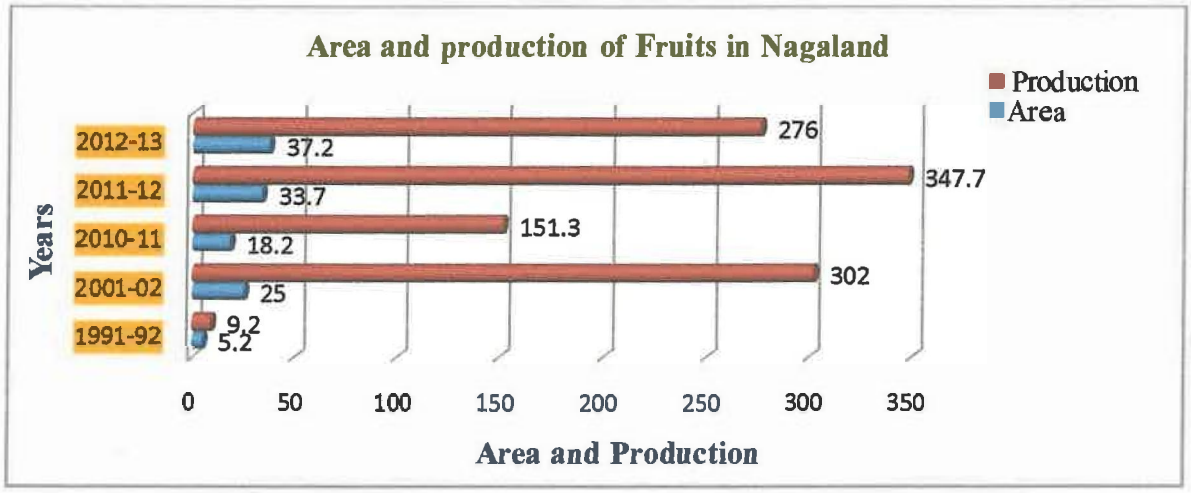


Figure 1.2: Area and production of Vegetables in Nagaland, 1991-92 to 2012-13

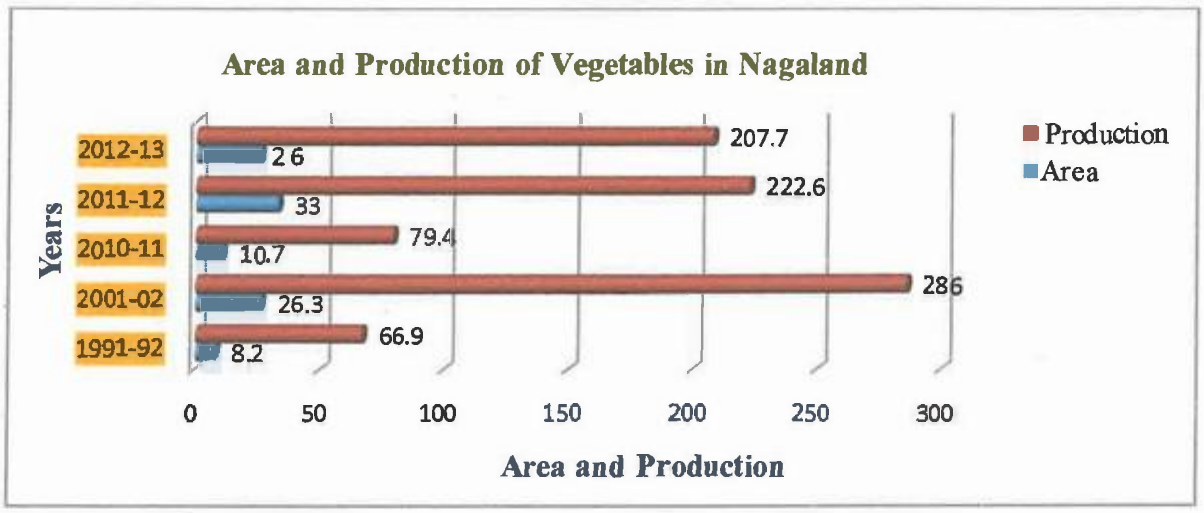
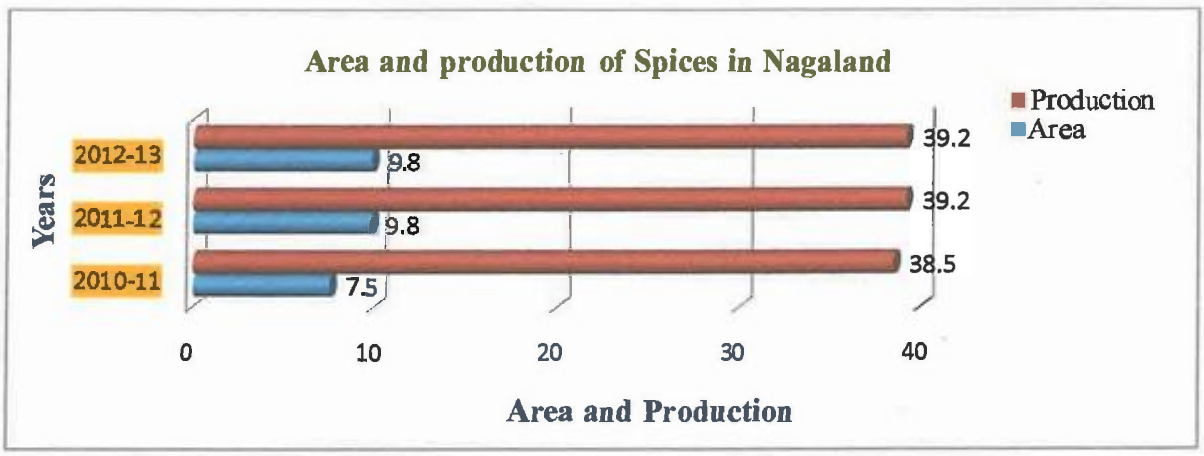


Figure 1.3: Area and production of Spices in Nagaland, 2010-11 to 2012-13



1.5 STATEMENT OF THE PROBLEM

Nagaland produces a large number of fruits, vegetables and spices having high commercial values. However, it has been observed that the production ventures these crops are taken up without having an organized marketing and targeting local markets only. The general inadequacies of the marketing system are: lack of storage facilities, poor capacity to withhold the stock from the market, inadequate transport facilities, improper warehousing; lack of grading and standardizing, presence of a large number of middlemen, lack of rest house in markets, inadequate market information, inadequate credit facilities, and inferior quality of the product. Extension officers working with ministries of agriculture or NGOs are often well-trained in horticultural production techniques but usually lack knowledge of marketing or post-harvest handling.[19]

The Horticulture crops being highly perishable in nature, seasonality and bulkiness, the farmers in Nagaland do not possess suitable marketing means and this feel that they run too high a risk of not being able to sell their produce at fair price. Lack of technical know-how and extension services, inadequacy in modern implements and financial facilities are major production constraints faced by the producers. It is important to secure a reliable market, a suitable price, and a system by way of which the farmer can market his surplus produce and at the same time receive the highest possible share of the price paid by the customer for that produce. The primary condition is the general infrastructure, which includes insufficient means of post-harvest management, poor transportation and communication facilities, bad roads; insufficient storage space and faulty facilities give rise to losses. The farmer in Nagaland has weak bargaining power, discouraging price and pricing policy, lack of marketing information, absence of agreed standards, lack of sufficient extension personnel and infrastructure from the marketing side of horticultural crops in the State as well as selected Districts. This, therefore, demands a holistic study of the system in the form of market efficiency and market chain analysis.

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[19] Dixie, Graham (2007). *Horticultural Marketing, Market Extension Guide 5*. Rome: FAO. Retrieved on 7th June 2010 from http://en.wikipedia.org/wiki/Agricultural_marketing#cite_note.6#cite_note.6

A number of factors related to technological, institutional, organizational and social factors influence marketed surplus and market efficiency. So information on factors that affect market efficiency of fruit, vegetable and spice is essential for the design of any strategy or policy that has an objective of intervention. Identification, characterization and evaluation of marketed surplus and market efficiency help to remove barriers affecting performance and to strengthen strong sides. Although horticultural crops are economically important commodities in the State, there was no study made on fruits and vegetables marketing to identify the key constraints and potentials on the system in the Districts as well as State. There is no adequate information on the supply and demand of fruits and vegetables and other market related. It is, for these specific reasons that the study was designed to be under taken in selected Districts in Nagaland.

1.6 RESEARCH QUESTIONS

From the above background the present study has taken up the below questions that need to be answered mainly related to the perishable commodities movement pattern through several intermediate players and their profiteering pattern. The important policy research questions to be answered are:

1. What is producers share in consumer's rupee?
2. How do producers sale their surplus into the market and what are its cost involved?
3. What is the marketing cost and marketing margins of market intermediaries?
4. What is the price spread under various channels?
5. Which marketing channel is more efficiency and for which crop?
6. What are the main constraints perceived by producers, wholesalers and retailers?
7. What are the possibilities for increasing the marketing efficiency of the selected commodities?

1.7 OBJECTIVES OF THE STUDY

The overall objective of the study was to assess marketed surplus and market efficiency of horticultural crops in selected Districts. The specific objectives of the study include:

1. To estimate the marketable and marketed surplus of selected horticulture crops and the factors affecting them with the help of micro-level data.
2. To identify the types of marketing channel practice by the farmers in disposing their produce and to determine the dominant channel for marketing of each selected crops in both the Districts.
3. To estimate the marketing cost and marketing margin of selected horticulture crops in various marketing channel.
4. To analyze the producers share in consumer's rupee, price spread and marketing efficiency in various marketing channel.
5. To identify the marketing constraints perceived by various stakeholders and suggest suitable strategies and measures to enhance the marketing efficiency of horticulture crops in the study area.

1.8 HYPOTHESIS

1. There is direct relationship between marketed surplus and the production as well as the size of land-holding.
2. Marketable and Marketed Surplus of horticultural commodities differ in different crops based on its nature of commodity.
3. Producers' share in consumer's rupee decline by increasing intermediary in marketing channels.
4. Marketing efficiency is high when producers sell directly to consumer by possess low marketing cost and own high market margin.

1.9 METHODOLOGY

1.9.1 Data and Data sources

The data has been collected from two different sources: primary and secondary. The secondary data have been obtained from Statistical Handbooks of Nagaland, 2001 to 2011; Indian Horticulture Data base, 2008 to 2013; Indian Census, GoI, 2011; Primary Census Abstract, Nagaland, 2011; Annual administrative report, Department of Horticulture, Nagaland; Success story of citrus Industry in Nagaland, Central Institute of Horticulture (CIH) and other available relevant published and unpublished sources were also collected for the present study. For the primary data, a pre-tested comprehensive schedule (questionnaire) was designed especially for the purpose and canvassed in the study area. The variables covered are area, production, consumption, others use (as gift to friends, relatives and religious payments), post-harvest losses and marketed surplus of each selected crops were collected. Price/kg sold and market expenses incurred by different agencies on marketing of produce from the producer till the final consumer at each successive channel were collected in the present study. Data related to constraints perceived by the farmers, retailers and wholesalers were gathered to analyze the factors limiting marketing of the selected crops.

1.9.2 Study Area

Present study has taken as comparative study in two different Districts and three different crops which includes vegetables, fruits, and species. Mokokchung and Wokha Districts were selected for study in Nagaland and cabbage, orange and chilly crops are selected. From each District three villages were selected according to crop wise; Longkhum (cabbage), Longsa (chilli) and Yajang (orange) village from Mokokchung District while Soku (cabbage), Akuk (chilli) and N. Longidang (orange) village from Wokha District. The Districts and Villages were purposively selected for the present study based on significant area, production and marketing activities taking place.

1.9.3. Sample Size

A sample of 50 respondents each from all the selected crops were collected and included for the present study. The total sample size of famers is 300 (150 from each District). Besides this, information was also collected from 10 wholesalers and 20 retailers for each crop from both the Districts. The details of data collected from the District, Sub-District and Village are presented in Table 1.4 along with crop wise details of market intermediaries (Table 1.5).

Table 1.4: Crop-wise details of respondents sample design

Crop	District	Sub-District	Village	Sample size
Cabbage	Mokokchung	Ongpangkong	Longkhum	50
	Wokha	Baghty	Soku	50
Chilli	Mokokchung	Ongpangkong	Longsa	50
	Wokha	Aitepyong	Akuk	50
Orange	Mokokchung	Longchem	Yachang	50
	Wokha	WokhaSadar	N. Longidang	50

Source: Field Survey, 2012-13

Table 1.5: Crop-wise details of market intermediaries sample design

Crops	Wholesalers	Retailers
Cabbage	10	20
Chilli	10	20
Orange	10	20

Source: Field Survey, 2012-13

1.9.4 Sampling Procedure

Multistage stratified random sampling technique was adopted for selection of Districts, sub-district, villages and respondents. A sample of 50 respondents was randomly selected from each village collecting a total of 150 from each District. The respondents were then classified into marginal (<1 ha), small (1-2 ha) and semi-medium

(2-4 ha) on the basis of their land holding to bring out the differences between them. For cabbage and chilli, the respondents in both the Districts were categorized to only marginal farmers as the area under crop is observed to be below 1 hectare. However, for orange, three category of farm size is noted in Mokokchung District and two category of farm size is noted in Wokha District according to their land holding.

The data were collected from the selected crops growers on actual post harvest marketed surplus on weight at the orchard. The data relating to area, total output, self consumption, gift to friends and relatives, religious payment, post-harvest losses, actual marketed surplus and selling price and all information relating to marketing of surplus of the producers were collected through personal interview with the help of pre-tested survey schedule. Information relating to marketing cost (fees, transport, packing, labour and other miscellaneous cost), marketing losses (spoilage and wastage due to mishandling and lack of storage) and sold price at wholesalers and retailers marketing levels were also collected through personal interview, mail, phone and internet with pre-tested questionnaire.

1.9.5 Period of Study

The collection of primary data pertains to the crop year 2012-13.

1.9.6 Tools and Techniques

The following analytical tools and techniques were applied to achieve the desired objectives:

(a) Marketable surplus

Marketable surplus of all selected crops is estimated as follows:

$$MS = P - C$$

Where,

MS–Marketable surplus

P – Total production

C – Total requirement (Self consumption, gift and payment in kinds)

(b) Marketed surplus

The marketed surplus is estimated as:

Md.S = MS–Post-harvest losses (at farm)

Where,

Md.S – Marketed surplus

MS – Marketable surplus

(c) Markcting Cost

The total cost incurred on marketing of selected crops by various intermediaries involved in moving the commodity from the producer till it reaches the final consumer is estimated as follows:

$$C = C_p + C_{mi} + \cdots + C_{mn}$$

Where,

C – Total marketing cost (Rs/q)

C_p – Marketing cost borne by the producer (Rs/q)

C_{mi} – marketing cost of ith middlemen (Rs/q)

(d) Marketing margin

Marketing margin includes cost of marketing of various intermediaries and profit earned by different marketing intermediaries involved in moving the product from the point of production till it reaches the ultimate consumer. The margins of market intermediaries include profits and return which accrue to them for storage, handling, labour, interest on capital and losses during transit. Following alternative measures[20] were used for calculating marketing margin:

a. Absolute method (A_{mi})

$$A_{mi} = P_{si} - (P_{pi} + C_i)$$

b. Percentage method (P_{mi})

$$P_{mi} = \frac{P_{si} - (P_{pi} + C_i)}{P_{si}} \times 100$$

Where,

P_{si} – sale price (value of receipts per unit in total)
P_{pi} –purchase price (value of goods purchased per unit)
C_i – marketing cost per unit.

(e) Producers' share

Producer's share is expressed as percentage of price received by the producer to retail price. The producers' share in consumer's rupee is calculated as follows:

$$PS = (PR \div PC) \times 100$$

[20] Acharya, S.S. and N.L. Agarwal (2010). *Agricultural marketing in India* (4th Edition), p. 401. New Delhi: Oxford & IBH Publishing Company Pvt. Ltd.

Where,

PS–Producers' share in consumer rupee (Rs/q)

PR – Price received by producer (Rs/q)

PC – Price paid by consumer (Rs/q)

(f) Price spread

It is the difference between the two prices, i.e., the price paid by the final consumer and the price received by the ultimate producer. It is calculated as follows:

$$PS = PC - PR$$

Where,

PS–Price spread (Rs/q)

PC – Price paid by final consumer (Rs/q)

PR – Price received by ultimate producer (Rs/q)

(g) Producers' Net price

The net price realized by the famers is estimated as the difference in gross price received and the sum of marketing cost incurred including post-harvest loss at different stages of handling the produce. The marketing loss of the produce is calculated as gross price received by the farmers, wholesalers and retailers as it would have been realized as return if there were no losses. The producers' net price is expressed mathematically as follows:

$$NP_P = GP_P - \{C_P + (ML_P \times GP_P)\}$$

Or

$$NP_P = \{GP_P\} - \{C_P\} - \{ML_P \times GP_P\}$$

Where,

NP_P – Net price received by the producers (Rs/q)

GP_P – Gross price received by producers (Rs/q)

C_P – Marketing cost incurred by the producers (Rs/q)

ML_P – Marketing Losses (Rs/q)

(h) Marketing Efficiency

Marketing efficiency is essentially the degree of market performance. Efficient marketing system ensures increased in farm production increasing the level of real income and consumer's satisfaction with low possible cost. The following methods were applied to determine marketing efficiency:

1. **Conventional Method:** According to this method, marketing efficiency is determined by the ratio of value added to total marketing cost.

$$CM = \frac{\text{Value added}}{\text{Total marketing cost}}$$

Where,

CM – Conventional method

Value added– (consumer price– Net price received by producer)

2. **Shepherd's Method (1965):** The ratio of price paid by the consumer's to total marketing cost may be used as a measure of marketing efficiency.

$$ME = \frac{V}{I} - 1$$

Where,

ME – Marketing efficiency Index

V – Price paid by consumer

I – Total marketing cost

3. **Acharya-Agarwal Modified Method (2001):** According to Acharya-Agarwal, marketing measures should include total marketing cost, Net marketing margins, price received by farmer and price paid by the consumers.

$$ME = \frac{NP_P}{MC + MM}$$

Where,

ME – Marketing efficiency

NP_P – Net price received by the producers (Rs/q)

MC – Marketing cost

MM – Marketing margin

(i) Multiple Regressions

In view of analyzing various factors influencing the marketed surplus of producers, Multiple Linear Regression Model (MLRM) has been employed. The Multiple Line Regression is specified as below:

$$Y_t = \sum_{i=0}^{n} \beta_1 x_{it} + \mu_t$$

Where,

Y_t – Marketed surplus

β_i – Coefficient

x_i – Determinants

μ_t – Error term

1.10 LIMITATION OF THE STUDY

The present study is first of its kind relating to Nagaland though some pioneering studies in India was made by Dharam Naraian in 1950's in India based on NSS data, however, relevant literatures pertaining to Nagaland could not be availed which put limitation on the present study. The data relating to production, consumption, other use and marketed surplus were collected on the recall memory of the farmers with proper care through personal discussion, advice, suggestions and coming to best conclusion applying simple mathematics with the help of the respondents and thereby minimize the biasness of over-estimation or under-estimation of the respondents. In the absence of the head of the family during interview, other responsible members of the households are questioned for extracting requisite information. Due to time and financial constraints, the study is further limited to only two Districts of Nagaland: Mokokchung and Wokha; selecting three villages from each District and three crops. Though the study is limited in its way shall provide opportunity for the growers and policy makers as income and employment generation are growing at large scale in horticultural sector.

1.11 ORGANIZATION OF THE STUDY

The present study, "Marketable and Marketed surplus of Horticulture crops in Nagaland: A comparative study of Mokokchung and Wokha Districts" has been presented in seven chapters.

Chapter One: Chapter one discusses the concept, definition, status of horticulture, statement of problem, research questions, objectives, hypothesis, data and methodology, limitations and chapterisation of the study

Chapter Two: Chapter two presents a detailed review of existing literatures relating to the study on marketable and marketed surplus, marketing cost, marketing margin, price spread and marketing efficiency.

Chapter Three: Chapter three covers the profile of the study area and is classified into three sections: section I highlights the State profile - geography, history, culture, Administration, demography and economy; section II highlights the District profile of the selected Districts - geography, demography and agriculture; and section III highlights the village profile and profile of the respondents.

Chapter Four: Chapter four presents a description on area, production and productivity of all the selected crops; and the estimated marketable surplus and marketed surplus after retaining home consumption and other use are included in this chapter of the thesis. The chapter further includes the factors determining marketed surplus of all selected crops was analyzed.

Chapter Five: Chapter five is classified into three sections. Section I covers the types of marketing channel practice for each respective crop in both the District and the disposal pattern of selected crops in both the District; section II covers the marketing cost, marketing margin and price spread in moving the commodity from producer till it reaches the final consumer; section III covers the marketing efficiency index of selected crops with the application of Conventional, Shepherd's and Acharya-Agarwal modified method.

Chapter Six: Chapter six covers the selling behaviour of famers and the major constraints perceived by the farmers in production, financing and marketing of the selected crops, and the problems faced by the market intermediaries are also covered in this chapter.

Chapter Seven: The last chapter covers the summary and conclusion of the findings with the policy implications of the subject matter.

Reference Style: The APA style 5th Edition is used for the purpose of reference in this thesis. In it, a citation in the text consists of author name(s) and publication date within parenthesis and the corresponding entry in the alphabetically arranged list of reference cited (Gurumani, 2010, p.134). Accordingly, the references are arranged alphabetically at the end of the thesis.

CHAPTER II

LITERATURE REVIEW

CHAPTER II

LITERATURE REVIEW

Introduction

This chapter is devoted to review of selected important studies in the relevant context, and broadly divided into four sections. Section one incorporates the literature review related to studies on marketable and marketed surplus of agricultural commodities; Section two contains the study related to marketable and marketed surplus of horticultural commodities along with marketing cost, marketing margin, producer's share, price spread and marketing efficiency etc.; Section three review the study on constraints encountered by the producers in marketing and strategies for promoting marketing efficiency; and Section four contains review on some dissertations carried on the relevant study.

2.1 Studies Relating to Marketable and Marketed Surplus of Agricultural Commodities

In this section, an attempt has been made to examine on marketable and marketed surplus of agriculture commodities with relevance to current study is incorporated.

Sharma (1969)[21] investigates the relation between consumption and marketable surplus in subsistence crops of a deficit village Salempur Kalan in Bharatpur district in Rajasthan. A census survey of 235 families conducted in 1967 was used in his study. The selected crops were wheat, barley, gram and bajra. The economy of the village is grain deficit. 158 families (67.23%) of 235 families were found to be deficit families while the grain surplus was only 77 families (32.77%). The average adult standard unit daily grain

[21] Sharma, P.P. (1969, February). Marketable surplus in subsistence crops: Case study of a deficit village in Rajasthan. *Economic and Political Weekly*, 4(5), 297-300.

consumption was found to be 32 ounces; minimum of 8 oz and maximum of72 oz. In his study daily consumption of 49 families (21%) was above the average on account of abnormal social ceremonial consumption during the year. Using estimated Log Linear consumption function per capita consumption of all grains to per capita gross income, gross income elasticity of demand for grains was found to be 0.7. Per capita income elasticity for wheat, barley and gram were 0.29, 0.18 and 0.09 respectively. Barley turns out to be inferior grain (-0.17). Proportionate grain consumption as a function of gross income coefficient are found to significant and positive except a negative coefficient was shown in barley (-0.007). Coefficient correlation incase of wheat was found to be three times more than barley and gram. It means that, wheat is the most prized grain consumed in the study area. In his study 8.75 maunds is the critical minimum subsistence output per head per year below which there is no surplus. To this 158 families have an output less than this critical minimum. Elasticity of marketable surplus below the critical minimum turns out to be 0.47 which implies that a unit increase in grain output will decrease the deficit by 0.47 percent. That is, "so long as a village remains a deficit village we speak not of an increase in the marketable surplus but of a decrease in the consumption deficit as output increases". It further suggested that if the abnormal social consumption is reduced, these families could supply 127 maunds of grains as marketable surplus. Sharma concludes for deficit region estimation of marketable surplus on the basis of cross-section data cannot give concrete answer rather it should be estimated with time series data.

Bardhan (1970)[22] in her study on price and output response of marketed surplus of food grains based on NSS data collected from 27 villages in Northwest India of Punjab and Uttar Pradesh using some village level cross sectional data found out that short run price elasticity of marketed surplus of food grains in Northwest India to be negative. Bardhan analyzed the percentage of foodgrains marketed to production, price of foodgrains and other factors using least square method. Her results showed two aspects: one is that, regression coefficient shows output elasticity of marketed surplus on

[22] Bardhan, Kalpana (1970, February). Price and Output response of marketable surplus of foodgrains: A cross-sectional study of some North Indian Villages. *American Journal of Agricultural Economics*, 52(1), 51-61.

production to be positive and significant. On the other, price response to marketed surplus as a proportion of production was negative (-.6). This negative response marketed surplus to price is due to the effect of changes in cultivators' income from other crops rather than food grain. In case of richer sub-samples, the estimated output elasticity of marketed surplus was 1.7. Cross section price elasticity of marketed surplus though negative was smaller in magnitude for richer sub-sample than general sample.

Haessel **(1975)**[23] investigates price and income responsiveness of foodgrains to consumption and marketing using Bardhan's data. He argues with her ordinary least square method applied and says the procedure is true if only price is exogenous but price and output cannot always be exogenous. Again if each is self-sufficient in foodgrains, the price will be endogenous as it will be affected by quantity produced and marketed. Ordinary least square method will therefore not yield consistent result. The objective of his study was to estimate farmers' price elasticity for foodgrains, farmers' income elasticity for foodgrains, pure price elasticity of marketing, pure income elasticity of marketing, gross elasticity of marketing, and inverse price elasticity. In Haessel's model, marketed surplus was treated as a residual after home consumption decision based on price of foodgrains and farmers' income. The short run price elasticity of marketed surplus was 2.7 in every case for the entire sample to more than 3 for the large which directly contradicts Bardhan's estimate (negative in her case). This implies that larger farmers are relatively more price and income responsive than smaller farmers. Gross elasticity of marketing with respect to production was fond to be 1.97 and 1.75 for both samples which was little higher than Bardhan's estimates of 1.78 and 1.60. They suggest that as output increase, the farmers will retain a smaller share for consumption purposes while make large share of output available for off-farm consumption. Haessel concluded that farmers are price and income responsive as consumers and higher price will result in larger quantities marketed.

[23] Haessel, Walter (1975). The Price and income Elasticities of home consumption and marketed surplus of foodgrains. *American Journal of Economics*, 57(1), 111-115.

Toquero et al (1975)[24] attempt to analyze difficulty in the empirical estimation of the price response between marketable surplus and home consumption and fill this gap using sample survey data of rice farmer for three consecutive years (1972, 1973 and 1974) in two regions in Philippines (Central and Southern Luzon).

The relationship between marketable surplus and home consumption was derived as:

$$\beta = \beta_p + \beta_Q \gamma$$

$$= -\frac{M}{C}\alpha_P + \left(\frac{Q}{C} - \frac{M}{C}\alpha_Q\right)\gamma$$

Where β and β_p are total and partial price elasticity of demand for home consumption, β_Q - elasticity of demand for home consumption to output, α_P - partial price elasticity of marketable surplus to output, α_Q - partial elasticity of marketed surplus to output, γ - price elasticity of output.

The regression estimation strongly support the hypothesis that the marketable surplus increases more than proportionately with output when the home consumption demand for rice is near a point of saturation. The expected value of family size to consumption was negative. The partial price elasticity of marketed surplus was between 0 to +0.3 while the partial price elasticity of home consumption was in the range of 0 to -0.4. Toquero et al. (1975) analyses comes to two striking result: (1) an increase in output results in an increase in both home consumption and marketed surplus (2) that price has a negligible effect in the allocation of rice output between home consumption and marketed surplus. It further suggests development of new technology and improved infrastructure will have positive effect in the marketable surplus of subsistence crops.

[24] Toquero, Zenaida, Bart Duff, Teresa Anden-Lacsina and Yujiro Hayami (1975, November). Marketable surplus functions of a subsistence crop: Rice in Philippines. *American Journal of Agricultural Economics*, 57(4), 705-709.

Medani (1975)[25] make direct estimate on price elasticities of marketable surplus of a subsistence crop for Sudanese staple food crop, sorghum grain from a sample of 600 rain-fed farmers for the year 1966-69 by applying stratified random sampling method. The rainfall data were used to compute expected yield. The farmers are classified into six groups according to their market involvement. The first four groups come under traditional agriculture and the last two come under modern agriculture while Medani in his study refers to the first four groups (traditional agriculture) and the four stage data are pooled together. A five equation model for the marketable surplus of a subsistence crop has been defined bur reduced to two equations in terms of observable variables. Price elasticity of marketable surplus estimates with expected price was statistically significant at 5 percent level which implies price to be a significant determinant in marketing decision. Price coefficient estimated for the pooled data was .45 which implies that short run and long run price elasticities are .21 and .30 respectively. Income was found to be a significant determinant of on-farm consumption at 5 percent level while estimates with family size was an important determinant in on-farm consumption at 1 percent level. The empirical results indicate that price was significant parameter of marketing decisions while income and family size a significant parameter determining on-farm consumption. Marketable surplus of subsistence crops is positively related to price at all stages.

Hati (1976)[26] studies the relationship between marketable and marketed surplus of paddy and the size of holding on the basis of information from Hoogly District of West Bengal. 150 sample farmers were collected from 15 villages across the district on the basis of systematic ransom sampling relating to three years 1970-71, 71-72 and 1972-73. He defined marketable surplus as net of repurchase. The result shows that for holding size below 0.66 hector or less (subsistence level) are obliged to forced sale (distress sale) while the second size group (1098 hectors) have a maximum selling capacity of more than 5 percent. This means that households in the second category have a strong tendency

[25] Medani, A.I. (1975, April). Elasticity of the marketable surplus of a subsistence crop at various stages of development. *Economic Development and cultural change*, 23(3), 421-429.

[26] Hati, Asoke (1976, July). Non-linear Marketable surplus functions. *Economic and Political Weekly*, 11 (29), 1080-1084.

to increase their consumption as the farm size increases. Here the farmers appear to be just above the subsistence level and to not enter the market as commercial sellers. The size group greater than 1.98 hectors shows that as farm size increases the proportion of marketable surplus also increases which means that the commercial character belonging to this size group. The study implies that as the net receipt increases the positive value of the net sale increases more than proportionately.

Nadkarni (1980)[27] examines marketable surplus and market dependence in a millet region of Maharashtra from Ahmednagar District for the year 1969-70, 1970-71 and 1971-72 relating to three important foodgrains (jowar, bajra, and wheat). The study intends to examine both marketable and marketed surplus on hand and the net output on the other. Two concepts were used in his study: (i) gross marketed surplus, which refers to the quantity actually marketed: (ii) net marketed surplus, which is the gross marketed surplus minus repurchases of foodgrains. Two concepts of net output have been used: (i) net available output and net output of seeds. Net output is defined as output plus receipts in kind, net of seeds and payment in kind.

15 villages were selected for the study of which, only 5 villages have good access to market while 10 villages have poor connection to markets. None of the village was directly connected by rail. The total area under foodgrains was 88.9%: jowar, 56.6%; bajra, 17.9% and wheat, 8.6%. Jowar dominates both in output and consumption. The study shows that the gross marketed surplus as a proportion of net output was 30.8% for foodgrains of which 24.4% for jowar, 29.7% for bajra and 34.8% for wheat, the proportion being highest for wheat and lowest for jowar. The net marketed surplus was 21.4% for foodgrains and incase of jowar, bajra and wheat were 15.7%, 20.4% and 30.5% respectively. The marketable surplus was found out to be 37.6% for total foodgrains and for jowar, bajra and wheat it was 23.2%, 32.0% and 75.5% respectively. The difference between marketed and marketable surplus of wheat appears to be due to under-recording

[27] Nadkarni, M.V. (1980), *Marketable Surplus and Market Dependence: A study of a Millet Region of Maharastra*. New Delhi: Allied publisher.

of sale. He found that marketable surplus is negative for jowar and bajra and for total foodgrains in the smallest two size-classes of below 2 hectares and 2 -4 hectares and in the case of jowar even for the next size-classes of 4 to 6 hectares. However, in the case of wheat the marketable surplus is positive for all the size-classes. The proportion of marketable surplus increases for both jowar and bajra but no such rise was noticed in case of wheat. It was found out that even the smallest size group has 61.8% net output of wheat as marketable surplus compared to large size group (81.7%). It suggest that the small farmers are obliged to sell superior grains (in this case, wheat) for purchasing relatively inferior ones (jowar, bajra, etc.) for consumption. Regression analysis shows that for households above demarcation, with every increase of a quintal in net output, marketable surplus of total foodgrains increased by 0.92 – 0.94 quintals while in case of wheat it increases by more than 0.94 quintals. The coefficient for jowar was 0.65-0.80 and bajra was 0.30-0.75. The results shows that whatever be the crop, the marketable surplus was more than unity for households above demarcation showing that marketable surplus increases more than proportionately with output. In regard to market dependence, all size groups are seen to purchase from the market although the magnitude of purchases declines in general as holding size increases. Of the total foodgrains purchased, jowar (50.4%) dominates the repurchase followed by bajra (20.8%) and wheat (12.6%). Though the share of wheat in total purchase is lowest, however, the market dependence for consumption of wheat is highest in relation to its total consumption.

Upender (1990)[28] makes an analytical study of marketable and marketed surplus of paddy in Warangle districts of Telangana Region in Andhra Pradesh. The focus of the study is on the response of marketed surplus of paddy to output of various size-groups on the basis of cross-sectional farm data collected from the randomly selected sample of 320 farmers on one hand, and the response of market surplus of paddy to price movements on the basis of secondary time series data collected from selected markets in Warangle districts on the other. The sample design of the study was a three stage stratified random sampling technique with revenue mandal as the first stage sampling unit, village as the second stage unit and farmers as the third unit of analysis. The cross-sectional data

[28]Upender, M. (1990). *Marketable and Marketed Surplus in Agriculture*. New Delhi: Mittal Publications.

collected for the study relates to a single agricultural year 1985-86. The small cultivators were found to have the maximum obligations in contrast to other size group of cultivators. The behaviour of marketed surplus as a proportion of production keeps on increasing as holding size increases. In all size groups studies, there exists a strong linear relationship between the marketed surplus and output. Since the elasticity of marketed surplus with respect to output exceeds unity, any increase in output is likely to be followed by a more than proportionate increase in marketed surplus. The price elasticity of market arrivals of paddy were positive and greater than unity in Kesamudrem and Narsampet markets indicating that price response is higher.

A study done by **Shah (2007)**[29] during 1994-95 in Jalgaon and Kolhapur districts of Maharashtra showed two scenarios insofar as the impact of milk cooperatives on production and marketed surplus is concerned. While milk cooperative had positive and significant impact on both production and marketed surplus of milk in Kolhapur districts, such impact could not be ascertained in Jalgaon district. The study also showed lower production and marketed surplus during summer season followed by rain and winter seasons. However, the percentage marketed surplus was the highest in summer season followed by winter and rainy seasons. The higher percentage of marketed surplus in summer season was due to lower milk production, higher demand and higher prices offered by various agencies compared to other seasons. On an average, nearly three-fourths of milk produced was sold in extension and two-thirds in control area of both the selected districts. However, this proportion differed in different seasons and herd size categories. An analysis drawn from Marketed Surplus Function (MSF) also showed that total milk production in the household was the single most significant factor contributing to marketed surplus of milk. The next important variable positively affecting the marketed surplus of milk was the education level of the head of the household, particularly in control area of both the districts. Further, the negative impact of family size on the marketed surplus of milk could be ascertained only in Kolhapur district.

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[29]Shah, Deepak (2007). *Impact of Milk Cooperatives on Marketed Surplus of Milk.* Retrieved on 7th May 2010 from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1007402

Naidu (1979)[30] in his study marketing efficiency of paddy investigates that the marginal and small farmers face price discrimination compared to big farmers in Madhya Pradesh. Data were collected from a sample of 23 farmers using a selected stratified sampling method. The result showed that marginal and small farmers sold more paddy than their marketable surplus because of their need for cash. The market price received by marginal and small farmers for a quintal of paddy sold in the village was Rs. 70 whereas the big farmers received Rs. 91 per quintal at the wholesale market. The study concluded that unless marginal and small farmers increase their marketable surplus, the chance for them to receive a better price is low.

Engalo and Baskaradoss (1979)[31] pointed that small farmers have low bargaining power. They received a low percentage of the consumer's price and are forced (distress sale) to sell their output to meet their current need for money and buy substantial quantities of food grains for their consumption needs at a later period of time when the prices are higher than their original selling price. The results show that small farmers are losers both as producers and consumers because they have to finance both production and consumption from their small marketable surplus. It suggests that wholesale trade in food grains must be taken over by the government which should procure directly from farmers and then distribute through fair price shops.

Raju and Von Open (1979)[32] studied the marketing margins and price correlation as measures of marketing performance for sorghum, millet, pigeon pea, chickpea and groundnut in Waragal, Khammam and Tandur markets. Primary data for analyzing marketing margins were collected from the market intermediaries over the period 1997-98, and time series data were used to measure price correlations. The results indicate that producer's share of the consumer's price decreased as the amount of services required for

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[30] Naidu, P. (1979). Marketing Efficiency of Paddy: A Case Study in Madhya Pradesh District. *Indian Journal of Agricultural Economics*, 34 (4), 240- 255.

[31] Engalo, R. and Baskaradoss K. (1979). Price Spread and Small Farmers in Thanjavur District. *Indian Journal of Agricultural Economics*, 34(4), 195-200.

[32] Raju, V. T. and Open, Von (1979), Marketing Margins and Price Correlations as Measure of Marketing Efficiency for Important Crops in Semi Arid Tropical India. *Indian Journal of Agricultural Economics*, 34 (4), 215-218.

transformation of raw product into final consumable commodity increases. The results concluded that marketing margins were significantly different in the selected markets, and that price correlation coefficients indicated that marketing efficiency for pigeon pea and chickpea was greater than the remaining commodities. Moreover, it was revealed that the smaller number of services required for transformation of raw product into a consumable commodity and shorter the marketing chain, the higher is the marketing efficiency.

Chattopadhyay and Sen (1988)[33] in their study marketable surplus and size-classes of holdings seek to examine some quantitative results in the relationship between marketable surplus and size class of holdings. Their study is based on farm management data from the states of West Bengal, Andhra Pradesh and Tamil Nada on paddy/rice for the years 1968-69, 1970-71 and 1972-73. For comparable figures in rice terms, they used a conversion factor where 100 kg paddy is equal to 62 kg of rice. In case of West Bengal, data's on retention (seeds and other payments by farm size groups) was directly available from FMS but for other two states they pooled the data (estimated on the basis of West Bengal) due to non availability of information on retention. Three independent variables were considered in their study- average farm size of each landholding class (x_1), per capita operational holding in size-classes (x_2) and per capita land cultivated for each crops in each size class (x_3). The results for the region of (1) West Bengal showed that, marketable surplus per hectare of all other groups are positive for all norms and it increases with increase in farm size groups except for small farm size groups. It further shows that the quantity of rice sold in the market by different size-class of holding are always positive. This means there are distress sale in small farm groups. (2) Andhra Pradesh showed that, except for the smaller size group having negative marketable surplus, marketable surplus per hectare increases with the increase in farm size groups. It is seen that marketable surplus for the large farm size was negative as well. Here large farm sell their commodity not as distress but need for cash for purchasing superior commodity through selling out rice. Per capita marketable surplus in this region seems negative because of strong incidence of negative marketable surplus. (3) Tamil Nadu

[33] Chattopadhyay, Manabendu and Sen, Ipsita (1988, December). Marketable surplus and size-classes of Holdings. *Economic and Political Weekly*, 23 (52), pp.A151-A156.

showed that, marketable surplus for all the size groups were positive. Per hectare marketable surplus decreases with increase in farm size and no incidence of negative marketable surplus among size-classes was recorded in this region. In case of Tamil Nadu, there was no distress sale and the small farmers seem to be the primary source of marketable surplus of rice in the region.

The rank correlation coefficient between marketable surplus and farm size was found to be negative and non-significant for Tamil Nadu whilst it positive and significant for West Bengal and Andhra Pradesh (i.e. marketable surplus per hectare increases with increase in farm size in this two region). When it comes to per capita landholding under specific crops, per capita marketable surplus push up with increase in cropped area. Regression coefficient also shows that per capita marketable surplus of rice per hectare largely depends on per capita land cultivated under the crops. They concluded marketable surplus of each crop depends on the per capita availability of acreage under each crop and not on the net/gross cultivated area for all crops as a whole. Certainly the per capita availability of cultivated land among the large farmer is higher compared to small farmers, but per capita availability of land under a specific crop need not be higher in the larger farms than the smaller farms.

Basavaraja et el (2007)[34] in their study investigates the post-harvest losses in two major food grains (rice and wheat) in Karnataka with the objective to estimate growth pattern, post-harvest losses and the factors affecting the losses at farm level. Both time series and cross sectional data were used for the year 1982-83 to 2001-02. A sample of 100 cultivators from Shimoga District (rice) and 100 cultivators from Dharwad (wheat) and from each district 20 wholesalers, 20 processors and 20 retailers were selected in their study. Cross section data were collected through personal interview with pre-tested schedule for the agricultural year 2003-04 (June – May). The proportion of illiterate farmers was 19.67 percent in case of rice cultivators while the proportion was high in case

[34] Basavaraja H., Mahajanashetti, S.B., and Udagatti Naveen C. (2007, January-June). Economics analysis of Post-harvest losses in foodgrains in India: A case study of Karnataka. *Agricultural Economics Research Review*, 20, 117-126.

of wheat cultivators (21.67%). The result depicts post harvest losses were 5.19 K/q for rice and 4.32 Kg/q for wheat. The losses were found to be high at the farm level: rice, 73.57% and wheat, 75.93%. At market level, losses were 5.59 percent for rice and 4.63 percent for wheat in case of wholesalers. The percentage losses in case of retailers were high in both the crops which invite for better storage facilities at retail level. The regression analysis show post harvest losses were positively and significantly related to production, area under rice, irrigation, commercial crops and weather in case of rice while it was contrary in case of wheat. The post harvest losses were negatively related with age and education of the farmers in both the crops. Their study further suggested education and training of farmer on post harvest management would help reduce the losses.

Chauhan and Chhabra (2005)[35] conducted study on production, marketing cost, marketed surplus, disposal, marketing margins and price spread for maize cultivation in the Hamirpur district of Himachal Pradesh. Factors affecting marketed surplus and the problems relating to marketing of maize were also considered in the study. Multi stage stratified sampling technique has been adopted to select the sample blocks (2), villages (10), and maize growers (120) for the year 2001-02. The selected farmers were categorized into small (upto 0.48 ha holding) and large (above 0.48 ha holding) based on cultivated area under maize using square root cumulative frequency method. Designed and pre-tested schedule through personal interview were used to collect primary data relating to production, consumption and disposal pattern of maize for the agricultural year 2001-02. Both linear and Cobb-Douglas production function were fitted to examine factors affecting the marketed surplus of maize the average size of the sample operational holding was 0.93 ha and the average area under was 0.59 ha which constitute 63.44 percent of operational holding. The average production of maize per farm was as high as 10.75 quintals and varied widely from 6.36 quintals on small farms to 16.32 quintals on large farm with a ratio of 1: 2.57 which indicates that volume of maize production had a positive relationship with the farm size. However, productivity reveals inverse relationship between small (2193 kg/ha) and large (1700 kg/ha). The lower productivity

[35] Chauhan, S.K. and Chhabra, Amit (2005, January-June). Marketable Surplus and Price-spread for maize in Hamirpur Districts of Himachal Pradesh. *Agricultural Economics Research Review*, 18, 39-49.

of large farmers was due to their large land fragment compared to small farmers. Marketable surplus was 5.72 quintals (53.21%) after keeping 5.03 quintals for farm level retention. The average farm level retention for small and large farmers was 3.73 and 6.65 quintals ratio of 1: 1.78. Of the total farm level retention, percentage share of home consumption by both small (83.11%) and large (71.13%) farmers was the highest. The average marketed surplus of maize was 5.56 quintals. Marketed surplus was not equal to marketable surplus because the farmers do not sell immediately but store for better future price. Poor storage led to losses of 0.16 quintals. Month wise disposal pattern of maize shows that 21.93 percent of farmers sell 15.14 percent of their total maize immediately after harvest in the month of October due to need for cash needs. They have inadequate storage facilities. Majority of the average farmers (28.95%) sold 20.19 percent of their produce in the month of November. 25.44 percent of the total farmers who had better storage facilities sold 33.08 percent during the second quarter (January-March) when prices were high. In the study area, marketing of maize was spread over six months from October to March. No sale was recorded after March. Regression result shows that only production of maize showed positive effect on the size of marketed surplus while the family size and average price received showed an inverse relationship with marketed surplus. Production was the most important significant factor to increase marketed surplus; one unit (quintal) increase in production results an increase of about 75 Kg in marketed surplus. Larger the family size lower the marketed surplus. It was fond out that with the increase of one family member, the marketed surplus decreased by around 43 Kg. The coefficient of average price having negative sign was due to distress sale by a fraction of maize growers just after the harvest. Three channels were identified for marketing of maize in the study area. Channel II was the main channel in the marketing of maize because 71.93 percent of the producers marketed 70 percent of maize through this channel. 25.44 percent of the producers marketed 29.30 percent of maize through channel III.

The net price received by the producers in both channel II and III was Rs. 518.29/quintal which accounted for 77.81 percent of consumers' rupee. No marketing cost was incurred by the producers in these channels. The total marketing cost incurred by

the local traders in channel II and III was Rs. 93.56/quintals. The net margin of the local traders was Rs. 24.15/quintals (3.63% of consumers' rupee) in both the channels. Net cost and net margin of WS/commission agent were Re. 0.01/q and Rs. 15.80/q in both the channels. The broker was found an important market intermediary in channel III: cost, Re 0.02/q; net margin, Rs 1.73/q. The study further found out that marketing cost of processor was Rs. 12.48/q in both the channels.

According to them, the constraints relating to marketing of maize in the study area were lacking low cost of transport, high standards of procurement, small marketable surplus making local traders monopoly in the market and lack of storage facilities and market information increases immediate sale after harvest. To minimize post-harvest losses, proper storage facilities, education, market information and co-operative societies needs to be established.

Sadhu (2011)[36] carried out study in Banaskantha District of Gujarat State with the objective to know the marketable surplus of potato. Purposive sampling technique was adopted for achieving the objective of the study. Samples of 90 farmers were selected from 5 villages. Both primary and secondary data were collected. For primary data, pre-tested schedule through personal interview with the farmers were collected for the year 2006-07. After deducting internal consumption (viz. home consumption, wage in kind, payment to artisans, seeds, spoilage etc) the remaining quantity of production is available for sale. The study found out that, the average marketable surplus of potato for selected farmers was 83.07 percent (276.32 quintals). Average marketable surplus across farm size ranged from 139.62 quintals (90.85%) for small to 409.42 quintals (80.85%) for large farmers. The average internal consumption was 56.32 quintals (16.93%) of which home consumption were 2.38%; wage in kind, 7.37%; paid to artisans, 2.81%; seed requirement, 1.86% and spoilage, 2.51%. Wage in kind was highest in case of large farmers (45.12 quintals) than medium (21.25 quintals) and small (5.18 quintals). This is due to higher wage paid by large farmers to laborers and village artisans. It further found

[36] Sadhu, Bela R. (2011, February). Marketable surplus of Potato. *International Referred Research Journal*, 2 (25), 65-66.

out that percentage share of product kept for wages in kind increased with increase in farm size.

Sandika (2011)[37] conducted study during the first quarter of 2010 with the purpose of investigating the factors affecting marketed surplus and income of dairy farmers in southern Sri Lanka. Its main objective was to study socio economic conditions of the farmers, marketable and marketed surplus of milk, income and the factors affecting marketed surplus in the study area. Structured questionnaire through personal interview was used to collect primary data from a sample of 119 milk farmers. Pearson product-moment correlation test was applied to identify the factors affecting marketed surplus. The study showed that 60 percent of respondents were having secondary education and further depicts that young generation is moving away from dairy farming to other non-farm activities. The correlation analyses show that there exist significant relationship for milk productivity with education, milk yield, gross income and number of milking cows. Regarding credit, 21 percent of the respondents received credit from formal institutes to develop their dairy production capacity. Marketable surplus was equal to marketed surplus due non expenses on payment to labour, landlords, social and religious work in terms of raw milk.

Marketable surplus was positively and significantly correlated with selling amount of farmers (r=0.307) and negatively correlated with the age of the farmers (r=0.20).Relating to income, it was found out that about 24 percent of the respondent had personal income in the range Rs.10, 000 and Rs.15, 000 while 26 percent had personal income below less than Rs.4, 999. 23 percent of the farmers had personal income more than Rs.20, 000. In the studied sample, 62 percent of the farmers sell raw milk while 24 percent of farmers prefer value added product to sale. Selling value added product generates more income than selling raw milk. Regression correlation shows that (1) income was positively related with milking cows, milk yield, productivity, quantity sold, price received per liter and extension service and training. (2) Milk yield had positive

[37] Sandika, A.L. (2011). Factors affecting marketable surplus and income of dairy farmers in southern Sri Lanka. *Veterinary Research*, 4 (4), 104-108.

correlation with amount of credit received, subsidy received, extension service and training. (3) Amount of credit had correlation with level of education and herd size. It concluded that majority of the farmers work dairying as part time income generation activity. The factors affecting marketed surplus have exhibited indirect influences on milk income. It suggested that extension activities and education of the farmers will help increase production and income of dairy farmers.

2.2 Studies Relating to Production, Marketed Surplus, Price Spread and Marketing Efficiency of Horticulture Crops

In this section, the studies relating to production and marketed surplus, marketing cost, marketing margin, producer's share, price spread and marketing efficiency of Horticulture crops are incorporated.

Thakur (1973)[38] examines the performance of the Indian apple market. A sample of 100 growers and 131 traders was collected to analyze the marketing margins and price spreads, and the secondary data were correlated to measure the degree of market integration in the major four markets. The results show that the marketing system for apples in India was well integrated and that traders' profit margins accounted for 45.5 percent of the price paid by the consumer. The main implications of his study show there was scope for traders to earn high profits. It was also viewed that traders' market power in procurement and stock should be regulated to ensure fair prices for producers and consumers through the establishment of farmer's cooperatives, market information centers and state-owned storage facilities.

Gupta and Ram (1979)[39] analyzed the behaviour of marketing margins and costs of vegetables in Delhi. The results show that producers received only 38 percent of the price paid by the consumer and the rest are earned by the middlemen. It also suggest to

[38] Thakur, D. S. (1973). Pricing Efficiency of the Indian Apple Market. *Indian Journal of Agricultural Economics*, 28 (4), 105-114.

[39] Gupta, A. K. & G. S., Ram G.S. (1979). Behavior of Marketing Margins and Costs of Vegetables in Delhi. *Indian Journal of Agricultural Economics*, 43 (4), 209-210.

established cooperative at both producer and consumer levels and that it was the responsibility of the government to make available more of market information centers, storage facilities and processing plants to increase the market efficiency of vegetables.

Naik and Arora (1986)[40] studied the marketing pattern and pricing efficiency in Indian arecanut market of Siri (primary market) and Nagpur and Kanpur (terminal markets). A random sample of 50 growers was selected and the price efficiency of arecanut marketing system was examined with reference to price spread and price correlation. The results showed that the establishment of co-operative (CAMPCO) for marketing arecanut increased the efficiency of marketing system and this increased the producer's share in consumer's price. The increase in marketing efficiency was because CAMPCO provided storage and transportation facilities, market information, and made necessary arrangement for the sale of the producers' surplus thereby, reducing costs for growers.

Agarwal & Saini (1995)[41] in their study Vegetable marketing - a case study of Jaipur market, Rajasthan investigates the marketing of brassica crops and assesses the price spread in different marketing channels. Two villages Mahapura and Bhankrota were selected for the study and the sample consists of 50 farmers comprising 18 small, 12 semi-mediums, 16 medium and 4 large farms. The estimation of price spread in the study area results a low share for farmers (52%-54%) due to high marketing costs and margins charged by intermediaries. The study also investigates the institutions, agencies and channels involved in the marketing of brassica crops.

Marothia, et al (1996)[42] in their study select two markets (Shastri market in Rajpur district and Subhash market in Durg district) in Chattigarh region of Madhya

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[40] Naik, G. & Arora, V. (1986). Marketing Pattern and Pricing Efficiency in Indian Arecaunut Market. *Indian Journal of Agricultural Economics*, 41 (2), 171-182.

[41] Agarwal, N. L. and Saini, T. C. (1995). Vegetable Marketing – Case Study of Jaipur Market (Rajasthan). *Indian Journal of Agricultural Marketing*, 9(1), 36-43.

[42] Marothia, D. K., Gupta, S. P., and Chandrakar, M. R. (1996). Vegetables marketing: A case study of two markets in Chattisgarh region of Madhya Pradesh. *Bihar Journal of Agricultural Marketing*: Department of Agricultural and Natural Resource Economics.

Pradesh to investigate the marketing of vegetables. It was design to examine the marketing pattern of vegetables, assesses the marketing cost, margins and price-spread in different marketing channels and thereby suggests policy measures to improve vegetable marketing. A sample of 40 and 32 vegetable growers, 6 and 4 commission agents and 15 retailers from each Shastri and Subhash market was selected respectively. The farmers were categorized into small, medium and large based on the quantity of vegetables sold in the market. The results show that the percentage area under vegetables was decreasing at both locations as size of holdings increased. The small farmers preferred to sell their vegetables directly to consumers; while medium and large farmers sold their produce to retailers through commission agents.

Prasad & Kirshana (1996)[43] in their study marketing of vegetables in Bihar concluded that in Jamshedpur market there is a high level of village sales of vegetables while Ranchi market transacts a high proportion of their product through cooperatively marketing institutions; prices are high because of the margin taken by large intermediaries.

Sharma and Sharma (1996)[44] examine the monthly prices variation of potato, onion and tomato in four (Delhi, Bombay, Calcutta and Madras) metropolitan cities of India over a period of five years from1989 to 1993. Among these three vegetables, tomato is the most expensive followed by onion and potato respectively. Potato prices are less variable related to onion and tomato. However, there is no significant positive correlation between levels of exports and domestic prices of vegetables.

Chole et al (2003)[45] attempt to investigate the different marketing channel in disposal of brinjal and to analyze the price spread in different marketing channels in

[43] Prasad, J. & Kirshana, M. (1996). Marketing of Vegetables in Bihar. *Journal of Economic Affairs* Institute of Social Studies, 41(4), 240-245.

[44] Sharma, K.C, & Sharma, A.K. (1996). Levels of and variations in wholesale prices and exports of selected vegetables ofIndia. *Bihar Journal of Agricultural Marketing*, 4(2), 132-143.

[45] Chole, V.M., Talathi J.M. and Naik, V.G. (2003, July-September). Price Spread in marketing ofBrinjal in Maharashtra State. *Agricultural Marketing*, XLVI (2), 5-8.

Maharashtra State. A sample of 100 vegetables cultivators in Panvel tahsil of Raigad district was selected randomly and 5 market functionaries was also selected to collect information on marketing, cost and price received by different intermediaries for the year 1999-2000. The selected vegetable growers were classified into three groups according to their size of land holding. In their study, marketable surplus was no different to marketed surplus because of its perishable nature, lack of storage and price fluctuation. 0.36 percent of total output was used for consumption purpose, 0.07 percent as gift and 0.22 accounted as losses. Their study revealed that marketed surplus decreases with increase in farm size. Three marketing channel were identified in the study area. Total production was 162.70 quintal and the actual quantity marketed was 161.64 quintal. Per quintal cost of marketing brinjal by producers was highest in channel II (Rs. 53.33) followed by channel I and channel III. The low cost in channel resulted because the producers transacted in large quantity resulting in low transport cost. Among the market intermediaries, commission agents incurred lower cost than wholesalers and retailers in marketing of brinjal. The reason was their non-performance of grading, packing and transport functions. The share of producers share in consumers' rupee was 69.28 percent while net margin of commission agents was 6.17 %; wholesalers, 5.09%; retailers, 23.74% respectively. In their study, marketing cost was found to highest in channel III and lowest in channel I. Marketing efficiency was found to be high in channel I. High marketing margin of intermediaries in channel II and channel III resulted in poor efficiency of marketing of brinjal.

Jyothi and Raju (2003)[46] in their study examine the marketing pattern and price spread of Crossandra, Jasmine and Rose flowers in east Godavari district of Andhra Pradesh. Two mandals (Kadium and Alamuru) were purposively selected having maximum area under flower and from each mandal two villages were selected and total of 90 cultivators were selected, 30 from each village. Information to primary data was collected through pre-test structured questionnaire for the agricultural year 1995-96. Information relating to market system, 5 wholesalers and 5 retailers were selected at

[46] Jyothi, S. Hyma & Raju, V.T. (2003, July-September). Study on Marketing of Crossandra, Jasmine and Rose flowers in east Godavari District of Andhra Pradesh. *Agricultural Marketing*, XLVI (2), 2-4.

Rajahmundry. Marketing channel from producer-wholesaler-retailer- consumer was used in their study. Price spread, marketing cost and marketing margin were collected for one basket of each flowers (one basket contains 3 kg Crossandra, 10 kg Jasmine and 500 piece of Rose). Their study showed that producers share in consumers rupee was 63.38 percent for crossandra; 58.06% for jasmine; 50% for rose. In the marketing of flowers, among the market intermediaries the share of wholesaler was found to higher than the retailer. In individual flowers, the share of producer in consumer's rupee was highest in crossandra followed by jasmine and rose.

Balappa and Hugas (2003)[47] attempts to examine the economics of onion production and its marketing cost, marketing channels, producer's share in consumer's rupee, price spread etc. in Karnataka State. Multi-stage random sampling method was used in their study and total samples of 150 cultivators were collected for the study. To study the market system, six markets were selected- Belgaum, Dharwad, Hubli, Bijapur, Raichur and Gulbarga and from each market, five wholesaler, five commission agents and five retailers were chosen through personal interview. The primary data on cultivation and marketing of onion relate to the agricultural year 1999-2000. Out of four channels, channel IV was not popular i.e. producer-consumer channel. The average cost of onion production was Rs. 24,000/ha of which variable cost accounted 90 percent of the cost indicating that vegetable cultivators used labour intensive technique of cultivation. The average net return of farmer was Rs. 45,429.29/ha (Gross return, 69,828.67/ha). On average, total cost of onion production was 202.45 per quintal of which cost of cultivation was higher than cost of marketing and the benefit cost ratio was 2.08. Among different markets, the farmers of Raichur district realized highest per quintal gross return while on net return it was highest in the district of Gulbarga. The benefit cost ratio was also found out to be highest in Gulbarga (2.38) and lowest in Belgaum district (1.58). Average marketing cost per quintal was recorded the highest in Gulbarga district. The magnitude of price spread was found to be lowest in Raichur market as compared to other markets. The producer's share in consumer's rupee of onion was almost equal in both channel I

[47] Balappa, S.R., L.B., Hugas (2003, July- September). An economic evaluation of onion production and its marketing system in Karnataka. *Agricultural Marketing*, XLVI (2), 22-26.

and II. The study showed that among the market intermediaries, the share of retailers was higher than other market intermediaries.

Kumar et al. (2004)[48] in their study investigates the changes in consumption pattern of vegetables at different levels of rural and urban by income groups and geographical regions of India. The elasticities of vegetables demand in rural and urban areas across income groups and regions have been computed. Long-term perspectives of vegetable demand and production have been presented. The study is based on the National Sample Survey (NSS) data of 38th, 43rd, 50th and 55th rounds pertaining to the periods 1983-84, 1988, 1993-94, and 1999-00, respectively.

The per capita annual consumption of vegetables has increased from 47 kg in 1983-84 to 76 kg in 1999-00 with 2.9 per cent annual growth rate. A widespread increase in consumption of vegetables has been observed across income groups, regions and areas (both rural and urban). The consumption of other vegetables was significantly higher in the urban India (37.3 kg) than in the rural India (33.6 kg). Potato has been reported to be the dominant vegetable contributing maximum in total consumption (24 per cent) followed by onion (12.4 per cent), leafy vegetables (8.4 per cent), tomato (6.8 per cent), brinjal (6.1 per cent), cabbage (3.7 per cent), and cauliflower (3.6 per cent). The poor consumers also had easy access to all kinds of vegetables but were found using low quality of vegetables as was evident from the lower prices paid by them for vegetables. The annual per capita consumption of vegetables increased with increase in income, from 48.34 kg for the very poor group of consumers to 88.86 kg for the non-poor high group of consumers. The growth rate in prices of vegetable was highest in both the urban (9.9 per cent) and rural (9.7 per cent) areas of Hill region. This growth rate was lowest in both the urban (5.9 per cent) and rural (5.8 per cent) areas of the Northeast region. The gap in vegetable prices between rural and urban depicted a declining trend, from 34 per cent in 1983 to 32 per cent in 1993 and a sharp decline to a level of 12 per cent in 1999. It

[48] Kumar, Praduman., Kumar, Pramod., and Mittal, Surabhi (2004). Vegetable Demand and Production in India: Long-term Perspective. In Sant kumar, P.K Joshi and Suresh Pal (Eds.), *Impact of Vegetable Research in India. Proceedings 13*. New Delhi: Indian Agricultural Research Institute (National Center for Agricultural Economics and Policy Research).

appeared that integration of vegetable market had taken place as a result of adoption of trade liberalization policies in the country. The income elasticity of demand for vegetables (0.3) is reported to be not as high as it is in other non-cereals. The results show that demand elasticity has been found to be very high for the very poor consumers of both urban (0.44) and rural areas (0.44). The high expenditure elasticity of vegetables reveals that the future demand for them would increase with economic growth. The demand for vegetables has been projected for 2006, 2011 and 2016. It is expected to be 85-88 Mt by the year 2006, 98 – 103 Mt by the year 2011 and 111-119 Mt by 2016. Productivity enhancement is the only to meet the production targets due to limited scope of bringing more area under vegetable cultivation. To achieve the production target, the productivity of vegetables should be 18.36 t/ha by the year 2006, 21 t/ha by 2011 and 23.73 t/ha by year 2016. This calls for a greater role on the part of researchers to develop high-yielding varieties and better crop management practices, and strengthening of extension agencies to disseminate these technologies. It further suggests efficient post-harvest management of the produce avoiding spoilage and bringing in value-addition through promotion of infrastructure to increase the availability of vegetables in India.

Svetlana (2006)[49] study the behavior of semi-subsistence banana producing households in Uganda using farm-level survey data collected in 2003. Bananas, the staple crop of the country, are important for meeting immediate consumption requirements and for income generation. The relationship between marketed surpluses and variety attributes is defined theoretically and tested empirically using a semi-parametric censored quintile regression. Inferences are made in two stages to account for differences in the structure of decision-making. Findings suggest that households sell the excess production of varieties that yield larger bunches, while keeping bunches of varieties with perceived superior quality attributes for own consumption. Reducing transactions costs is perhaps a necessary condition for stimulating market participation, but it is not a sufficient condition for explaining the composition of participation. Provision of information and improvement of market signals related to quality characteristics of specific varieties may

[49]Edmeades, Svetlana (2006). *Varieties, attributes and Marketed Surplus of a Subsistence Crop: Bananas in Uganda.* Retrieved on 7th May 2010 from http://purl.umn.edu/25654

also be required in order to stimulate a more disaggregated supply response across varieties. This can, consequently, have implications for crop improvement strategies.

Ojogho and Alufohai (2009)[50] investigates the effect of price and income changes on Cassava farmers marketed surplus in Oredo and Egor Local Government Areas of Edo State, Nigeria with the objective to study the price elasticity of home consumption, income elasticity of marketed surplus and total price elasticity of cassava marketed surplus. Cross-section primary data were collected from352 cassava farmers through well structured questionnaire using simple random sampling technique. The structured questionnaire designed to collect information on consumption, total production, marketed surplus, price and income of the farmers. Two Stage Least Square (2SLS) methods were used to analyze the data. The results show that the average total farm production was 38500 tonne with a standard deviation of 100.8. It was high among the small farmer (57.25) followed by large (54.12) and medium (15.13). The large variation shown by the standard deviation implies that farm levels output are affected by their size categories. The total consumption was 15600 (sd. 36.6) and the total marketed surplus was 22772.75 (sd. 27.17). The study found out that among the different size groups, positive trend was noticed in respect to output, consumption, marketable and marketed surplus. Marketed surplus to marketable surplus decreases as farm size increases. The result also showed that for every unit increase in income of the farmers' consumption of cassava will be increased by 0.206 unit showing that cassava is an inferior commodity. While for every unit increase in price of cassava consumption of cassava will decreased by 1.23 units implying that the farmers will have more for market. These decrease in consumption was highest among the large farmer (-1.57) for every unit increase in the price of cassava. Consumption of cassava with every increase in income was high among the large farmers (0.513). The percentage change in consumption per unit percentage change in income was 0.59 which means that increase in income leads to a less than proportionate increase in consumption. This means that farmers will keep a

[50] Ojogho, O. & Alufohai, G.O. (2009). Effect of price and income changes on farmers' cassava marketed surplus in Edo State. *International Journal of Agricultural Economics & Rural Development*, 2(2), 26-32.

smaller share and make the available for marketing. Total price elasticity was 1.03 which indicates that as price increases more of cassava will be brought to market by the farmers.

Baba et al (2010)[51] in their study reported the growth of vegetable sector in relation to technology mission, extent and determinants of marketed surplus and price spread of vegetables in the Kashmir valley. Their studies include vegetables crops of cauliflower, cabbage, Kale, tomato, brinjal and others (carrot, turnip, potato cucurbits, etc.)Both primary and secondary data were used in the study. Primary data regarding cropping system and marketing of selected vegetables was collected from 120 farmers drawn from six villages o the districts of Srinagar and Budgam applying multi-stage stratified random sampling technique. 60 market intermediaries were selected for obtaining relevant information to marketing of vegetables. The data were collected through well designed questionnaire and pre-tested schedule for the year 2006. The vegetable sector in the valley is commercialized and currently earned Rs. 125 crore through marketing of vegetables to the neighboring regions. Under Mini-Mission (II) of Technology Mission 1614 hectares of land have brought under vegetables cultivation in the study area. Under this Mission vegetable production increased from 138 q/ha (2002-03) to 241 q/ha during 2007-08. The spatial distribution of different crops shows that vegetables occupy 89 percent of total cropped area. This higher proportion of cropped area vegetables was due to irrigation facilities and better agro-climate condition. Cropping intensity was 258 percent indicating farmers cultivate more than two crops a year. Marketable surplus was more than 92 percent of the total vegetable production per farm. Proportion of marketed surplus was higher in case of cauliflower and cabbage. Farm retention (consumption, gifts to friends and relatives) and spoilage was higher in case of tomato in the valley. Regression coefficient shows that production, net price received by producers and level of education were positive and significant determinants of marketed surplus while spoilage had a negative significant to marketed surplus. Literacy level was found to be important determinant of marketed surplus because educated farmers are more innovative and productive. Returns to farmers improve their

[51] Baba, S.H., Wani, M.H., Wani S.A. and Yousuf, Shahid (2010, January-June). Marketed surplus and price spread of vegetables in Kashmir Valley. *Agricultural Economics Research Review*, 23, 115-127.

economic status and encourage them to apply input innovation leading to increased production. The major cause of loss at the farm level was the incidence of insects/pest. Infestation of fruits borer was common among the vegetable growers. R^2 estimates 85 percent variations in the marketed surplus of vegetables. Four marketing channels were indentified in the study area. In channel I, producers went through streets as vendors and sold the fresh vegetables directly to the consumers. Transportation and packing cost were important for all vegetables except for tomato which was usually carried on crates and required no extra cost after initial cost. Spoilage was high in case of tomato than other crops. The detachment of outer leaves or portion of head in case of cabbage and cauliflower during transit resulted in losses. In channel II retailers visit daily local mandis to purchase fresh vegetables and incurred cost on transport, packing and other miscellaneous. The net margin of retailers as percent of consumers' rupee was higher in kale. Price spread was higher in channel III due to existence of pre-harvest contractors, wholesalers and retailers. Producers received 43.93 percent in cauliflower and the least in kale (33.86%) as net return in consumers' rupee. The share of commission agent was more than 2 percent of consumers' rupee in all the selected vegetables. Producers incurred all the expenses in channel IV because it has to shift the produce to terminal market located distantly. Producers realized absolute price in tomato followed by brinjal and cauliflower. Channel I was the most efficient market followed by channel II and channel IV. In channel III, net return were lower to the producers and was found out to be less efficient for marketing of all vegetables. It has been observed that as the number of market intermediaries increases, the producers share in consumers' rupee decreases.

Barakade et al (2011)[52] carried out study on March-April 2010 to determine the economics of onion cultivation, price spread, marketing channels and marketing efficiency of onion in Satara District of Maharashtra. Satara District is leading in onion production. It covers 12.38 percent of total area in the state. Stratified random sampling procedure was adopted for the selection of villages and onion cultivation. A sample of 20

[52] Barakade, A.J., Lokhande T.N. and Todkari, G.U. (2011). Economics of onion cultivation ant its marketing pattern in Satara District of Maharashtra. *International Journal of Agricultural Sciences*, 3(3), 110-117.

villages and 180 respondents were selected for the study. The selected cultivators were classified into three categories i.e. small (below 2 ha.), medium (2-4 ha.) and large (above 4 ha.) based on land holding size of the farmers. The primary data were collected by survey method with the help of pretested schedule of questionnaire through personal interview and data relating to cost, yield, price and expenditure were collected for the year 2010-11. The study shows that total variable cost was Rs. 93500.19 (91.09%) and fixed cost of production was Rs. 9136.85(8.90%) to total cost of production. Among the different items of cost, the rental value of land, bullock charges, total hired labour charges, seeds, manures, fertilizers, plant protection and irrigation cost were the main items of cost of cultivation in all farm size. The net return obtain per hectare was Rs. 49800.41 with gross returns of 152437.45 per hectare. Average yield per hectare was 258.50 quintal. The cost benefit ratio was 1:1.48. The identified marketing channels in the study area were (1) producers-consumers (2) producer-wholesaler-consumer (3) producer-retailer-consumer (4) producer-wholesaler-retailer-consumer. It was also found out that onion growers have no control over the market due to the absence of coordination and integration among themselves. All the market expenses are incurred by the producers. Maximum quantity of onion was transacted through channel IV (75.90%) followed by channel II (21.30%), channel III (12.98%) and channel I (2.88%). The total marketing cost was for all stages was higher in channel IV which amounted to Rs. 188.45/quintal compared to Rs. 47/quintal in channel I. The high marketing cost incurred by farmers in channel IV was their 19.48 percent to total marketing cost. Producers share in consumer's rupee was highest in channel I (93.06%) and the lowest in channel IV (68.82%). The high share of producer in channel I was the absence of middlemen between producers and consumers. Low share in channel II, III and IV is because the producers marketed their produce through different market intermediaries who reaped away large amount from consumers' rupee. The net margin of wholesaler was 5.38 percent of consumers' rupee while the retailers' net margin was worked out as 7.08 percent in channel III and 6.88 percent in channel IV. The marketing margin was highest in channel IV, while it was lowest in absence of fluctuations. The marketing was higher in channel I mainly because of higher price realization by the farmers due to reduced marketing cost. Marketing margin was much higher in channel I (13.41) than in channel II (4.61), channel III (4.51)

and channel (4.13) which means that higher market margin were pocketed by the market intermediaries resulted in poor marketing efficiency. It also suggested in order to regulate the expenditure on commission, transportation and packing, effort be made to develop necessary infrastructure for onion marketing in the district. Labour saving practice should be developed and co-operative marketing should be encouraged to increase the producers share in consumers' rupee. To safe guard the interest of farmers Government intervention as vital.

Joshi (2011)[53] conducted a study and found out that the marginal farmers have higher per hectare production than the large, small and medium farmers in case of brinjal in the study area. However, the percentage of marketed surplus among all categories of farmers is recorded to be slightly high in the medium farm followed by marginal, large and small farmers. The study further found out three channels for disposing the surplus and resulted producers share in consumer's rupee to be highest were there are less number of intermediaries.

Dastagiri et al. (2013)[54] conducted study on production trends, marketing efficiency and export competitiveness of Indian vegetables in 8 states of India covering 20 crops and found that the area under total vegetables cultivation is growing at the rate of 4.12 percent and production at the rate of 6.48 percent. They revealed that producer-wholesaler-retailer-consumer is the most common marketing channel followed by producer-retailer-consumer and producer-consumer channel. Producer share in consumer rupee was highest in the States of Punjab, Tamil Nadu and Manipur comparing to Andhra Pradesh, West Bengal and Rajasthan. Marketing efficiency was found to be highest in producer-consumer channel; marketing cost, marketing margin, transportation and labour cost are the factors adversely affecting marketing efficiency while open market price,

[53] Joshi, Gaurav (2011). An Analysis of Marketed surplus and price spread of Brinjal in Western Uttar Pradesh. *Asian Journal of Management Research*, 2(1), 484-490.

[54] Dastagiri, M.B.; Chand, Ramesh; Immanuelraj, T.K.; Hanumanthaiah, C.V.; Paramsivam, P.; Sidhu, R.S.; Sudha, M.; Mandal, Subhasis; Singh, Basantha; Chand, Khem & Kumar, B. Ganesh (2013, May). Indian Vegetables: Production trends, Marketing efficiency and export competitiveness. *American Journal of Agriculture and Forestry*, 1(1), 1-11.

volume of produce and net price received are increasing factors for marketing efficiency. The study found that more than 90 percent of the fruits and vegetables of India's export goes to West Asia and East European market. Export of mangoes, grapes, and mushroom were recorded going to UK, Middle East, Singapore and Hong Kong and suggested that Indian Government should give priority to vegetable production, processing and exports.

Kalidas and Akila (2014)[55] in their study in Coimbatore District, Pollachi, Kinathukadavu, Madukkarai, Anaimalai blocks were selected and from each block five villages were randomly selected based on production and marketing during the year 2011-12. A total of 120 tomato growers, 30 commission agents, 30 wholesalers and 30 retailers were randomly selected. The study found out that, the quantum of losses is governed by factors like perishable nature, methods of harvesting, packing, transportation, etc and these losses at farm gate ranges from 13-26 percent. Most of the farmers sell their produce to the wholesalers. The study further suggested efforts should be made to adopt improved packing techniques and materials at farm level.

2.3 Studies Relating to Marketing Constraints and Strategies

In this section, the studies made by several authors relating to constraints faced by producers in marketing of their surplus are reviewed.

Despande (1979)[56] in his study efficiency in fruit marketing tested the hypothesis that small farmers get comparatively lower prices than medium and large farmers. A sample of 50 farmers from nine villages in Bhandara was selected for the analysis. The results of his study supported the hypothesis that small farmers are always price disadvantaged. The main problems facing small farmers are lack of capital, limited

[55] Kalidas, K. & Akila, K. (2014, May). Micro Level Investigation of Marketing and Post harvest losses of Tomato in Coimbatore District of Tamilnadu. *Journal of Stored Products and Post harvest Research*, 5(1), 1-7.

[56] Despande, S. L. (1979). Efficiency in Fruit Marketing A Case Study of Small Farmers in Maharashtra. *India, Journal of American Statistical Association*, 74, 241-254.

marketable surpluses, lack of trading skills, education and know-how, and lack of contact/access with extension agencies.

Parmar et al. (1994)[57] conducted study on marketing of vegetables in South Gujarat and concluded that, most vegetable growers in South Gujarat revealed problem to spoilage and malpractices in weighing and further suggested the need for improving the marketing system by regulating the marketing operations, establishment of efficient transportation system and co-operative marketing structure.

El-Dawees et al (1996)[58] analyses the major production and marketing problems facing vegetable producers in greenhouse projects in the Riyadh and Kharj areas of Saudi Arabia. Their results showed that the most important market related problems are low farm-gate prices, production surpluses in the market, competition of products from both traditional farms and imports, price variations, and the strong bargaining power of the middlemen. It was also found out the marketing problems are more important to vegetable producers in greenhouse projects than production problems.

Kohli (2000)[59] in his study on off season vegetable production identified various problems among the vegetable grower in Himachal Pradesh. Some of the main constraints are non-availability of reliable seeds, lack of irrigation facilities, lack of timely supply of fertilizers and chemicals, high packing materials etc and further suggested improvement in production technology, resistance to pests and diseases, availing better packing materials and organized marketing of off season vegetables.

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[57] Parmar, G.D., Khunt, K.A., & Desai, D.R. (1994). Marketing of vegetables in South Gujarat. *Indian Journal of Agricultural Economics*, 8(2), 458-263.

[58] El-Dawees, A. M., Sefyan, B. and Esmail, S. M. (1996). The Production and Marketing Problems Facing Vegetable Production from Greenhouse Projects in the Riyadh and Kharj areas. *Bulletin of Agriculture*, University Cairo, 47 (2), 191- 212.

[59] Kohli (2000). Off-season vegetable production: Perspective and strategies. In L. R. Verma (Ed.), *Natural resources and development in Himalaya*, (pp.184-208). New Delhi: Malhotra Publishing House.

Khare et al (2003)[60] in their study marketing of milk production set to analysis the volume of milk production through different co-operatives and their distance, estimate cost and price. Bhopal Sahakari Dugdh Sangh Maryadit Sang was purposively selected for their study. Sample of 63 milk producers, 10 milk-produer's co-operative societies of five routes ofHabibganj plant were selected in their study. Personal investigation through pre-tested questionnaire was used to collect primary information. The study year relates to 2000-01. Their study result showed growth rate of milk production to 12.59 percent per year. Each year milk production increased with 25.43 lakh litre during the study period. 83.24 percent of milk was collected by producer's co-operative societies and the remaining 16.76 percent from other agencies in the study area. The study also shows that distance of the society was negatively related with the volume of milk collection. Total cost milk production was Rs. 111.43 per farm and the variable cost was Rs. 98.72. The cost of milk production was Rs. 7.90 per litre in the study area. Producers' share in consumers' rupee was 71.84 percent but their profit was only Rs. 2.19 per litre (15.4%) in the marketing of milk. Low price of milk was the main problem as reported by 84 percent of respondent and on the part of producer's co-operative societies it was the lack of cold storage facilities in marking of milk. Milk collection was found to be higher during the month from September to February and low from March to August.

Gajanana and Sudha (2004)[61] examine the marketing system of vegetables and strategies to overcome the problems during their post-harvest handling have been suggested. The per capita availability of vegetables (174 g per person per day) was found to be far less than the recommended dose (300 g per person per day) as per ICMR recommendations. The per capita availability of vegetables is low due to huge post-harvest losses including those in transportation and marketing. This suggested that there was a need to increase marketing of vegetables through technological innovations, and

[60] Khare, Prashant., Sharma, H.O. and Singh, T.B. (2003). Marketing analysis of Milk Production in Bhopal Districts of Madhya Pradesh. *Agricultural Marketing*, XLVI (2), 9-14.

[61] Gajanana, T. M. & Sudha, M. (2004). Marketing Strategies for Vegetables in the Context of the Changing Policy Environment. In Sant kumar, P.K Joshi and Suresh Pal (Eds.), *Impact of Vegetable Research in India, Proceedings 13*. Bangalore: Indian Institute of Horticultural Research (National Center for Agricultural Economics and Policy Research).

improving marketing efficiency. The presence of many intermediaries has resulted in exploitation of the growers and sellers. It is imperative that growers get a reasonably good price for their produce and for this it is essential to identify the best channel of marketing the vegetables. One of the main problems faced by the vegetable cultivators was the price risks. In such cases, a linkage of producer with the processor becomes important to reduce the price fluctuations and avoid distress sale by the cultivators. This type of arrangements would also help in reducing the postharvest losses. It has been reported that the brinjal growers in Karnataka could get a higher price (Rs 51.50/q) by selling through cooperatives than other agencies. Feasibility study has shown that with an average area of 0.45 ha under tomato crop per grower, hardly 10-20 growers can supply the required materials to a small-scale processing unit. This suggested that the small-scale processing units could be started on cooperative basis. It was also observed that despite high investment, the benefit-cost ratio has been found to be higher for processed tomato (2.23) as compared to fresh tomato (1.72). The analysis of data on fresh and processed vegetables during 1993-2001, indicated that exports of processed vegetables have been growing at the rate of more than 20 per cent per annum, both in quantity and value terms showing there is a good scope in export of new and processed vegetable products.

It further suggest strategies like cooperative marketing of vegetables, distant market sale, integration of production with marketing through processing, preferably on cooperative basis and contract farming to establish backward linkage with the producers by providing all the inputs would help to overcome the problems of post-harvest handling of vegetables.

Bezabih and Hadera (2007)[62] state low level of improved agricultural technologies, risks associated with weather conditions, diseases and pests, as the main reasons for low productivity. Moreover, due to the increasing population pressure the land holding per household is declining leading to low level of production to meet the consumption requirement of the household. As a result, intensive production is becoming

[62] Bezabih, E. & Hadera, G. (2007). Constraints and opportunities of horticulture production and marketing in eastern Ethiopia, *Dry Lands Coordination Group Report No 46*, P.90, Norway.

a means of promoting agro-enterprise development in order to increase the land productivity. Horticultural production gives an opportunity for intensive production and increases small holders' farmers' participation in the market. On top of this, Bezabih and Hadera, further identified pest, drought, shortage of fertilizer, and price of fuel for pumping water as the major constraints of horticulture production in Eastern Ethiopia. Other problems they reported also include poor know how in product sorting, grading, packing, and traditional transporting affecting quality. Many of these findings also hold true for other parts of the country like Alamata. They added absence of direct transaction or linkage between the producer and the large buyer as another property that characterized horticulture marketing. Buyers follow contact persons who identify vegetables to be purchased, negotiate the price, and purchase and deliver the products. Bezabih and Hadera categorized actors in the marketing channel as producers, intermediaries/ brokers, traders and consumers.

2.4. Dissertations

This section contains dissertation reviewed relevant to the current study.

A study made by **Moraket (2001)**[63] indicated households participating in the market for horticultural commodities are considered to be more commercially inclined due to the nature of the product. Horticulture crops are generally perishable and require immediate disposal. As such, farmers producing horticulture crops do so with intent to sell. In his study it was found that 19% of the sample households are selling all or a proportion of their fruits and vegetable harvest to a range of market outlets varying from informal markets to the large urban based fresh produce markets. Typically, many of the households producing fruits and vegetables also have access to a dry land plot where they commonly produce maize and/or other filed crops.

[63] Thomas, Moraket (2001). Overcoming transaction costs Barriers to market participation of Small holder farmers in the Northern Province of South Africa. *Unpublished Ph.D Dissertation*, university of Pretoria.

Mari (2009)[64] in his doctoral study selected vegetable crops of onion, tomato and chilly in three districts of Sindh, namely Hyderabad, Thatta and Mirpurkhas with the purpose to investigate the vegetables production and marketing system in Pakistan for analyzing production and marketing efficiency. Hyderabad was selected for onion crop, Thatta for tomato crop, and Mirpurkhas for chilies. Samples of 180 farmers were randomly selected; sixty from each vegetable for this study and 130 market intermediaries were also interviewed. Primary data were collected by survey method using a pre-tested questionnaire and secondary data were gathered from statistical bulletins. Time series data on market prices in four spatial markets of Pakistan for the selected vegetables was used to investigate long run market relationships. Similarly time series data of production of these vegetables was used for forecast estimates. A combination of analytical techniques including the measurement of growth rates of area and production of vegetables in Pakistan and across provinces, returns to scale analysis through using Cobb-Douglas production function, estimation of technical efficiency and technical efficiency rating across farms, marketing margins, market integration, and production forecast were used to assess the production and marketing system of onion, tomato and chilies in Sindh.

Cobb-Douglas production function was estimated to measure elasticity of production and the degree of returns to scale for onion, tomato and chilies producing farms in Hyderabad, Thatta and Mirpurkhas districts of Sindh. The results showed that the onion, tomato and chilies production exhibited constant returns to scale. These results indicated that if all inputs were increased proportionately, the output could be increased with the same proportion. The mean efficiency of chilies, tomato and onion was 0.83, 0.74 and 0.59 respectively. The results further revealed that chilies growers were more efficient when compared to the onion and tomato farmers, while, tomato growers were found more efficient than onion farmers. The results of price spread across marketing chain revealed that producer's share in consumer's rupee was 58, 66 and 65 percent for onion, tomato and chilies respectively, while the rest goes to commission agents,

[64] Mari, Fateh Mohammad (2009). Structure and efficiency analysis of vegetable production and marketing in Sindh, Pakistan. *Unpublished Ph.D Thesis*, Department of Agricultural Economics, Faculty of Agricultural Social Sciences. Tando Jam: Sindh Agricultural University.

wholesalers and retailers. The results further revealed that the average returns of retailer on capital employed were three times higher in onion business and almost two times higher in tomato and chilies.

The forecast results show that production of tomato and onion, respectively, is expected to grow by 12825 and 40226 tons per annum, which results in little growth in per capita production of these vegetables. It revealed that per capita tomato and onion production would maintain upto 2020, and chilies production would not decline upto 2020. It further suggests policy measures for government giving guidelines for promoting efficient production of onion and optimum land use in Pakistan and to extend recommendations for further research. The results show that the yields of vegetables in Sindh have grown at higher rate when compared to other provinces, perhaps due to higher demand based on the urbanizations. Onion and chilies production are labour intensive. Better vocational and skills training and technology transfer to laborers in onion and chilies production may help not only in increasing level of efficiency for producing these crops but it may change the steady state of production function by its upward movement. As vegetable production exhibited constant returns to scale and inefficiencies across farms agricultural extension, support services, credit and technology transfer may be improved to increase output and generate exportable surpluses. Government should also give incentives for growth and promotion of input industry required for onion, tomato and chilies production and to industries like packaging, processing, transportation and storage to promote trade along with employment. Profits of middlemen may also be rationalized through regulation and selective control. Government role needs to be invoked, wherever necessary, to remove market imperfections in the interest of producer and consumer.

Takele (2010)[65] in his M.Sc. Thesis examined the profitability and marketing chain of rice in Fogera Woreda, South Gondar zone of Amhara Regional State. From the woreda, 14 peasant associations (PAs) producing rice were selected purposively and it is

[65] Takele, Astewel (2010). Analysis of Rice Profitability and marketing chain: the case of Foera Woreda, South Gondar Zone, Amhara National Regional State, Ethiopia. *Unpublished Msc. Thesis.* Haramaya University Department of Agricultural Economics, School of Graduate Studies.

stratified based on the existing rice production farming system (upland and lowland), from each farming system two PAs were selected randomly. Samples of 165 farm households were selected from the four PAs for the interview. In addition, market related data were collected from 25 assemblers (20 rural and five urban marketers) and six wholesalers and 10 millers at Woreda market, 21 retailers and five urban distributors at Bahir Dar market and 29 retailers at Gondar market. Both econometrics and descriptive analyses were used in this study. Results from the descriptive analysis show that wholesalers and millers are the most important buyers of rice from producers, about 45% and 27%, respectively. Farmers travel, on average, 1.6hr to the woreda market to sell their rice produce. The market concentration ratio is 0.77, showing that the rice market is oligopsonsitic. High initial capital and prior control of farmers is a barrier to entry in rice trading. Household head's education level and total quantity rice produced were positively affecting the level of rice sale. However, increase in family size decrease the volume of rice supply to the market per household. The cost benefit analysis of rice production shows that rice production is a profitable business for farmers. The net income obtained from production per hectare of rice is Birr 5006.48. The cost margin indicate that producers obtain on average 35.97 Birr per qt, assemblers get 139 Birr per qt, millers a profit of 5.4 Birr per qt, wholesalers 9 Birr per qt, urban distributors birr 3.88 Birr per qt and retailers around 19 Birr per qt respectively. Though, assemblers get more profit, they also incur more marketing cost. The possible recommendations forwarded are strengthening market information and extension system, intervention to increase production and productivities by using improved agricultural inputs, promoting education and trainings about rice production and marketing and finally promoting family planning are the recommended policy implications.

Abay (2010)[66] in his M.Sc Thesis focused on the overall market chain analysis of red pepper in Bure Woreda and major regional intermediate markets which is mainly produced by smallholder farmers. The basic objective of this study was to analyze

[66] Abay, Alemnew (2010). Market Chain analysis of Red Pepper: The case of Bure Woreda, West Gojjam Zone, Amhara National Regional State, Ethiopia. *Unpublished M.sc Thesis.* Haramaya University: School of Agricultural Economics and Agribusiness Management,

profitability of red pepper production, determinants of household's marketable surplus and the degree of market integration in major regional intermediate markets using primary data collected from households through semi structured questionnaire. The producers' survey result revealed that all farmers supply the product to the market and 85.3% of red pepper produced by the sampled farmers in the production year was supplied to the market. Farmers in the Woreda do not have any standard measure to identify the quality of pepper. They usually identify quality of red pepper by its color, pest damage, size, shape, odor and foreign matter. The sampled farmers use color and shape (42.5%) as a means of differentiating the quality of the product. In the Woreda, the four largest traders handled 30.2% of the total volume of purchased pepper. Hence the structure of the pepper market in the study area was somewhat competitive. The profitability analysis also indicates that red pepper production was profitable. The average amount of red pepper supplied to the market by producers was 5.24 quintal with minimum amount of 0.5 quintals and maximum of 19 quintals. The variables that influenced the marketable supply positively were agricultural experience, access to credit, yield, land size, current year and lagged prices. Among the significant variables yield and access to credit were highly significant at less than 1% significant level. The result of market integration analysis also shows that pepper markets in the western part of the region were integrated. The major problems identified are low access to improved inputs, collateral problem to get credit, poor storage facilities and low price of produce. To solve these problems increased access to improved inputs, strengthening credit institutions, strengthening of cooperatives, education and training, price information and establishment of storage and processing facilities are recommended.

The socioeconomic characteristics of traders include the physical and financial assets such as store, balance, telephone (fixed or mobile), vehicles, mill, pack animals, animal driven cart and working capital. The survey result indicates that all the sample traders store the product on the average for 52 days before sale. From the total respondents 93% of them have a separate place of storage while 7% of traders use residence store. The average holding capacity of the store was 108 quintals (minimum 20 maximum 250). To exchange market information 93% of traders use mobile telephone

while the remaining ones use fixed telephone. Only few traders have access to credit. The study result revealed that only 16% of producers had access to credit at an annual interest rate of 12.5%. The main objectives of the credit were to purchase fertilizer (63%) and improved seed (25%). The amount of credit ranges from 1500-3000 birr for a production year and 93% of the respondents mentioned that the credit was not sufficient for pepper production. The main source of credit was ACSI with annual interest rate of 12.5%. Producer's share is highest (86.7%) from the total consumers' price in channel II and lowest in channel V (81.77) because of the involvement of rural assemblers in this channel that purchase relatively at a lower price from producers in their locality.

Recapitulation

Though the theoretical link between marketed surplus and market efficiency of horticultural crops have not well documented in the literature, some sought of nexus are developed using various measures. These linkages, which are developed in the literature, are mainly based on the empirical analysis. Also, the results from these analyses, which investigate the marketed surplus, marketing cost, marketing margin and marketing efficiency of agricultural and horticultural commodities, show mixed results. Hence, employing an appropriate methodology for the analytical purpose play a crucial role for the researchers and the policy makers in estimating marketing efficiency of various horticultural commodities in different districts found to be an important issue.

CHAPTER III

PROFILE OF THE STUDY AREA

CHAPTER III

PROFILE OF THE STUDY AREA

Introduction

The present chapter deals with physical, demographic and socio-economic features of the study area. The chapter is divided into four sections: Section I will cover the State profile of the study area (geography, history, culture, administration, demography, land holding system, agriculture and economy); Section II will cover the District profile of the selected Districts (geography, demography and agriculture); Section III will cover the profile of the selected villages from the two Districts and Section VI will cover the profile of the respondents (demography, landholding, age composition, dependency ratio, income, education and occupation).

3.1 STATE PROFILE

3.1.1 Geography of Nagaland

The State of Nagaland[67] established on December 1, 1963 covering an area of 16,579 sq. km is located between 25°6'N – 27°4'N latitude and between 93°20'E – 95°15'E longitude (Table 3.1). Topographically, the State is mountainous and the altitude varies approximately between 194 to 3,048 meters above the sea level. It is bounded by Assam on the North and West, Manipur on the South, Arunachal Pradesh on the North East and shares international boundary with Myanmar on the East. The state is largely mountainous with Mount Saramati in Tuensang District the highest peak measuring 3,840 meters above sea level. Mount Japfu and Mount Pauna with 3,014 and 2,841 meters

[67] Wikipedia (2014). *Nagaland Economy*. Retrieved on 1st July 2014 from http://en.wikipedia.org/wiki/Nagaland#Economy

respectively are other important peaks in Nagaland. The main rivers that flow through Nagaland are Doyang, Dhansiri, Dikhu, Milak, Tizu and Zungki. The state enjoys a salubrious climate between 16°C (61°F) to 31°C (88°F) during summer (June to September) with minimum of 4°C (39°F) to 24°C (75°F) during winter (October to February). Heavy rainfall occurs between the months of May and August. September and October months influence occasional showers. The recorded average annual rainfall of the state ranges from 2000 mm-2500 mm. Strong north-west winds blow across the state during the months of February and March.

Table 3.1: Geographical features of Nagaland

Geographical Features	Nagaland
Area	16, 579 sq. km
Location	Between 25°6'N – 27°4'N and between 93°20'E– 95°15'E
Climate	Salubrious climate between 16°C (61°F) to 31°C (88°F) during summer with minimum of 4°C (390°F) to 24°C (75°F) during winter
Rainfall	2000 mm-2500 mm per year
Soil	Sandy loam and sandy clay loam with the pH ranging from 4.5-6.0
Major peaks	Saramati, Japfu and Pauna
Major rivers	Doyang, Dhansiri, Dikhu Milak, Tizu and Zungki
Boundary	Assam on the North and West, Manipur on the south, Arunachal Pradesh on the North East and shares international boundary with Myanmar on the East

Source : Statistical Handbook of Nagaland, 2013.
Agricultural Practices (2014). Retrieved on 3rd July 2014 from http://www.advanceagriculturalpractice.in/w/index.php/Farming_in_Nagaland

3.1.2 History of Nagaland

The people were originally referred to as '*Naka*' in Burmese languages, which means 'people with pierced ears'[68]. Some anthropologists suggest Nagas belong to the Mongoloid race: different tribes migrated at different times and each settling in the north-eastern part of India establishing their respective sovereign mountain terrains and village-states[69]. Not much is known about the history before the Burmese invasion or before the Christianity. There is no written document that tells us about the history of Nagaland yet the medieval documents of Ahom in Assam remark the economic and social lives of the Nagas[70].

Following an invasion in 1816, the area along with Assam came under direct rule of Myanmar from 1819 to 1826 and from 1826 the British East India Company took control of Assam steadily expanded their area over Naga Hills. By 1892, except the Tuengsang area the entire Naga region was governed by the British and was joined politically into Assam, which in turn was for long a part of Bengal province. The British brought an end to internecine tribal conflicts and practice of head-hunting by the use of force and diplomacy[71] however; it was largely due to the work of Christian missionaries that Nagas embraced Christianity particularly the Baptist faith. After the independence of India in 1947, the area remained a part of the province of Assam. In 1957, the Naga Hills District of Assam and the Tuensang frontier were united in a single political entity Naga Hills Tuensang Area (NHTA) that became a Union territory with large degree of autonomy. Discontentment among tribes raised agitation and violence; civil-disobedience and non-payment of taxes and on July, 1960 between the leaders of Naga People Convention (NPC) and the Government of India (GoI) sign a 16 point agreement the

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[68] Shikhu, Inato Yekheto (2007). *A re-discovery and re-building of Naga cultural values: an analytical approach with special reference to Maori as a colonized and minority group of people in New Zealand.* Daya Books, p. 4. Retrieved on 4th July 2014 from https://readtiger.com/wkp/en/Naga_people

[69] Wikipedia (2014). *Nagaland.* Retrieved on 1st July 2014 from http://en.wikipedia.org/wiki/Nagaland

[70] Maps of India (2014). *History of Nagaland.* Retrieved on 1st July 2014 from http://www.mapsofindia.com/nagaland/history.html

[71] NewKerale.com (2014). *Nagaland State Information.* Retrieved on 1st July 2014 from http://www.newkerala.com/states-of-india/nagaland.php#.U7JPpMsVv1Y

formation of Nagaland as a full-fledged State within the Union of India[72]. The State of Nagaland was formally inaugurated on December 1, 1963 with Kohima as the State capital and the first state-level democratic election was held on February 11, 1964.

3.1.3 Culture of Nagaland

The state have eleven Districts: Kohima, Phek, Mokokchung, Wokha, Zunheboto, Tuensang, Mon, Dimapur, Peren, Kiphire and Longleng with 16 main tribes Angami, Ao, Chakhesang, Chang, Khiamniungan, Kachari, Konyak, Lotha, Phom, Pochury, Rengma, Sangtam, Sema, Yimchunger, Kuki, and Zeliang. The Konyaks, Angamis, Aos, Lothas, and Sumis are the largest Naga tribes. Nagaland is known as the land of festivals and most of the festivals revolve round agriculture. Christmas and Hornbill are two major festival celebrated throughout the State. Nagas have mostly oral tradition preserved through songs and tales. Folk song are both romantic and historical relating to famous ancestors and incidents while some to agricultural season. War dances and other dances belonging to distinctive Naga tribes are a major art form in Nagaland. Christianity is the predominant religion; and every tribe has its own mother tongue but uses Nagamese (a mixture of Assamese and Naga language) to communicate with other tribe. In 1967, the Nagaland Assembly proclaimed English as the official language and is the medium for education in Nagaland.

3.1.4 Administration of Nagaland

According to Nagaland census, 2011 as shown in Table 3.2, the State has 11 Districts, 114 sub-Districts/circles, 26 towns (19 statutory and 7 census towns) and 1,428 villages while the corresponding figures during 2001 was 8 Districts, 93 sub-Districts/circles, 9 towns and 1,317 villages. The table shows an increase of 3 Districts, 21 sub-Districts/circles, 17 towns and 111 villages during the period 2001-2011.

[72] Wikipedia (2014). *Economy of Nagaland*. Retrieved on 1st July 2014 from http://en.wikipedia.org/wiki/Nagaland#Economy

Table 3.2: Administrative units of Nagaland, 2001-11

Particulars	2001	2011	Growth
No. of District	8	11	3
No. of Sub-District/Circle	93	114	21
No. of Town	9	26	17
No. of statutory town	8	19	11
No. of Census town	1	7	6
No. of village	1,317	1,428	111

Source: Primary Census Abstract, Nagaland, 2011

3.1.5 Demography of Nagaland

The total population figure according to Primary Census Abstract (PCA), 2011 is recorded to be 1,978,502 while it is 1,980,602 according to Provisional Population total. In PCA population came down by 2,100 from the provisional total resulting slight changes in literacy and child sex ratio. The percentage of urban population to total population is 28.86%; rural: 71.14% respectively. Longleng District (-58.5%) recorded the highest decrease in person while Dimapur District (22.9%) recording the highest increase in person (see Annexure II).

The proportion of male and female to total population is 51.8 percent and 48.2 percent respectively (Table 3.3). The overall literacy rate is 79.6 percent of which male literacy is higher than female literacy. The ratio of female per 1000 male population is 931 and the density of population per sq.km is 119 in Nagaland. The Total Work Participation Rate (TWPR) in 2011 is 49.2 percent of which cultivators to total workers constituted the highest (55.2%) followed by other workers (36.0%), Agricultural Labourers (6.5%) and Household industry (2.3%). This shows that, more than 60 percent of the work force remain engaged in agricultural activities throughout the year while, about 36 percent of the working force are employed in tertiary sector.

Table 3.3: Demographic features of Nagaland, 2011

Particulars	Nagaland	Mokokchung	Wokha
Total population	1,978,502	194,622	166,343
Male	1,024,649 (51.8)	101,092 (51.9)	84,505 (50.8)
Female	953,853 (48.2)	93,530 (48.1)	81,838 (49.2)
Literacy	1,342,438 (79.6)	159,494 (91.6)	128,208 (87.7)
Male	723,957 (82.8)	83,479 (92.2)	67,385 (90.8)
Female	618,477 (76.1)	76,015 (91.0)	60,823 (84.5)
Sex ratio	931	925	968
Density of population	119	121	102
Total Work Participation Rate	974,122 (49.2)	100,067 (51.4)	78,412 (47.1)
Cultivators	537,702 (55.2)	48,925 (48.9)	47,473 (60.5)
Agricultural Labourers	62,962 (6.5)	9,166 (9.2)	6,438 (8.2)
Household Industries	22,838 (2.3)	3,798 (3.8)	1,965 (2.5)
Other Workers	350,620 (36.0)	38,178 (38.2)	22,536 (28.7)

Source : Primary Census Abstract, Nagaland, 2011
Note : Figure in parenthesis is in percentage

3.1.6 Land Holding System of Nagaland

Fragmentation of land holding is not an issue in Nagaland due to the peculiar system of land ownership and usage existing in the State. It is unique and different from the rest of the world, where customary laws govern the land where, each tribe or village has its own unique customary laws and traditions. The only legal framework is the Jhum

Land Regulation Act 1970[73]. In Nagaland, about 92 percent of the land is unclassified and are under community land which falls under any of private land, clan land, morung land, and common land. The state government owns just about 7 percent of the total land area[74]. Thus, depending upon the tribe, the land either belongs to the village chief, the community or individual and are restricted to transfer or even use of traditional land by the outsiders who do not belong to the community or clan, or in any cases, are not subject of the same chief. The major activity of the people is shifting cultivation and this land are usually controlled by the community but are regulated by the respective village councils which areas to be cleared for Jhumming each year. Naga society is based on patrilineal descent; hence, the property is inherited by the male heirs while, women have no share in such inheritance accept as gift. It is widely believed that the daughters after their marriage come under the care of the husband's clan and family. Largely because of this, in practice, no landed property was gifted to women although most of the work on the land was done by the womenfolk. Regardless of poor economic condition, even farmers can be regarded as resource rich in Nagaland; this is due to no alienation of the people from their land and resources. Increased privatization and individual ownership, especially of land under permanent cultivation such as WRC/TRC, orchards, plantation, bamboo groves, fishery etc., are recent noticeable trends in the State.

3.1.7 Agriculture of Nagaland

Nagaland is basically a land of agriculture. More than 60 percent of the total working population depends on farming for their livelihood. Rice is the staple food and occupies 68.65 percent of the total area under cultivation. The major land use pattern is slash and burn cultivation locally known as Jhum. The area cultivated under Jhum paddy is 94,920 ha and the cultivated area under terraced paddy is 88,410 ha during 2013[75].

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[73] ENVIS Center on Nagaland (2014). *Land reform measures and operational land holdings in the State.* Retrieved on 13th October 2014 from http://www.nagenvis.nic.in/Database/LandReform_922.aspx

[74] ENVIS Center on Nagaland (2014). *Land Use pattern.* Retrieved on 13th October 2014 from http://www.nagenvis.nic.in/Database/LandUsePattern_921.aspx

[75] Statistical Handbook of Nagaland (2013). Kohima: Directorate of Economics & Statistics, Government of Nagaland.

Though majority of the population is engaged in farming, Nagaland still depends on the import of food supply from other States due to low area under cultivation resulting low availability of foodgrains.

3.1.7.1 Land Utilization

Out of 1, 657,900 hectares ofland, forest land covers more than 52 percent of the total geographical area (Table 3.4). During the decade, the percentage of net sown area, land under non-agricultural use, cultivable waste land and fallow land increased while, the percentage land under trees and groves, and current fallow land decreased during the decade. The net sown area used for different crops is 22.93 percent (2012-13) and is followed by fallow land (6.0%), land under trees and groves (5.65%) and land under non-agricultural uses (5.59%).

Table 3.4: Area under different land utilization in Nagaland

(Percentage share to Total Geo. Area)

Classification	2001-02	2010-11	2011-12	2012-13
Total geographical area (hectare)	1,657,900	1,657,900	1,657,900	1,657,900
Forest	52.05	52.05	52.05	52.05
Land under non- agricultural uses	4.02	5.25	5.59	5.59
Barren and uncultivable land	N.A	0.15	0.15	0.15
Land under trees and groves	7.46	6.22	5.54	5.65
Cultivable Waste land	3.66	3.16	4.07	4.24
Fallow land	4.49	6.05	5.92	6.00
Current follow	5.23	3.31	2.97	3.02
Net Area Sown	18.68	21.85	22.89	22.93
Area sown more than once	2.87	5.80	5.73	6.53
Total cropped area	21.55	27.65	28.61	29.47
Net irrigated area	3.88	N.A	4.79	5.33
Gross irrigated Area	4.46	N.A	5.55	5.58

Source : Statistical Handbook of Nagaland, 2004, 2011 & 2013

Note : N.A – Not Available

3.1.7.2 Area, production and productivity of principal crops

The main foodgrains grown in the State include rice, maize, millet and pulses while oilseeds like soyabean, linseed and mustard alone with other commercial crops such as sugarcane, potato, tapioca and colocasia are important crops grown in Nagaland. Coffee, cashewnut and tea are grown as plantation crops in the State. The trend of area, production and productivity of principal crops in Nagaland is presented in the Table 3.5. During the period 2001-02 to 2012-13, the area and production witness an increasing trend however, its percent to total area for cereal crops and pulses witness a decline while that of oilseeds and commercial crops saw an increasing trend in the State. The area in cereal crops declined from 70 percent to 66 percent during the period (see Annexure VI). In the year 2012-13, cereals occupied 65.94 percent of the total area and the total production is 558,510 MT. Cultivated areas for pulses declined by 2 percent while for commercial crops, it increased by 6 percent during the decade.

Table 3.5: Trend of Area, Production and Productivity of principal crops in Nagaland from 2001-02 to 2012-13

Crops	Area/Production	2001-02	2010-11	2011-12	2012-13
Cereals	Area(inha)	222500	264400	264750	267050
	Production (in MT)	323620	531860	533270	558510
	Productivity (MT/ha)	1.45	2.01	2.01	2.09
Pulses	Area(inha)	35000	34430	34940	36200
	Production (in MT)	29650	36460	37170	40450
	Productivity (MT/ha)	0.85	1.06	1.06	1.12
Oilseeds	Area (inha)	50500	65840	66280	66820
	Production (in MT)	53650	67530	68120	68900
	Productivity (MT/ha)	1.06	1.03	1.03	1.03
Commercial crops	Area(inha)	7650	29400	31240	34900
	Production (in MT)	111220	392170	385800	443750
	Productivity (MT/ha)	14.54	13.34	12.35	12.71
Total	Area(inha)	315650	394070	397210	404970
	Production (in MT)	520170	1028020	1024360	1111610

Source : Statistical Handbook ofNagaland, 2004, 2011 & 2013

3.1.8 Economy of Nagaland

Nagaland is an agrarian economy and a remarkable feature is that there is no class of landless peasants in the State. Apart from growing foodgrains, oilseeds and horticulture crops, livestock is another key economic factor of Nagaland that includes fishery, animal husbandry, cattle farming, piggery and poultry. Forestry is also an important source of income. Three medium-level industries have been established by the government for the development of Industrial sector: sugar mill at Dimapur with an installed capacity of 1,000 tons of cane per day; pulp and paper mill at Tuli; and plywood factory at Tizit[76]. Cottage industries such as weaving, woodwork and pottery are also an important source of revenue. Tourism is important, but limited owing to geographical isolation and political instability.

The percentage contribution of primary sectors declined from 51.03 percent to 39.50 percent during the period 2004-05 to 2012-13 while the percentage contribution of secondary and tertiary sector increases during the same period as shown in Table 3.6. During 2012-13 at current price, tertiary sector contributes the highest followed by primary and secondary sector in Nagaland. About 40 percent of the GSDP is contributed by the primary sector and another 45 percent is by tertiary sector.

The radar diagram in the Figure 3.1 explains the curve closer to the center lower will the contribution to GSDP and the curve closer to the outer line or away from the center indicates higher level. Table 3.7 shows the percentage growth of GSDP in Nagaland is far below compared to NER and India. The per capita NSDP in Nagaland during the year 2012-13 is Rs. 59,535 while it is Rs. 68,757 for all India (Table 3.8) showing low percentage growth in Nagaland over previous years compared to all India. Figure 3.2 illustrates the per capita NSDP between Nagaland and India.

[76] Economy of Nagaland (2014). Retrieved on 5th July 2014 from http://www.webindia123.com/nagaland/economy/econom.htm

Table 3.6: Gross State Domestic Product (GSDP) at current price by industry of origin, 2004-05 to 2012-13

(In percentage)

Sectors	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Primary	51.03	48.06	45.24	42.09	42.33	41.41	41.02	40.24	39.50
Secondary	10.60	11.57	12.60	12.97	14.54	14.91	15.14	15.23	15.49
Tertiary	38.37	40.38	42.16	44.94	43.13	43.68	43.83	44.53	45.01
GSDP (in crore)	5839	6588	7257	8075	9436	10527	11315	12272	13322

Source: Computed from Central Statistical Organization (CSO), (As on 01-08-2013) and NEDFi Databank (2014). Sectoral contribution. Retrieved on 5th July 2014 from http://databank.nedfi.com/content/sectoral-contribution-14

Figure 3.1: GSDP at current price by industry of origin, 2004-05 to 2012-13

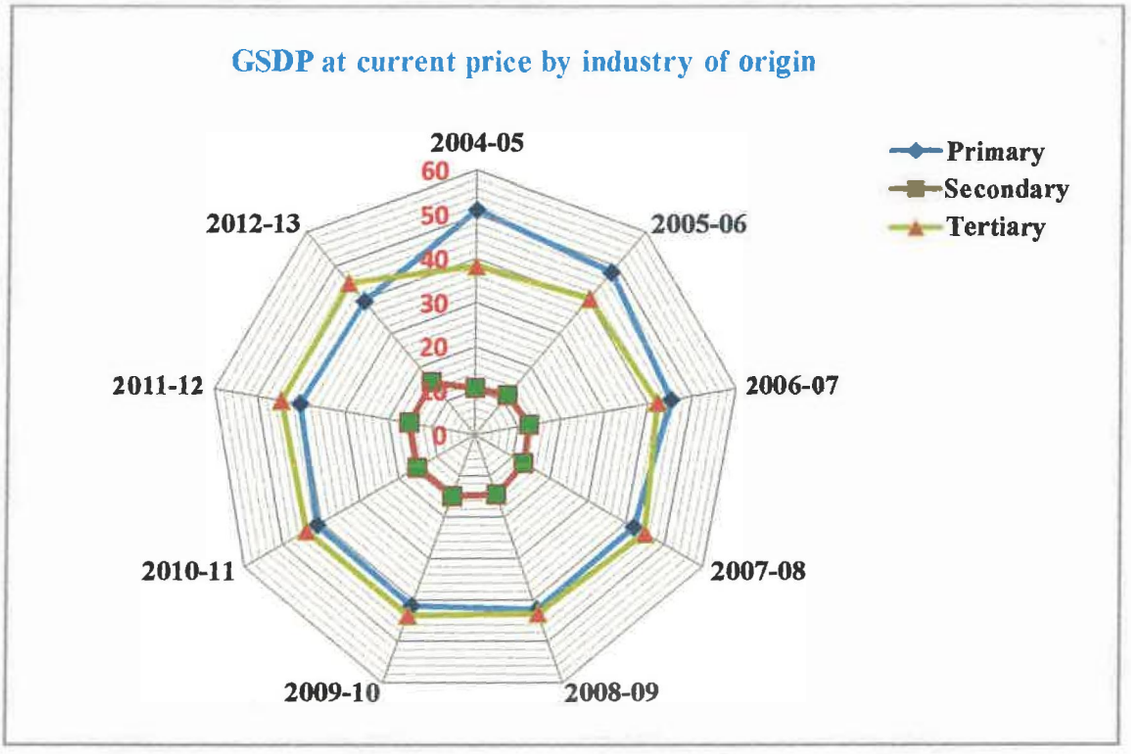


Table 3.7: Gross State Domestic Product (GSDP) at current price

(Rs. in crore)

Year	Nagaland		NER		India	
	GSDP	% Growth over previous year	GSDP	% Growth over previous year	GSDP	% Growth over previous year
2004-2005	5839	-	87742	-	2971464	-
2005-2006	6588	12.83	97501	11.12	3390503	14.10
2006-2007	7257	10.15	107184	9.93	3953276	16.60
2007-2008	8075	11.27	118598	10.65	4582086	15.91
2008-2009	9436	16.85	136592	15.17	5303567	15.75
2009-2010	10527	11.56	161735	18.41	6108903	15.18
2010-2011	11315	7.49	187443	15.90	7266967	18.96
2011-2012	12272	8.46	211775	12.98	8353495	14.95
2012-2013	13322	8.56	NA	NA	9461013	13.26

Source: Central Statistical Organization (CSO), (As on 01-08-2013) and NEDFi Databank (2014). Gross State Domestic Product of Nagaland. Retrieved on 5th July 2014 from http://databank.nedfi.com/content/gross-state-domesticproductnagaland.

Note : NER – North Eastern Region, NA– Not Available

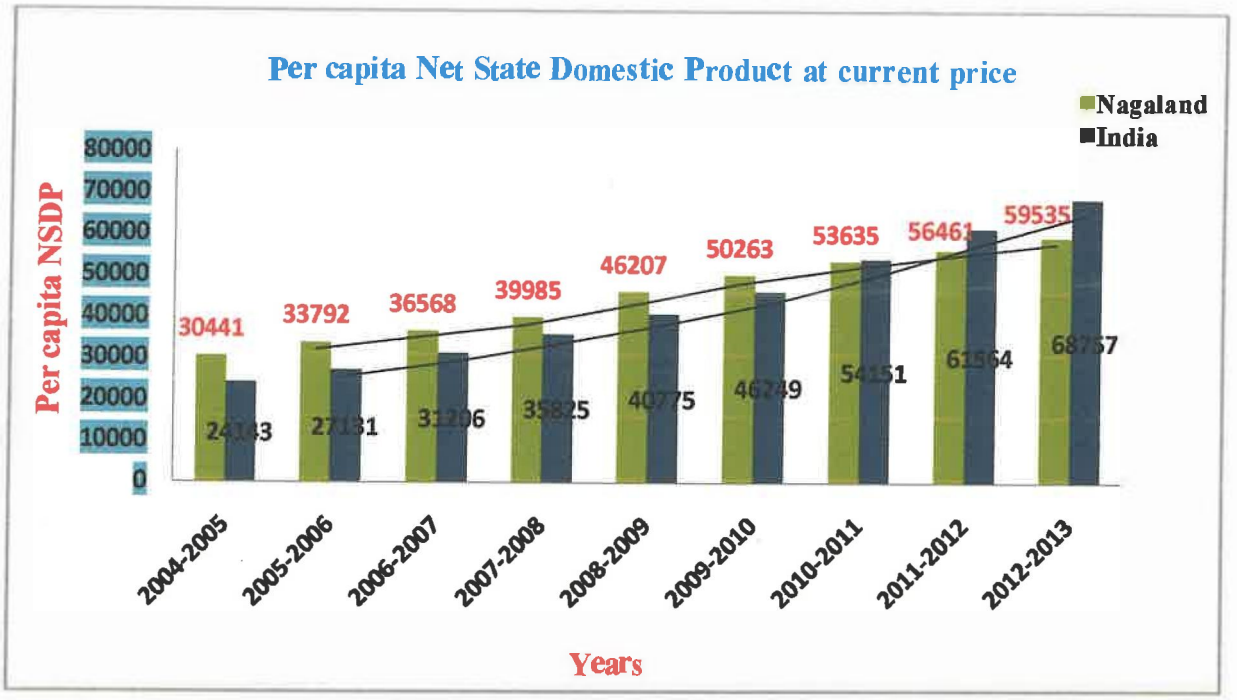
Table 3.8: Per capita Net State Domestic Product (PCNSDP) at current price

(In Rupees)

Year	Nagaland		India	
	Per Capita NSDP	% Growth over previous year	Per Capita NSDP	% Growth over previous year
2004-2005	30441	-	24143	-
2005-2006	33792	11.01	27131	12.38
2006-2007	36568	8.21	31206	15.02
2007-2008	39985	9.35	35825	14.80
2008-2009	46207	15.56	40775	13.82
2009-2010	50263	8.78	46249	13.42
2010-2011	53635	6.71	54151	17.09
2011-2012	56461	5.27	61564	13.69
2012-2013	59535	5.44	68757	11.68

Source: Central Statistical Organization (CSO), (As on 01-08-2013) and NEDFi Databank (2014). Per Capita Net State Domestic Product of Nagaland. Retrieved on 5th July 2014 from http://databank.nedfi.com/content/capita-nsdp-4

Figure 3.2: Per capita NSDP at current price, 2004-05 to 2012-13



3.2 DISTRICT PROFILE

3.2.1 Mokokchung District

3.2.1.1 Geographical Features

Mokokchung[77] District covers an area of 1,615 sq. km lies between 94.29 and 94.76 degrees longitude and 26.20 and 26.77 degrees latitude located at an elevation of 1326 meters above sea level. The average temperature ranges from 19°C to 29°C. It is bounded by Assam to its North, Wokha and Assam to its West, Tuensang to its East, and Zunheboto to its South. The District has six distinct hill ranges-Tzurangkong range, Japukong range, Changkikong range, Asetkong range, Langpangkong range and Ongpangkong range.

[77] National Informatics Center (2014). *Discover Mokokchung*. Retrieved on 3rd August 2014 from http://mokokchung.nic.in/index.html and http://mokokchung.nic.in/files/geo.html
Wikipedia (2014). *Mokokchung District*. Retrieved on 3rd August 2014 from http://en.wikipedia.org/wiki/Mokokchung_district;
Government of Nagaland (2014). Retrieved on 3rd August 2014 from http://www.nagaland.nic.in

Table 3.9: Geographical features of Mokokchung District

Geographical Features	Mokokchung
Area	1,615 sq. km
Location	lies between 94.29 and 94.76 degrees longitude and 26.20 and 26.77 degrees latitude located at an elevation of 1,326 metres above sea level
Climate	19°C to 29°C
Rainfall	2000 – 2500 mm per year
Soil	Alluvial soil, non-laterite red soil and forest soil
Major rivers	Milak, Dikhu and Tsurang
Hill Range	Tzurangkong range, Japukong range, Changkikong range, Asetkong range, Langpangkong range and Ongpangkong range
Boundary	Assam to its North, Wokha and Assam to its West, Tuensang to its East, and Zunheboto to its South

Source : Statistical Handbook of Nagaland, 2013.
National Informatics Center (2014). *Discover Mokokchung*. Retrieved on 14th December 2014 from http://mokokchung.nic.in/files/topo.html

3.2.1.2 Demography

As per 2011 census, the total population of Mokokchung District is recorded to be 194,622 of which male constitute 51.94 percent and female 48.06 percent of the total population (see Table 3.3). During the period 2001-11, population registered a negative growth by -16.1 percent; rural population declined by -30.9 percent while urban population increased by 78.5 percent (see Annexure II). Density of population is observed to be 121 per sq.km and sex ratio per 1000 males is 925; higher than all Nagaland. The literacy rate of the District is 91.6 percent with male having higher percentage of literates than the female literates. The TWPR in 2011 is 51.4 percent of which cultivators constitute the highest (48.9%) followed by other workers: 38.2%; Agricultural Labourers: 9.2% and Household industry: 3.8% (see Table 3.3). The percentage of main workers to total work force is 80.99 percent while, marginal workers are about 19.01 percent (see Annexure III).

3.2.1.3 Agriculture

Agriculture is the back bone of the Mokokchung people where 58.1 percent of the total working population remain engage throughout the year. Rice is the stable food of the people. Cereals like rice, maize, small millet; pulses like Green gram (Moongdal), Naga dal, pea; oilseeds like soyabean, mustard seeds and linseed are produced as major crops in the District. Commercial crops like sugarcane, potato and tea are popularly grown in the District. Table 3.10 shows that, area under cereal crops and pulses in Mokokchung District decreases during the decade while that of oilseeds and commercial crops noticed an increasing trend. During the period 2012-13, cereals occupied 60.61 percent of the agricultural land and the total production is 40,730 MT. Cultivated area under pulses decreased by 2.36 percent while, oilseeds and commercial crops increased to 18.55 percent and 11.91 percent respectively during the decade.

Table 3.10: Trend of Area, Production and Productivity of principal crops in Mokokchung District from 2001-02 to 2012-13

Crops	Area/Production	2001-02	2010-11	2011-12	2012-13
Cereals	Area(inha)	26750	22840	19920	20000
	Production (in MT)	38640	44730	38920	40730
	Productivity (MT/ha)	1.44	1.96	1.95	2.04
Pulses	Area (inha)	4230	2940	2970	2950
	Production (in MT)	3490	2970	3030	3210
	Productivity (MT/ha)	0.83	1.01	1.02	1.09
Oilseeds	Area(inha)	5580	6000	6050	6120
	Production (in MT)	5860	5620	5700	5820
	Productivity (MT/ha)	1.05	0.94	0.94	0.95
Commercial crops	Area (inha)	880	3340	3570	3930
	Production (in MT)	11730	44070	44010	46040
	Productivity (MT/ha)	13.33	13.19	12.33	11.72
Total	Area(inha)	37440	35120	32510	33000
	Production (in MT)	59720	97390	91660	95800

Source: Statistical Handbook of Nagaland, 2004, 2011 & 2013

3.2.2 Wokha district

3.2.2.1 Geographical features

Wokha[78] District covers an area of 1,628 sq. km is at an elevation of 1,314 above sea level lies between Latitudes 26°01' and 26°08' N and Longitudes 94°18' and 94°27' E. It is bounded by Assam to its North and West, Mokokchung and Zunheboto to its East, Kohima to its South. During summer the temperature of Wokha is between 16°C and 32°C with minimum of 2°C during winter and the annual rainfall is between 2000 to 2500 mm per year.

Table 3.11: Geographical features of Wokha District

Geographical Features	Wokha
Area	1,628 sq. km
Location	Lies between Latitudes 26°01' and 26°08' N and Longitudes 94°18' and 94°27' E at an elevation of 1,314 meters above sea level
Climate	16°C and 32°C
Rainfall	2000 to 2500 mm per year
Soil	Recent and Older Alluvial soil, Residual soil
Major rivers	Doyang, Chubi, Nruk and Nzhu
Boundary	Assam to its North and West, Mokokchung and Zunheboto to its East, Kohima to its South

Source : Statistical Handbook of Nagaland, 2013

3.2.2.2 Demography

According to 2011 census, the total population of Wokha District is recorded to be 166,343 of which male constitute 50.80 percent and female 49.20 percent of the total population (see Table 3.3). About 78.96 percent of the total population in Wokha District lives in rural area while urban population constitutes only 21.04 percent of the total

[78] Wikipedia (2014). *Wokha District*. Retrieved on 3rd July 2014 from http://en.wikipedia.org/wiki/Wokha http://www.censusindia.gov.in/pca/SearchDetails.aspx?Id=285355

population. Decadal growth of Wokha District shows an inverse compared to Mokokchung District. During the period 2001-11, population is found to grow by 3.2 percent. Rural population is seen to grow by 6.3 percent registering highest growth to all Nagaland while urban population is seen to fall by -7.0 percent registering lowest urban populations growth to all Nagaland (see Annexure II). Density of population and sex ratio is observed to be 102 per sq.km and 968 per 1000 males respectively. It has a literacy rate of 87.7 percent of which male constitute 90.8 percent and female 84.5 percent. The TWPR is about 47.1 percent of which cultivators constitute 60.5% followed by other workers: 28.7%; Agricultural Labourers: 8.2% and Household industry: 2.5% (see Table 3.3). The total work force participation rate in Wokha District is comparatively lower than Mokokchung District and all Nagaland.

3.2.2.3 Agriculture

About 68.7 percent of the total working population is engaged in agricultural activities in the District. Rice is the staple food of the people. Cereal crops like rice, maize, small millet; pulses like Naga dal, beans, pea; and oilseeds like soyabean, mustard seeds and linseed are considered as principle crops in the District. Sugarcane, potato and colocasia are popularly grown as commercial crops.

The Table 3.12 shows that, area under pulses and oilseeds in Wokha District decreased during the decade while that of cereals and commercial crops noticed an increasing trend. During the period 2012-13, cereals occupied 68.11 percent of the total area and the total production is 49,450 MT. Cultivated areas under pulses and oilseeds decreased to 7.33 percent and 16.06 percent respectively while that of commercial crops increased by 6.13 percent during the decade.

Table 3.12: Trend of Area, Production and Productivity of principal crops in Wokha District from 2001-02 to 2012-13

Crops	Area/Production	2001-02	2010-11	2011-12	2012-13
Cereals	Area (inha)	32700	25370	24320	24430
	Production (in MT)	46500	49440	47310	49450
	Productivity (MT/ha)	1.42	1.95	1.95	2.02
Pulses	Area(inha)	5480	2640	2710	2630
	Production (in MT)	4750	2650	2760	2870
	Productivity (MT/ha)	0.87	1.0	1.02	1.09
Oilseeds	Area (inha)	8770	5690	5730	5760
	Production (in MT)	8730	5470	5480	5560
	Productivity (MT/ha)	1.0	0.96	0.96	0.97
Commercial crops	Area(inha)	1140	2410	2590	3050
	Production (in MT)	16270	36640	36560	41060
	Productivity (MT/ha)	14.27	15.20	14.12	13.46
Total	Area(inha)	48090	36110	35350	35870
	Production (in MT)	78250	94200	92110	98940

Source: Statistical Handbook of Nagaland, 2004, 2011 & 2013

3.3 VILLAGE PROFILE

3.3.1 Mokokchung District

Longkhum Village: The total geographical area of the village is 39 sq. km situated at a distance of 20 km off the District Head Quarters (HQs) and its percentage share to total geographical area of the District is about 2.41 percent. The village is composed of 546 households with the total population of 3,811 of which male population constitute 51.46 percent and female 48.54 percent (Table 3.13). The overall literacy of the village is 86.62 percent with male population having more literates than the female literates. The TWPR of the village is 58.27 percent of which the percentage of cultivators to total workers is 76.89%; other workers: 19.49%; household industries: 2.51% and agricultural labourers: 1.11%. This shows that, more than 76 percent of the rural population remain engaged in agricultural activities throughout the year while, only 19.5 percent of the working force are found to engaged in tertiary sectors. The percentage of

main and marginal workers to total work force in the village is 75.0 percent and 25.0 percent respectively (see Annexure VI). Out of the 39 sq. km of geographical area, 95 percent of the available land is under cultivation of different crops while, land under forest cover is only 5 percent.

Longsa Village: The total geographical area of the village is 53.43 sq. km situated about 30 km away from the District Head Quarters (HQs) and its percentage share to total geographical area of the District is about 3.31 percent. The village is composed of 505 households with the total population of 2,603 of which male population constitute 50.50 percent and female 49.50 percent (Table 3.13). The overall literacy of the village is 80.97 percent with male population having more literates than the female literates. The TWPR of the village is 58.27 percent of which the percentage of cultivators to total workers is 47.75%; other workers: 8.17%; household industries: 1.18% and agricultural labourers: 1.15%. This shows that, agriculture is the main activity of the village. About 90 percent of the land is cultivated in the village, and about 8.42 percent of the area is left under forest cover.

Yajang Village: The total geographical area of the village is 22 sq. km situated 90 km away from the District HQs and its percentage share to total geographical area of the District is about 1.36 percent. The village is composed of 772 households with the total population of 3,206 of which male population constitute 53.44 percent and female 46.56 percent (Table 3.13). The overall literacy of the village is 70.57 percent with male population having more literates than the female literates. The TWPR of the village is 67.46 percent of which the percentage of cultivators to total workers is 53.67%; other workers: 10.03%; agricultural labourers: 3.34% and household industries: 0.42%. The percentage of main workers and marginal workers to total workers is 74.03 percent and 25.97 percent respectively. About 80 percent of the land is cultivated in the village, and about 19.5 percent of the area is left under forest cover.

Table 3.13: Profile of the Selected Villages in Mokokchung District at a glance

Particulars	Longkhum	Longsa	Yajang
Location			
Geographical Area	39 sq. km	53.43 sq. km	22 sq. km
Distance from District HQ	20km	30 km	90km
Demography			
No. of Household	546	772	505
Total Population (persons)	3,811	3,206	2,603
• Male	1,961	1,619	1,391
• Female	1,850	1,587	1,212
Literates (persons)	3,301	2,596	1,837
• Male	1,704	1,330	999
• Female	1,597	1,266	838
Total Work Force	2,155	1,868	1,756
Cultivators	1,657	1,531	1,397
Agricultural Labours	24	37	87
Households	54	38	11
Other Workers	420	262	261
Land Utilization			
Total Cultivated area (in ha)	3,709	4,782	1,771
Forest (in ha)	150	450	430

Source: Census of India, Primary Census Abstract, Nagaland, 2011
Census of India (2011). Retrieved on 7th June 2014 from http://www.censusindia.gov.in/pca/SearchDetails.aspx?Id=284398,http://commissionernagaland.com/Districts/Villages/VillageDetail.aspx?VillageID=241&DistrictID=40

3.3.2 Wokha District

Soku Village: The Soku village situated on the North of Wokha District is about 42 km away from the District HQs covers an area of 800 hectares. The village is composed of 80 households with the total population of 350 of which male population constitute 51.43 percent and female 48.57 percent (Table 3.14). The overall literacy of the village is 72.86 percent with male population having more literates than the female literates. The TWPR of the village is 35.43 percent of which the percentage of cultivators to total workers is 22%; other workers: 13.14% and household industries: 0.29%. The total area under the forest cover is more than cultivated area in the village.

Table3.14: Profile of the Selected Villages in Wokha District at a glance

Particulars	Soku	Akuk	N. Longidang
Location			
Geographical Area	8 sq. km	30 sq. km	39.15 sq. km
Distance from District HQ	42km	65km	21km
Demography			
No. of Households	80	842	436
Total Population	350	4,213	2,318
• Male	180	2,132	1,146
• Female	170	2,081	1,172
Literates (persons)	255	3,128	1,650
• Male	132	1,617	851
• Female	123	1,511	799
Total Work Force	124	1,930	1,044
Cultivators	77	1,701	952
Agricultural Labours	0	16	0
Households	1	29	7
Other Workers	46	184	85
Land Utilization			
Total Cultivated area (in ha)	343	2,386	3,310
Forest (in ha)	483	285	550

Source : Census of India, Primary Census Abstract, Nagaland, 2011.
Census of India (2011). Retrieved on 7th June 2014 from
http://www.censusindia.gov.in/pca/SearchDetails.aspx?Id=284398

Akuk Village: The total geographical area of the village is 30 sq. km situated about 65 km away from the District HQs and its percentage share to total area of the District is about 1.84 percent. The village is composed of 842 households with the total population of 4,213 of which male population constitute 50.61 percent and female 49.39 percent (Table 3.14). The overall literacy of the village is 74.25 percent with male population having more literates than the female population. The TWPR of the village is 45.81 percent of which the percentage of cultivators to total workers is 40.38%; other workers: 4.37%; household industries: 0.69% and agricultural labourers: 0.38%. This reveals that more than 40 percent of the rural population remain engaged in agricultural activities throughout the year while, only 4.37 percent of the working force are found to engaged in tertiary sectors. The total cultivated land is 2,386 ha and the area under forest cover is 285 ha.

N. Longidang Village: The total geographical area of the village is 39.15 sq. km situated 21 km away from the District HQs and its percentage to total area of the District is about 2.4 percent. The village is composed of 436 households with the total population of 2,318 of which male population constitute 49.44 percent and female 50.56 percent (Table 3.14). The overall literacy of the village is 71.18 percent with male population having more literates than the female literates. The TWPR of the village is 45.04 percent of which the percentage of cultivators to total workers is 41.07%; other workers: 3.67% and household industries: 0.30%. This reveals that more than 41 percent of the population is engaged in agricultural activities and about 3.67 percent of the working force is engaged in tertiary sector. The total cultivated land is 3,310 ha and the area under forest cover is 550 ha.

3.4 PROFILE OF THE RESPONDENTS

In this section of the thesis, an attempt has been made to analyse the socio-economic status of the respondents as it was felt essential the behaviour of marketable and marketed surplus has substantial interconnection on socio-economic base. The variables chosen for socio-economic base of the respondents are limited to land holding, age composition of the respondent, income, educational level and occupational pattern to hold the study brief.

3.4.1 Respondents according to Household, Area and Farm Size

Mokokchung District: The detail distribution of respondents according to household, cultivated area under crop and farm size of all three villages in Mokokchung District is shown in Table 3.15. All sample respondents in Longkhum and Longsa village are categorized as marginal farmers accept for Yajang village where there are three classes of farm size.

Table 3.15: Distribution of respondents according to Household, Area and Farm size in Mokokchung District

Village/Farm size	No.of household	% to total household	Cultivated area under crop (ha)	% to total cultivated area	Average cultivated area per Farm (ha)
Longkhum village	50	100.00	20.13	100.00	0.40
Longsa village	50	100.00	17	100.00	0.34
Yajang village	50	100.00	97	100.00	1.94
• Marginal	13	26.00	13	13.4	1
• Small	29	58.0	58	59.79	2
• Semi-medium	8	16.0	26	26.8	3.25
Overall	150	100.00	134.13	100.00	0.89
• Marginal	113	75.33	50.13	37.37	0.44
• Small	29	19.33	58	43.24	2
• Semi-medium	8	5.33	26	19.38	3.25

Source: Based on Field survey, 2012-13

From the table it can be seen that, the total cultivated area for cabbage, chilli and orange in Longkhum, Longsa and Yajang villages are 20.13 hectare, 17 hectare and 97 hectare with the average area of 0.4 hectare, 0.34 hectare and 1.94 hectare respectively. The table further results that, about 58.0 percent of the respondents in Yajang village are small famers; 26 percent marginal and 16 percent large farmers. Thus, 59.79 percent of the total area is cultivated by the small farmers; semi-medium: 26.8% and marginal farmers: 13.4% respectively. The average cultivated area for marginal farmers is 1 ha; small farmers: 2 ha and semi-medium farmers: 3.25 ha.

Wokha District: The detail distribution of respondents according to household, cultivated area and farm size of all the selected villages in Wokha District is shown in Table 3.16. The table shows that, the total cultivated area for cabbage, chilli and orange in Soku, Akuk and N. Longidang villages are 12.32 hectares, 14.08 hectares and 47.12 hectares respectively. The average cultivated area for respective crops in Soku, Akuk and N. Longidang villages is 0.25 hectare, 0.28 hectare and 0.94 hectare.

Table 3.16: Distribution of respondents according to Household, Area and Farm size in Wokha District

Village/Farm size	No. of household	% to total household	Cultivated area under crop (ha)	% to total cultivated area	Average cultivated area per Farm (ha)
Soku village	50	100.00	12.32	100.00	0.25
Akuk village	50	100.00	14.08	100.00	0.28
N. Longidang village	50	100.00	47.12	100.00	0.94
• Marginal	42	84.0	31.12	66.04	0.74
• Small	8	16.0	16	33.96	2
Overall	150	100.00	73.52	100.00	0.49
• Marginal	142	94.67	57.52	78.24	0.41
• Small	8	5.33	16	21.76	2

Source: Based on Field Survey, 2012-13

Whilst in N. Longidang village of Wokha District, there are two category of farm size: marginal and small farmers with 84.0 percent of the total respondents in marginal farm group and 16.0 percent in small farm group; this shows the percentage of orange growers in N. Longidang village are mostly marginal farmers. The table further shows that, 66.04 percent of the total area is cultivated by the marginal farmers with an average of 0.74 hectare while the remaining 33.96 percent is cultivated by the small farmers with an average of 2 hectare. Thus, the average holding size in all selected villages according to the respective crops is comparatively higher in Mokokchung District when compared to Wokha District.

3.4.2 Age Composition and Dependency Ratio

Mokokchung District: The age composition and dependency ratio of sample respondents of the selected villages in Mokokchung District are presented in the Table 3.17. Year of crop practicing is significant as it determines the experience of the farmer and the year the particular crop has been growing in the area. It also determines the crop dominance in the socio-economic life of the farmer through production, retention and marketing of surplus produce. The overall average age of the sample respondents is 58.15

years and the year of crop practicing is 23.54 years; indicating the predominance of the sample respondents on land for their livelihood. The total family size of the sample respondents in Mokokchung District is found out to be 904 with an average of 6.48 and dependency ratio of 12.72 percent. Among the villages in Mokokchung District, the average age of the respondents in Longsa village is higher while the average size of the family members and dependency ratio of children below 15 years is higher in Longkhum village. The average age of the sample respondents, years of crops practicing and family size across all farm size is eminent in the semi-medium farmers while dependency ratio is towering in the marginal farm size groups.

Wokha District: Table 3.18 presents age composition and dependency ratio of sample households of the selected villages in Wokha District. Among the villages in Wokha District, the average age, family size and dependency ratio in Akuk village is relatively higher than Soku and N. Longidang village. The overall average age of the sample respondents is 58.33 years and the year of crop practicing is 22.31 years. The total family size of the sample respondents in Wokha District is 881 with an average of 6.88 and dependency ratio of 11.66 percent. The average age and average family size of the sample respondents is comparatively higher in Wokha District while year of cropping experience and children below 15 years is eminent in Mokokchung District.

3.4.3 Income and Farm size

Another important aspect on the socio-economic base of the sample respondents in both the Districts is its income (monthly) as presented in Table 3.19 and Table 3.20. In the present study, the respondents are distributed into four categories according to their income; the first group below Rs. 5,000; the second group between Rs. 5,001-10,000; the third group between Rs. 10,001-15,000 and the fourth group above Rs 15,000.

Mokokchung District: In the overall situation in Mokokchung District, majority of the respondents are in the second and third income group and only 6.67 percent of the respondents are in the income group above Rs. 15,000 per month while, 14 percent of the

sample household are in the low income group below Rs. 5,000 (Table 3.19). Across the farm size, marginal farmers have high concentration of respondents in the income group below Rs. 5,000 whereas the large farmers are concentrated mostly in the third and fourth income groups. In Longkhum village, 56 percent of the respondents are in the income group between Rs. 5,001-10,000 and about 24 percent are in the low income group below Rs. 5,000. Similarly, in Longsa village and Yajang village more than 40 percent of the respondents are in the second and third income group while their percent in the income group above Rs. 15,000 is much lower comparing to Longkhum village. In Yajang village, among the marginal farmers no respondents recorded in the income range above Rs. 15,000 likewise, respondents in the small and semi-medium farmers did not show in the income group below Rs. 5,000.

Wokha District: Similarly in Wokha District, in the overall situation 50.67 percent of the respondents are in the second income group followed by third group, first group and the fourth group (Table 3.20). The percentage of respondents in the income group above Rs. 15,000 is comparatively lower than Mokokchung District while its percent in the income group below Rs. 5,000 is eminent in Wokha District. The table further reveals that, as farm size increases, the percentage concentration of respondents in the high income group increases. In Soku and Akuk village, large proportion of the respondents has income below Rs. 10,000; and these respondents did not record income above Rs. 15,000. Whereas in N. Longidang village, more than 48 percent of the respondents are in the income group between Rs. 10,001-15,000 resulting better economic status of the farmers in this village comparing to Soku village and Akuk village.

Table 3.17: Age-wise composition of respondents in Mokokchung District

Village/Farm size	No. of house-hold	Avg. Age of the head of HH	Year of crop practicing	15 years below			Adult (15-64 years)			Total family member	Family size (Avg.)	Dependency ratio
				M	F	Total	M	F	Total			
Longkhum village	50	57.64	14.74	24	19	43	148	124	272	315	6.3	15.81
Longsa village	50	58.34	21.82	15	13	28	142	118	260	288	5.76	10.77
Yajang village	50	57.92	24.55	16	15	31	148	122	270	301	6.02	11.48
• Marginal	13	56.97	23.31	5	6	11	27	25	52	63	4.85	21.15
• Small	29	57.88	24.93	8	8	16	90	73	163	179	6.17	9.82
• Semi-medium	8	58.91	25.41	3	1	4	31	24	55	59	7.37	7.27
Overall	150	58.15	23.43	55	47	102	438	364	802	904	6.03	12.72
• Marginal	113	57.65	19.96	44	38	82	317	267	584	666	5.89	14.01
• Small	29	57.88	24.93	8	8	16	90	73	163	179	6.17	9.82
• Semi-medium	8	58.91	25.41	3	1	4	31	24	55	59	6.48	7.27

Source: Based on Field Survey, 2012-13

Table 3.18: Age-wise composition of respondents in Wokha District

Village/Farm size	No. of house-hold	Avg. Age of the head of HH	Year of crop practicing	15 years below			Adult (15-64 years)			Total family member	Family size (Avg.)	Dependency ratio
				M	F	Total	M	F	Total			
Soku village	50	56.4	12.25	14	16	30	117	111	228	258	5.16	13.16
Akuk village	50	58.54	23.6	21	17	38	143	137	280	318	6.36	13.57
N. Longidang village	50	58.19	24.13	11	13	24	148	133	281	305	6.1	8.54
• Marginal	42	57.08	23.41	11	13	24	110	107	217	241	5.74	11.06
• Small	8	59.31	24.86	-	-	-	38	26	64	64	8	-
Overall	150	58.33	22.31	46	46	92	408	381	789	881	6.88	11.66
• Marginal	142	57.34	19.75	46	46	92	370	355	725	817	5.75	12.69
• Small	8	59.31	24.86	-	-	-	38	26	64	64	8	-

Source: Based on Field Survey, 2012-13

Table 3.19: Distribution of respondents according to income in Mokokchung District

Village/Income (Rs)	Below 5,000	5,001-10,000	10,001-15,000	15,000 Above	Total
Longkhum Village	12 (24.0)	28 (56.0)	4 (8.0)	6 (12.0)	50 (100.00)
Longsa Village	5 (10.0)	24 (48.0)	20 (40.0)	1 (2.0)	50 (100.00)
Yajang Village	4 (8.0)	22 (44.0)	21 (42.0)	3 (6.0)	50 (100.00)
• Marginal	4 (30.77)	3 (23.08)	6 (46.15)	-	13 (100.00)
• Small	-	18 (62.07)	10 (34.48)	1 (3.45)	29 (100.00)
• Semi-medium	-	1 (12.5)	5 (62.5)	2 (25.0)	8 (100.00)
Overall	21 (14.0)	74 (49.33)	45 (30.0)	10 (6.67)	150 (100.00)
• Marginal	21 (18.58)	55 (48.67)	30 (26.55)	7 (6.19)	113 (100.00)
• Small	-	18 (62.07)	10 (34.48)	1 (3.45)	29 (100.00)
• Semi-medium	-	1 (12.5)	5 (62.5)	2 (25.0)	8 (100.00)

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis is in percentage to total

Table 3.20: Distribution of respondents according to income in Wokha District

Village/Income (Rs)	Below 5,000	5,001-10,000	10,001-15,000	15,000 Above	Total
Soku Village	15 (30.0)	29 (58.0)	6 (12.0)	-	50 (100.00)
Akuk Village	12 (24.0)	27 (54.0)	11 (22.0)	-	50 (100.00)
N. Longidang Village	3 (6.0)	20 (40.0)	24 (48.0)	3 (6.0)	50 (100.00)
• Marginal	3 (7.14)	20 (47.62)	18 (42.86)	1 (2.38)	42 (100.00)
• Small	-	-	6 (75.0)	2 (25.0)	8 (100.00)
Overall	30 (20.0)	76 (50.67)	41 (27.33)	3 (2.0)	150 (100.00)
• Marginal	30 (21.13)	76 (53.52)	35 (25.65)	1 (0.7)	142 (100.00)
• Small	-	-	6 (75.0)	2 (25.0)	8 (100.00)

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis is in percentage to total

3.4.4 Educational Status of the Respondents

Mokokchung District: The distribution of sample households in Mokokchung District according to their educational status is given in Table 3.21. It can be noted from the table the overall percentage of illiterates is comparatively very low among the sample households in Mokokchung District than Wokha District (see Table 3.22). Taking all the sample respondents together, 1.33 percent of the total respondents are illiterate in Mokokchung District. The percentage of illiterates is found to be high in the small farm groups (3.45%) in Mokokchung District while no illiterates are recorded among the semi-medium famers. The overall level of education is high at the primary level (50%) followed by secondary (36.67%) higher secondary (6.67%) and degree (5.33%). In Longkhum village, out of 50 respondents 26 percent have primary education; 54% secondary; 12% higher secondary and 8% degree. There are no illiterates among the respondents in Longkhum village. Whereas in Longsa and Yajang villages of Mokokchung District, the sample respondents have 2 percent of illiterates respectively and with large percentage of the respondents have only primary education followed by secondary and degree. This shows that, the level of educational attainment is higher in Longkhum village than Longsa and Yajang village.

Wokha District: The distribution of sample households in Wokha District according to their educational status is given in Table 3.22. The overall illiterates are 3.33 percent in Wokha District with 12.5 percent in the small farm size and 2.82 percent in the marginal farm size. Likewise in Mokokchung District, the percentage of total respondents in Wokha District having primary level of education is higher and least in degree. In Soku village, out of 50 respondents 4 percent are illiterate and 60 percent have primary education; 34% secondary; and 2% degree. There are no higher secondary among the respondents in Soku village. Whereas in Akuk village there are no illiterates with 76 percent of the respondents having primary education; 22 percent secondary education and 2 percent higher education with no degree education. Similarly in N. Longidang village, 72 percent of the total respondents have primary education and only 2 percent have degree certificate with 6 percent of illiterates. Thus, on contrary to Mokokchung District,

the percentage of illiterate and primary education is higher in Wokha District while percentage of secondary, higher secondary and degree education is comparatively higher in Mokokchung District than Wokha District.

Table 3.21: Educational status of respondents in Mokokchung District

Village/Farm size	Educational level					
	Illiterate	Primary	Secondary	Higher Sec.	Degree	Total
Longkhum village	-	13 (26.0)	27 (54.0)	6 (12.0)	4 (8.0)	50 (100.00)
Longsa village	1 (2.0)	29 (58.0)	15 (30.0)	3 (6.0)	2 (4.0)	50 (100.00)
Yajang village	1 (2.0)	33 (66.0)	13 (26.0)	1 (2.0)	2 (4.0)	50 (100.00)
• Marginal	-	8 (61.54)	4 (30.77)	-	1 (7.69)	13 (100.00)
• Small	1 (3.45)	21 (72.41)	5 (17.24)	1 (3.45)	1 (3.45)	29 (100.00)
• Semi-medium	-	4 (50.0)	4 (50.0)	-	-	8 (100.00)
Overall	2 (1.33)	75 (50.0)	55 (36.67)	10 (6.67)	8 (5.33)	150 (100.00)
• Marginal	1 (0.88)	50 (44.25)	46 (40.71)	9 (7.96)	7 (6.19)	113 (100.00)
• Small	1 (3.45)	21 (72.41)	5 (17.24)	1 (3.45)	1 (3.45)	29 (100.00)
• Semi-medium	-	4 (50.0)	4 (50.0)	-	-	8 (100.00)

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis is in percentage to total

Table 3.22: Educational status of respondents in Wokha District

Village/Farm size	Educational level					
	Illiterate	Primary	Secondary	Higher Sec.	Degree	Total
Soku village	2 (4.0)	30 (60.0)	17 (34.0)	-	1 (2.0)	50 (100.00)
Akuk village	-	38 (76.0)	11 (22.0)	1 (2.0)	-	50 (100.00)
N. Longidang village	3 (6.0)	36 (72.0)	9 (18.0)	1 (2.0)	1 (2.0)	50 (100.00)
• Marginal	2 (4.76)	30 (71.43)	8 (19.05)	1 (2.38)	1 (2.38)	42 (100.00)
• Small	1 (12.5)	6 (75.0)	1 (12.5)	-	-	8 (100.00)
Overall	5 (3.33)	104 (69.33)	37 (24.67)	2 (1.33)	2 (1.33)	150 (100.00)
• Marginal	4 (2.82)	98 (69.01)	36 (25.35)	2 (1.41)	2 (1.41)	142 (100.00)
• Small	1 (12.5)	6 (75.0)	1 (12.5)	-	-	8 (100.00)

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis is in percentage to total

3.4.5. Occupational pattern of the Respondents

Mokokchung District: The occupational pattern of the respondents of each selected villages in Mokokchung District is presented in Table 3.23. It may be seen from the table that in the overall farm situation, 70 percent of the respondents are owner cultivators, 10.67 percent are agricultural labourers and 19.33 percent are in service sector. This shows that, 80.67 percent of the total respondents depend upon agriculture activities for their livelihood. The percentage of agricultural labourers is found to be high among the small farmers while the percentage of workers in service sector is high among marginal farmers. The percentage of respondents both as cultivators and agricultural labourers is found to be more than 86 percent in Longsa and Yajang village while 68 percent of the respondents engaged either as cultivators or agricultural labourers in Longkhum village. This reveals that, respondents in Longkhum village are moving more towards service sector comparing to Longsa and Yajang village.

Table 3.23: Occupational pattern of Respondents in Mokokchung District

Village/Farm size	Occupationalpattern			
	Cultivators (Owners)	Agricultural labourers	Service	Total
Longkhum village	31 (62.0)	3 (6.0)	16 (32.0)	50 (100.00)
Longsa village	37 (74.0)	7 (14.0)	6 (12.0)	50 (100.00)
Yajang village	37 (74.0)	6 (12.0)	7 (14.0)	50 (100.00)
• Marginal	8 (61.54)	2 (15.38)	3 (23.0)	13 (100.00)
• Small	22 (75.86)	4 (13.79)	3 (10.34)	29 (100.00)
• Semi-medium	7 (87.5)	-	1 (12.5)	8 (100.00)
Overall	105 (70.0)	16 (10.67)	29 (19.33)	150 (100.00)
• Marginal	76 (67.26)	12 (10.62)	25 (22.12)	113 (100.00)
• Small	22 (75.86)	4 (13.79)	3 (10.34)	29 (100.00)
• Semi-medium	7 (87.5)	-	1 (12.5)	8 (100.00)

Source : Based on Field survey, 2012-13
Note : Figure in parenthesis is in percentage to total

Wokha District: Table 3.24 depicts the occupational pattern of the respondents of each selected villages in Wokha District. It may be seen from the table that in the overall farm situation, 77.33 percent of the total respondents are owner cultivators, 11.33 percent are agricultural labourers indicating that 88.66 percent of the sample respondents depend on land for their living while, the remaining 11.33 percent are engaged in service sector. On contrary, the percentage of agricultural labourers is found to be high among the marginal farmers in Wokha District and high percentage of small farmers engaged in service sector. Thus, number of cultivators and agricultural labourers is comparatively higher in Wokha District suggesting predominance of agrarian and poor economy of the people whereas number of respondents in the service sector is relatively higher in Mokokchung District.

Table 3.24: Occupational pattern of Respondents in Wokha District

Village/Farm size	Occupational pattern			
	Cultivators (Owners)	Agricultural labourers	Service	Total
Soku village	38 (76.0)	5 (10.0)	7 (14.0)	50 (100.00)
Akuk village	41 (82.0)	4 (8.0)	5 (10.0)	50 (100.00)
N. Longidang village	37 (74.0)	8 (16.0)	5 (10.0)	50 (100.00)
• Marginal	30 (71.43)	8 (19.05)	4 (9.52)	42 (100.00)
• Small	7 (87.5)	-	1 (12.5)	8 (100.00)
Overall	116 (77.33)	17 (11.33)	17 (11.33)	150 (100.00)
• Marginal	109 (76.76)	17 (11.97)	16 (11.27)	142 (100.00)
• Small	7 (87.5)	-	1 (12.5)	8 (100.00)

Source : Based on Field survey, 2012-13
Note : Figure in parenthesis is in percentage to total

Recapitulation

Gathering statistical and theoretical information from statistical departments, census reports, annual handbooks, published and unpublished reports, journals, as well as from the respondents in selected villages and other reliable sources of the study area is presented in this chapter. It presents location, history, culture, demography, agriculture, education and income levels of respondents and other economic characteristics of the study areas for development of agriculture/horticultural sectors which are the major indicators to understand the behaviour of village economy.

The study resulted that, the average holding size in all selected villages according to the respective crops is comparatively higher in Mokokchung District when compared to Wokha District. The average age and family size of the respondents is comparatively higher in Wokha District while year of cropping experience and children below 15 years

is eminent in Mokokchung District. In the overall situation in Mokokchung District, 6.67 percent of the respondents are in the income group above Rs. 15,000 and 14 percent in the low income group below Rs. 5,000 whereas in Wokha District, only 2% percent of the respondents are in the income group above Rs. 15,000 and 20 percent in the low income group below Rs. 5,000. Likewise, the percentage of illiterates and primary education is higher in Wokha District while percentage of secondary, higher secondary and degree education is comparatively higher in Mokokchung District. While in case of occupation, the number of cultivators and agricultural labourers is comparatively higher in Wokha District suggesting predominance of agrarian and poor economy of the people whereas number of respondents in the service sector is relatively higher in Mokokchung District.

CHAPTER IV

ESTIMATION OF MARKETABLE AND MARKETED SURPLUS OF HORTICULTURAL CROPS

CHAPTER IV

ESTIMATION OF MARKETABLE AND MARKETED SURPLUS OF HORTICULTURAL CROPS

Introduction

The marketing practices of the farmers are determined mainly on the basis of surplus available with them, after meeting own requirements. The market structure and behaviour on the other hand determine the incentives for the farmers to sell their surplus. Further, market structure and conduct depend on the quantity of surpluses available to be handled by the system. In this context, the estimates of marketable and marketed surplus assume critical importance for farmers, marketing system as well as for framing suitable policy. Volume of marketable and marketed surplus product also affects the supplies and prices of commodity for the non-farm population and agro based industries (Shah and Manish, 2013)[79]. In this context, estimation of marketed and marketable surplus ratio for horticultural commodities and particularly of fruits and vegetables has attracted the more attention of researchers and policy makers. The present chapter focuses on the area, production, farm retention, post-harvest losses, marketable and marketed surplus and the factors determining marketed surplus, and it is classified into three broad sections: Section I presents the area, production and productivity of selected horticulture crops; Section II highlights the marketable surplus after retaining for home consumption and other use, and the quantity actually marketed; Section III deals with factors determining marketed surplus and its impact on the marketed surplus with the application of linear regression model (statistical analysis and interpretation of the data).

[79] Shah, V.D & ManishMawana (2013). Marketable and Marketed surplus of major food grains in Rajasthan. *Agro-Economic Research Centre (AERC report 150)*. Gujarat: Sardar Vallabhbhai Patel University.

4.1 AREA, PRODUCTION AND PRODUCTIVITY

The sample respondents of cabbage and chilli growers in both the Districts are categorized to marginal farmers as their cultivated area to respective crops is below 1 hectare while in case of orange, the respondents are accordingly classified into marginal, small and semi-medium farmers (based on NSSO classification of land holding[80]).

4.1.1 Cabbage

Cabbage[81] is popular both for commercial production and for home gardens. Commercially, annual world production in 2011 was about 69 million metric tons (FAO, 2013)[82] with China producing 46 percent of the world total followed by India producing 12 percent. According to Indian Horticulture Database[83], during the period 2012-13, the total production of cabbage in India was 8534.2 thousand metric tons (MT) cultivated at an area of 372.4 thousand hectares with West Bengal producing 26%; Odisha: 13%; Bihar: 9%; Gujarat and Assam 8% respectively. Total production of cabbage during the period 2012-13 in Nagaland is recorded to be 20 thousand metric tons with used surface area of 2000 hectares[84]. The major cabbage growing belts in Nagaland are Kohima, Wokha, Mokokchung, Phek, Dimapur and Peren. The total cultivated area of cabbage[85] in Mokokchung and Wokha Districts were 150 and 210 hectares producing 1500 MT and 2100 MT respectively during the same period.

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[80] NSSO Report No. 492 (2006). *Some aspects of operational land holdings in India, 2002-03.* Ministry of Statistics and Programme Implementation, (GoI), p. 2. Retrieved on 26th May 2014 from http://mospi.gov.in/nss_press_note_492.htm

[81] Cabbage (***Brassica oleracea* or *B. oleracea* var. *capitata***) is a leafy hardy vegetable that grows especially well in fertile soils with a pH between 6.0 and 6.8 and temperatures between 4 and 24 °C (39 and 75 °F). Cabbage can be of green cabbage, red cabbage and savoy cabbage. Firm headed green cabbage is most common grown crop. Cabbage is a good source of vitamin K, vitamin C and dietary fiber.

[82] Wikipedia (2014). *Cabbage.* Retrieved on 23rd July 2014 fromhttp://en.wikipedia.org/wiki/Cabbage

[83] National Horticulture Database (2013). *Indian Horticulture Database, 2013.* Gurgaon: Ministry of Agriculture, Government of India, p.139.

[84] Statistical handbook of Nagaland (2013). Kohima: Directorate of Economics & Statistics, Government of Nagaland, p.74.

[85] Cabbage in both the selected villages of Mokokchung and Wokha District are sown in the month of late March to first week of April and are harvested from the month of mid July till second week of August.

Table 4.1: Area, production and productivity of cabbage

(Area-hectare, Production-quintal & Productivity-q/ha)

Village	Area (hectare)		Total production (q)	Productivity (q/ha)
	Total Area	Average		
Longkhum village (N=50)	20.13	0.40	464.7 9.29*	23.08
Soku village (N=50)	12.32	0.25	236.7 4.73*	19.21

Source : Based on Field Survey, 2012-13

Note : N – Total number of respondents

* - are in average production

Table 4.1 shows the area, production and productivity of cabbage in selected villages of Longkhum and Soku in Mokokchung and Wokha Districts respectively. Out of 20.13 hectare used surface area, the total production of cabbage is about 464.7 quintals in Longkhum village whereas, in their counterpart village of Soku village, out of 12.32 hectare used surface area, the total production of cabbage is 236.7 quintals relatively lower than the Longkhum village. The average land holding of all farms in Longkhum village is 0.4 hectare whereas it is only 0.25 hectare in Soku village. Likewise, the average production of cabbage per farm in Longkhum village is high as 9.29 quintals while in Soku village it is 4.73 quintals per farm. The table further reveals that the productivity of cabbage per hectare is higher in Longkhum village (23.08 q/ha) than their counterpart village producing 18.92 q/ha.

4.1.2. Chilli

India is the world's largest producer, consumer and exporter of chillies[86] in the world[87] followed by China. Guntur (Andhra Pradesh) produces 30% of all the chillies

[86] Chilli (***Capsicum annuum* L.; *Capsicum frutescens* L.**) is a fruit belonging to the family of 'Solanaceae' which also includes tomato and potato, are small in size and are known for their sharp acidic flavor and color. It grows well in fertile soils with a pH between 5.0 and 6.0 and temperature between 28 and 32°C (82 and 89.6° F). It contains large amount of vitamin C and small amounts of carotene (provitamin A).

[87] Dry chilli (2014). Retrieved on 24th July 2014 from http://www.agrocrops.com/red-dry-chillies.php

produced in India[88], and the state of Andhra Pradesh as a whole contributes 75% of India's chilli exports. India exports around 80,000 – 100,000 MT of chillies every year in the form of dried chilli, Chilli powder, picked chilli and Chilli oleoresin. Indian Chilli is mainly exported to USA, Sri Lanka, Bangladesh, the Middle East and the Far East. During the period 2012-13, it is estimated that Nagaland produces 30,000 MT of chilli from an area of 4000 hectare[89]. Wokha, Kohima and Tuensang Districts contribute equally the highest in terms of area (12.5%) and production (12.5%) of chilli followed by Mokokchung (area: 10.0%; output: 10.0%), Phek and Mon Districts.

With an area of 17 hectare and 14.08 hectare, the total production of chilli[90] is recorded to be 470.17 quintals and 369.88 quintals in Longsa and Akuk village respectively as given in Table 4.2. The table further indicates the average holding size and average production per farm is comparatively higher in Longsa village than in Akuk village. Similarly, the productivity per hectare is 27.66 quintals in Longsa village and 26.27q/ha in Akuk village with marginally higher in the former village. The post-harvest production of chilli in both the villages showed maximum output in the month of July as presented in the Table 4.3. Out of 470.17 quintals of chilli produced in Longsa village, 41.92 percent is produced in July, 31.25 percent in June and 26.83 percent in August. Likewise in Akuk village, percentage of production is highest in the month July (42.28%) followed by June and August. Hence, the peak season for harvesting of chilli in both the villages is in the month of June and the lean season is in August.

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[88] Post-harvest profile of Chilli (2009). Nagpur: Directorate of Marketing and Inspection, Government of India. Retrieved on 19th June 2014 from http://agmarknet.nic.in/preface-chhilli.pdf

[89] Statistical Handbook of Nagaland (2013). Ibid.

[90] Chilli in the study area is sown in the month of late February and early March and harvesting is done from June and continues till August (for three months). Both the villages show high output in July (peak season) and low output in August (lean season).

Table 4.2: Area, production and productivity of chilli

(Area-hectare, Production-quintal & Productivity-q/ha)

Village	Area (hectare)		Total production (q)	Productivity (q/ha)
	Total Area	Average		
Longsa village (N=50)	17	0.34	470.17 9.4*	27.66
Akuk village (N=50)	14.08	0.28	369.88 7.4*	26.27

Source : Based on Field Survey, 2012-13
Note : N – Number of respondents
* - are in average production

Table 4.3: Post-harvest production period of chilli

(In quintal)

Village	Production			
	June	July	August	Total
Longsa Village (N=50)	146.95 (31.25)	197.08 (41.92)	126.14 (26.83)	470.17 (100.00)
Akuk Village (N=50)	112.35 (30.37)	156.38 (42.28)	101.15 (27.35)	369.88 (100.00)

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis is in percentage to total

4.1.3 Orange

According to Indian Horticulture database[91], during the period 2012-13, the total production of orange is recorded to be 2906.3 thousand MT with the surface area of 311.2 thousand hectares. In India, Punjab is the leading producing State with 34 percent, Madhya Pradesh 29 percent and Maharashtra 13 percent respectively. Indian oranges are exported to Bangladesh, Nepal, Sri Lanka, Canada, U.S.A., U.K., Germany and Gulf countries viz. Saudi Arabia, U.A.E., Qatar, Bahrain, Kuwait and Oman[92]. Similarly, the

[91] Indian Horticulture Database (2013). Ibid, p.76.
[92] Orange/Mandarin (2014). Retrieved on 25th July 2014 from http://www.nhb.gov.in/Horticulture%20Crops%5Corange%5Corange1.htm

total production of orange in Nagaland[93] is recorded to be 50, 000 MT with an area of 5,500 hectares with Mokokchung District leading the highest in area and production (area: 950 ha; output: 8500 MT). The major producing orange belts in Nagaland are concentrated in Mokokchung, Wokha, Kohima, Kiphire and Peren[94].

Area, production and productivity of the sample respondents in Yajang village of Mokokchung District and N. Longidang village of Wokha District are presented in the Table 4.4 and Table 4.5. Table 4.4 shows three categories of farmers in Yajang village of which 13 respondents are marginal farmers; 29 are small farmers; and 8 are semi-medium farmers with small farmers occupying 58 percent of the total respondents in the village. The average cultivated area for marginal, small and semi-medium farmers is 1 ha, 2 ha and 3.25 ha respectively with a ratio of 1:3.25 from marginal to semi-medium farmers. The overall cultivated area and production of orange in Yajang village of Mokokchung District is 97 hectare and 7195 quintals with the average area and production of 1.94 hectare and 143.9 quintals. The total cultivated land by marginal farmers is 13 ha; small: 58 ha; semi-medium: 26 ha with marginal farmers producing 1079 quintals; small farmers: 4143.5 quintals; and semi-medium farmers: 1981.5 quintals respectively. The all farm productivity per hectare is 74.17 quintals. The productivity is shown to be highest in marginal farm size (83 q/ha) followed by semi-medium and small farm groups.

However, in N. Longidang village of Wokha District, the sample respondents are categorized into marginal and small with marginal farmers making 84 percent of the total respondents. The total cultivated area and production of orange is 47.12 hectare and 3042.56 quintals out of which marginal farmers produce 2221 quintals and small farmers produce 820.6 quintals as shown in the Table 4.5. The table further reveals that the average production per hectare increase as farm size increases with a ratio of 1:2.98 from

[93] Nagaland is famous for mandarin orange (***Citrus reticulata***). It can grow in almost all types of soil having a pH range of 5.5 to 7.5 and annual temperature ranging 13° – 38° C. Small scale production of Sweet orange (***Citrus sinensis***), lemon (***Citrus limon***) and Pummelo (***Citrus grandis***) are also grown as backyard crop. Orange is rich in vitamin C, A, B and phosphorus.

[94] Statistical handbook ofNagaland (2011). Kohima: Directorate of Economics & Statistics, Government of Nagaland, p.54.

marginal to semi-medium farmers in Yajang village while it increases at the ratio of 1:1.94 in N. Longidang village. The average production of orange in Yajang village of Mokokchung District is about 2.36 times higher than the average production of orange in N. Longidang village of Wokha District and also its productivity per hectare in Yajang village is higher comparing to N. Longidang village.

The post-harvest production of orange across different farm size in both the villages is presented in Table 4.6, showing maximum quantity of orange produce in the month of December. Out of 7195 quintals of orange produced in Yajang village, 56.87 percent is produced in December, 36.4 percent in November and 6.73 percent in January. Likewise, in N. Longidang village, 61.25 percentage is produced in December followed by November (34.37%) and January (4.38%). Therefore, the peak season for harvesting of orange in both the villages is in the month of December and the lean season is in January.

Table 4.4: Area, production and productivity of orange (Yajang)

(Area-hectare, Production-quintal & Productivity-q/ha)

Category	Area (Hectare)		Total production (q)	Productivity (q/ha)
	Total Area	Average		
Marginal (N=13)	13	1	1079 83*	83.0
Small (N=29)	58	2	4143.5 142.88*	71.44
Semi-medium (N=8)	26	3.25	1981.5 247.69*	76.21
All Farms (N=50)	97	1.94	7195 143.9*	74.17

Source : Based on Field Survey, 2012-13

Note : N – Number of respondents

* - are in average production

Table 4.5: Area, production and productivity of orange (N. Longidang)

(Area-hectare, Production-quintal & Productivity-q/ha)

Category	Area (hectare)		Total production (q)	Productivity (q/ha)
	Total Area	Average		
Marginal (N=42)	31.12	0.74	2221.9 52.9*	71.40
Small (N=8)	16	2	820.66 102.58*	51.29
All Farms (N=50)	47.12	0.94	3042.56 60.85*	64.57

Source : Based on Field Survey, 2012-13
Note : N – Number ofrespondents
* - are in average production

Table 4.6: Post-harvest production period of orange

(In Quintal)

Category	Yajang			
	November	December	January	Total
Marginal(N=13)	405 (37.53)	624 (57.83)	50 (4.63)	1079 (100.00)
Small (N=29)	1416 (34.25)	2447 (59.18)	271.5 (6.57)	4134.5 (100.00)
Semi-medium (N=8)	798 (40.27)	1021 (51.53)	162.5 (8.2)	1981.5 (100.00)
All Farms (N=50)	2619 (36.4)	4092 (56.87)	484 (6.73)	7195 (100.00)
	N. Longidang			
Marginal (N=42)	737.6 (33.2)	1400.7 (63.04)	83.6 (3.76)	2221.9 (100.00)
Small (N=8)	308 (37.53)	463 (56.42)	49.66 (6.05)	820.66 (100.00)
All Farms (N=50)	1045.6 (34.37)	1863.7 (61.25)	133.26 (4.38)	3042.56 (100.00)

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis is in percentage to total

4.2 ESTIMATION OF MARKETABLE AND MARKETED SURPLUS

Producer's surplus plays a significant role in a developing economy. It is the quantity which is actually made available to the non-producing population and all market arrangements have to be made for the surplus available with the farmers. Marketable surplus is the residual left with the producer after meeting his requirements while, marketed surplus is the quantity actually sold by the producers irrespective of his farm requirements. The economist like M. Dobb, W.H. Nicholl and W.W. Rostow all favoured that marketed surplus must increase with production for rapid economic development. It helps to increase export and importing capital goods and other essential raw materials for robust economic growth in general and raising the income of farmers and contributes to improve the standard of living of producers and sellers in horticultural sector. An increase in marketed surplus will contribute to capital formation through providing requisites of horticultural production. There has been a prominent studies which provides the estimates of marketable and marketed surplus at micro and macro level and have been used to bring out the nature and extent of sale by various farmers (Kohls, 1967; Narain, 1961; Shepherd, 1965; Nadkarni, 1980; Goel and Singh, 1998; Joshi, 2011; Chauhan and Chabra, 2005; Baba et al., 2010; Ojogho and Alufohai, 2009; Chole et al., 2003; Upender, 1990; Sabhu, 2011; Gunwant, et al.,2012; Mehta and Chauhan, 1996; Sashimatsung et al.,2013; Kaur et al.,2013; Dastagiri et al., 2013; Kalidas and Akila, 2014).

The present study made an attempt to analyse the production, consumption, marketable and marketed surplus of selected horticultural commodities (cabbage, chilli and orange) in Mokokchung and Wokha Districts during the study period. Area under crop, output, home consumption and retention for other farm purposes are well known important determinants and is presented to identify the contribution of different categories of farmers to marketable surplus. Merely increase in agricultural production is not important for agrarian economics but marketable surplus must also increase simultaneously (Chole et al., 2003)[95]. The relation of marketable and marketed surplus

[95] Chole, V.M., Talathi J.M. and Naik, V.G. (2003, July-September). Price Spread in marketing of Brinjal in Maharashtra State. *Agricultural Marketing*, XLVI (2), 5-8.

may be more, less or equal depending upon the condition of farmer as well the nature of the crop. Marketed surplus is less than marketable surplus in most cases because of hoarding a part of commodity for better price in future. Contrary to that, there is not much difference between marketable and marketed surplus in case of fruits and vegetable because of its nature of perishability and seasonality.

4.2.1 Cabbage – Output, Retention, Marketable and Marketed Surplus

The overall production, farm retention, marketable and marketed surplus of cabbage in Longkhum and Soku villages are presented in Table 4.7. The table reveals that, the total production of cabbage in Longkhum village of Mokokchung District is 464.7 quintals with the average of 9.29 quintals of which the total retention for home consumption and other use is 15.95 quintals (3.43%); this left a marketable surplus of 96.57 percent. Contrary to that, the total production of cabbage in Soku village of Wokha District is 236.7 quintals with the average of 4.73 quintals which is lower than their counterpart village and the quantity retained for home consumption and other use is 18.8 quintals (7.94%) in the village. The marketable surplus is about 92.06 percent. The low percentage of marketable surplus in Soku village comparing to Longkhum village is because of their high retention purpose. About 1.08 percent of the total production is used for home consumption and about 2.35 percent is used as gift to friends, relatives and religious payment by the producers in Longkhum village while the percentage of home consumption and other use in Soku village is noticed to be higher comparing to Longkhum village. Self consumption and gift to friends and relatives in kind is relatively high in Soku village while its percentage of religious payment is found to be low comparing to Longkhum village.

Table 4.7: Production, retention, marketable and marketed surplus of cabbage

(In Quintal)

SI No.	Particulars	Longkhum		Soku	
		Quantity (q)	Average (q)	Quantity (q)	Average (q)
1	Production	464.7 (100.00)	9.29	236.7 (100.00)	4.73
2	Total Retention [a+b]	15.95 (3.43)	0.32	18.8 (7.94)	0.38
	[a] Self consumption	5.03 (1.08)	0.1	4.22 (1.78)	0.08
	[b] Other use	10.92 (2.35)	0.22	14.58 (6.16)	0.29
	• Gift to friends	1.10 10.07*	0.02	2 13.72*	0.04
	• Gift to relatives	1.24 11.36*	0.03	1.82 12.48*	0.04
	• Religious payment**	8.58 78.57*	0.17	10.76 73.8*	0.22
3	Marketable surplus	448.75 (96.57)	8.97	217.9 (92.06)	4.36
4	Post-harvest losses	47.35 (10.19)	0.95	60.53 (25.57)	1.21
5	Marketed surplus	401.4 (86.38)	8.03	157.37 (66.49)	3.15

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to total production

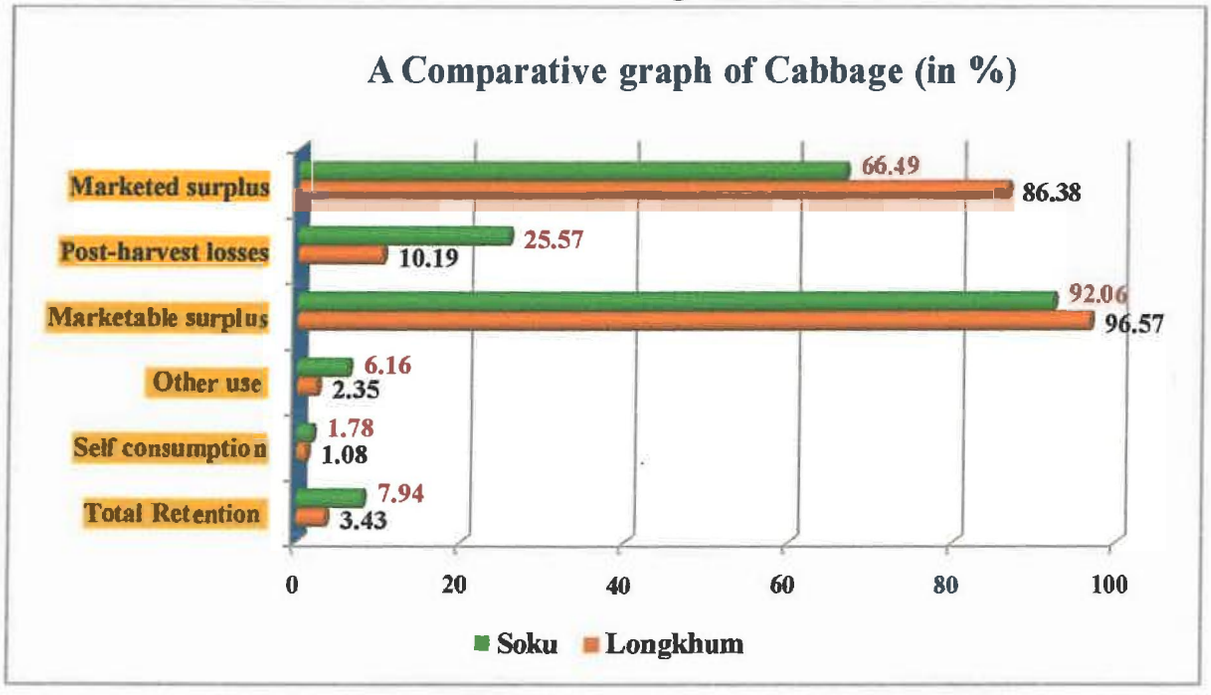
*- are in percentage to other use

**- Religious payments are given by the farmer in the form of tithes and offering to their respective local churches as thanksgiving and seeking blessing from the Almighty. This is both in cash and kind. In-case of cash amount is converted to kind accordingly to price/kg in order to correctly estimate marketable-(ed) surplus of the producer to total production.

The study found out that, an increase in production with less marketing opportunities for the farmers to sell the surplus leads to rise in home consumption and payment in kind as gift to friends and relatives. The average consumption of cabbage is, however, high in absolute terms among the farmers in Longkhum village than Soku village. Lack of post-harvest storage facility, lack of market link and marketing information, poor economic management and losses due to mishandling, wastage and

spoilage by removing the outer layer of the cabbage resulted in post-harvest losses of 47.35 quintals (10.19%) in Longkhum village and the actual quantity that is marketed by the producer is 401.4 quintals (86.38%). In the same way, in Soku village, the post-harvest losses due to lack of adequate economic infrastructure resulted about 60.53 quintals (25.57%). The average post-harvest loss per farm is observed to be high in Soku village than Longkhum village and thus, the marketed surplus in Soku village is 66.49 percent which is comparatively lower than the Longkhum village (86.38%). A comparative percentage retention, marketable surplus and marketed surplus of cabbage between Longkhum and Soku villages are exhibited in Figure 4.1.

Figure 4.1: Percentage retention and marketed surplus of cabbage in Longkhum and Soku village



4.2.2 Chilli – Output, Retention, Marketable and Marketed Surplus

Production, retention, marketable and marketed surplus of chilli between Longsa village of Mokokchung District and Akuk village of Wokha District are show in the Table 4.8.

Table 4.8: Overall production, retention, marketable and marketed surplus of chilli

(In Quintal)

SI No.	Particulars	Longsa		Akuk	
		Quantity (q)	Average (q)	Quantity (q)	Average (q)
1	Production	470.17 (100.00)	9.4	369.88 (100.00)	7.4
2	Total Retention [a+b]	44.66 (9.5)	0.89	32.88 (8.89)	0.66
	[a]. Self consumption	12.19 (2.59)	0.24	15.39 (4.16)	0.31
	[b]. Other use	32.47 (6.91)	0.65	17.49 (4.73)	0.35
	• Gift to friends	4.2 12.93*	0.08	1.13 6.46*	0.02
	• Gift to relatives	3.71 11.43*	0.07	1.71 9.78*	0.03
	• Gift to labours	1.58 4.87*	0.03	0.23 1.31*	0.0046
	• Religious payment**	22.98 70.77*	0.46	14.42 82.45*	0.29
3	Marketable surplus	425.51 (90.5)	8.51	337 (91.11)	6.74
4	Post-harvest losses	19.61 (4.17)	0.39	10.06 (2.72)	0.2
5	Marketed surplus	405.9 (86.33)	8.12	326.94 (88.39)	6.54

Source : Based on Field survey, 2012-13

Note : Figure in parenthesis is in percentage to total production

*- are in percentage to other use

**- see note in Table 4.7 [same as in the case of cabbage]

From the table it is noted that, the total production of chilli in Longsa village of Mokokchung District is 470.17 quintals with the average of 9.4 quintals of which the total retention for home consumption and other use is 44.66 quintals (9.5%) and remaining 425.51 quintals (90.5%) will be left as a marketable surplus. On the contrary to that, the total production of chilli in Akuk village of Wokha District is 369.88 quintals with the average of 7.4 quintals and the quantity retained for home consumption and other use is 32.88 quintals (8.89%) and this left a marketable surplus of 337 quintals (91.11%). The

percentage of marketable surplus to total production is slightly higher in Akuk village and this low percentage of marketable surplus in Longsa village is because of their elevated retention purpose especially for other use during the specific study year.

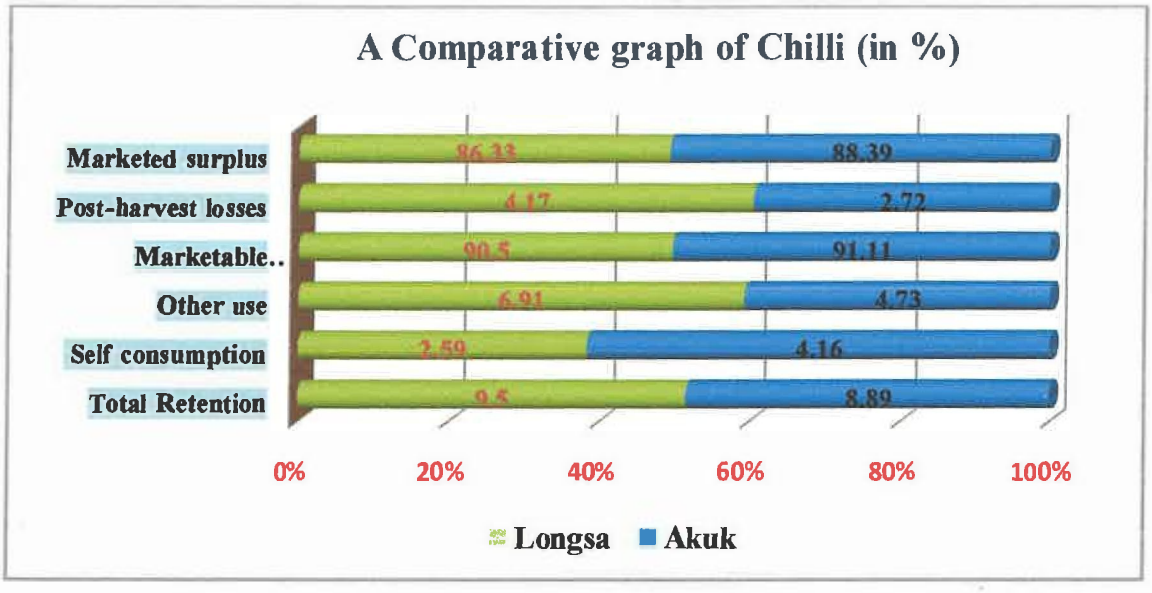
From the table it is noticed that, the percentage of self consumption of chilli is about 2.59 percent in Longsa village which is lower than in Akuk village in which they are consuming more than 4 percent of their total production. However, the retention for other use (viz. gift to friends, relatives, labours and religious payment) in Longsa village is about 6.91 percent which is much higher than their counterpart of Akuk village where the retention for other use is only 4.73 percent. As a result of this, the percentage of marketable surplus is marginally lower in Longsa village when compared to Akuk village since the percentage of total retention in Longsa village is relatively higher than Akuk village in Wokha District.

The market infrastructure especially the cold storage facility for storing the fresh chilli after harvest is prerequisite. Post-harvest losses due to lack of storage, wastage and spoilage is at significant level in both villages during the reference year 2012-13. The post-harvest loss in Longsa village is about 19.61 quintals which accounted 4.17 percent of the total production and the quantity that is actually marketed by the producers is 405.9 quintals (86.33%). On the contrary to that, post-harvest losses in Akuk village is lower and it is about 10.06 quintals (2.72 percent) and thus the quantity actually marketed is 326.94 quintals (88.39%) which is slightly higher than Longsa village by low[96] post-harvest losses and better market accessibility. Lack of storage infrastructure, market linkage, market information, traditional behaviour and ignorance of the farmers leads to increase in retention for 'other use' as gift which in turn reduce marketable surplus. An efficient marketing system will, therefore, help to reduce the use of unnecessary or extra farm retention of the producers thereby increase marketable and marketed surplus in the

[96] This is because of the durability of fresh chilli for three to four days after the harvest in Akuk village while in case of Longsa village the crop could hardly hold up for two days and get rotten (due to excess moisture contain on chilli) thereby become unsuitable for marketing rising post-harvest losses.

study area. Figure 4.2 presents the percentage retention and marketed surplus of chilli between Longsa and Akuk villages.

Figure 4.2: Percentage retention and marketed surplus of chilli in Longsa and Akuk village



Similarly, month wise information on production, retention marketable and marketed surplus of chilli crop in both Longsa and Akuk villages is presented in Table 4.9. The production of chilli in Longsa village in June is about 146.95 quintals; in July: 197.08 quintals and in August it is about 126.14 quintals. Whereas, in Akuk village the production of chilli in June is about 112.35 quintals; in July it is 156.38 quintals and in August it is 101.15 quintals. The data reveals that, maximum output of chilli is yielding in the month of July in both the villages and the production will be less in the month of August. The farm retention is high during the months of June and July when the production are maximum in both the villages and decline as production falls in August. Self consumption of respective farmer-producer is around 3 to 4 percent in both the villages throughout the production period. Similarly, the retention for other use is high in July and low in August in both the villages on the basis of peak and lean season. The marketable surplus of chilli differ in different months in Longsa village that is, in June the marketable surplus is about 131.9 quintals (89.76%); in July it is about 175 quintals

(89.29%) and in August it is around 117.63 quintals (93.25%). While in Akuk village, in June the marketable surplus is about 101.55 quintals (90.39%); July: 141.51quintals (90.49%); and August: 93.94 quintals (92.87%). The percentage of marketable surplus to total production is marginally higher in Longsa than Akuk but the percentage of marketed surplus in Akuk village is greater than the Longsa village by vary in post-harvest losses among the two villages.

Table 4.9: Production, retention and marketable surplus of chilli in post-harvest period

(In Quintal)

SI No.	Particulars	Longsa			Akuk		
		June	July	August	June	July	August
1	Production	146.95 (100.00)	197.08 (100.00)	126.14 (100.00)	112.35 (100.00)	156.38 (100.00)	101.15 (100.00)
2	Total Retention [a+b]	15.05 (10.24)	21.1 (10.71)	8.51 (6.75)	10.8 (9.61)	14.87 (9.51)	7.21 (7.13)
	[a]. Home consumption	3.73 (2.54)	5.30 (2.69)	3.16 (2.51)	4.88 (4.34)	6.10 (3.90)	4.41 (4.36)
	[b]. Other use	11.32 (7.70)	15.80 (8.02)	5.35 (4.24)	5.92 (5.27)	8.77 (5.61)	2.80 (2.77)
	• Gift to friends	1.56 13.78*	2.1 13.29*	0.54 10.09*	0.36 6.08*	0.62 7.07*	0.15 5.36*
	• Gift to relatives	1.05 9.28*	2.19 13.86*	0.47 8.78*	0.43 7.26*	1.08 12.31*	0.2 7.14*
	• Gift to labours	0.61 5.39*	0.81 5.13*	0.16 2.99*	0.08 1.35*	0.11 1.25*	0.04 1.43*
	• Religious payment**	8.1 71.55*	10.7 67.72*	4.18 78.13*	5.05 85.30*	6.96 79.36*	2.41 86.07*
3	Marketable surplus	131.9 (89.76)	175.98 (89.29)	117.63 (93.25)	101.55 (90.39)	141.51 (90.49)	93.94 (92.87)
4	Post-harvest losses	6.17 (4.2)	8.87 (4.5)	4.57 (3.62)	3.20 (2.85)	4.46 (2.85)	2.4 (2.37)
5	Marketed surplus	125.73 (85.56)	167.11 (84.79)	113.06 (89.63)	98.35 (87.54)	137.05 (87.64)	91.54 (90.5)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to respective month-wise production and total

*- are in percentage to other use

**- see note in Table 4.7 [same as in the case of cabbage]

4.2.3 Orange – Output, Retention, Marketable and Marketed Surplus

The overall production, retention, marketable and marketed surplus of orange in Yajang and N. Longidang village is presented in the Table 4.10. The total production of orange in Yajang village is about 7195 quintals. After retaining 4.69 percent of the total production for self consumption (0.51%) and other use (4.18%), the farmers are left with 6857.65 quintals (95.31%) as surplus for marketing. Post-harvest losses due to rotting and spoilage accounted 1555.6 quintals (21.62%) and the quantity that is actually marketed is 5302.05 quintals (73.69%) in Yajang village. The average loss per farm is 31.11 quintals which indicates high inefficiency in crop managing and poor economic and marketing infrastructure in the village. On contrary to that, the total production of orange in N. Longidang village is about 3042.56 quintals with the average production of 60.85 quintals comparatively lower than the Yajang village. The farm retains 7.09 percent of the total production for self consumption (0.91%) and other use (6.17%) allowing 2826.94 quintals (92.91%) for marketing. Thus, the marketable surplus is more in Yajang village compared to N. Longidang village.

It is interesting to note that the percentage of gift to friends and religious payment is high among the producers in N. Longidang village, however, gift to labour by farmers did not recorded in this village. Post-harvest loss due to spoilage and wastage accounted around 477.34 quintals (15.69%) and as a consequence, the actual quantity marketed is 2349.6 quintals (77.22%) in N. Longidang village. Comparing the two villages, the percentage of marketed surplus in N. Longidang village of Wokha District is relatively higher than the Yajang village owing to high percentage post-harvest losses and remoteness of the village in Mokokchung District. The study indicates that the efficient management practices, adequate marketing information about the demand and prevailing market price, increase marketing linkage, and training of farmers may help to reduce the post harvest losses and increase marketed surplus of oranges in both the villages. Figure 4.3 shows the percentage retention and marketed surplus of orange between Yajang and N. Longidang villages.

Table 4.10: Overall production, retention, marketable and marketed surplus of orange

(In Quintal)

SI No	Particulars	Yajang				N. Longidang		
		Marginal	Small	Semi-medium	All farm	Marginal	Small	All farm
1	Production	1079 (100.00) [83]	4134.5 (100.00) [142.57]	1981.5 (100.00) [247.69]	7195 (100.00) [143.9]	2221.9 (100.00) [52.9]	820.66 (100.00) [102.58]	3042.56 (100.00) [60.85]
2	Total Retention [a+b]	51.95 (4.81) [4]	183.43 (4.44) [6.32]	101.97 (5.15) [12.75]	337.35 (4.69) [6.75]	155.26 (6.99) [3.7]	60.36 (7.36) [7.54]	215.62 (7.09) [4.31]
	[a]. Self consumption	7.74 (0.72) [0.6]	21.87 (0.53) [0.75]	6.94 (0.35) [0.87]	36.55 (0.51) [0.73]	21.98 (0.99) [0.52]	5.84 (0.71) [0.73]	27.82 (0.91) [0.56]
	[b]. Other use	44.21 (4.1) [3.4]	161.56 (3.91) [5.57]	95.03 (4.8) [11.88]	300.8 (4.18) [6.02]	133.28 (6.0) [3.17]	54.52 (6.64) [6.82]	187.8 (6.17) [3.76]
	• Gift to friends	0.62 1.40* [0.05]	6.57 4.07* [0.23]	9.38 9.87* [1.17]	16.57 5.51* [0.33]	9.39 7.04* [0.22]	3.85 7.06* [0.48]	13.24 7.05* [0.26]
	• Gift to relatives	5.2 11.76* [0.4]	20.03 12.4* [0.69]	8.95 9.42* [1.12]	34.18 11.36* [0.68]	12.85 9.64* [0.31]	4.87 8.93* [0.61]	17.72 9.44* [0.35]
	• Gift to labours	0.05 0.11* [0.004]	1.49 0.92* [0.05]	1.58 1.66* [0.2]	3.12 1.04* [0.06]	-	-	-
	• Religious payment**	38.34 86.72* [2.95]	133.47 82.61* [4.6]	75.12 79.05* [9.39]	246.93 82.09* [4.94]	111.04 83.31* [2.64]	45.8 84.01* [5.72]	156.84 83.51* [3.14]
3	Marketable surplus	1027.05 (95.19) [79]	3951.07 (95.56) [136.24]	1879.53 (94.85) [234.94]	6857.65 (95.31) [137.15]	2066.64 (93.01) [49.21]	760.3 (92.64) [95.04]	2826.94 (92.91 [56.54]
4	Post-harvest losses	203.67 (18.88) [15.67]	886.1 (21.43) [30.56]	465.83 (23.51) [58.23]	1555.6 (21.62) [31.11]	349.14 (15.71) [8.31]	128.2 (15.62) [16.02]	477.34 (15.69) [9.55]
5	Marketed surplus	823.38 (76.31) [63.34]	3064.97 (74.13) [105.69]	1413.7 (71.34) [176.71]	5302.05 (73.69) [106.04]	1717.5 (77.3) [40.89]	632.1 (77.02) [79.01]	2349.6 (77.22) [46.99]

Source : Based on Field Survey, 2012-13

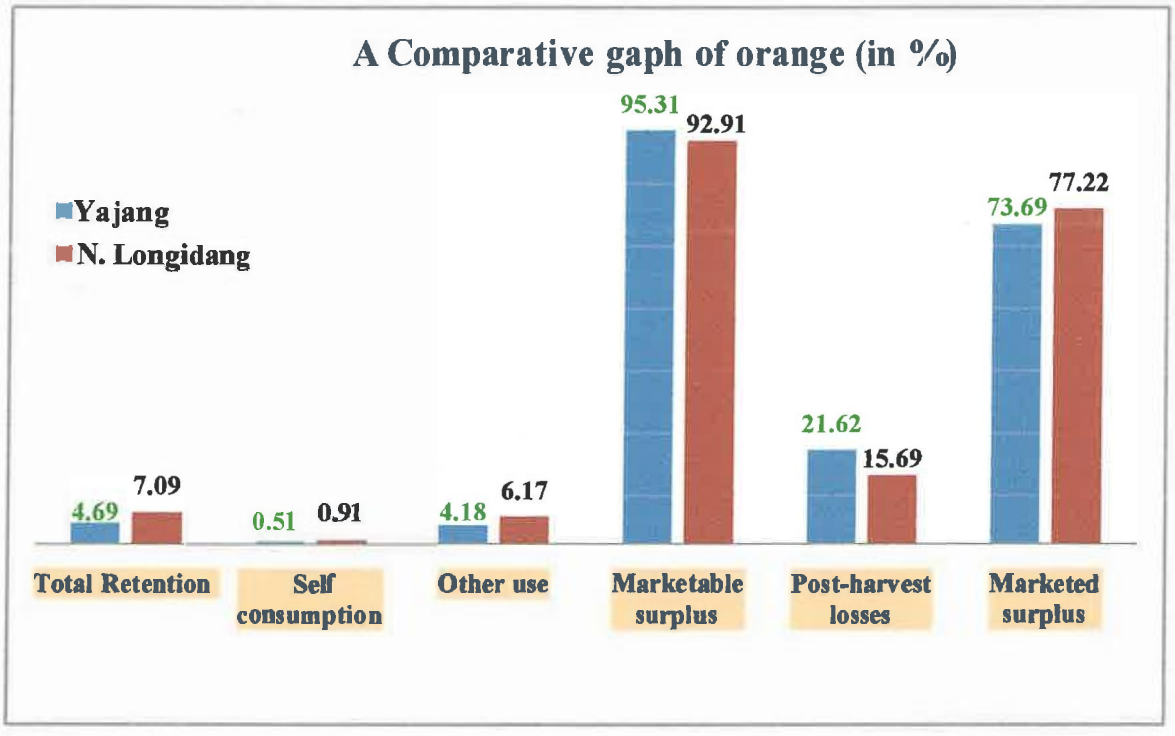
Note : Figure in parenthesis is in percentage to respective farm total and all farm total

Figure in square bracket is in average

*- are in percentage to other use

**- see note in Table 4.7 [same as in the case of cabbage]

Figure 4.3: Percentage retention and marketed surplus of orange in Yajang and N. Longidang village



The table further shows that, the average production of producer increases as farm size increases; that is, the average production of marginal farmers is 83 quintals in Yajang village which increases to 142.57 quintals and 247.69 quintals as the farm size increases to small and semi-medium farmers. This also holds true for N. Longidang village in Wokha District. The ratio of self consumption is noticed to be high in the marginal farmers (0.72%) and low among the semi-medium farmers (0.35%) while retention for other use is noticed to be high among the semi-medium farmers (4.8%) than marginal farmers. Similar results are obtained in their counterpart village in Wokha District. The table further indicates that, post-harvest losses are high among the large farm groups than the marginal farmers in Yajang village. Marketing infrastructure in Yajang as well as N. Longidang villages being inadequate and with no storage facilities to capture the surplus production leads to greater post-harvest losses. As a result of this, the proportion of marketed surplus to total production is indicated to be high among the marginal famers in both villages.

Table 4.11: Production, retention and marketable surplus of orange in post-harvest period (Yajang village)

(In Quintal)

Particulars	Marginal				Small				Semi-medium			
	Nov	Dec	Jan	Total	Nov	Dec	Jan	Total	Nov	Dec	Jan	Total
Production	405 (100.00)	624 (100.00)	50 (100.00)	(1079 (100.00)	1416 (100.00)	2447 (100.00)	271.5 (100.00)	(134.5 (100.00)	798 (100.00)	1021 (100.00)	162.5 (100.00)	1981.5 (100.00)
Total Retention [a+b]	36.26 (8.95)	13.(1 (2.2)	(1.98 (3.96)	51.95 (4.81)	122.2 (8.63)	53.11 (2.17)	8.12 (2.99)	183.43 (4.44)	68.67 (8.61)	27.57 (2.7)	5.73 (3.53)	101.97 (5.15)
[a]. Home consumption	2.56 (0.62)	3.26 (0.52)	(1.92 (3.84)	7.74 (0.72)	7.2 (0.51)	9.24 (0.38)	5.43 (2.0)	21.87 (0.53)	2.23 (0.28)	2.93 (0.29)	1.78 (1.1)	6.94 (0.35)
[b]. Other use	33.7 (8.32)	(10.45 (1.67)	0.06 ((.12)	44.21 (4.1)	15 (8.12)	43.87 (1.79)	2.69 (0.1)	161.56 (3.91)	66.44 (8.33)	24.64 (2.41)	3.95 (2.43)	95.03 (4.8)
• Gift to friend	0.2 0.59*	0.4 3.83*	0.02 33.33*	0.62 1.4*	(1.68 1.46*	4.5 10.26*	0.39 14.5*	6.57 4.07*	2.9 4.36*	5.7 23.13*	0.78 19.75*	9.38 9.87*
• Gift to relative	1.8 5.34*	3.4 32.54*	-	5.2 11.76*	6.4 5.56*	12.7 28.95*	0.93 34.57*	20.03 12.4*	2.75 4.14*	5.2 21.1*	1 25.32*	8.95 9.42*
• Gift to labour	-	0.05 0.48*	-	0.05 0.(1*	0.52 0.45*	0.97 2.21*	-	1.49 0.92*	0.59 0.89*	0.84 3.41*	0.15 3.8*	1.58 1.66*
• Religious payment**	(1.7 94.07*	6.6 6(16*	0.04 66.67*	38.34 86.72*	106.4 92.52*	25.7 58.58*	1.37 50.93*	133.47 82.61*	60.2 90.61*	12.9 52.35*	2.02 51.14*	75.12 79.05*
Marketable surplus	368.74 (91.05)	610.29 (97.80)	48.02 (96.04)	1027.05 (100.00)	1293.8 (91.37)	2393.89 (97.83)	263.38 (97.01)	3951.07 (95.56)	729.33 (91.39)	993.43 (97.3)	156.77 (96.47)	1879.53 (94.85)
Post-harvest losses	78.37 (19.35)	121.59 (19.49)	3.71 (7.42)	203.67 (100.00)	328.72 (23.21)	539.75 (22.06)	17.63 (6.49)	886.1 (21.43)	195.37 (24.48)	255.42 (25.02)	15.04 (9.26)	465.83 (23.51)
Marketed surplus	290.37 (71.7)	488.7 (78.32)	44.31 (88.62)	823.38 (100.00)	965.08 (6(15)	1854.14 (75.77)	245.75 (90.52)	3064.97 (7(13)	533.96 (66.91)	738.01 (72.28)	141.73 (87.22)	1413.7 (71.34)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to respective month-wise production and total

Nov-November, Dec-December and Jan-January

*- are in percentage to other use

**- see note in Table 4.7 [same as in the case of cabbage]

Table 4.12: Production, retention and marketable surplus of orange in post-harvest period (N. Longidang village)

(In Quintal)

Particulars	Marginal				Small			
	November	December	January	Total	November	December	January	Total
Production	737.6 (100.00)	1400.7 (100.00)	83.6 (100.00)	2221.9 (100.00)	308 (100.00)	463 (100.00)	49.66 (100.00)	820.66 (100.00)
Total Retention [a+b]	67.56 (9.16)	79.06 (5.64)	8.64 (10.33)	155.26 (6.99)	28.45 (9.24)	26.67 (5.76)	5.24 (10.55)	60.36 (7.36)
[a]. Home consumption	7.08 (0.96)	10.06 (0.72)	4.84 (5.79)	21.98 (0.99)	1.93 (0.63)	2.62 (0.57)	1.29 (2.6)	5.84 (0.71)
[b]. Other use	60.48 (8.2)	69 (4.93)	3.8 (4.54)	133.28 (6.0)	26.52 (8.61)	24.05 (5.19)	3.95 (7.95)	54.52 (6.64)
• Gift to friend	3.14 5.19*	5.71 8.28*	0.54 14.21*	9.39 7.04*	1.1 4.15*	1.95 8.11*	0.8 20.25*	3.85 7.06*
• Gift to relative	4.24 7.01*	7.89 11.43*	0.72 18.95*	12.85 9.64*	1.42 5.35*	2.6 10.81*	0.85 21.52	4.87 8.93*
• Gift to labour	-	-	-	00 (100.00)	-	-	-	00 (100.00)
• Religious payment**	53.1 87.8*	55.4 80.29*	2.54 66.84*	111.04 83.31*	24 90.5*	19.5 81.08*	2.3 58.23*	45.8 84.01*
Marketable surplus	670.04 (90.84)	1321.64 (94.36)	74.96 (89.67)	2066.64 (93.01)	279.55 (90.76)	436.33 (94.24)	44.42 (89.45)	760.3 (92.64)
Post-harvest losses	123.55 (16.75)	221.46 (15.81)	4.13 (4.94)	349.14 (15.71)	45.53 (14.78)	79.15 (17.1)	3.52 (7.09)	128.2 (15.62)
Marketed surplus	546.49 (74.09)	1100.18 (78.55)	70.83 (84.72)	1717.5 (77.3)	234.02 (75.98)	357.18 (77.14)	40.9 (82.36)	632.1 (77.02)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to respective month-wise production and total

*- are in percentage to other use

**- see note in Table 4.7 [same as in the case of cabbage]

The peak season for harvesting of orange in Mokokchung and Wokha District is in November and December. The percentage of self consumption to total production is high in the month of January and low in the month of December while, retention for other use is maximum in the month of November for all categories of farmer in both the villages (Table 4.11 and 4.12). In Yajang village, self consumption of orange by marginal farmers is 3.84 percent of total production in the month of January followed by small farmers (2.0%) and semi-medium farmers (1.1%). However, the retention for other use is high in November for all the farm size groups in which the semi-medium farmers retention is about 8.33 percent followed by marginal farmers: 8.32% and small farmers: 8.12% (Table 4.11). Similarly, in N. Longidang village, self consumption in January is higher than other months and marginal farmers are consuming at higher level (5.79%) than small farmers (2.6%) while the retention for other use is high in November and small farmers predominates (8.61%) in retention than marginal farmers (Table 4.12). The percentage of marketable surplus is high in December for all categories of producers in both the villages owing to peak season; however, the percentage of marketed surplus is greater in the month of January in both the villages because of lean season and better post-harvest management reducing spoilage and wastage losses.

4.3 FACTORS DETERMINING MARKETED SURPLUS

Marketed surplus differs from region to region, crop to crop and from farm to farm. On a particular farm, the quantity of marketed surplus depends on the following factors:

a. Family size: With the increase in family size will raise family consumption. Hence, larger the number of family members, the smaller will be the marketed surplus available to the farm.

b. Age of the respondents: Age of the respondents is another significant factor; as age increases, the farming experience increases and better marketed surplus.

c. Education: There is positive relationship between degree of education and marketed surplus.

d. Size of holding: As holding size increases, production will increase. Therefore, larger the farm size, larger the marketed surplus.

e. Size of production: An important factor affecting the size of marketed surplus is the volume of production which in turn depends on the area under crop and per hectare yield. The higher the production, the larger will be the marketed surplus, and vice- versa.

f. Consumption habit: The quantity of marketed surplus by the farm family depends on the consumption habits and nature of the crops. Marketed surplus is low if the commodity is staple food; however, in case of perishable commodity, marketed surplus is obviously higher for all farm groups.

g. Other use: 'Other use' is gift to friends, relatives, labours and religious payments. As 'other use' increases, this will have negative effect on the marketed surplus.

h. Post-harvest losses: There is negative relationship between the volume of post-harvest losses and marketed surplus. Increase in post-harvest losses will directly reduce the marketed surplus.

i. Price of the commodity: Two postulates have been advanced to explain the relationship between price and marketed surplus. Mathur and Ezekeil postulate an inverse relationship that farmers cash requirement is fixed and have inelastic cash requirement. However, Dandekar and Rajkrishna put forward the case of positive relationship between price and marketed surplus that farmers are price conscious. In the present study, the farmers are noticed to be price conscious.

j. Storage facilities: Improved infrastructure for storing the surplus produce adds to marketed surplus and will also positively induce the farmers to increase production.

k. Weather condition: This is another factor influencing marketed surplus. Bad monsoon and bad weather will lead to low production reducing surplus.

l. Transportation: Timely availability of transport facilities at cheaper rate will also have positive impact on marketed surplus. With no storage infrastructure at village level and crops being highly perishable, transportation will help reduce this problem of farmers moving the surplus on time reaching the desired market centers.

m. Market links and facilities: More market linkages means more market centers. This creates optimism among the farmers increase sale, hence, more marketed surplus. Facilities like storage, lodging and rest room for famers in the main market center will encourage the farmers at production level and marketing.

n. Availability of labour: Increasing availability of labour will bring more area under crop; increase production; increase producer's surplus.

The factors affecting marketed surplus in cabbage, chilli and orange is expressed in the form of equation as:

$$MS = f(X1, X2, X3, X4, X5, X6, X7 \ldots \ldots\ldots Xn)$$

Where,

MS = Marketed surplus and 'f' is the functional relationship
X1 = Family size
X2 = Age of the respondents
X3 = Education of the respondents in years
X4 = Area under the crop (in hectare)
X5 = Production of selected crops (kg/household)
X6 = Self consumption of the farm (kg/household)
X7 = Other use i.e. for gift and religious payments
X8 = post-harvest losses from producer till consumer (kg/household)
X9 = Price of the commodity (Rs/kg)
X10 = Storage facility (1 – for adequate and 0 – for otherwise)

X11 = Weather condition (1– for adequate and 0–for otherwise)

X12 = Transportation facilities (1 –for adequate and 0–for otherwise)

X13 = Market linkage (1 –for adequate and 0 – for otherwise)

X14 = Marketing facilities (1 –for adequate and 0 – for otherwise)

X15 = Availability of labour (1 – for adequate and 0 – for otherwise)

4.3.1 Regression Results

In view of analyzing the factors determining marketed surplus, a multiple linear regression model has been applied as specified below:

$$MS = a_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + \ldots + b_n x_n + e_t$$

Where,

a_0 = Constant

b's= Regression coefficient of independent variables

x's = Determinants of marketed surplus

e_t = Error term

The regression analysis of cabbage, chilli and orange in Mokokchung and Wokha District with and without dummy variables was analyzed and interpreted from Table 4.13 to 4.21 and each estimated coefficient results show probability results at different significance level.

4.3.1.1 Regression Results of Cabbage

The regression results of cabbage in Longkhum village and Soku village under the respective Districts with and without dummy variables is presented in Table 4.13. In Longkhum village of Mokokchung District all the selected variables are indicating

expected sign and the factors like production, self consumption, post-harvest losses, storage and labour availability are showing statistical significant on the size of marketed surplus in the study area. Production and storage facility shows positive effect at 1% and 5% probability level suggesting that a unit increase in both these factors will increase the marketed surplus by 896.88 kg and 43.50 kg respectively. This might be due to the fact that as production increases the producers are left with more surpluses after retaining for home consumption and other uses and similarly as storage facilities are improved, losses from spoilage and rotting will be minimized and percentage of marketed surplus to total production will increase. Better storage facility will also motivate producers increase volume of production.

While self consumption, post-harvest losses, and labour availability shows negative effect on marketed surplus at 5% and 1% significance levels respectively. With a unit increase in self consumption at farm will reduce marketed surplus by 104.41 kg because, as consumption increases fewer surpluses will be available for marketing. Similarly, a unit increase in the post-harvest losses will reduce marketed surplus by 92.21 kg. In case of availability of labour, the result shows negative significance at 1% probability level reducing marketed surplus by 152.96 kg; this might be due to the fact that cultivated area under crop is marginal and the existing family member are just enough to cultivate the crop. Therefore, an additional labour will have negative impact on production reducing the surplus. Education, weather and market facility also shows inverse relationship with marketed surplus though not significant at the estimated p-value 0.05.

Similarly, the regression estimation after dropping dummy variables and refitting the model in Longkhum village for cabbage crop, area and production have positive and are statistically significant at 1% probability level which means that a unit increase in both the determinants marketed surplus will increase by 510.80 kg and 786.97 kg respectively. While the variable post-harvest losses have negative relationship with marketed surplus and are resulted to be statistically significant at 1% level of significance on marketed surplus; this shows that a unit increase in post-harvest losses will reduce

marketed surplus by 100.22 kg. The variables explain 99 percent and 98 percent of the variation in the marketed surplus with and without dummy variable respectively.

Table 4.13: Regression results of cabbage in Longkhum and Soku village, 2012-13

Variables	Longkhum		Soku	
	WithDV	WithoutDV	WithDV	WithoutDV
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	-4448.47	-3926.59	-2334.27	-2573.14
Family size	14.26 (1.37)	7.01 (0.60)	20.30 (2.24)**	12.37 (1.24)
Age	0.85 (0.47)	-0.56 (0.27)	-1.16 (0.92)	-1.02 (0.79)
Education	-1.91 (0.67)	-3.33 (1.06)	-0.32 (0.15)	1.15 (0.55)
Area	227.63 (1.17)	510.80 (3.42)*	-113.56 (0.64)	-48.77 (0.27)
Production	896.88 (12.78)*	786.97 (10.51)*	515.44 (10.67)*	530.76 (11.93)*
Self consumption	-104.41 (2.11)**	-79.88 (1.10)	-123.65 (2.75)*	-82.64 (1.74)***
Other use	0.56 (0.04)	3.36 (0.21)	-15.28 (1.43)	-16.29 (1.41)
Post-harvest losses	-92.21 (3.86)*	-100.22 (3.49)*	-1.71 (0.08)	4.82 (0.19)
Price	2.75 (0.34)	-7.73 (0.86)	-3.84 (0.48)	-3.68 (0.42)
Storage (DV)	43.50 (2.04)**	-	1.57 (0.09)	-
Weather (DV)	-29.11 (1.27)	-	-24.24 (1.75)***	-
Transportation (DV)	2.81 (0.16)	-	24.43 (1.58)	-
Market link (DV)	31.98 (1.08)	-	-30.71 (1.41)	-
Market facility(DV)	-15.42 (0.62)	-	31.94 (1.59)	-
Labour availability (DV)	-152.96 (4.12)*	-	-36.59 (1.83)***	-
R^2	0.987	0.980	0.961	0.948
F change	246.652	267.970	79.201	100.078
N	50	50	50	50

Source : Based on Field Survey, 2012-13
Note : DV-Dummy Variable
Figure in parenthesis indicates't' value of the estimates
* ** ***-significance at 1%, 5% & 10% probability level respectively

On contrary to that, in Soku village the regression results with all variables have expected signs and the factors such as family size, production, self consumption, weather and labour availability shows statistical significant to the dependent variable. Family size and production have a positive and are statistical significant at 5% and 1% probability level of significance respectively. The theoretical concept and relevant studies show there is an inverse relationship between the family size and marketed surplus, however, in the present study there exist positive relationship between the two and a unit increase in family size will increase marketed surplus by 20.30 kg. The reason could be, with increase in family size will induce area expansion with more family labour to handle the crop and increase production contributing to increasing marketed surplus. Self consumption, weather and labour availability shows inverse relationship with marketed surplus respectively and shows statistically significant at 1% and 10% level of significance.

Similarly, after dropping dummy variable, only production and self consumption shows statistical significance at 1% and 10% probability levels. It reveals that a unit increase in production will improve dependent variable by 530.76 kg while a unit increase in self consumption will reduce the marketed surplus by 82.64 kg in Soku village of Wokha District. The variables explain 95 percent of the variation in marketed surplus.

4.3.1.2 Regression Results of Chilli

(a) Longsa Village– (With all Variables)

Table 4.14 shows the regression results of chilli in Longsa village of Mokokchung District including dummy variables. The results of regression coefficient with all factors shows expected signs and the factors such as age of the farmer, area, production, self consumption, post-harvest losses, storage facility and transportation indicating statistical significant at different levels. Area, production, storage and transportation have positive significance on the surplus at 1% level indicates that a unit increase in these variables will

increase marketed surplus by 897.14 kg, 832.82 kg, 75.94 kg and 105.85 kg respectively. With an increase in area, more crops will be brought under cultivation adding to total production thereby increasing the surplus for marketing. Chilli is highly perishable in nature, and as such, availability and improvement in storage facilities will add to marketed surplus of the producers and the timely availability of transportation for disposing the surplus into the near and outdistance market will add to marketed surplus by eliminating the risk of post-harvest losses. While the age of the farmer, self consumption and post-harvest losses have negative impact on marketed surplus and are statistically significant at 10%, and 5% level respectively (Table 4.14). The negative coefficient of age on marketed surplus might be, as the age of the farmer-producer increases, the physical fitness of the farmer might deteriorate, lowering working hour on the farm reducing production. Similar to more post-harvest losses due to low care and handling of the crop and increase in self consumption reduce marketed surplus by 47.75 kg and 92.68 kg respectively adding more on this two variables, lower will be the surplus available to the farmers for marketing. The variables explain 99 percent of the variation in the marketed surplus.

Similarly, the monthly wise estimation of regression analysis indicates that in the month of June, age, area, production, storage, transportation and market facility are major determinants having statistical significance at the estimated p-value 0.05. Except the age of the farmer, the other five variables show positive relationship with marketed surplus. The effect of market facility on marketed surplus is shown to be statistically significant at 5% level; this means that, with the provision and better availability of marketing facility like storage, information on price and rest room, the producers will have a positive motivational influence to produce more and increase marketed surplus. In July, the determinants having positive significant impact on marketed surplus are area, production, price, storage, transportation and market facility. Here price is statistically significant at 10% level of significance; this means that, one unit of increase in price will increase marketed surplus by 4.87 kg because with better price, the farmers will have a tendency to sell more and this may also have a direct influence on production at the farm level. Self consumption, other use and post-harvest losses show negative relationship with marketed

surplus. The negative significant result of other use to marketed surplus is, with increase in the need for gift to friends, relatives, labours and religious payment will directly reduce the marketed surplus. Therefore, marketed surplus of the respondents is significantly affected when there is an increase in other use. Likewise in the month of August, the variables having positive statistical significance are area, production, price, storage, transportation and market facility while, the variable other use have negative significant impact on the marketed surplus.

(b) Longsa Village– (without Dummy Variables)

The regression results of chilli in Longsa village after dropping dummy variables is shown in the Table 4.15. The regression coefficients of chilli shows area and production are predominant and indicating statistical significant to increase the marketed surplus suggesting that one unit increase in area and production of chilli will result in an increase of about 849.68 kg and 890.80 kg respectively. The factor 'other use' shows a negative relationship and is statistically significant at 10% level indicating that a unit increase in this factor will reduce marketed surplus by 126.32 kg. Variables like family size, age of the respondents, self consumption and post-harvest losses also show negative relationship to a degree though the resultant is not statistically significant at the estimated p-value. The variables explain 96 percent of the variations in the marketed surplus of chilli in Longsa village during 2012-13.

The table further explains the month wise analysis indicating that, during the months of June and July, the factors like area and production give positive significant at 1% probability level while other use give negative significant results at 10% level. Whilst in the month of August, area, production and price have positive relationship with marketed surplus and the variables explain more than 96 percent of the variation in the marketed surplus.

Table 4.14: Regression results of chilli in Longsa village, 2012-13

Variables	June	July	August	Overall
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	-1245.83	-2042.58	-1628.20	-4375.63
Family size	3.20 (1.47)	2.98 (1.59)	2.62 (1.08)	9.36 (1.50)
Age	-0.95 (1.73)***	-0.77 (1.58)	-0.56 (1.05)	-2.77 (1.78)***
Education	0.29 (0.38)	0.14 (0.18)	0.66 (0.89)	1.78 (0.78)
Area	295.05 (4.40)*	219.98 (3.13)*	274.07 (3.83)*	897.14 (4.19)*
Production	225.56 (7.04)*	394.86 (10.14)*	225.89 (8.77)*	832.82 (7.69)*
Self consumption	-6.89 (0.88)	-15.93 (2.51)*	12.28 (1.62)	-47.75 (2.17)**
Other use	-2.64 (0.22)	-32.41 (2.70)*	-8.89 (1.70)***	-68.48 (1.54)
Post-harvest losses	-12.24 (0.89)	-32.14 (2.02)**	-4.16 (0.44)	-92.68 (1.77)***
Price	4.22 (1.43)	4.87 (1.71)***	11.26 (3.14)*	0.83 (0.13)
Storage (DV)	24.53 (2.50)*	23.91 (2.70)*	21.84 (2.11)**	75.94 (2.68)*
Weather (DV)	-0.09 (0.12)	-1.24 (0.25)	-8.44 (1.52)	-8.25 (0.53)
Transportation (DV)	40.97 (5.03)*	29.59 (4.31)*	27.16 (3.28)*	105.85 (4.62)*
Market link (DV)	-5.43 (0.62)	-13.03 (1.65)	-9.75 (1.19)	-35.12 (1.44)
Market facility (DV)	24.48 (2.18)**	17.12 (1.69)***	19.89 (1.96)***	48.17 (1.49)
Labour availability (DV)	-4.39 (0.55)	3.32 (0.49)	-1.78 (0.23)	2.71 (0.12)
R^2	0.983	0.988	0.983	0.985
F change	189.794	281.291	191.154	219.953
N	50	50	50	50

Source : Based on Field Survey, 2012-13

Note : DV-Dummy Variable

Figure in parenthesis indicates't' value of the estimates

* ** ***-significance at 1%, 5% & 10% probability level respectively

Table 4.15: Regression results of chilli in Longsa village, 2012-13

Variables	June	July	August	Overall
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	-1522.23	-1817.39	-2306.61	-4903.18
Family size	-2.24 (0.71)	-0.28 (0.10)	-2.79 (0.89)	-4.57 (0.49)
Age	-0.23 (0.28)	0.31 (0.43)	0.28 (0.38)	-0.16 (0.07)
Education	0.72 (0.60)	0.84 (0.71)	0.76 (0.70)	2.84 (0.78)
Area	292.47 (2.98)*	286.86 (2.69)*	180.40 (1.93)***	849.68 (2.59)*
Production	272.43 (5.75)*	334.39 (5.73)*	258.94 (8.13)*	890.80 (5.50)*
Self consumption	3.01 (0.26)	-14.02 (1.39)	-3.89 (0.37)	-25.55 (0.73)
Other use	-29.45 (1.72)***	-34.41 (1.85)***	-7.75 (1.03)	-126.32 (1.87)***
Post-harvest losses	-27.61 (1.29)	-7.55 (0.31)	2.75 (0.21)	-87.25 (1.12)
Price	7.41 (1.60)	5.47 (1.20)	21.02 (4.55)*	7.72 (0.74)
R^2	0.956	0.969	0.962	0.959
F change	118.409	171.967	140.280	129.968
N	50	50	50	50

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis indicates't' value of the estimates

* ** ***-significance at 1%, 5% & 10% probability level respectively

(c) Akuk Village–(With all Variables)

Table 4.16 shows the regression coefficient results of chilli in Akuk village of Wokha District and the table indicates that all the variables shows expected signs. The factors like area, production, post-harvest losses and market link are found to be statistically significant on the marketed surplus of which area, production, and market link have positive association with marketed surplus at 1% level of significance; this means that, a unit increase of these variables will increase marketed surplus by an amount

of 479.43 kg, 613.93 kg and 30.10 kg respectively. The significant impact of market link on marketed surplus could mean more marketing opportunities for producers to sell their surplus produce. In spite of that, other most important factor showing inverse relationship and causing significant reduction in marketed surplus is the post-harvest losses due to spoilage, rotting, mishandling and wastage. The explanatory variables explain 99 percent of the variations in the marketed surplus with dummy variables.

Similarly, the regression results of chilli across post-harvest period can further be seen on monthly basis in table 4.16. The results indicates that in the month of June area, production, self consumption, market link and other use are major determinants influencing marketed surplus. Area, production and market link show positive relationship with marketed surplus and are all statistically significant at 1% level. The results also indicate a positive relationship between self consumption and marketed surplus and it implies that a unit increase in self consumption will increase marketed surplus by 1.84 kg. The reasons might be, farmers will put extra effort to produce more from the existing land or bring additional land under the crop for meeting their home consumption and this positively adds up to the marketed surplus of the respondents. The variable other use have negative impact on the marketed surplus. While in the month of July area, production, price and market link are major determinants having positive impact on the marketed surplus but then self consumption, other use and post-harvest losses are some major determinants having inverse impact on the marketed surplus. Unlike in June, there is negative relationship between self consumption and marketed surplus in July. Area, production and market link have positive statistical significant at 1% probability level in August while other use, post-harvest losses and labour availability have negative effect on the marketed surplus.

Table 4.16: Regression results of chilli in Akuk Village, 2012-13

Variables	June	July	August	Overall
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	-840.37	-1452.92	-880.66	-3436.37
Family size	-0.50 (0.37)	-0.69 (0.89)	1.15 (0.90)	-1.23 (0.39)
Age	0.01 (0.05)	-0.30 (0.15)	0.06 (0.20)	0.16 (0.21)
Education	-0.13 (0.23)	-0.18 (0.49)	-0.11 (0.20)	-0.13 (1.00)
Area	174.15 (10.98)*	143.461 (14.57)*	172.74 (12.69)*	479.43 (12.15)*
Production	181.72 (15.79)*	274.63 (32.20)*	177.12 (15.97)*	613.93 (21.77)*
Self consumption	1.84 (2.13)**	-0.58 (1.72)***	0.14 (0.14)	0.98 (1.22)
Other use	-1.04 (2.45)*	-0.57 (2.19)**	-1.20 (2.38)**	-0.54 (1.10)
Post-harvest losses	-0.48 (0.49)	-1.19 (2.23)**	-2.87 (2.69)*	-1.92 (1.88)***
Price	0.40 (0.23)	3.20 (1.87)***	1.70 (0.89)	-0.41 (0.09)
Storage (DV)	-3.83 (1.02)	-0.84 (0.35)	1.71 (0.45)	-2.74 (0.28)
Weather (DV)	-0.67 (0.21)	-2.46 (1.19)	0.25 (0.08)	-1.42 (0.18)
Transportation (DV)	1.21 (0.48)	1.23 (0.77)	-1.06 (0.42)	1.32 (0.22)
Market link (DV)	9.92 (3.00)*	6.96 (2.94)*	14.48 (4.65)*	30.10 (3.51)*
Market facility (DV)	-0.33 (0.10)	0.31 (0.16)	-3.19 (1.02)	-2.10 (0.26)
Labour availability (DV)	-2.49 (0.53)	-2.41 (0.83)	-10.91 (2.26)**	-15.90 (1.40)
R^2	0.991	0.997	0.992	0.994
F change	353.407	1021.798	408.748	574.565
N	50	50	50	50

Source : Based on Field Survey, 2012-13

Note : DV-Dummy Variable

Figure in parenthesis indicates't' value of the estimates

* ** ***-significance at 1%, 5% & 10% probability level respectively

(d) Akuk Village– (Without Dummy Variables)

The regression coefficient results of chilli in Akuk village after dropping some dummy variables are depicted in the Table 4.17. The results shows that the factors such as area, production and self consumption are statistical significant to increase the marketed surplus suggesting that one unit increase in these factors will increase marketed surplus by 497.78 kg, 567.68 kg and 1.76 kg respectively. On the other hand, post-harvest losses have negative impact and it decrease the marketed surplus by 1.82 kg for one unit rise and is shown to be statistically significant at 10% probability level of significance. The variables explain 99 percent of the variations in the marketed surplus of chilli.

Table 4.17: Regression results of chilli in Akuk Village, 2012-13

Variables	June	July	August	Overall
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	-768.35	-1360.40	-592.39	-3318.78
Family size	0.01 (0.01)	-0.12 (0.16)	2.94 (2.11)**	0.27 (0.08)
Age	-0.06 (0.18)	-0.04 (0.22)	-0.21 (0.59)	-0.25 (0.33)
Education	-0.25 (0.43)	-0.11 (0.28)	0.15 (0.24)	-0.06 (0.04)
Area	179.09 (11.35)*	144.18 (15.22)*	194.60 (14.12)*	497.78 (13.05)*
Production	166.16 (16.40)*	259.54 (43.82)*	154.55 (14.26)*	567.68 (25.38)*
Self consumption	2.36 (2.65)*	-0.32 (0.92)	-0.01 (0.01)	1.76 (2.16)**
Other use	-1.10 (2.50)*	-0.33 (1.34)	-1.47 (2.78)*	-0.49 (1.00)
Post-harvest losses	-0.16 (0.15)	-1.33 (2.49)*	-2.42 (2.01)**	-1.82 (1.71)***
Price	0.54 (0.30)	2.90 (1.72)***	-1.15 (0.62)	2.73 (0.61)
R^2	0.989	0.996	0.988	0.993
F change	510.334	1522.648	460.048	805.368
N	50	50	50	50

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis indicates't' value of the estimates

* ** ***-significance at 1%, 5% & 10% probability level respectively

Similarly from the month wise analysis with respective post-harvest period, the variables having statistical significance in June are: area, production, self consumption and other use; July: area, production, post-harvest losses and price; and August: area, production, other use and post-harvest losses. A unit change in any of these variables will have substantial influence on the size of the marketed surplus.

4.3.1.3 Regression Results of Orange

(a) Yajang Village– (With all Variables)

The regression results of orange in Yajang village of Mokokchung District taking all the variables is presented in the Table 4.18. The table depicts that, all the variable show expected signs and the factors like area, other use and price are found to be statistically significant in the overall coefficient results. Area under crop and other use have a positive relationship with marketed surplus and are statistically significant at 1% probability level of significance and it implies that a unit increase in area and other use will increase marketed surplus by 4159.05 kg and 3148.17 kg respectively. However, the price factor shows that there is an inverse relation with marketed surplus in Yajang village and is significant statistically at 1% level. That is, a unit rise in price will reduce marketable surplus by 992.98 kg. In the subsequent literatures reviewed, fruits and vegetables are mostly marketable because of its highly perishable nature unlike subsistence crops. Therefore, the coefficient estimates of price having negative sign might be because of the ignorance of the producers due to remoteness of the village from the main stream market center, lacking market intelligence on price behaviour and demand. Thus, the producers in Yajang village are found to sell at a much lower price per kg than their counterpart village of N. Longidang village (see Chapter VI, Table 6.7). The adjusted R^2 explains 98 percent of the variations in the dependent variable.

Table 4.18: Regression equation of orange in Mokokchung District, 2012-13

Variables	November	December	January	Overall
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	-41308.73	-25268.47	1827.40	13007.55
Family size	73.90 (0.56)	47.68 (0.33)	30.55 (0.89)	138.38 (0.47)
Age	-0.78 (0.05)	-4.33 (0.34)	-1.32 (0.31)	-8.13 (0.31)
Education	30.98 (1.46)	-0.74 (0.04)	7.96 (1.25)	17.82 (0.45)
Area	1175.94 (3.07)*	1305.78 (4.05)*	248.96 (3.10)*	4159.05 (5.27)*
Production	10046.47 (5.23)*	3143.61 (1.73)***	-103.62 (0.75)	-2379.37 (0.47)
Self consumption	-879.45 (1.30)	-228.58 (0.28)	-158.80 (0.91)	24.95 (0.02)
Other use	-393.56 (0.44)	114.40 (0.46)	7.88 (0.35)	3148.17 (2.84)*
Post-harvest losses	-5396.00 (4.76)*	943.64 (0.65)	511.11 (3.18)*	2140.04 (0.60)
Price	45.63 (0.24)	-220.02 (1.39)	-87.81 (3.13)*	-992.98 (2.88)*
Storage (DV)	153.44 (0.69)	258.72 (1.40)	169.06 (2.74)*	642.42 (1.59)
Weather (DV)	46.12 (0.21)	247.05 (1.09)	8.07 (0.15)	615.10 (1.48)
Market link (DV)	151.70 (0.76)	-350.68 (2.02)**	59.83 (1.10)	-493.57 (1.42)
Labour availability (DV)	48.13 (0.24)	14.14 (0.08)	-19.45 (0.32)	-196.83 (0.52)
R^2	0.961	0.980	0.953	0.978
F change	94.905	182.414	76.735	169.495
N	50	50	50	50

Source : Based on Field Survey, 2012-13

Note : DV-dummy variable

Figure in parenthesis indicates't' value of the estimates

* ** ***-significance at 1%, 5% & 10% probability level respectively

Further from the table, the month wise analysis indicates that, in the month of November, area and production are the major determinants for increasing marketed surplus of oranges and are statistically significant at 1% level. Therefore, an increase in these variables will contribute 1175.94 kg and 10046.47 kg respectively to the marketed

surplus. Post-harvest losses have negative statistical significance at 1% level and the marketed surplus of the respondents is significantly affected when there is an increase in post-harvest losses. Similarly, area and production are the two major factors for a significant increase in the marketed surplus in December. In January, area, post-harvest losses, price and storage facilities are the major determining factors for marketed surplus and indicate 1% level of significance. There is positive relationship between post-harvest losses and farm marketed surplus which implies that a unit increase in post-harvest losses will increase marketed surplus by 511.11 kg. However, the reason for this may be unlikely and might give a reverse picture to the growers as it is conceived that post-harvest losses are a bonus and the farmers may likely devote less time in handling the losses due to press and wastage during harvest time. There is also shown to be negative and statistical significance at 1% level between price and dependent variable in the month of January.

(b) Yajang Village– (Without Dummy Variables)

The regression results of orange in Yajang village after dropping dummy variable is given in Table 4.19. In the overall coefficient results, area and other use have positive impact while price have negative impact on the marketed surplus and are each statistically significant at 1% probability level of significance. The adjusted R^2 explains 98 percent of the variations in the dependent variable.

The table further reveals the month wise analysis of orange that in the month of November, area and production are two major factors for a significant increase in the marketed surplus whereas, post-harvest losses possess an inverse relationship with marketed surplus causing significant reduction of surplus. Similarly, in the month of December, area and production have positive significance to marketed surplus whereas price show inverse relationship to marketed surplus. Whilst in the month of January, area and post-harvest losses showed positive significance but the later variable may be unlikely to additional surplus. The negative sign of price to marketed surplus may be due to ignorance, inadequate market intelligence and remoteness of the production area.

Table 4.19: Regression results of orange in Yajang Village, 2012-13

Variables	Nov	Dec	Jan	Overall
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	-41089.19	-28663.94	1645.10	-9843.49
Family size	42.35 (0.37)	77.28 (0.56)	18.19 (0.55)	149.75 (0.56)
Age	0.21 (0.02)	-4.11 (0.32)	0.76 (0.19)	-10.30 (0.40)
Education	30.90 (1.51)	0.41 (0.02)	5.29 (0.81)	21.58 (0.51)
Area	1045.61 (3.22)*	1001.48 (3.72)*	228.25 (2.75)	3161.06 (4.75)*
Production	9772.24 (5.46)*	4413.11 (2.36)*	-143.45 (0.99)	2059.00 (0.41)
Self consumption	-589.34 (1.02)	-368.72 (0.48)	-158.99 (0.92)	-426.82 (0.29)
Other use	-80.47 (0.10)	14.29 (0.06)	20.01 (0.90)	3502.49 (3.12)*
Post-harvest losses	-5231.15 (5.16)*	579.51 (0.38)	601.84 (3.70)*	194.10 (0.06)
Price	-31.36 (0.21)	-424.43 (3.22)*	-82.52 (3.02)*	-1085.48 (3.22)*
R^2	0.964	0.977	0.948	0.975
F change	146.697	231.756	99.389	216.702
N	50	50	50	50

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis indicates't' value of the estimates

* ** ***-significance at 1%, 5% & 10% probability level respectively

(c) N. Longidang Village– (With all Variables)

Table 4.20 presents the regression results of orange in N. Longidang village of Wokha District with all variables. In the overall regression results the variables viz. age, area, production, post-harvest losses and price are the major factors and having significant impact on marketed surplus at 1% level of significance. Area, production and price of the commodity have positive impact on marketed surplus indicating that a unit increase in these factors will increase marketed surplus by 1254.27 kg, 8172.30 kg and 54.33 kg respectively while, the age of the respondents and post-harvest losses have negative relationship with the marketed surplus. The result reveals that age of the respondents have

negative impact and is statistically significant at 1% level indicating that a unit increase in years of the respondents will reduce marketed surplus by 26.65 kg. The reason may be as age increases, physical fitness of the farmer will be low, working hours will fall, the ability to increase production will decline and handling post-harvest orange will reduce cutting down surplus. Another factor for a significant decline in marketed surplus of the respondents is the post-harvest losses; therefore, an increase in this loss will lead to 3757.88 kg reduction in marketed surplus. Thus, the variables explain 99 percent of the variations in the marketed surplus.

The month wise analysis of regression results is further depicted by Table. 4.20 and it indicates that in the month of November, area and production are two major factors for increasing marketed surplus and is estimated to be statistically significant at 1% level whereas, post-harvest losses shows negative and is significant at 1% level is the most important factor reducing marketed surplus. Similarly, in the month of December, area and production shows positive significance at 1% level while age of the respondents and post-harvest losses show negative relationship at 10% and 5% significance level. However, in January six variables show significant impact on the size of marketed surplus positively at different level of significance. Positive significance of post-harvest losses may be unlikely in this case. Apart from area and production, a unit increase in age of the respondent will increase marketed surplus by 6.66 kg which implies with age, the farmers will have improved knowledge and experience in managing the crop from their past, preventing crops from damage and taking possible measures and precaution to improve the surplus. The result further shows that in January, education have positive significance at 10% level and a unit increase in this factor will increase marketed surplus by 6.81 kg. This may be because the farmers with better educational qualification will have better knowledge and understanding regarding area, production, disease/pest control, crop management, marketing information like price and demand thus, acts as a proxy for significant increase in marketed surplus. Labour availability is another factor for increasing marketed surplus and is statistically significant at 5% level pointing that an increase in this variable contributes 58.07 kg gain in marketed surplus. This means that as the availability of labour grows, farmers will have more labour and his attitude towards

production might change bringing bigger area under crop cultivation and by that means increase the surplus.

Table 4.20: Regression results of orange in N. Longidang Village, 2012-13

Variables	Nov	Dec	Jan	Overall
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	-10532.62	-22114.10	-1251.08	-40814.28
Family size	46.71 (1.42)	-75.58 (0.94)	-17.05 (0.88)	48.54 (0.45)
Age	-2.77 (0.62)	-14.62 (1.94)***	6.66 (2.66)*	-26.65 (2.58)*
Education	8.96 (1.31)	-0.59 (0.05)	6.81 (1.82)***	-11.55 (0.71)
Area	477.25 (4.41)*	653.79 (3.91)*	143.85 (3.53)*	1254.27 (4.26)*
Production	2566.08 (7.29)*	3994.89 (5.18)*	136.54 (4.65)*	8172.30 (5.93)*
Self consumption	-182.20 (1.14)	507.13 (1.15)	37.70 (0.41)	-73.38 (0.13)
Other use	-183.64 (1.28)	-126.20 (0.57)	-12.36 (0.78)	-58.52 (0.14)
Post-harvest losses	-981.06 (5.29)*	-1224.38 (2.01)**	17.97 (1.94)***	-3757.88 (4.19)*
Price	-15.98 (1.37)	11.16 (0.45)	5.10 (1.16)	54.33 (291)*
Storage (DV)	69.32 (1.34)	64.89 (0.74)	11.59 (0.38)	-27.94 (0.23)
Weather (DV)	21.09 (0.46)	106.10 (1.34)	11.47 (0.49)	132.44 (1.29)
Transportation (DV)	-57.05 (1.57)	-65.65 (1.06)	0.33 (0.02)	-111.58 (1.38)
Market link (DV)	-0.36 (0.01)	69.70 (0.82)	-29.02 (1.19)	121.83 (1.12)
Market facility (DV)	-34.02 (0.86)	-75.40 (1.08)	-18.95 (0.90)	-47.63 (0.52)
Labour availability (DV)	12.38 (0.25)	-35.80 (0.41)	58.07 (2.31)**	-157.26 (1.35)
R^2	0.985	0.978	0.888	0.988
F change	215.54	148.191	26.934	280.933
N	50	50	50	50

Source : Based on Field Survey, 2012-13
Note : DV-dummy variable
Figure in parenthesis indicates't' value of the estimates
* ** ***-significance at 1%, 5% & 10% probability level respectively

(d) N. Longidang Village– (Without Dummy Variables)

The regression results of orange in N. Longidang village after dropping dummy variables is presented in the Table 4.21. In the overall regression results the variables such as area, production and price are most dominant and significant factors to increase the marketed surplus pointing out that, one unit increase in these variables will increase marketed surplus by 925.85 kg, 8764.37 kg and 48.44 kg respectively. While on the other hand, the most dominant factors having inverse relationship with the marketed surplus causing significant step down were the age of the farmers and losses due to spoilage or wastage. This entails that, an increase in these variables diminishes marketed surplus by 23.58 kg and 3843.08 kg respectively.

Table 4.21: Regression results of orange in N. Longidang village, 2012-13

Variables	Nov	Dec	Jan	Overall
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	-11352.12	-22753.38	-1251.71	-44538.64
Family size	55.00 (1.73)***	29.58 (0.46)	-13.94 (0.75)	79.29 (0.80)
Age	-6.17 (1.49)	-15.83 (2.32)**	5.73 (2.59)*	-23.58 (2.55)*
Education	5.37 (0.83)	-3.57 (0.31)	6.58 (1.89)***	-4.57 (0.30)
Area	389.96 (4.09)*	565.17 (3.72)*	165.06 (4.25)*	925.85 (3.53)*
Production	2754.59 (8.28)*	4444.97 (6.01)*	144.13 (5.14)*	8764.37 (6.96)*
Self consumption	-163.12 (1.05)	-49.70 (0.13)	8.94 (0.10)	-180.75 (0.33)
Other use	-159.86 (1.10)	-157.01 (0.76)	-22.06 (1.58)	-93.31 (0.23)
Post-harvest losses	-1080.53 (6.19)*	-1442.34 (2.46)*	14.87 (1.64)	-3843.08 (4.76)*
Price	-15.28 (1.32)	7.57 (0.32)	6.96 (1.71)***	48.44 (2.74)*
R^2	0.984	0.978	0.885	0.987
F change	342.277	240.408	42.903	427.973
N	50	50	50	50

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis indicates't' value of the estimates
* ** ***-significance at 1%, 5% & 10% probability level respectively

The table further indicates that in the month of November, the factors like area, production and family size shows significant impact on marketed surplus at 1% and 10% levels of significance and post-harvest losses have negative sign and are statistically significant at 1% probability level in both November and December. The age of the respondents have negative sign and are significant at 5% level in December while it shows positive significance at 1% level in January. Whilst in the month of January, education status of respondents and price of the commodity have positive statistical significance at 10% level suggesting a unit level increase in this two factors marketed surplus will rise by about 7 kg respectively.

Recapitulation

The information provided in this chapter reveals that the area, production and productivity for all the selected crops and villages are found to be comparatively higher in Mokokchung District than Wokha District. The study found that, the percentage of self consumption for all the selected crops is higher in Wokha District than Mokokchung District. Self consumption of orange decline as holding size increases in both the villages. Other use is the prime factor of increased total retention for all the selected crops. Post-harvest loss for cabbage is high in Soku village than Longkhum village. On contrary to that, for chilli and orange crops Longsa and Yajang villages of Mokokchung District predominate in post harvest loss. Among all factors of determining marketed surplus, area and production are the main factors for increasing marketed surplus. In case of orange, there is positive relationship between price and marketed surplus in N. Longidang village; however, it is negative in case of Yajang village of Mokokchung District. The independent variables explain more than 95 percent of the variation in the dependent variable.

CHAPTERV

MARKETING COST, MARKETING MARGIN AND PRICE SPREAD

CHAPTERV

MARKETING COST, MARKETING MARGIN AND PRICE SPREAD

Introduction

In recent times, production and marketing of horticulture crops has received wide attention from the policy makers, planners and scholars due to its profitable enterprise and export potential (Srivastava, 1994)[97]. According to the Report of National Commission on Agriculture[98], "it is necessary to improve the marketing system to aid the process of agricultural development for two reasons: if the additional surplus is not move to the market to bring additional revenue to farmers, it may work as disincentive to increase production; secondly, if the system does not supply foodgrains and other agricultural commodities, such as oils, fruits, vegetables, milk, fish, meat at reasonable prices to consumers at the time and place needed by them, increased production has no meaning in welfare society." It further state that, agricultural marketing is a process; starts with a decision to produce a saleable commodity which includes all market aspects both in pre and post harvest operation like assembling, storage and distribution.

Several institutions have been promoted by the Central and State Governments to develop the marketing of agricultural and horticultural crops with a view to improve market infrastructure, market facilities and reduce the margin of intermediaries so that marginal and small farmers receive higher share of consumer's rupee. The marketing of farm products is a complex process and includes all marketing functions in moving the produce from the producers to the final consumers (Acharya and Agarwal, 2010)[99]. Both

[97] Srivastava, G .C. (1994). An empirical investigation into production, marketing and export potential of vegetables in Bihar. In A. Prasad and J. Prasad (Eds.), *Development Planning for Agriculture* (pp.317-330). New Delhi: Mittal publication.

[98] Report of National commission on Agriculture (1976). *Supportive Services and Incentives, part XII* (pp.110-186). New Delhi Govt. of India.

[99] Acharya, S.S. & Agarwal, N.L. (2010). *Agricultural marketing in India* (4th Edition), p.80. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

producers and consumers are spread and not located at one place, the market functionaries, cost, margins or profits and trade competition will vary depending on the demand and supply, commodity to commodity and from place to place. Buying and selling is the most important activity in the marketing process and its performance also depends on the length of the marketing channel. The shortest channel of marketing commodities is from producers to consumers while other channel linking producer and consumer consist of intermediary viz. wholesaler and retailer. There are no institutional agencies[100] like marketing society or any regulated market involved in the distribution process of cabbage, chilli and orange in the study areas in both the Districts. Hence, growers in both Districts sell directly in the local market in gunny bags and bamboo baskets or loose for cabbage and chilli; carton boxes, wooden boxes and plastic crates for orange. Plastic crates and wooden boxes were found to use by wholesaler who already are in orange business for years in the study area.

This chapter is classified into three sections. Section I will cover the types of marketing channel practice and the disposal pattern of selected crops in both the Districts; Section II covers the marketing cost, marketing margin and price spread in moving the commodity from producer till it reaches the final consumer; Section III covers the marketing efficiency index of the selected crops with the application of Conventional method, Shepherd's method and Acharya-Agarwal modified method.

5.1 TYPES OF MARKETING CHANNEL

Marketing channels are combination of agencies and intermediaries through which the producer dispose his products in the market to the ultimate consumer. With increase area and production of horticultural crops, the marketable surplus also increases. Now, if there is no sufficient demand or appropriate marketing facility to absorb this increase production, or the failure of markets to transmit price would result in frequent market gluts and associated price crash. The main factor that determines in decision

[100] APMC have low support on farmers in buying or distributing the surplus produce in both the District.

making of the producers is the price offered by the traders at harvest time (Sreenivasa et al. 2002)[101]. Far distant marketing channels indicate how market intermediaries are set to accomplish the movement of a product from producer to the final consumer. The most commonly used market channel by producers is selling through retailers for cabbage and chilli while wholesaler for orange in both the Districts of the study. Marketing channels for horticulture crops vary depending on the producers, distance, commodity and place.

(a) Cabbage

In the present study, three marketing channels were identified in Longkhum village (Mokokchung District) and two marketing channels in case of Soku village (Wokha District). Channel II is the most prominent channel in both the villages. The most commonly used channels by the producers are as follows:

Marketing channel in Longkhum village of Mokokchung District

Channel I : Producer – Consumer

Channel II : Producer – Retailer/Vendor – Consumer

Channel III : Producer – Wholesaler – Retailer – Consumer

Marketing channel in Soku village of Wokha District

Channel I : Producer – Consumer

Channel II : Producer – Retailer/Vendor – Consumer

[101] Sreenivasa, M.D., Gajanana, T.M., Sudha, M. & Subramanyan, K.V. (2002). *Post-harvest loss estimation in mango at different stages of marketing – A methodological perspective.* Agricultural Economic Research Review 15(2), 188-200.

(b) Chilli

Similarly the other crop of chilli growers mainly prefer market sell through retailers in both the Districts. Three channels for marketing of chilli have been identified in Longsa and Akuk villages respectively. The details of the most commonly practice marketing channel by chilli growers in both the villages are:

Channel I : Producer – Consumer

Channel II : Producer – Retailer/Vendor – Consumer

Channel III : Producer – Wholesaler – Retailer – Consumer

(c) Orange

Marketing of oranges being highly seasonal, bulky and perishable in nature needs to be transported in a very cumbersome process requiring special skills. In both the Districts of the selected villages, the role played by wholesaler is noticed to be significant. The identified channels for marketing of oranges in both the villages are given below:

Marketing channel in Yajang village of Mokokchung District

Channel I : Producer – Local seller – Consumer

Channel II : Producer – Wholesaler – Retailer – Consumer

Marketing channel in N. Longidang village of Wokha District

Channel I : Producer – Consumer

Channel II : Producer – Retailer/Vendor – Consumer

Channel III : Producer – Wholesaler – Retailer – Consumer

5.1.1 Disposal Pattern

The marketing of selected horticulture crops through different marketing channel practice by the producers in both the Districts are given from Table 5.1 to 5.3.

(a) Cabbage

The comparative disposal pattern of cabbage through different marketing channels in selected villages of both Mokokchung and Wokha Districts is presented in the Table 5.1.

Table 5.1: Disposal pattern of cabbage through different marketing channels

(In Quintal)

Longkhum			
Marketing Channel	**Channel No**	**Quantity sold**	**In%**
Producer – Consumer	I	9.41	2.34
Producer – Retailer/Vendor – Consumer	II	337.89	84.18
Producer – Wholesaler – Retailer – Consumer	III	54.1	13.48
Total		401.4	100.00
Soku			
Producer – Consumer	I	31.82	20.22
Producer – Retailer/Vendor – Consumer	II	125.55	79.78
Total		157.37	100.00

Source: Based on Field Survey, 2012-13

It is observed from the table that, the quantity disposed in channel I: 9.41 quintals; Channel II: 337.89 quintals; channel III: 54.1 quintals in Longkhum village of Mokokchung District while it is 31.82 quintals and 125.55 quintals in channel I and II respectively in their counterpart village of Wokha District. The producers sell more than 84 percent of their surplus in channel II (through retailers) while about 13 percent and 2 percent is sold in channel III and channel I respectively in Longkhum village and this reveals that, channel I is less significant in Longkhum village. In a similar manner, producers in Soku village of Wokha District dispose about 80 percent of the surplus in

channel II, and about 20 percent directly to consumers (channel I). Thus, it can be seen from the table that, channel II is the most prominent channel for marketing of cabbage in both the villages of the Districts during the reference year.

(b) Chilli

The identified channel for marketing of chilli in Longsa and Akuk villages is shown in Table 5.2. The total quantity marketed by chilli growers in channel I, II and III are 28.17, 212.09 and 165.64 quintals in Longsa village whereas it is 46.09, 167.92 and 112.93 quintals in Akuk village respectively. In Longsa village of Mokokchung District, 52.25 percent of the total marketed surplus is sold in channel II followed by channel III (40.81%) and Channel I (6.94%). Similarly, in counterpart village of Akuk, 51.36 percent of the quantity is marketed through channel II followed by channel III (34.54%) and I (14.1%). Therefore, marketing of chilli in both the villages is found to be significant in channel II and less in channel I. It is further observed from the table that the percentage sell of chilli in channel II and III is comparatively higher in Longsa village than the Akuk village whereas, channel I plays an insignificant role for marketing of chilli in both the villages during the reference year.

Table 5.2: Disposal pattern of chilli through different marketing channels

(In Quintal)

Longsa			
Marketing Channel	**Channel No**	**Quantity sold**	**In %**
Producer – Consumer	I	28.17	6.94
Producer – Retailer/Vendor – Consumer	II	212.09	52.25
Producer – Wholesaler – Retailer – Consumer	III	165.64	40.81
Total		405.9	100.00
Akuk			
Producer – Consumer	I	46.09	14.1
Producer – Retailer/Vendor – Consumer	II	167.92	51.36
Producer – Wholesaler – Retailer – Consumer	III	112.93	34.54
Total		326.94	100.00

Source: Based on Field Survey, 2012-13

(c) Orange

Table 5.3 presents the different marketing channels practiced by producers for marketing of orange in Yajang and N. Longidang village. There are two ways for marketing of oranges in Yajang village such as sell through the local sellers[102] and sell through the wholesalers. From the table it can be observed that, producers sell 17.74 percent (940.8 quintals) of their surplus in channel I and about 82.26 percent (4361.25 quintals) in channel II. Thus, selling through wholesalers (channel II) is more predominant channel for marketing oranges in Yajang village. On contrary to that, there are three channels for marketing of orange in N. Longidang village. Out of 2349.6 quintals of total oranges marketed, 2101.34 quintals (89.43%) is sold in channel III; 207.5 (8.83%) in channel II and only 40.76 quintals (1.73%) is sold in channel I. The data reveals that, Channel III in N. Longidang village and Channel II in Yajang village are major marketing channels for selling orange product than shortest channel of direct market of producer-consumer in both the Districts.

Similarly the disposal pattern of orange in both the villages across farm size can be observed from the Table 5.3. The table indicates that in Yajang village, marginal farmers sell about 23.78 percent of the marketed surplus in channel I; small farmers: 17.17% and semi-medium farmers: 15.48%. Hence, marginal farmers are detected to sell larger proportion of their marketed surplus in channel I, and as farm size increases, the percentage sell of producers in channel I decreases. This is true in the case of N. Longidang village in which marginal farmers sell 2.35 percent of the marketed surplus in channel I while the small farmers sell marginally 0.07 percent in channel I.

[102] They are non-producers of oranges who reach to farm by bicycle and on foot; buys from the producers directly about 25 to 35 kilogram @ Rs. 22.55/kg (avg.) every day at post-harvest season and sell them directly to consumers@ Rs 34.5/kg (avg.). They act as intermediaries between producer and consumer and represent the channel I. They go from street to street or sell by road side as vendors and thus, meet their requirements. Net share of local seller in consumer's rupee is 34.31% [see Table 5.14].

Table 5.3: Disposal pattern of orange through different marketing channels

(In Quintal)

Channels	Channel No	Marginal	Small	Semi-medium	All Farms
Yajang					
Producer – Local seller – Consumer	I	195.78 (23.78)	526.12 (17.17)	218.90 (15.48)	940.80 (17.74)
Producer – Wholesaler – Retailer – Consumer	II	627.60 (76.22)	2538.85 (82.83)	1194.80 (84.52)	4361.25 (82.26)
Total		823.38 (100.00)	3064.97 (100.00)	1413.70 (100.00)	5302.05 (100.00)
N. Longidang					
Producer – Consumer	I	40.32 (2.35)	0.44 (0.07)	-	40.76 (1.73)
Producer – Retailer/Vendor – Consumer	II	196.80 (11.46)	10.70 (1.69)	-	207.5 (8.83)
Producer – Wholesaler – Retailer – Consumer	III	1480.38 (86.19)	620.96 (98.24)	-	2101.34 (89.43)
Total		1717.50 (100.00)	632.10 (100.00)	-	2349.60 (100.00)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to total

5.2 MARKETING COST, MARKETING MARGIN AND PRICE SPREAD

Every marketing function performed by the market functionaries or institutions in moving the commodity from the producers to consumers involves cost. Marketing cost varies from commodity to commodity and changes overtime depending on nature of commodity, consumption, storage, transportation, market distance, packing, labour, tax and price (Acharya and Agarwal, 2010)[103]. Marketing cost and marketing margin vary considerably from channel to channel and are related directly to the length of the channel, *i.e.*, longer the channel, marketing cost and marketing margin will be more. The market intermediaries in order to remain in trade make some profit after meeting the cost is called market margin. Marketing margin includes cost of marketing of various intermediaries and profit earned by different marketing intermediaries involved in moving

[103] Acharya and Agarwal (2010). Ibid., p.402.

the product from the point of production till it reaches the ultimate consumer. The size of marketing margin depends on the nature of competition, market structure and scale of business. Larger the marketing margin, greater is the inefficiency of the marketing system. In the marketing of horticultural crops, the difference between the price paid by the consumer and the price received by the producers for an equivalent quantity of farm produce is the price spread. In the view point of marketing efficiency, this gap has to be reduced to the closest minimum (Gunwant et al., 2012)[104].

(a) Cabbage

The channel wise comparative analysis of marketing cost, marketing margin, price spread and net price received by producers for cabbage in Longkhum and Soku village is presented in Table 5.4 – 5.8. Depending on the geographical location, different prices[105] were note to follow in all the different channels by the producers.

In channel I, producers gather their produce in daily local market or went through streets as vendors and sell the fresh cabbage directly to consumers and incur the entire marketing cost in this channel till the product reach the consumer. The total marketing cost (Table 5.4) incurred by producers in channel I is Rs. 170 for their product sold to the consumer in Longkhum village whereas it is Rs. 601 in Soku village. Their shares in consumer's rupee is 1.3 and 1.8 percent respectively which reveals that cost of marketing cabbage is higher in Soku village of Wokha District and it is because of their purchase on plastic bags and labour cost than Longkhum village in which the producers incur only the

[104] Gunwant, Vinay Kumar; Hussain, Mustfa; Purohit, R.C.; Ali, Syed Mohd. Faisal & Rana, Divya (2012, December). A Comparative Study of Production and Marketing Practices of Vegetables in Nainital and U.S. Nagar District of State of Uttarakhand, India. *International Journal of Advances in Computing and Information Technology*, 569-578.

[105] In Longkhum village, producers sell cabbage@ Rs. 13.9/kg in channel I; @ Rs. 19.2/kg in channel II; and@ Rs. 9.64/kg in channel III. In channel III, wholesalers dispose to retailers at Rs.19/kg .The final price paid by consumer is settled at Rs. 25/kg in channel II & III. On the contrary, in Soku village the producers sell @ Rs. 10.52/kg in channel I; @ Rs. 14.48/kg in channel II and the final price paid by consumers is Rs. 22.5/kg (channel II). Price difference shows, in all marketing situations, producers in Longkhum village receive greater price/kg for an equivalent quantity of cabbage than the counterpart of the producers in Soku village.

cost on plastic bags. Net price received by producers in Longkhum village is Rs. 12,910 for total quantity sold in channel I of total consumers rupee of Rs.13,080 (i.e. 941 kg @ 13. 9 per kg.) whereas in Soku village it is about Rs. 32,874 of total consumers rupee of Rs.33,475 (i.e. 3182 kg @ 10.52 per kg). The producers share in consumer's rupee is marginally higher among the cabbage growers in Longkhum village (98.7%) than in Soku village (98.2%) because of the low marketing cost.

Table 5.4: Marketing cost, marketing margin and price spread of cabbage in Channel–I

[Rs/Total quantity sold]

Particulars	Longkhum	Producers share in consumer's rupee(%)	Soku	Producers share in consumer's rupee(%)
Producer's Level				
Sale price	13,080	100.00	33,475	100.00
Marketing cost				
• **Labour cost**	-	-	469	1.4
• Plastic bags	170	1.3	132	0.39
Total marketing cost of producer	170	1.3	601	1.8
Net price received by producer	12,910	98.7	32,874	98.2
Consumer's price	13,080	100.00	33,475	100.00

Source: Based on Field Survey, 2012-13

Note: Longkhum village (sale price), 941 (kg) x 13.9 (Rs/kg)= Rs. 13,080
Soku village (sale price), 3182 (kg) x 10.52 (Rs/kg)= Rs. 33,475

Nevertheless, **in channel II**, retailers exist as an intermediary between producer and consumer (Table 5.5). In this channel, producers sell their surplus produce to retailers and obtain cost on transport, packing and labour. In Longkhum village, the total marketing cost in channel II is Rs. 61,060 for total quantity sold of which producers incurred Rs. 38,220 (4.52%) and retailers incurred Rs. 228,409 (2.7%) respectively. Likewise, in the counterpart village of Soku, marketing cost at producer's level is Rs. 13,794 (4.88%) and at the retailer's level it is Rs. 7,083 (2.51%). An overview of the marketing cost in the Table 5.7 shows, producers in both the villages incur more than 62 percent of the total cost in channel II. At producer's level, marketing cost of the producers

in consumer's rupee is higher in Soku village than Longkhum village; this is mainly due to high transportation cost involved in moving the commodity. At retailer level, the cost of items include labour cost, plastic bags, market fee/tax, marketing loss and other miscellaneous cost.

Table 5.5: Marketing cost, marketing margin and price spread of cabbage in Channel–II

[Rs/Total quantity sold]

Particulars	Longkhum	Producers share in consumer's rupee (%)	Soku	Producers share in consumer's rupee(%)
Producer's Level				
Sale price	648,749	76.8	181,796	64.36
Marketing cost of producer				
• Total Transport cost	27,540	3.26	12,540	4.44
• Packing cost	5,500	0.66	12,540	0.44
• Labour cost	5,180	0.61	-	-
[A] Total marketing cost of producer	38,220	4.52	13,794	4.88
Net price received by producer	610,529	72.27	168,002	59.47
Retailer's Level				
Purchase price/sale price of producer	648,749	76.8	181,796	64.36
Marketing cost of Retailer				
• Labour charge	3,160	0.37	1,584	0.56
• Plastic bags	2,703	0.32	1,004	0.36
• Market fee/Tax	2,950	0.35	1,335	o.47
• Miscellaneous cost	1,352	0.16	325	0.12
• Marketing Losses	12,675	1.5	2,835	1.0
[B] Total marketing cost of Retailer	22,840	2.7	7,083	2.51
Net margin of Retailer	173,136	20.5	93,609	33.14
Total marketing cost [A+B]	61,060	7.23	20,877	7.39
Consumer's price	844,725	100.00	282,488	100.00
Price spread	195,976	23.2	100,692	35.64

Source: Based on Field Survey, 2012-13

Note: Longkhum village (sale price), 33789 (kg) x 19.2 (Rs/kg)= Rs. 648,749
Retailers sell @Rs. 25/kg [33789x25=Rs. 844,725]
Soku village (sale price), 12555 (kg) x 14.48 (Rs/kg) =Rs. 181,796
Retailers sell@ Rs. 22.5/kg [12555x22.5= Rs. 282,488]

Similarly, the percentage cost of retailers in consumer's rupee in Mokokchung District is higher than in Wokha District by high marketing losses among retailers. In

channel II, the producers received 72.27 percent of the consumer's rupee and the remaining 20.5 percent are obtained by the retailers as profit margin whereas in Soku village, net price received by the producers is 59.47 percent and retailers received 33.14 percent of the consumer's rupee. Marketing margin at higher level taken by the intermediaries lead to less efficiency in the marketing system[106]. The study reveals that the producers avails greater share in consumer's rupee in Longkhum village while retailers share in consumer's rupee is high in Soku village. Thus, marketing of cabbage in channel II is more efficient and better off in Longkhum village of Mokokchung District. The final consumers' price is determined at Rs. 844,725 (i.e. 33,789 kg@ 25 per kg) and Rs. 282,488 (i.e.12, 555 kg@ 22.5 per kg.) in Longkhum and Soku village respectively. The difference in price paid by the consumer and the price received by the producer in Longkhum village is Rs. 195,976 (Rs. 11.1/kg) while it is Rs. 100,692 (Rs. 11.98/kg) in Soku village. This shows that, price spread per kg of cabbage is higher in Soku village.

While **in channel III**, the producers gather the commodity at an assembling point manually employing labour or by motor is the only cost incurred by the producers. In this channel, wholesalers and retailers are two market intermediary between the producer and the final consumer. The total marketing cost is Rs. 18,190 of quantity sold in this channel of which producers spends Rs. 947 (0.7%); wholesalers spends Rs. 10,944 (8.09%) and retailers spends Rs. 6,299 (4.66%) (See in Table 5.6). An overview of marketing cost in Table 5.7 indicates that about 60.16 percent of the total cost spends by the wholesalers followed by retailers (34.63%) and producers (5.22%). The high marketing cost at wholesaler's level is the transport cost and marketing losses at transit while the low marketing cost at producer's level is due to only cost on assembling and handling charge. The total marketing losses[107] in channel III is estimated to be Rs. 3,726 for total quantity sold of which losses at the retailer's level (72.46%) is higher than at the wholesaler's level (27.54%).

[106] Acharya and Agarwal (2010. Ibid, p.402.

[107] Total marketing loss is the sum of losses at wholesaler's (1026 kg) and retailer's (2700 kg) level and the percentage is calculated to their total losses [see Table 5.6]. Similarly, the marketing losses for chilli and orange are calculated.

Table 5.6: Marketing cost, marketing margin and price spread of cabbage in Channel–III

[Rs/Total quantity sold]

Particulars	Longkhum	Producers share in consumer's rupee(%)
Producer's Level		
Sale price	52,152	38.56
Marketing cost of producer		
• Assembling cost	947	0.7
[A] Total marketing cost of producer	947	0.7
Net price received by producer	51,205	37.86
Wholesaler's Level		
Purchase price/sale price of producer	52,152	38.52
Marketing cost of Wholesaler		
• Transport cost	5,400	4.0
• Packing cost	810	0.6
• Labour cost	3,600	0.27
• Miscellaneous cost	108	0.08
• Marketing Losses	1,026	0.76
[B] Total marketing cost of Wholesaler	10,944	8.09
Net margin of Wholesaler	39,664	29.35
Retailer's Level		
Purchase price/sale price of Wholesaler	102,790	76.0
Marketing cost of Retailer		
• Plastic bags	433	0.32
• Market fee/Tax	2,950	2.18
• Miscellaneous cost	216	0.16
• Marketing Losses	2,700	2.0
[C] Total marketing cost of Retailer	6,299	4.66
Net margin of Retailer	26,161	19.34
Total Marketing cost [A+B+C]	18,190	13.45
Consumer's price	135,250	100.00
Price spread	83,098	61.44

Source: Based on Field Survey, 2012-13

Note: Longkhum village (sale price), 5410 (kg) x 9.64 (Rs/kg)= Rs. 52,152
Wholesalers sell @Rs. 19/kg [5410x19= Rs. 102,790]
Retailers sell @Rs. 25/kg [5410x25=Rs. 135,250]

Net price received by producers in channel III is Rs. 51,205 (37.86%) and the net margin of wholesalers and retailers are Rs. 39,664 (29.35%) and Rs. 26,161 (19.34%) respectively; resulting that greater share in consumer's rupee are pocketed by market intermediaries in channel III. The net price received by producers is found to decrease in channel II and III as market intermediary increases (Table 5.8). The table (5.8) further reveals that cost of marketing increases from channel II to III with the additional number of market intermediaries and the final price paid by the consumers is determined at Rs. 135,250 and the price spread from producer to final consumer is Rs. 83,098 (Rs. 15.36/kg). Therefore, it comes to conclusion that, as marketing channel increases marketing cost increases, producers share in consumer's rupee decline and the profit margins of the market intermediary increases and the price gap between producer and consumer widen.

Table 5.7: Over view of marketing cost met by various intermediaries [Cabbage]

[Rs/Total quantity sold]

Intermediaries	Longkhum			Soku	
	Channel I	Channel II	Channel III	Channel I	Channel II
Producer	170 (100.00)	38,220 (62.59)	947 (5.22)	601 (100.00)	13,794 (66.07)
Retailer	-	22,840 (37.41)	6,299 (34.63)	-	7,083 (33.93)
Wholesaler	-	-	10,944 (60.16)	-	-
Total cost	170 (100.00)	61,060 (100.00)	18,190 (100.00)	601 (100.00)	20,877 (100.00)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to total cost

Table 5.8: Over view of per quintal price spread and returns of cabbage

[Rs/ Total quantity sold]

Intermediaries	Longkhum			Soku	
	Channel I	Channel II	Channel III	Channel I	Channel II
Net price received by Producer	12,910 (98.7)	610,529 (72.27)	51,205 (37.86)	32,874 (98.2)	168,002 (59.47)
Net margin of Retailer	-	173,136 (20.5)	26,161 (19.34)	-	93,609 (33.14)
Net margin of Wholesaler	-	-	39,664 (29.35)	-	-
Cost of marketing	170 (1.3)	61,060 (7.23)	18,190 (13.45)	601 (1.8)	20,877 (7.39)
Consumer price	13,080 (100.00)	844,725 (100.00)	135,250 (100.00)	33,475 (100.00)	282,488 (100.00)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to consumer price

(b) Chilli

The channel wise marketing cost, marketing margin, price spread, and net price received by producers for chilli in Longsa and Akuk village is summarized from Table 5.9 – 5.13. In both the selected villages, different marketing prices[108] were noted in disposing the surplus through different marketing channels. **In channel I**, producers sell directly to consumers and obtain entire cost in moving the commodity is presented in Table 5.9. The total marketing cost for selling total quantity of chilli in channel I incurred by producers is Rs. 3,077 in Longsa village whereas it is Rs. 5,465 in Akuk village and their respective share in consumer's rupee is 2.37 and 2.26 percent. The data reveals that, marketing cost of chilli in terms of percentage is marginally higher in Longsa village than Akuk village during the year. This is mainly due to high labour cost in Longsa village. The producers share in consumer's rupee is about 98 percent in both the villages in channel I.

[108] Producers in Longsa village sell@ Rs. 46.11/kg in channel I;@ Rs. 53.24/kg in channel II and @Rs. 39.54/kg in channel III. In channel III, wholesalers dispose to retailers at Rs.51.17/kg. The consumers price in channel II & III is settled at Rs. 62.67/kg. Whereas in Akuk village of Wokha District, the producers sell @ Rs. 52.46/kg in channel I; @ Rs. 59.9/kg in channel II and@ Rs. 47.1/kg in channel III. In channel III, wholesalers dispose to retailers@ Rs.57.67/kg while the retailers channel II and III sell@ Rs. 68.33/kg to the consumer's. Price difference shows, in all marketing situations, producers in Akuk village generate higher price/kg for an equivalent quantity of chilli.

Table 5.9: Marketing cost, marketing margin and price spread of chilli in Channel–I

[Rs/ Total quantity sold]

Particulars	Longsa	Producers share in consumer's rupee(%)	Akuk	Producers share in consumer's rupee(%)
Producer's Level				
Sale price	129,892	100.00	241,788	100.00
Marketing cost				
• Labour cost	2,817	2.17	4,787	1.98
• Plastic bags	260	0.2	678	0.28
Total marketing cost of producer	3,077	2.37	5,465	2.26
Net price received by producer	126,815	97.63	236,323	97.74
Consumer's price	129,892	100.00	241,788	100.00

Source: Based on Field Survey, 2012-13

Note: Longsa village (sale price), 2817 (kg) x 46.11 (Rs/kg)= Rs. 129,892
Akuk village (sale price), 4609 (kg) x 52.46 (Rs/kg)= Rs.241,788

On the other hand, **in channel II**, the producers sell their surplus to retailers (Table 5.10). In Longsa village, total marketing cost is Rs. 62, 352 of total quantity sold of which producers incurred Rs. 33,480 and retailers incurred Rs. 28,872 before it reaches the final consumer. Whereas in Akuk village of Wokha District, out of Rs. 57,364 of total marketing cost, the producers obtain Rs. 21,676 and retailers Rs. 35,688. An overview of the marketing cost (Table 5.12) shows, producers in Longsa village incur more than 50 percent of the total cost whereas in Akuk village, the producers incur only 37.79 percent of the total cost and the remaining 62.21 percent are expensed by the retailers. The low cost of producers in Akuk village is with absence of labour cost and the comparative high marketing cost at retailer's level is their marketing losses and high labour charge.

The final consumer's price is determined at Rs. 1, 329,168 and Rs. 1, 147,397 for total quintal sold in Longsa and Akuk village respectively of which net price received by the producers in consumer's rupee in Longsa village is 82.43 percent and the retailer's margin is 12.87 percent. Similarly, in Akuk village the producers share in consumer's rupee is 85.77 percent comparatively higher than Longsa village while, the retailers share

in consumer's rupee is only 9.23 percent. The percentage of price spread in consumer's rupee is 15.05 percent and 12.34 percent respectively in Longsa and Akuk village which indicates that, price difference between producer and consumer is high in Longsa village than Akuk village.

Table 5.10: Marketing cost, marketing margin and price spread of chilli in Channel–II

[Rs/ Total quantity sold]

Particulars	Longsa	Producers share in consumer's rupee(%)	Akuk	Producers share in consumer's rupee(%)
Producer's Level				
Sale price	1, 129,167	84.95	1, 005,841	87.66
Marketing cost of producer				
• Total Transport cost	24,200	1.82	20,350	1.77
• Packing cost	3,280	0.25	1,326	0.12
• Labour cost	6,000	0.45	-	-
[A] Total marketing cost of producer	33,480	2.52	21,676	1.89
Net price received by producer	1, 095,687	82.43	984,165	85.77
Retailer's Level				
Purchase price/sale price of producer	1, 129,167	84.95	1, 005,841	87.66
Marketing cost of Retailer				
• Labour charge	3,000	0.23	8,032	0.7
• Plastic bags	2,545	0.19	1,679	0.15
• Market fee/Tax	2,125	0.16	1,675	0.15
• Miscellaneous cost	1,273	0.1	1,343	0.12
• Marketing Losses	19,929	1.5	22,959	2.0
[B] Total marketing cost of Retailer	28,872	2.17	35,688	3.11
Net margin of Retailer	171,129	12.87	105,868	9.23
Total marketing cost [A+B]	62,352	4.69	57,364	5.0
Consumer's price	1, 329,168	100.00	1, 147,397	100.00
Price spread	200,001	15.05	141,556	12.34

Source: Based on Field Survey, 2012-13

Note: Longsa village (sale price), 21209 (kg) x 53.24 (Rs/kg)= Rs. 1, 129,167
Retailers sell @Rs. 62.67/kg [21209x62.67=Rs. 1, 329, 168]
Akuk village (sale price), 16792 (kg) x 59.9 (Rs/kg)= Rs. 1, 005, 841
Retailers sell @Rs. 68.33/kg [16792x68.33= Rs. 1, 147, 397]

Table 5.11: Marketing cost, marketing margin and price spread of chilli in Channel–III

[Rs/ Total quantity sold]

Particulars	Longsa	Producers share in consumer's rupee(%)	Akuk	Producers share in consumer's rupee(%)
Producer's Level				
Sale price	654,941	63.09	531,900	68.93
Marketing cost of producer				
• Assembling and handling charge	12,353	1.19	4,321	0.56
[A] Total marketing cost of producer	12,353	1.19	4,321	0.56
Net price received by producer	642,588	61.9	527,579	68.37
Wholesaler's Level				
Purchase price/sale price of producer	654,941	63.09	531,900	68.93
Marketing cost of Wholesaler				
• Transport cost	22,750	2.19	22,650	2.94
• Packing cost	1,950	0.19	1,359	0.18
• Labour cost	195	1.88	11,325	1.47
• Miscellaneous cost	663	0.06	452	0.06
• Marketing Losses	12,690	1.22	7,151	0.93
[B] Total marketing cost of Wholesaler	57,553	5.54	42,937	5.56
Net margin of Wholesaler	135,086	13.01	76,430	9.9
Retailer's Level				
Purchase price/sale price of Wholesaler	847,580	81.65	651,267	84.4
Marketing cost of Retailer				
• Plastic bags	1,988	0.19	1,129	0.15
• Market fee/Tax	2,125	0.2	1,675	0.22
• Miscellaneous cost	994	0.1	903	0.12
• Marketing Losses	17,673	1.7	15,443	2.0
[C] Total marketing cost of Retailer	2,278	2.19	19,150	2.48
Net margin of Retailer	167,706	16.16	101,234	13.12
Total Marketing cost [A+B+C]	92,686	8.93	66,408	8.61
Consumer's price	1,038,066	100.00	771,651	100.00
Price spread	383,125	36.91	239,751	31.07

Source: Based on Field Survey, 2012-13

Note: Longsa village (sale price), 16564 (kg) x 39.54 (Rs/kg)= Rs. 654,941
Wholesalers sell @Rs. 51.17/kg [16564x51.17= Rs. 847,580]
Retailers sell @Rs. 62.67/kg [16564x62.67=Rs. 1, 038,066]
Akuk village (sale price), 11293 (kg) x 47.1 (Rs/kg)= Rs. 531,900
Wholesalers sell @Rs. 57.67/kg [11293x57.67= Rs. 651,267]
Retailers sell @Rs. 68.33/kg [11293x68.33=Rs. 771,651]

Similarly, **in channel III**, wholesalers buy the commodity directly from the producers at the farm and sell them to retailers before it reaches the final consumers. In this channel, wholesalers and retailers exist as market intermediary between the producers and the final consumers (Table 5.11). Out of the total marketing cost, the wholesalers contributed more than 62 percent of the total cost followed by retailers (24.58%) and producers (13.33%) in Longsa village; whereas in Akuk village, the marketing cost incur by wholesaler at 64.65 percent of the total cost followed by retailer at 28.84 percent and only 6.51 percent at the producer's level (Table 5.12).

High cost of marketing among wholesalers in both the villages is on transportation, labour cost and marketing losses. Similarly, retailers in both the villages have high marketing losses. The total marketing losses of chilli during transit, wastage and losses at both wholesaler and retailer's level is estimated to be Rs. 30,363 and Rs. 22,592 respectively for total output purchased and sold to consumers both in Longsa and Akuk villages. The study reveals that the retailers have greater losses than wholesalers in both Longsa village (retailers 58.21%; wholesalers 41.79%) and Akuk village (retailers 68.36%; wholesalers 31.65%).

The final price paid by the consumers is determined at Rs. 1, 038,066 and Rs. 771,651 for output sold in Longsa and Akuk village respectively; and the price spread is Rs. 383,125 (Rs. 23.13/kg) in Longsa village and Rs. 239,751 (Rs. 21.23/kg) in Akuk village indicating that producers share in consumer's rupee is comparatively higher in Akuk village than in Longsa village.

Table 5.12: Overview of marketing cost met by various intermediaries [Chilli]

[Rs/Total quantity sold]

Intermediaries	Longsa			Akuk		
	Channel I	Channel II	Channel III	Channel I	Channel II	Channel III
Producer	3,077 (100.00)	33,480 (53.7)	12,353 (13.33)	5,465 (100.00)	21,676 (37.79)	4,321 (6.51)
Retailer	-	28,872 (46.3)	2,278 (24.58)	-	35,688 (62.21)	19,150 (28.84)
Wholesaler	-	-	57,553 (62.09)	-	-	42,937 (64.65)
Total Marketing Cost	3,077 (100.00)	62,352 (100.00)	92,686 (100.00)	5,465 (100.00)	57,364 (100.00)	66,408 (100.00)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to total cost

Table 5.13: Overview of price spread and returns of chilli

[Rs/Total quantity sold]

Intermediaries	Longsa			Akuk		
	Channel I	Channel II	Channel III	Channel I	Channel II	Channel III
Net price received by Producer	126,815 (97.63)	1,095,687 (82.43)	642,588 (61.9)	236,323 (97.74)	984,165 (85.77)	527,579 (68.37)
Net margin of Retailer	-	171,129 (12.87)	167,706 (16.16)	-	105,868 (9.23)	101,234 (13.12)
Net margin of Wholesaler	-	-	135,086 (13.01)	-	-	7,643 (9.9)
Cost of marketing	3,077 (2.37)	62,352 (4.69)	92,686 (8.93)	5,465 (2.26)	57,364 (5.0)	66,408 (8.61)
Consumer price	129,892 (100.00)	1,329,168 (100.00)	1,038,066 (100.00)	241,788 (100.00)	1,147,397 (100.00)	771,651 (100.00)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to consumer price

(c) Orange

The channel wise marketing cost, marketing margin, price spread and net price received by producers in Yajang and N. Longidang village is summarized from Table 5.14 – 5.20. Different selling prices[109] in the two selected villages were noted in the present study. **In channel I** in Mokokchung District, producers sell to local seller and the net price received by the producers, price spread and marketing cost in moving the commodity till final consumers is presented in Table 5.14. No marketing cost is borne by producers and all marketing cost is expense by the local sellers in this channel. Marketing losses due to press and mishandling during transit accounted Rs. 2,553 (0.08%) and thus, the total marketing cost incurred by local sellers is Rs. 10,476 and its share in consumer's rupee is 0.32 percent. The net price received by producers is Rs. 2, 121,504 (94,080 kg@ Rs. 22.55/kg) for total quantity sold and its share in consumer's rupee is 65.36 percent while net margin received by the local sellers is 34.31 percent. Final price paid by consumers is Rs. 32, 45,760 and the price spread is Rs. 1, 124,256 (Rs. 12/kg) of total quantity sold.

However, channel I in N. Longidang village of Wokha District, producer sell directly to consumer and all cost involved in transaction are made by the producer alone. The total marketing cost incurred by the producer is Rs. 6,131 which accounted 3.75 percent of consumer's rupee (Table 5.15). Labour, marketing losses, transport, plastic bags and packing added to producers marketing cost in channel I and the net margin received by producers is Rs. 157,317 for total quantity sold, receiving about 96.25 percent of consumer's rupee.

[109] Producers in Yajang village sell @Rs. 22.55/kg in channel I; @Rs. 22.39/kg in channel II. In channel I, local sellers sell @ Rs. 34.5/kg to consumers. In channel II, wholesalers dispose to retailers @ Rs.31.67/kg and the retailers to consumer's price@ Rs. 40/kg. While in N. Longidang village, producers sell @ Rs. 40.10/kg in channel I; @ Rs. 38.79/kg in channel II and @ Rs. 31.19/kg in channel III. In channel III, wholesalers dispose to retailers@Rs.40.67/kg and the final price paid by consumers in channel I and II is settled @ Rs. 50/kg. Price difference shows, in all marketing situations, producers in N. Longidang village generate higher price/kg for an equivalent quantity of orange.

Table 5.14: Marketing cost, marketing margin and price spread of orange in Channel – I [Yajang Village]

[Rs/ Total quantity sold]

Particulars	Yajang	Producers share in consumer's rupee(%)
Producer's Level		
Sale price	2, 121,504	65.36
Marketing cost of producer	-	-
Net price received by producer	2, 121,504	65.36
Local seller's Level		
Purchase price/sale price of producer	2, 121,504	65.36
Marketing cost of Local seller		
• Labour cost	6,300	0.19
• Plastic bags	1,623	0.05
• Marketing Losses	2,553	0.08
Total marketing cost of Local seller	10,476	0.32
Net margin of Local seller	1, 113,780	34.31
Total marketing cost	10,476	0.32
Consumer's price	3, 245,760	100.00
Price spread	1, 124,256	34.64

Source: Based on Field Survey, 2012-13

Note: Yajang village (sale price), 94080 (kg) x 22.55 (Rs/kg)= Rs. 2, 121,504
Local seller sell@ 34.5/kg [94080x34.5= Rs. 3, 245,760].

Table 5.15: Marketing cost, marketing margin and price spread of orange in Channel – I [N. Longidang Village]

[Rs/ Total quantity sold]

Particulars	N. Longidang	Producers share in consumer's rupee(%)
Producer's Level		
Sale price	163,448	100.00
Marketing cost		
• Transport cost	720	0.44
• Labour cost	2,942	1.8
• Packing cost	96	0.06
• Plastic bags	408	0.25
• Marketing Losses	1,965	1.2
Total marketing cost of producer	6,131	3.75
Net price received by producer	157,317	96.25
Consumer's price	163,448	100.00

Source: Based on Field Survey, 2012-13

Note: N. Longidang village (sale price), 4076 (kg) x 40.10 (Rs/kg)= Rs.163,448

On the other hand, **in channel II**, wholesaler and retailer are two market intermediaries in Yajang village of Mokokchung District which is depicted in the Table 5.16. Similarly, like in channel I, no marketing cost is borne by producers in Yajang village in channel II. Total marketing cost of Rs. 1, 212,153 for total quantity sold in channel II of which wholesalers incurred Rs. 967,055 and retailers incurred Rs. 245,098 percent of the total cost i.e. wholesalers incur about 80 percent and retailers incur about 20 percent of the total cost (Table 5.19). High marketing cost at wholesaler's level is on transportation and marketing losses due to spoilage and wastage accounting 3.23 percent and 1.58 percent of consumer's rupee. The total marketing losses in this channel is estimated to be Rs. 433,257 and to this wholesaler have greater losses (63.76%)) than retailers (36.24%). Producers share in consumer's rupee is 55.98 percent and the margin of wholesalers and retailers is 17.66 and 19.42 percent respectively. Thus, among the two market intermediaries, retailers are earning greater profit margins than the wholesaler. The final consumer's price is Rs. 17,445,000 for total quantity of which the price spread is Rs. 7, 680,161 in this channel (Rs. 17.6/kg).

Whereas in N. Longidang village of Wokha District, only retailer exist as an intermediary between the buyers and sellers in channel II (Table 5.17). The total marketing cost is Rs. 46,374 of which producers and retailers incurred 19.43 and 80.57 percent respectively (Table 5.19), indicating high cost at retailer's level. This high marketing cost of retailer is due to market fee/tax and marketing losses. Producers share in consumer's rupee is 76.71 percent and the net margin received by retailers is 18.82 percent. The final consumer's price is Rs. 1, 037,500 of which the price spread to total quantity sold is Rs. 232,607 (Rs. 11.21/kg).

Table 5.16: Marketing cost, marketing margin and price spread of orange in channel–II [Yajang Village]

[Rs/ Total quantity sold]

Particulars	Yajang	Producers share in consumer's rupee(%)
Producer's Level		
Sale price	9, 764,839	55.98
[A] Marketing cost of producer	-	-
Net price received by producer	9, 764,839	55.98
Wholesaler's Level		
Purchase price/sale price of producer	9, 764,839	55.98
Marketing cost of Wholesaler		
• Transport cost	563,474	3.23
• Packing cost	34,890	0.2
• Labour cost	87,200	0.5
• Miscellaneous cost	5,234	0.03
• Marketing Losses	276,257	1.58
[B]Total marketing cost of Wholesaler	967,055	5.54
Net margin of Wholesaler	3, 080,185	17.66
Retailer's Level		
Purchase price/sale price of Wholesaler	13,812,079	79.18
Marketing cost of Retailer		
• Plastic bags	65,419	0.38
• Market fee/Tax	17,445	0.1
• Miscellaneous cost	5,234	0.03
• Marketing Losses	157,000	0.9
[C] Total marketing cost of Retailer	245,098	1.4
Net margin of Retailer	3, 387,823	19.42
Total Marketing cost [A+B+C]	1, 212,153	6.95
Consumer's price	17,445,000	100.00
Price spread	7, 680,161	44.02

Source: Based on Field Survey, 2012-13

Note: Yajang village (sale price), 436125 (kg) x 22.39 (Rs/kg)= Rs. 9, 764,839
Wholesaler sell @ Rs. 31.67/kg [436125x31.67= Rs. 13, 812,079]
Retailers sell @ Rs. 40/kg [436125x40=Rs. 17, 445,000]

Table 5.17: Marketing cost, marketing margin and price spread of orange in Channel–II [N. Longidang Village]

[Rs/ Total quantity sold]

Particulars	N. Longidang	Producers share in consumer's rupee(%)
Producer's Level		
Sale price	804,893	77.58
Marketing cost of producer		
• Total Transport cost	7,950	0.77
• Packing cost	1,060	0.1
[A] Total marketing cost of producer	9,010	0.87
Net price received by producer	795,883	76.71
Retailer's Level		
Purchase price/sale price of produce	804,893	77.58
Marketing cost of Retailer		
• Plastic bags	3,113	0.3
• Market fee/Tax	19,700	1.9
• Miscellaneous cost	1,038	0.1
• Marketing Losses	13,500	1.3
[B] Total marketing cost of Retailer	37,364	3.6
Net margin of Retailer	195,243	18.82
Total marketing cost [A+B]	46,374	4.47
Consumer's price	1, 037,500	100.00
Price spread	232,607	22.42

Source: Based on Field Survey, 2012-13

Note: N. Longidang village (sale price), 20750 (kg) x 38.79 (Rs/kg)= Rs. 804,893
Retailers sell@ Rs. 50/kg [20750x50=Rs. 1, 037,500]

Table 5.18: Marketing cost, marketing margin and price spread of orange in Channel–III

[Rs/ Total quantity sold]

Particulars	N. Longidang	Producers share in consumer's rupee(%)
Producer's Level		
Sale price	6, 554,079	62.38
Marketing cost of producer		
• Assembling and handling charge	42,027	0.4
[A] Total marketing cost of producer	42,027	0.4
Net price received by producer	6, 512,052	61.98
Wholesaler's Level		
Purchase price/sale price of producer	6, 554,079	62.38
Marketing cost of Wholesaler		
• Transport cost	430,775	4.1
• Packing cost	12,158	0.12
• Labour cost	31,500	0.3
• Miscellaneous cost	4,203	0.04
• Marketing Losses	145,273	1.38
[B] Total marketing cost of Wholesaler	623,909	5.94
Net margin of Wholesaler	1, 368,162	13.02
Retailer's Level		
Purchase price/sale price of Wholesaler	8, 546,150	81.34
Marketing cost Retailer		
• Plastic bags	21,013	0.3
• Market fee/Tax	19,713	0.19
• Miscellaneous cost	8,000	0.08
• Marketing Losses	210,150	2.0
[C] Total marketing cost of Retailer	258,876	2.46
Net margin of Retailer	1, 701,674	16.2
Total Marketing cost [A+B+C]	924,812	8.8
Consumer's price	10,506,700	100.00
Price spread	3, 952,621	37.62

Source: Based on Field Survey, 2012-13

Note: N. Longidang village (sale price), 210134 (kg) x 31.19 (Rs/kg)= Rs. 6, 554,079
Wholesalers sell @Rs. 40.67/kg [210134x40.67= Rs. 8, 546,150]
Retailers sell @ Rs. 50/kg [210134x50=Rs. 10, 506,700]

The information regarding marketing cost, marketing margin and price spread of orange in N. Longidang village of Wokha District **in channel III**, is presented in Table 5.18. Out of the total marketing cost Rs. 924,812 for total output sold in this channel, wholesaler's expense at higher cost of Rs. 623,909 followed by retailer's Rs. 258,876 and producer Rs. 42,027. An overview of marketing cost in Table 5.19 shows 67.46 percent of the total cost is expensed by the wholesalers followed by retailers (27.99%) and only 4.54 percent incurred by producers. High marketing cost at wholesaler's level is mainly on transport cost and marketing losses. Retailers have high marketing losses while producers cost is only on assembling and handling charge. The total marketing losses due to wastage and spoilage is estimated to be Rs. 355,423 of which the retailer has greater losses (59.13%) than wholesalers (40.87%) indicates that marketing losses at the retailer's level is high in channel III.

Producers share in consumer's rupee is 61.98 percent (Rs. 6,512,052) and the margins received by the intermediaries are 13.02 percent and 16.2 percent for wholesalers and retailers respectively. The price spread for output sold in channel III is Rs. 3, 952,621 (Rs. 18.81/kg). The producers share in consumer's rupee decline as marketing channel increases in both the Districts (Table 5.20). With increase in middlemen, marketing cost and total marketing margin increases reducing the net price received by the producers in both selected villages of the Districts. Among the market intermediaries, net margin received by the retailers is higher than wholesalers in the study area.

Table 5.19: Overview of marketing cost met by various intermediaries [Orange]

[Rs/ Total quantity sold]

Intermediaries	Yajang		N. Longidang		
	Channel I	Channel II	Channel I	Channel II	Channel III
Producer	Nil (00.00)	Nil (00.00)	6,131 (100.00)	901 (19.43)	42,027 (4.54)
Local seller	10,476 (100.00)	-	-	-	-
Retailer	-	245,098 (20.22)	-	37,364 (80.57)	25,8876 (27.99)
Wholesaler	-	967,055 (79.78)	-	-	623,909 (67.46)
Total	10,476 (100.00)	121,2153 (100.00)	6,131 (100.00)	46,374 (100.00)	924,812 (100.00)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to total cost

Table 5.20: Overview of per quintal price spread and returns of orange

[Rs/ Total quantity sold]

Particulars	Yajang		N. Longidang		
	Channel I	Channel II	Channel I	Channel II	Channel III
Net price received by Producer	2,121,504 (65.36)	9,764,839 (55.98)	157,317 (96.25)	795,883 (76.71)	6,512,052 (61.98)
Net margin of Local seller	11,13,780 (34.31)	-	-	-	-
Net margin of Retailer	-	3,387,823 (19.42)	-	195,243 (18.82)	1,701,674 (16.2)
Net margin of Wholesaler	-	3,080,185 (17.66)	-	-	1,368,162 (13.02)
Cost of marketing	10,476 (0.32)	1,212,153 (6.95)	6,131 (3.75)	46,374 (4.47)	924,812 (8.8)
Consumer price	324,576 (100.00)	17,445,000 (100.00)	163,448 (100.00)	1,037,500 (100.00)	10,506,700 (100.00)

Source : Based on Field Survey, 2012-13

Note : Figure in parenthesis is in percentage to consumer price

5.3 MARKETING EFFICIENCY

Marketing efficiency is essentially the degree of market performance. The consistent movement of goods from producers to consumers at the lowest possible cost as desired by the consumers is an efficient marketing system (Acharya and Agarwal, 2010) [110]. The concept of marketing efficiency is broad and dynamic. Marketing efficiency is the ratio of market output to marketing input; higher is the ratio, greater the marketing efficiency. Any increase in this ratio results good marketing efficiency while decrease shows poor marketing efficiency. A reduction in the cost for the same level of output or an increase in the output at a given cost results in the efficiency of marketing (Khols and Uhl, 1980)[111]. Marketing efficiency has been defined consisting three[112] components: the effectiveness with which a marketing service is performed; cost at which marketing service is performed; and the effect of cost on production and consumption. The improvement in marketing efficiency means the reduction of marketing cost without reducing the quantum of services to the consumer (Solanke et al., 2013; Thamizhselvan and Murugan, 2012). A higher level of consumer's satisfaction even at higher cost of marketing indicates marketing efficiency. Efficient marketing system ensures increased in farm production increasing the level of real income and consumer's satisfaction with low possible cost. Thus, an efficient marketing system is a pre-requisite for all-round development of the horticultural sector as it enables the farmers to secure better prices to their produce which in term gives incentives to produce more. For raising income and consumers satisfaction marketing system must be corrected to help improve life and quality of the masses. Following measures were adopted in the present study to assess marketing efficiency of the selected crops:

1. **Conventional Method:** According to this method, marketing efficiency is determined by the ratio of value added to total marketing cost.

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[110] Acharya, S.S. and Agarwal, N.L. (2010), Ibid., p.386

[111] Kohls, R.L. & Uhl, J.N. (1980). *Marketing of Agricultural products* (5th Edition), p.589. New York: MacMillan Publishing Company Inc.

[112] Clark, Fred E. (1954). Principles of Marketing, p.777

2. **Shepherd's[113] Method:** The ratio of price paid by the consumer's to total marketing cost may be used as a measure of marketing efficiency. Higher the ratio, higher the efficiency and vice-versa. This method neglects the problem of measurement of value added.

3. **Acharya-Agarwal[114] Modified Method:** According to Acharya-Agarwal, marketing measures should include total marketing cost, net marketing margins, price received by farmer and price paid by the consumers. The limitation of Conventional and Shepherd's method is that, it does not take into consideration the price received by the producer. The limitation of both these methods is taken into consideration by the modified method suggested by Acharya-Agarwal.

(a) Cabbage

The result of marketing efficiency calculated by conventional method, Shepherd's Method and Acharya-Agarwal modified methods is presented in Table 5.21. In Mokokchung District, marketing efficiency index ratios according to Shepherd's method in channel I is 75.94, channel II is 12.83 and channel III is 6.43. Similarly, Acharya-Agarwal method indicates the market efficiency index ratio in channel I is 75.94, channel II is 2.61 and channel III is 0.61. Whereas, in Conventional method themarket efficiency index ratio shows in channel I is1.0, channel II is 3.84 and channel III is 4.62. On the other hand, in Soku village of Wokha District, marketing efficiency index ratio according to Shepherd's method in channel I is 54.70 and channel II is 12.53; similar to Acharya-Agarwal in channel I it is 54.70 and channel II is 1.47 and by Conventional method channel I is 1.0 and channel II is 5.48.

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[113] Shepherd, G.S. (1965). *Marketing farm products- Economic Analysis* (p.254). Ames: Iowa State University press.

[114] Acharya, S.S. and Agarwal, N.L. (2001). *Agricultural marketing in India* (pp.98-138). New Delhi: Oxford & IBH Publishing Company.

Table 5.21: Marketing efficiency index of cabbage in different marketing channels

[Rs/ Total quantity sold]

Particulars	Mokokchung		
	Channel–I	**Channel–II**	**Channel–II**
Net price received by producer	12,910	610,529	51,205
Marketing cost	170	61,060	18,190
Marketing margin	0.00	173,136	65,825
Value added by the marketing system	170	234,196	84,045
Consumer price	13,080	844,725	135,250
Marketing Efficiency			
• Conventional method	1.00	3.84	4.62
• Shepherd's method	75.94	12.83	6.43
• Acharya- Agarwal method	75.94	2.61	0.61
	Wokha		
Net price received by producer	32,874	168,002	-
Marketing cost	601	20,877	-
Marketing margin	0.00	93,609	-
Value added by the marketing system	601	114,486	-
Consumer price	33,475	282,488	-
Marketing Efficiency			
• Conventional method	1.00	5.48	-
• Shepherd's method	54.70	12.53	-
• Acharya- Agarwal method	54.70	1.47	-

Source: Compiled by researcher, 2012-13

The results indicates that according to Shepherd and Acharya-Agarwal method, channel I is most efficient channel for marketing of cabbage than by channel II or channel III in both the Districts. On contrary to that, according to Conventional[115] method, channel III shows more efficient than channel II and channel I for marketing of cabbage. High marketing efficiency of producers in channel I in both the Districts is by their low cost and larger returns of the consumer's price with absence of intermediaries in the process of marketing. In this channel, producers share in consumer's rupee is more than 98 percent in both the Districts. With increase in number of market intermediaries (channel II and III), marketing cost and margin increases (see Table 5.8) resulting in low

[115] Under conventional method, channel-III shows the most efficient market when the price received by the producer is lowest, high cost and more prices spread. Therefore, this method is not suitable under Indian conditions (Acharya–Agarwal, 2010).

marketing efficiency. Similar studies and results were reported by Karla et al., 2000; Solanke et al., 2013; Dastagiri et al., 2013; Sashimatsung et al., 2013; Barakada et al., 2011; Thamizhselvan and Murugan, 2012; Kalidas and Akila, 2014; Gunwant et al., 2012; Gangwar et al., 2007. The highest marketing efficiency channel is from producer to consumer; hence, policy makers should initiate and promote direct marketing models for horticultural marketing in the two Districts. Table 5.21 further indicates marketing efficiency ratio is high in Mokokchung District compared to Wokha District in all the channels. This shows marketing of cabbage is more efficient in Mokokchung District compared to Wokha District.

(b) Chilli

The results of efficiency calculated by conventional method, Shepherd's method and Acharya-Agarwal modified method for chilli crop is presented in Table 5.22. Marketing efficiency index ratio in Mokokchung District, according to Shepherd's method in channel I: 41.21; channel II: 21.32 and channel III: 10.20; according to Acharya-Agarwal channel I: 41.21; channel II: 4.69 and channel III: 1.62; whereas, according to Conventional method channel I: 1.0; channel II: 3.74 and channel III: 4.27. On the other hand in Wokha District, marketing efficiency index ratio according to Shepherd's method is channel I: 43.24; channel II: 19.0 and channel III: 10.62; according to Acharya-Agarwal channel I: 43.24; channel II: 6.03 and channel III: 2.16; while according to Conventional method channel I: 1.0; channel II: 2.85 and channel III: 3.67.

The results from both Shepherd's and Acharya-Agarwal methods indicate that, channel I is most efficient channel for marketing of chilli followed by channel II and III in both the Districts. In channel I, the producers sell directly to consumers and received more than 97 percent of the consumer's price at low marketing cost. Less efficiency of channel II and III is due to increased cost and market margin of intermediaries (see Table 5.13) involved in moving the surplus from producer to consumer. Table 5.22 further shows marketing efficiency ratio higher in Wokha District compared to Mokokchung

District in all the three marketing channels. This shows marketing of chilli is more efficient in Wokha District compared to Mokokchung District.

Table 5.22: Marketing efficiency index of chilli in different marketing channels

[Rs/ Total quantity sold]

Particulars	Mokokchung		
	Channel–I	**Channel–II**	**Channel–II**
Net price received by producer	126,815	1, 095,687	642,588
Marketing cost	3,077	62,352	92,686
Marketing margin	0.00	171,129	302,792
Value added by the marketing system	3,077	233,481	395,478
Consumer price	129,892	1, 329,168	1, 038,066
Marketing Efficiency			
• Conventional method	1.00	3.74	4.27
• Shepherd's method	41.21	21.32	10.20
• Acharya- Agarwal method	41.21	4.69	1.62
	Wokha		
Net price received by producer	236,323	984,165	527,579
Marketing cost	5,465	57,364	66,408
Marketing margin	0.00	105,868	177,664
Value added by the marketing system	5,465	163,232	244,072
Consumer price	241,788	1, 147,397	771,651
Marketing Efficiency			
• Conventional method	1.00	2.85	3.67
• Shepherd's method	43.24	19.00	10.62
• Acharya- Agarwal method	43.24	6.03	2.16

Source: Compiled by researcher, 2012-13

(c) Orange

Similarly, the results of marketing efficiency calculated by conventional method, Shepherd's method and Acharya-Agarwal modified method for orange is presented in the Table 5.23. Marketing efficiency index ratio in Mokokchung District, according to Shepherd's method in channel I is 308.83 and channel II it is 13.39; according to Acharya-Agarwal, channel I is 1.89 and channel II is 1.27 and according to Conventional method the marketing efficiency index ratio in channel I is 107.32 and in channel II it is

6.34. While in Wokha District, marketing efficiency index ratio according to Shepherd's method in channel I is 25.66, channel II is 21.37 and channel III is 10.36; according to Acharya-Agarwal marketing efficiency index ratio in channel I is 38.23, channel II is 3.29 and channel III is 1.63. Contrary to that, in Conventional method the marketing efficiency index ratio of orange crop in channel I is 1.0, channel II is 5.21 and channel III is 4.32.

The two models show (Shepherd, Acharya-Agarwal) channel I is most efficient channel for marketing of orange followed by channel II and III in both the Districts. Channel I is shown to be highly efficient according to Shepherd's and Conventional method in Mokokchung District. According to Acharya-Agarwal, marketing efficiency ratio is higher in Wokha compared to Mokokchung District revealing that marketing of orange is more efficient in Wokha District.

Table 5.23: Marketing efficiency index of orange in different marketing channels

[Rs/ Total quantity sold]

Particulars	Mokokchung		
	Channel–I	**Channel–II**	**Channel–II**
Net price received by producer	2, 121,504	9, 764,839	-
Marketing cost	10,476	1, 212,153	-
Marketing margin	1, 113,780	6, 468,008	-
Value added by the marketing system	1, 124,256	7, 680,161	-
Consumer price	3, 245,760	17,445,000	
Marketing Efficiency			
• Conventional method	107.32	6.34	-
• Shepherd's method	308.83	13.39	-
• Acharya- Agarwal method	1.89	1.27	-
	Wokha		
Net price received by producer	157,317	795,883	6, 512,052
Marketing cost	6,131	46,374	924,812
Marketing margin	0.00	195,243	3, 069,836
Value added by the marketing system	6,131	241,617	3,994,648
Consumer price	163,448	1, 037,500	1, 0506,700
Marketing Efficiency			
• Conventional method	1.0	5.21	4.32
• Shepherd's method	25.66	21.37	10.36
• Acharya- Agarwal method	38.23	3.29	1.63

Source: Compiled by researcher, 2012-13

Recapitulation

The producers are found to dispose maximum quantity of cabbage and chilli through retailers in both the District. In case of orange, the producers use wholesaler involvement as the main channel for marketing the surplus in both the Districts. The least marketing channel was producer-consumer channel. The producers incurred all marketing cost in channel I and its cost decline as market intermediary increases. Wholesalers hold more than 60 percent of the total marketing costs except for cabbage in Soku village of Wokha District. The net price received by the producers is highest in channel I, followed by channel II and III. Low margin of producers in subsequent channels is due to the percentage share of consumer's rupee pocketed by the intermediaries as margin. Channel I (producer-consumer) is the most efficient channel for marketing of selected crops followed by channel II and III. Marketing efficiency decline as market intermediaries increases and vice versa.

CHAPTER VI

SELLING BEHAVIOUR OF FARMERS AND MARKETING PROBLEMS

CHAPTER VI

SELLING BEHAVIOUR OF FARMERS AND MARKETING PROBLEMS

Introduction

In countries with predominantly agrarian economies like India, most farmers produce primarily to ensure food security for their families, only selling the marketable surplus that they generate. Farmers produce horticultural commodities such as vegetables and fruits first to sell to the local market or traders that collect at their farm gate. This emphasis is on production rather than demand from consumers, which ultimately leads to the familiar phenomena of market gluts, wastage and high price fluctuations, particularly in the case of perishable commodities. As a matter of fact, the marketing of fruits and vegetables is still complex being sold by a number of different ways and methods and by a large number of different market intermediaries. Intrinsically, the marketing pattern of agricultural produce in general and marketing of fruits and vegetables in particular varies considerably from commodity to commodity and from producer to producer depending upon the nature of the commodity and potentiality of the producers (Prasad, 1989)[116].

It is a practice for marketing most of the horticultural crops has to change hands three to four times from the producer before it reaches the final consumer. In case of Nagaland for the selected crops there are no village merchants, commission agents and itinerant dealers in the study area, therefore, the producer sell directly to consumers at village level as vendors and sell into the main market through retailers and wholesalers. In Nagaland, marketing of selected horticulture crops are primarily operated by private traders through katcha or unorganized retailers and wholesalers. The marketed surplus that moves from farm to urban market center operates through multiplicity of market

[116] Prasad, J. (1989). *Marketable surplus and market performance* (1st Edition), p. 100-110. New Delhi: Mittal Publication.

intermediaries in an unprocessed form due to local nature of trade; there are no standardization weight, measure and grading of commodity in the study area.

6.1 FARMERS BEHAVIOUR TO PLACE OF SALE

For understanding the marketing system (Acharya and Agarwal, 2010)[117], it is vital to acknowledge the disposal pattern of marketed surplus according to producer's place of selling the commodity and the time of selling the commodity. The producers' conclusion to dispose his surplus produce at particular point of time is significant for it may bring about scarcity or glut in the market which ultimately impact price of the commodity. In an agrarian economy, the immediate sell of a commodity after post-harvest the producers receive lower price and this phenomenon of very concentration of market arrivals at a short period of time has been termed as 'Market getting choked' by Tyagi,[118]. However, market arrival also depends on the nature, seasonality and bulkiness of the commodity. Fruits and vegetables are highly perishable in nature and with no better cold storage facility in the study area forced the farmers to dispose the surplus immediately after the harvest when the crops are fresh.

The behaviour of producers in selling the surplus based on place of disposal is split into sale 'within village' and sale 'in market' place and the quantum of surplus sell changes within commodity and the size group of farmers. The magnitude sale of the selected horticultural crops within village and in market in Mokokchung District by farm size is present in Table 6.1. The table indicates that, about 82.26 to 97.66 percent of the total marketed surplus of cabbage, chilli and orange is traded by the producers in the market, and about 2.34 to 17.74 percent is marketed within village. The table further shows (in case of orange), the percentage of quantity marketed within village decreases with the increase in the farm size from 23.77 to 15.48 percent. Similarly the monthwise[119]

[117] Acharya, S.S. and N.L. Agarwal (2010). *Agricultural marketing in India (4th Ed)*, pp.61-62. New Delhi: Oxford & IBH Publishing Company Pvt. Ltd.

[118] Tyagi, D.S. (1990). *Managing India's food economy* (pp.113-116). New Delhi: Sage publications.

[119] Month-wise in this section of Thesis refers to only post-harvest production period for all the respective selected crops, villages and Districts.

disposal of chilli indicates that in the month of June, the crop sale within village is about 8.26 percent, and decreased by 4.91 percent in July as surplus increases (Table 6.2). However, increase sale within village in August is because of rise in price due to fewer surpluses owing to lean period and rise in market demand for the commodity. Month-wise sale within village of orange decline as farm size increases accept for semi-medium farmers in December where its sale within village is higher than the small farmers (Table 6.3). The magnitude of sale within village and in market in both the Districts is further shown in the Figure 6.1 and Figure 6.2.

Similarly, in Wokha District about 79.78 to 98.27 percent (Table 6.4) of the total marketed surplus is marketed in market while about 1.73 to 20.22 percent is sold within village. As farm size increases sale within village declines from 2.35 to 0.07 percent for orange resulting that, sale in market have positive relationship with increase surplus. Month-wise disposal of chilly and orange in Wokha District (Table 6.2 and Table 6.3) shows similar results to Mokokchung District in which the percentage sale in market increases as farm size increases. Similarly, the month wise analysis of crop sales indicates that the sales of chilli crop in August and orange crop in January respectively increases within the village by changes in production and price attractiveness in subsequent months.

Table 6.1: Magnitude of sale within village and in market in Mokokchung District

(In Quintal)

Crops/ Farm size	Place of sale		Total
	Within village	In market	
Cabbage	9.41 (2.34)	391.99 (97.66)	401.40 (100.00)
Chilli	28.17 (6.94)	377.73 (93.06)	405.90 (100.00)
Orange (overall)	940.80 (17.74)	4361.25 (82.26)	5302.05 (100.00)
• Marginal	195.75 (23.77)	627.60 (76.22)	823.38 (100.00)
• Small	526.12 (17.17)	2538.85 (82.83)	3064.97 (100.00)
• Semi-medium	218.90 (15.48)	1194.80 (84.52)	1413.70 (100.00)

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis is in percentage to total

Table 6.2: Month-wise magnitude of sale within village and in market of chilli in Mokokchung and Wokha District

(In Quintal)

District	Place of sale	Month		
		June	July	August
Mokokchung	Within village	10.39 (8.26)	8.20 (4.91)	9.58 (8.47)
	In market	115.34 (91.74)	158.91 (95.09)	103.48 (91.53)
Wokha	Within village	12.34 (12.55)	15.23 (11.11)	18.52 (20.23)
	In market	86.01 (87.45)	121.82 (88.89)	73.02 (79.77)

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis is in percentage to total

Table 6.3: Month-wise magnitude of sale within village and in market of orange in Mokokchung and Wokha District

(In Quintal)

District	Place of sale	Month		
		November	December	January
Mokokchung				
Marginal	Within village	77.17 (26.58)	102.70 (21.01)	15.91 (35.91)
	In market	213.20 (73.42)	386.00 (78.99)	28.40 (64.09)
Small	Within village	228.93 (23.72)	253.64 (13.68)	43.55 (17.72)
	In market	736.15 (76.28)	1600.50 (86.32)	202.20 (82.28)
Semi-medium	Within village	98.46 (18.44)	109.81 (14.88)	10.63 (7.50)
	In market	435.50 (81.56)	628.20 (85.12)	131.10 (92.50)
Wokha				
• Marginal	Within village	13.40 (2.45)	19.97 (1.82)	6.95 (9.81)
	In market	533.09 (97.55)	1080.21 (98.18)	63.88 (90.19)
• Small	Within village	-	-	0.44 (1.08)
	In market	234.02 (100.00)	357.18 (100.00)	40.46 (98.92)

Source : Based on Field Survey, 2012-13
Note : Figure in parenthesis is in percentage to total

Table 6.4: Magnitude of sale within village and in market in Wokha District

(In Quintal)

Crops/ Farm size	Place of sale		Total
	Within village	In market	
Cabbage	31.82 (20.22)	125.55 (79.78)	157.37 (100.00)
Chilli	46.09 (14.10)	280.85 (85.90)	326.94 (100.00)
Orange (overall)	40.76 (1.73)	2308.84 (98.27)	2349.60 (100.00)
• Marginal	40.32 (2.35)	1677.18 (97.65)	1717.50 (100.00)
• small	0.44 (0.07)	631.66 (99.93)	632.1 (100.00)

Source : Based on Field Survey, 2012-13

Note` : Figure in parenthesis is in percentage to total

Figure 6.1: Magnitude of sale within village and in market in Mokokchung District

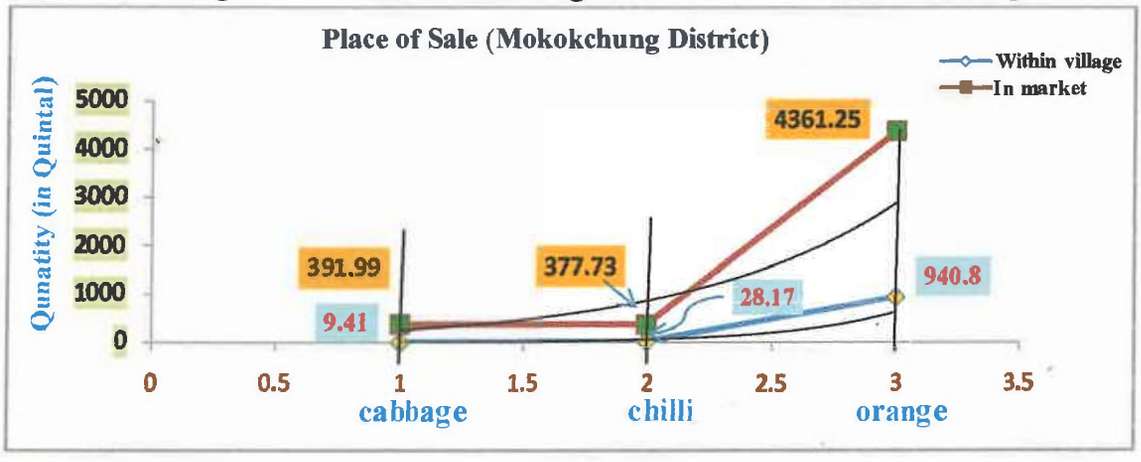
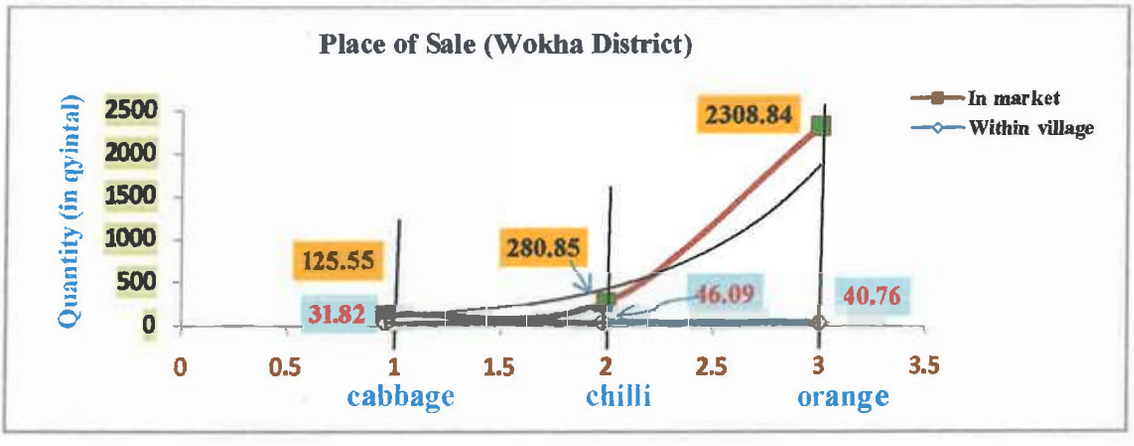


Figure 6.2: Magnitude of sale within village and in market in Wokha District



6.2 SELLING BEHAVIOUR

The selling behaviour of producers according to different marketing channels and agencies to whom the marketed surplus is sold and the average monthly post-harvest price practice in the study area is discussed in this section. The pattern of marketing of selected horticultural crops is further brought out by the analysis of the distribution of marketed surplus by respondents in both the Districts. The data is shown in from Table 6.5 to 6.8.

(a) Cabbage

Table 6.5 depicts the percentage distribution of marketed surplus for cabbage in Mokokchung and Wokha Districts. In Mokokchung District, the table indicates that the farmers sell 2.34 percent of the surplus directly to consumers at Rs. 13.9/kg; to retailers it is about 84.18 percent at Rs.19.2/kg and to wholesalers it is about 13.48 percent at Rs. 9.64/kg. However, in Wokha District the farmers sale 20.22 percent of their surplus to direct consumer at Rs. 10.52/kg and to retailers 79.78 percent at Rs. 14.48/kg. It is interesting to note that in both the Districts, the farmers sell more than 80 percent of their surplus to retailers at higher price than other source. This might be due to the higher returns per kg received by the farmers; especially the village in Mokokchung District have better price received per kg of cabbage in all marketing situations.

Table 6.5: Distribution of Marketed surplus of cabbage by respondents in different channels

(In percentage)

Category	Mokokchung	Wokha
Consumer	2.34 13.9*	20.22 10.52*
Retailer	84.18 19.2*	79.78 14.48*
Wholesaler	13.48 9.64*	-

Source : Based on Field Survey, 2012-13

Note` :* - average selling price per kg

(b) Chilli

The distribution of marketed surplus for chilli by the sample respondents in different channels in both the Districts is presented in the Table 6.6. In Mokokchung District, the percentage sell of crop from producer to consumer in June, July and August is 8.26%, 4.91% and 8.47%; to retailers 49.79%, 45.90% and 64.37%, and to wholesalers 41.95%, 49.19% and 27.15% percent respectively. The data reveals that the producers sell of their total marketed surplus to retailers at higher level in all post-harvest months and the lowest to consumers except July. During July in Mokokchung Districts, a decline in price is observed and sells more to wholesalers. This is due to rise in output of chilli increasing supply with no cold storage, bulkiness and highly perishable nature of the crop the farmers sale at lower price to wholesaler who buy large volume of fresh chilli but no such similarity is observed in Wokha District. The major part about 52.25 percent is sold to retailers at an average price of Rs. 53.24/kg. The study reveals that the producers prefer to sell more to retailers than wholesalers or consumers directly.

Table 6.6: Distribution of Marketed surplus of chilli by respondents in different channels

(In percentage)

Mokokchung				
Category	**June**	**July**	**August**	**Total**
Consumer	8.26 43.72*	4.91 43.75*	8.47 49.59*	6.94 46.11*
Retailer	49.79 51.08*	45.90 50.8*	64.37 57.83*	52.25 53.24*
Wholesaler	41.95 37.24*	49.19 36.88*	27.15 45.82*	40.81 39.54*
Wokha				
Consumer	12.55 49.51*	11.11 49.51*	20.23 58.35*	14.10 52.46*
Retailer	51.23 56.66*	45.40 55.66*	60.43 66.37*	51.56 59.90*
Wholesaler	36.23 45.62*	43.49 45.70*	19.34 53.63*	34.54 47.10*

Source : Based on Field Survey, 2012-13

Note : * - average selling price per kg

On the other hand, in Wokha District, the percentage sell of producer to consumer in all the Months is little higher than their counterpart village, June: 12.55%, July: 11.11% and August: 20.23% respectively. Whereas, for retailers it is about 51.23, 45.40 and 60.43 and to wholesalers 36.23, 43.49 and 19.34 percent respectively, which is slight lower than their counterpart village. In both the Districts, producers sell maximum percentage of their total marketed surplus to retailers in all post-harvest months and the lowest to consumers. The overall figures indicates that about 51.56 percent is sold to retailers at the average price of Rs. 59.90/kg and 14.10 percent to consumer at Rs. 52.46/kg. In August, increased sell of marketed surplus directly to consumers and retailers with a drastic decline of sell to wholesalers is observed in both the Districts. This is mainly due to high price as result of low output and increased demand for consumption of fresh chilli in the market. The table further shows, in marketing of chilli the producers in Wokha District receive higher price for an equivalent quantity of chilli than in Mokokchung District. The overall percentage indicates that the selling behaviour of producers directly to consumer is predominant in Wokha District while it is lower in case of sell to retailers and wholesalers compared to Mokokchung District.

(c) Orange

The percentage distribution of marketed surplus for orange by sample respondents in different channels is depicted in Table 6.7. The table indicates that, the marginal farmers (i.e. upto 1 hectare) sells 27.83 percent of their marketed surplus to local sellers at Rs. 22.92/kg in Mokokchung District. However, sell of orange to local seller decline as farm size increases in other groups of small (18.37%) and semi medium farmers (13.61%). Similarly, the price distribution per kg among different size class shows declining as farm size increase from Rs. 22.92/kg to Rs. 21.57/kg. On the other hand, sell of orange to wholesalers in Mokokchung District across farm size increases. This is expected because large farm groups have better conditions in case of transportation and marketing connectivity to sell their surplus produce in the main market center. The overall data indicates that about 82.26 percent of the marketed surplus is sold through wholesaler in Mokokchung District.

Table 6.7: Distribution of Marketed surplus of orange by respondents in different channels

(In percentage)

Category/ Farm size	Mokokchung			
	Marginal	Small	Semi-medium	Overall
Local seller	27.83 22.92*	18.37 22.65*	13.61 21.57*	17.74 22.55*
Wholesaler	72.17 22.75*	81.64 22.39*	86.42 21.75*	82.26 22.39*
	Wokha			
Consumer	4.69 39.04*	1.18 48.67*	-	1.73 40.10*
Retailer	16.36 39.42*	2.02 38.75*	-	8.83 38.79*
Wholesaler	78.94 32.4*	97.62 31.75*	-	89.43 31.19*

Source : Based on Field Survey, 2012-13

Note : * - average selling price per kg

Similarly, the month wise distribution of marketed surplus reveals better view of the producer's marketing practice in both the Districts (Table 6.8). The selling behaviour of farmer across harvesting month indicates that in the month of December, the sample respondent's sale high percentage of their surpluses to wholesaler in both the Districts, however, in January, the percentage sell from producer to local seller, consumer and retailers are found to be higher in both the Districts. This may be due to rising price by fewer surpluses available for marketing. The producers increase their possible selling towards those channels that gives more profits to them. The impact on selling the surplus due to price change is found to be more among the marginal farmer in the study area.

Table 6.8: Month-wise distribution of Marketed surplus for orange by respondents in different channels

(In percentage)

Mokokchung									
Category/ Farm size	Marginal			Small			Semi-medium		
	Nov	Dec	Jan	Nov	Dec	Jan	Nov	Dec	Jan
Local seller	26.58 19.54*	21.01 19.54*	35.91 29.69*	23.72 19.42*	13.68 19.42*	17.72 29.1*	18.44 18.36*	14.88 18.36*	7.50 28*
Wholesaler	73.42 19.46*	78.99 19.46*	64.09 29.34*	76.28 19.21*	86.32 19.21*	82.28 28.76*	81.56 19*	85.12 19*	92.59 27.25*
Wokha									
Consumer	2.45 34.02*	1.82 33.92*	9.81 49.17*	-	-	1.18 48.67*	-	-	-
Retailer	11.73 34.52*	10.32 34.48*	27.04 49.25*	1.67 34.25*	1.58 34*	2.81 48*	-	-	-
Wholesaler	85.81 28.98*	87.87 28.45*	63.15 39.77*	98.33 27.94*	98.42 27.94*	96.11 39.38*	-	-	-

Source : Based on Field Survey, 2012-13

Note :* - average selling price per kg

Nov-November, Dec-December, Jan-January

6.3 MARKETING CONSTRAINTS

In spite of the fact that Nagaland is blessed with a wide range of soil and climatic conditions for growing large number of horticultural crops, a reasonable budgetary allocation, a sound network of R & D system, a large number of high yielding varieties/ hybrids and proven technologies, there are still several constraints which adversely affect development of a sound horticulture industry. The common major constraints pertain to the following areas:

(i) Inadequate Availability of Quality Planting Material

The impact of using quality planting material will increase productivity of horticultural crops. However, the acute shortage of quality planting/seed materials including seeds of improved varieties is one of the major constraints limiting faster development in many horticulture and plantation crops. The State Departments of Horticulture are the major buyers of planting materials for distribution to the farmers on

subsidized costs under various developmental programmes and it is mostly through these purchases that the farmers receive inferior material.

(ii) Lack of Transport Facility

With increase in production and marketed surplus, producers are faced with the problem of adequate and quick means of transportation at the village level. High transport cost is another constraint in the study area.

(iii) Inadequate Storage Facility

Horticulture and plantation crops are both perishable (fruits, vegetables etc) and non-perishable (spices, cashewnut etc). Perishability alone contributes to heavy losses in the absence of storage facilities. The unscientific methods of storage lead to considerable wastage. In the present study, post-harvest losses at farm level alone range from 2.7 percent to 25.6 percent.

(iv) Poor Market Infrastructure

Marketing of horticultural produce is a major constraint in the production and disposal system and has a major role to play in making the industry feasible or otherwise. The farmer does not have clear market information leading to glut situation and opens opportunities for exploitation of small and marginal farmers by middlemen. Lack of adequate grading and standardization for quality produce also hinders the export prospects of horticulture crops.

(v) Inadequate Research and Extension Support

Improved production technologies developed at Research Stations have not been transferred to the field to the required extent due to lack of sufficient extension personnel and infrastructure in the study area. Motivation of farmers to adopt new technology through field demonstration has not been carried out satisfactorily.

The constraints faced by selected horticultural growers, wholesalers and retailers in both the Districts are discussed from Table 6.9 to 6.20.

6.3.1. Cabbage

(a) Constraints faced by producers in production

Marketing problems for selling of cabbage crop in selected villages by the growers in production and financing in both the Districts is presented in Table 6.9. The table reveals that all the farmers in Longkhum village faced problem of insects and cabbage moth that destroys the crops creating bores on the outer leave damaging the crops reducing production. Similarly, the lack of extension service is positively responded by 94 percent of the sample farmers. About 90 percent of the respondents responded on neglect in controlling of insects and pest that destroy the crops. There is wide technology gap by weak extension support from Department of Horticulture to spread technical know-how to the farmers[120].

Similarly, more than 84 percent of the famers revealed problem in lack of modern equipments, machinery and lack of storage facilities. It is observed that most of the respondents are marginal farmers who are not financially sound, therefore, it is suggested that government should provide these material on subsidized rates. The financial institutions should also provide loans at low rate of interest to farmers to purchase these materials. Lack of resources is another major constraint faced by the sample farmers with the result these farmers are unable to invest for better production technology. There is need for creation of co-operative societies to cater the needs of farmers.

On the other hand, in Soku village of Wokha District, more than 90 percent of the famers respond positively to lack of post-harvest infrastructure in the growing area, lack of extension services and lack of resources. Other major constraints are the problems relating to insects and technical know-how. About 70 percent revealed problem of unavailability of high yielding varieties and 62 percent revealed the wage rate of labour to be high. In both the Districts it can be seen the least percent of farmers responded to

[120] Shaheen, F.A & Gupta, S.P. (2002, July-September). Economics of Apple Marketing in Kashmir Province - Problems & Prospects. *Agricultural Marketing*, XLV (2), 5-13.

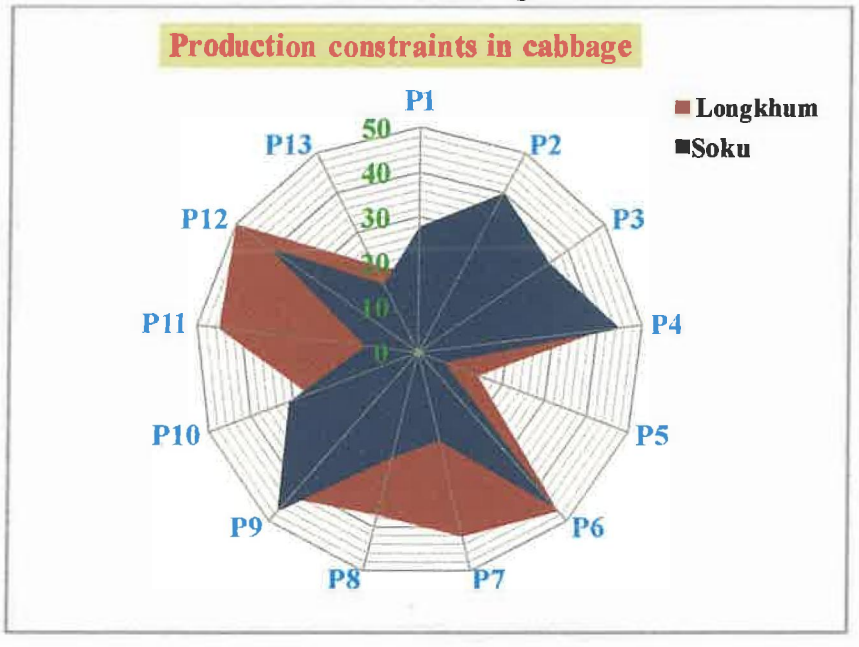
shortage of labour. The comparative constraint between Longkhum and Soku village in the production of cabbage is depicted in Figure 6.3. From the radar diagram it can be seen that constraints P5, P7, P8, P11, P12 and P13 is greater among the Longkhum producers whereas constraints P1, P2, P3, P4, P9, P10 responded maximum in Soku village.

Table 6.9: Constraints faced by the sample respondents in production and financing of cabbage

Constraints	No of respondents total expressed the problem	% to total (N=50)	No of respondents total expressed the problem	% to total (N=50)
Production	**Longkhum**		**Soku**	
Poor infrastructure (roads, electricity and water). P1	17	34.00	28	56.00
Lack of technical knowhow. P2	38	76.00	40	80.00
Lack of improved and high yielding varieties. P3	27	54.00	35	70.00
Lack of resources. P4	40	80.00	45	90.00
Shortage of labour. P5	14	28.00	6	12.00
Lack of extension services. P6	47	94.00	46	92.00
Lack of modern equipment and machinery. P7	42	84.00	20	40.00
Low productivity. P8	37	74.00	24	48.00
Lack of post harvest infrastructure in growing area. P9	43	86.00	47	94.00
High wage rate of hired labour. P10	26	52.00	31	62.00
Lack of insect-pest disease control. P11	45	90.00	12	24.00
Problem of insects and moth. P12	50	100.00	41	82.00
Lack of irrigation facilities. P13	22	44.00	17	34.00
Financing				
Lack of Timely and sufficient availability of credit. F1	5	10.00	3	6.00
Problem faced by the farmer in dealing with banks. F2	3	6.00	1	2.00
Borrow from money lenders at high rate of interest. F3	18	36.00	24	48.00

Source: Based on Field Survey, 2012-13

Figure 6.3: Constraints faced by producers in production of cabbage in Longkhum and Soku village



(b) Constraints faced by producers in financing

Marginal farmers are more predominant in both selected villages and the rising cost of living and maintenance of orchards; the farmers have no capacity to invest in better production technology. There access to financial institutions has been limited with certain constraints. Table 6.9 further shows that in Longkhum village, only 10 percent of the respondents revealed problems to lack of timely and sufficient availability of credit and only 6 percent of the farmers reveal problem to dealing with banks as procedural and time consuming. This indicates that 90 percent of the sample respondents are ignorant or not availing financial assistance from any source because of its complexity. The farmers have to depend on money lenders, friends and relatives at very high rate of interest in order to meet the requirement with money to perform various operations during harvesting. On the other hand, in Wokha District, only 6 percent of the respondents positively reported on credit accessibility and only 2 percent dealing with banks which show loan facilities provided by the banks are not popular among the farming community

in the District. The table further shows 48 percent of the farmers borrow from money lender at high rate of interest.

(c) Constraints faced by producers in marketing

The major constraint faced by the sample respondents with respect to marketing of cabbage is presented in Table 6.10. In Longkhum village, about 94 percent of the farmers are concerned to risk of not being able to sale their surplus produce on time. This is due to perishability of the commodity. More than 80 percent of the farmers responded positively to problems of high transport cost, lack of market information on existing price and demand, lack of regulated and co-operative societies leaving the growers at the mercy of the market intermediaries. 74 percent respondents reported the problem to malpractices in selling methods; this is due to competition among the producers in disposing their surplus at lower price without the knowledge of the fellow farmers or dealing in secret with wholesaler/retailers.

The data further reveals lack of coordination among the farmers resultant is misconduct and cheating. Similarly, lack of market facility, transportation, market glut during peak season, dominance of traditional retailers and no correct weighing are some other constraints confronted by the farmers in marketing of cabbage. About 44 percent of the respondents have reported the problem related to exploitative nature by market intermediaries, lack of market link, lack of packing materials and lack of remunerative price in marketing of cabbage.

On contrary to that in Soku village, more than 90 percent of the farmers reported on lack of regulated and co-operative marketing societies, and market information and intelligence and about 80 percent responded positively on lack of market linkage, transportation and risk of timely sale. More than 74 percent respondents reported on lack of market facilities and market glut during peak season. The table further shows that respondents reported at lower percentage on problems of marketing losses during transit, malpractice in selling the commodity, lack of remunerative price received by the famers,

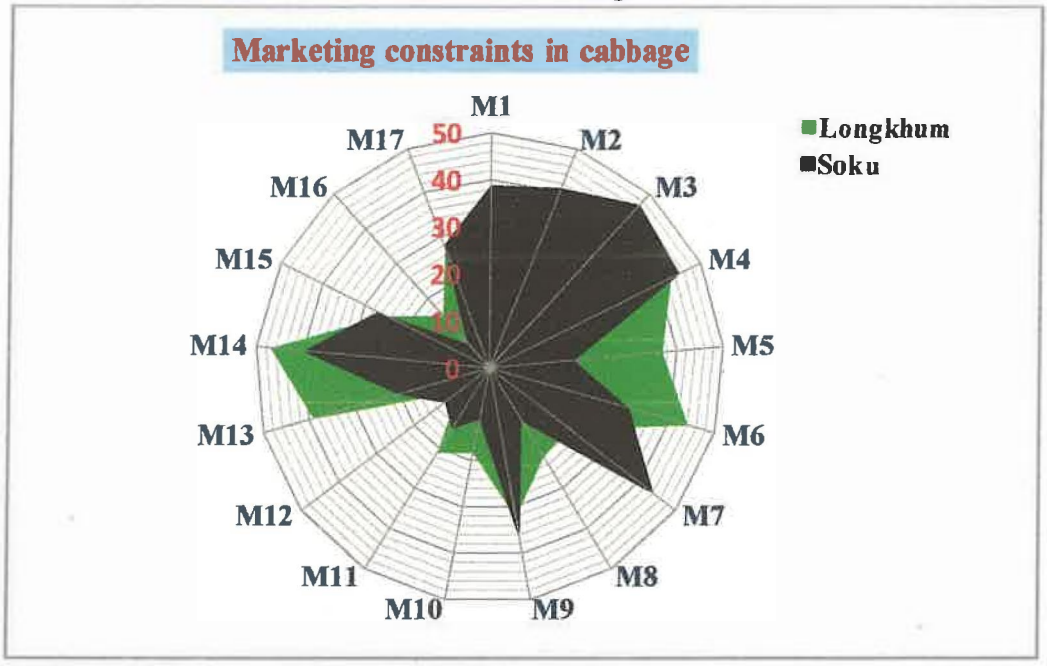
no facilities for personal stay at the market and lack of packing materials in the District. The comparison of major problems involved between the two villages is illustrated in the Figure 6.4. The number of respondents to M5, M6, M8, M10, M11, M13, M14 and M16 is relatively higher in Longkhum village while M1, M2, M3, M4, M7 and M9 constraints responded positively in Soku village.

Table 6.10: Constraints faced by the sample respondents in marketing of cabbage

Constraints	No of respondents total expressed the problem	% to total (N=50)	No of respondents total expressed the problem	% to total (N=50)
	Longkhum		Soku	
Lack of market facilities. M1	33	66.00	39	78.00
Lack of transportation and road infrastructure. M2	34	68.00	41	82.00
Lack of regulated and co-operative marketing societies. M3	40	80.00	47	94.00
Lack of market news and intelligence. M4	43	86.00	45	90.00
Malpractice in selling method. M5	37	74.00	18	36.00
High charges of transportation. M6	44	88.00	31	62.00
Lack of market link road. M7	21	42.00	44	88.00
Presence of exploitative middlemen. M8	22	44.00	13	26.00
Market glut during peak season. M9	32	64.00	37	74.00
Lack of packing material. M10	18	36.00	11	22.00
Lack ofremunerative price. M11	21	42.00	15	30.00
No facilities for personal stay at the market. M12	8	16.00	12	24.00
Marketing losses. M13	39	78.00	20	40.00
Risk of timely disposal of commodity. M14	47	94.00	40	80.00
Faulty weighed/ No correct weighing. M15	25	50.00	27	54.00
Bandh, blockage, strikes. M16	15	30.00	7	14.00
Dominance of traditional retailers. M17	27	54.00	28	56.00

Source: Based on Field Survey, 2012-13

Figure 6.4: Constraints faced by producers in marketing of cabbage in Longkhum and Soku village



(d) Constraints faced by wholesalers

Market glut during peak season is the major constraint the wholesalers faced in marketing of cabbage in Mokokchung District (Table 6.11). This leads fall in price due to excess supply in the market from different production unit and the storage facility to contain the perishable surplus for few days is poor resulting in losses. The other major constraints from the wholesaler's view are non-availability of marketing credit, risk of timely disposal of the commodity and risk of bandh, blockage, strikes etc. Due to perishable nature of cabbage, the produce cannot be kept for long therefore, if bands, blockade, strikes, etc. occurred, the market will be close for the day and this will hinder the business and the produce may loss. Again, lack of adequate storage facilities compelled the wholesalers to get rid of their produce as soon as possible. Marketing losses, lack of storage facilities, malpractice and faulty weighed, high market fees, poor transport facilities, cheating by producers are other constraints faced by the wholesalers in Mokokchung District.

Table 6.11: Constraints faced by the sample wholesalers in marketing of cabbage

Constraints	No of respondents total expressed the problem	% to total (N=10)	No of respondents total expressed the problem	% to total (N=10)
	Mokokchung		Wokha	
Lack of storage facilities	5	50.00	6	60.00
Marketing losses	6	60.00	3	30.00
Malpractice in selling method	4	40.00	1	10.00
Faulty weighed/ No correct weighing	4	40.00	2	20.00
Non-availability of marketing credit	8	80.00	6	60.00
Market glut during peak season	9	90.00	8	80.00
Poor transportation facilities	2	20.00	7	70.00
High market fees	3	30.00	4	40.00
Payment of unauthorized fee (bribing)	4	40.00	6	60.00
Inadequate facilities at the market	5	50.00	3	30.00
Risk of timely disposal of commodities	7	70.00	8	80.00
Cheating by producers	1	10.00	2	20.00
Risk of Bandh, blockage, strikes	7	70.00	5	50.00

Source: Based on Field Survey, 2012-13

Similarly in Wokha District, about 80 percent of wholesalers reported constraint to market glut during peak season and risk of timely disposal of cabbage. Poor transport facility is another constraint among the wholesaler. About 60 percent respondents reported problem to storage facilities, non-availability of marketing credit and payment of unauthorized fee (bribing). The other constraints were risk of bandh, blockage, strikes, high market fees, inadequate market facility, marketing losses, cheating by producers, faulty weighed and malpractice in selling method are common in practice.

(e) Constraints faced by retailers

Unlike the wholesalers, risk of sale on time is the major problem faced by the retailers in Mokokchung District (Table 6.12). More the 70 percent of the retailers reported the problems of frequent bandh, blockage, strikes; market glut during peak

season and lack of storage facilities. Due to perishable nature of cabbage, a delay of two to three days in its marketing cause considerable losses in business and the lack of storage facility forced the retailers to sale at lower price than rotting and wastage. It is observed from the table that 65 percent of the retailers have reported on marketing losses and inadequate facilities in the market. The other constraints were high market fee, unauthorized payment, cheating by producers/wholesalers, non-availability of marketing credit, faulty weighed and unhygienic market condition.

Table 6.12: Constraints faced by the sample retailers in marketing of cabbage

Constraints	No of respondents total expressed the problem	% to total (N=20)	No of respondents total expressed the problem	% to total (N=20)
	Mokokchung		Wokha	
Lack of storage facilities	14	70.00	15	75.00
Marketing losses	13	65.00	10	50.00
Faulty weighed/ No correct weighing	4	20.00	9	45.00
Non-availability of marketing credit	8	40.00	3	15.00
Market glut during peak season	15	75.00	12	60.00
Unhygienic market condition	3	15.00	6	30.00
High market fees	11	55.00	13	65.00
Payment of unauthorized fee (bribing)	9	45.00	14	70.00
Inadequate facilities at the market	13	65.00	17	85.00
Risk of timely disposal of commodities	18	90.00	12	60.00
Cheating by producers/wholesalers	7	35.00	7	35.00
Bandh, blockage, strikes	15	75.00	9	45.00

Source: Based on Field Survey, 2012-13

On the other hand, in Wokha District, inadequate market facility is the major problem faced by the retailers followed by lack of storage and payment of unauthorized fees (bribing). More than 60 percent of retailers have reported that the problems of high marketing fee, risk of sale on time and market glut during peak season in the District along with marketing losses, faulty weighed, strikes, unhygienic market condition and non-availability of marketing credit at significant level in the District.

6.3.2 Chilli

(a) Constraints faced by producers in production

Similar to the cabbage crop, constraints faced by chilli growers in production and financing in both the Districts is presented in Table 6.13 and Figure 6.5 draws the difference in their problems faced in production.

Table 6.13: Constraints faced by the sample respondents in production and financing of chilli

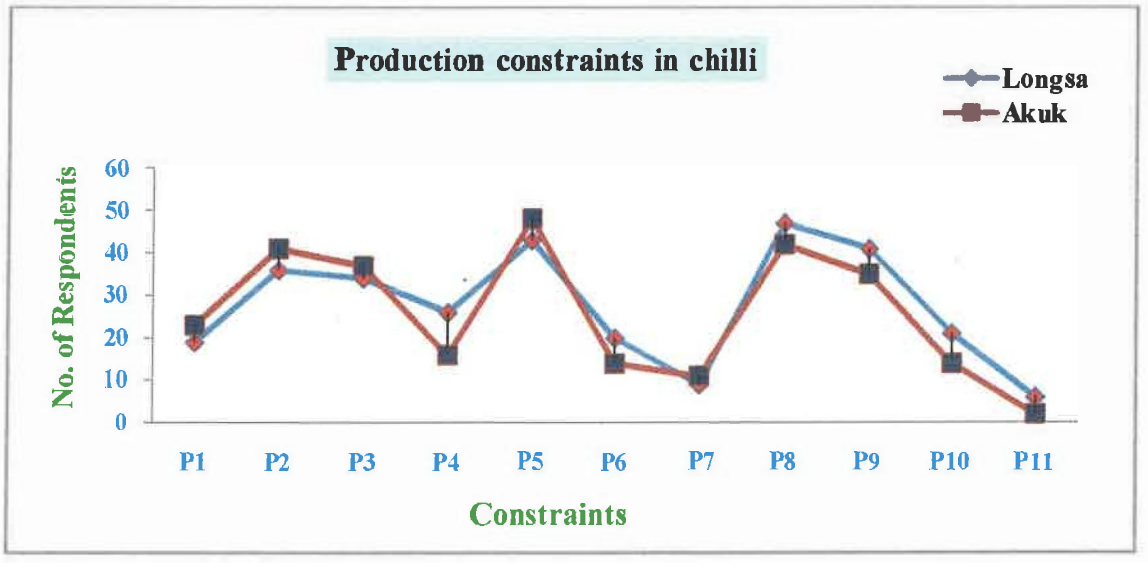
Constraints	No of respondents total expressed the problem	% to total (N=50)	No of respondents total expressed the problem	% to total (N=50)
Production	**Longsa**		**Akuk**	
Poor infrastructure (roads, electricity and water). P1	19	38.00	23	46.00
Lack of technical knowhow. P2	36	72.00	41	82.00
Lack of resources. P3	34	68.00	37	74.00
Shortage of labour. P4	26	52.00	16	32.00
Lack of extension services. P5	43	86.00	48	96.00
Lack of modern equipment and machinery. P6	20	40.00	14	28.00
Low productivity. P7	9	18.00	11	22.00
Lack of post harvest infrastructure in growing area. P8	47	94.00	42	84.00
Risk of excess rain. P9	41	82.00	35	70.00
High wage rate of hired labour. P10	21	42.00	14	28.00
Lack of irrigation facilities. P11	6	12.00	2	04.00
Financing				
Lack of Timely and sufficient availability of credit. F1	08	16.00	02	04.00
Problem faced by the farmer in dealing with banks. F2	03	06.00	02	04.00
Borrow from money lenders at high rate of interest. F3	21	42.00	25	50.00

Source: Based on Field Survey, 2012-13

The table indicates that the study village of Longsa in Mokokchung District, about 94 percent of the sample respondents reported that they do not have storage facilities near the growing area. Due to high perishabilty of chilli and lack of cold storage facilities is

the major problem to producers as this leads to excess loss on rotting and wastage. Similarly, lack of extension services (86%) of the farmers, risk of excess rain (82%) destroying the crop pre-matured reducing output, lack of technical know-how (72%), lack of resources(68%) and shortage of labour (52%) are some of the major constraints faced by the farmer-grower. Shortage of labour problem becomes more acute at the harvesting stage because it gets synched with the paddy weeding and other agricultural activities declining availability of labour. Consequently, the farmers have to pay higher wages in order to attract labour to carry out the work on time. High wage rate, lack of modern implements and machinery, poor infrastructure, low productivity and lack of irrigation facilities were other constraints confronting farmers in the study village.

Figure 6.5: Constraints faced by producers in production of chilli in Longsa and Akuk village



Similarly in Akuk village, about 96 percent of the respondents have reported that lack of extension service is the major constraint followed by lack of storage facilities and technical know-how. About 70 percent of the respondents responded problem to lack of resources and risk of excess rain as hindrance to production of chilli in the village. The other constraints confronting farmers were poor infrastructure, shortage of labour, lack of

modern equipments and machinery, low productivity, high wage rate and lack of irrigation facilities in the study village.

(b) Constraints faced by producers in financing

Table 6.13 further shows that in Longsa village, only 16 percent of the respondents revealed problems to lack of timely and sufficient availability of credit and only 6 percent of the farmers reveal problem to dealing with banks as procedural and time consuming. It is an interesting to note that about 84 percent of the sample respondents are ignorant and not availing financial assistance from the source of formal institutions (banks or cooperative societies). It is noticed that 42 percent of the respondents borrow money from friends and relatives at higher interest rate to maintain their orchards and household needs. On the other hand, in Akuk village, credit accessibility from the banks and other informal lenders are highly insignificant and only 4 percent (2 respondents) have reported the problems on availability of credit and dealing with banks which show loan facilities provided by the banks are not popular among the farming community in the District.

(c) Constraints faced by producers in marketing

The major constraint faced by the sample respondents with respect to marketing conditions of chilli crop is presented in Table 6.14. In Longsa village, all the respondents reported that they are experiencing market glut during peak season and risk of sale on time every year. This is due to its highly perishable nature with no storage provision, excess supply during peak season results in driving to more risk of not being sold on time going rotten and spoilage. Chilli is highly perishable; the quality of produce deteriorates sometime after the harvest so, the farmers have to market their produce as soon as possible at the prevailing market price even if the price is very low. At the market place the farmers are exploited by the middlemen by offering low price as responded by 98 percent of the farmers. The farmers are obliged to accept the price extended by the middlemen as their bargaining power is very weak. The farmers cannot negotiate since

they may be denied even a low price and their products could be liable to rotting, since it is perishable. Moreover, farmers could not keep their product for long because they did not have storage facilities.

Lack of market road link to other market places at low transport cost is third major constraint in marketing of chilli in Longsa village. Lack of regulated and co-operative marketing societies, lack of transportation and road infrastructure, no facilities for personal stay at the market and high transportation cost is positively responded by more than 80 percent. Lack of market information on price and arrival and market dominance by traditional retailers is reported by more than 76 percent of the sample farmers. Bandh, blockage, strikes, malpractice in selling and lack of remunerative price are common problems even in Longsa village for the crop of chilli.

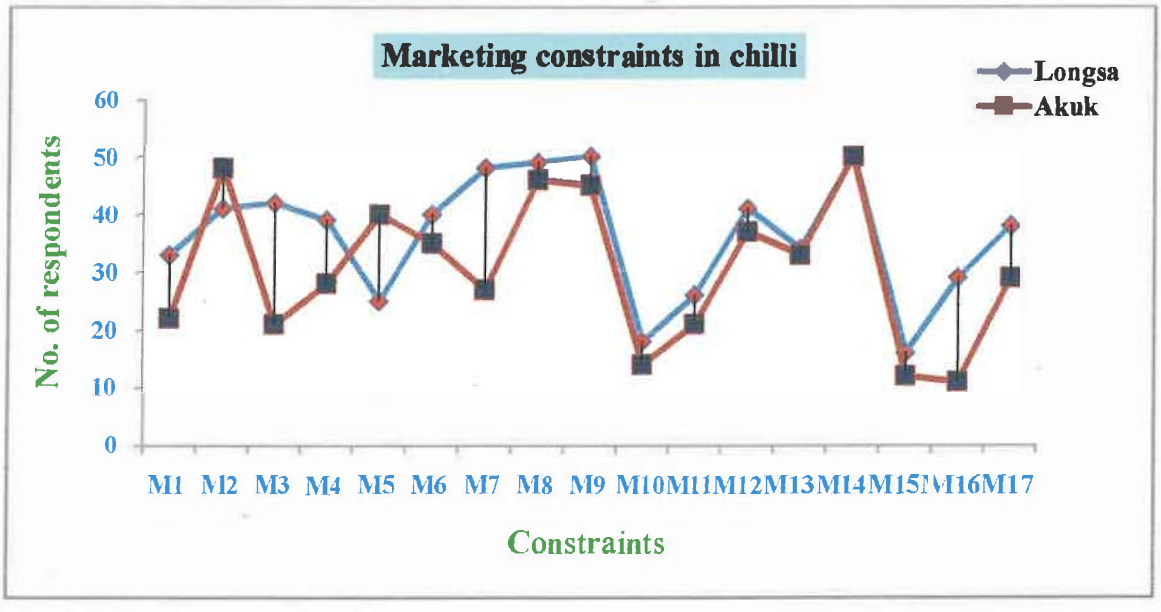
Table 6.14: Constraints faced by the sample respondents in marketing of chilli

Constraints	No of respondents total expressed the problem	% to total (N=50)	No of respondents total expressed the problem	% to total (N=50)
	Longsa		Akuk	
Lack of market facilities. M1	33	66.00	22	44.00
Lack of transportation and road infrastructure. M2	41	82.00	48	96.00
Lack of regulated and co-operative marketing societies. M3	42	84.00	21	42.00
Lack of awareness about market news and intelligence. M4	39	78.00	28	56.00
Malpractice in selling method. M5	25	50.00	40	80.00
High charges of transportation. M6	40	80.00	35	70.00
Lack of market link road. M7	48	96.00	27	54.00
Presence of exploitative middlemen. M8	49	98.00	46	92.00
Market glut during peak season. M9	50	100.00	45	90.00
Lack of packing material. M10	18	36.00	14	28.00
Lack of remunerative price. M11	26	52.00	21	42.00
No facilities for personal stay at the market. M12	41	82.00	37	74.00
Marketing losses. M13	34	68.00	33	66.00
Risk of timely disposal of commodity. M14	50	100.00	50	100.00
Faulty weighed/ No correct weighing. M15	16	32.00	12	24.00
Bandh, blockage, strikes. M16	29	58.00	11	22.00
Dominance of traditional retailers. M17	38	76.00	29	58.00

Source: Based on Field Survey, 2012-13

While in Akuk village of Wokha District, the producers have the common problem of timely disposal of crop as responded by all the sample respondents. The other important problem encountered by producers in this village is lack of transportation facility and poor road condition. The producers have to bring their surplus to the market for marketing and transport posed serious threat to producers as the transportation charge is very high due to poor road condition and there are not sufficient automobiles for bringing their surplus to the market. Presence of exploitative middlemen and market glut during peak season are positively reported by 92 and 90 percent of the respondents respectively. The other major constraints confronted by producers while marketing of chilli were malpractice in selling methods, lack of provision for personal stay in market, high transport cost, marketing losses, dominance of traditional retailers, lack of market information and lack of market link road. The marketing constraint encountered by the respondent in the two villages is further show in the Figure 6.6.

Figure 6.6: Constraints faced by producers in marketing of chilli in Longsa and Akuk village



(d) Constraints faced by wholesaler

The primary constraint faced by wholesalers in Mokokchung District is the risk of timely disposal of chilli; this is because of its high perishability (Table 6.15). About 80 percent of the wholesalers responded problems to lack of storage facilities, market glut during peak season and risk of band, blockage, strikes and curfew. Due to highly perishable nature of chilli, the produce cannot be kept for long time. Lack of adequate storage facilities compelled the wholesaler to get rid of their produce as soon as possible. During the bandh, blockade and strikes, the market will be close for the day incurring losses. Marketing losses, non-availability of marketing credit, inadequate facilities at the market and cheating by producers by mixing rotten chilli with fresh chilli by some producers are other constraints perceived by wholesaler in marketing of chilli in Mokokchung District.

Table 6.15: Constraints faced by the sample wholesalers in marketing of chilli

Constraints	No of respondents total expressed the problem	% to total (N=10)	No of respondents total expressed the problem	% to total (N=10)
	Mokokchung		Wokha	
Lack of storage facilities	8	80.00	6	80.00
Marketing losses	7	70.00	7	70.00
Malpractice in selling method	4	40.00	2	20.00
Faulty weighed/ No correct weighing	3	30.00	4	40.00
Non-availability of marketing credit	5	50.00	3	30.00
Market glut during peak season	8	80.00	6	60.00
Poor transportation facilities	3	30.00	6	60.00
High market fees	3	30.00	4	40.00
Payment of unauthorized fee (bribing)	2	20.00	5	50.00
Inadequate facilities at the market	5	50.00	6	60.00
Risk of timely disposal of commodities	10	100.00	8	80.00
Cheating by producers	5	50.00	4	40.00
Risk of Bandh, blockage, strikes	8	80.00	6	60.00

Source: Based on Field Survey, 2012-13

Similarly, in Akuk village of Wokha District, majority of wholesalers (80%) have reported that they have the problem of risk in timely disposal of chilli. The other important problems for the wholesalers (70%) is the marketing losses during transit and lack of storage facilities, market glut during peak season, poor transportation facilities, inadequate facilities at the market and risk of bandh, blockage and strikes. Payment of unauthorized fee is reported by 50 percent of the wholesalers while such type of fee is reported only 20 percent in Mokokchung District.

(e) Constraints faced by retailers

The detail information on market constraints faced by retailers in both the Districts for chilli crop is presented in Table 6.16. The table indicates that in Mokokchung District, risk of timely disposal of chilli is the foremost constraint perceived by all retailers followed by risk of bandh, blockage, strikes, marketing losses and market glut during peak season and lack of storage facilities in marketing of chilli by the retailers. About 50 percent of the retailers responded problem to high market fees and inadequate facilities in the market. Similarly, in Wokha District, the main constraint faced by retailers is the risk of timely disposal of chilli (100%) followed by marketing losses and market glut during the peak season. The table further shows that, 60 percent of the retailers reported the constraints perceived on lack of storage facilities and inadequate facilities at the market viz. such as limited seats, no proper parking for vehicles, unhygienic market place, difficulty during rainy season etc. 50 percent of retailers reported that the problem of high marketing fees and unauthorized fee payment to different individuals, groups and societies discourage retailers for marketing of chilli crop.

Table 6.16: Constraints faced by the sample retailers in marketing of chilli

Constraints	No of respondents total expressed the problem	% to total (N=20)	No of respondents total expressed the problem	% to total (N=20)
	Mokokchung		Wokha	
Lack of storage facilities	13	65.00	12	60.00
Marketing losses	17	85.00	18	90.00
Faulty weighed/ No correct weighing	8	40.00	5	25.00
Non-availability of marketing credit	9	45.00	3	15.00
Market glut during peak season	14	70.00	16	80.00
Unhygienic market condition	4	20.00	7	35.00
High market fees	11	55.00	10	50.00
Payment of unauthorized fee (bribing)	6	30.00	10	50.00
Inadequate facilities at the market	10	50.00	12	60.00
Risk of timely disposal of commodities	20	100.00	20	100.00
Cheating by producers/wholesalers	4	20.00	7	35.00
Bandh, blockage, strikes	18	90.00	8	40.00

Source: Based on Field Survey, 2012-13

6.3.3 Orange

(a) Constraints faced by producers in production

Lack of post-harvest infrastructure is the major problem in Yajang village of Mokokchung District reported by all the farmer growers for the production of orange (see table 6.17). The other constraints confronted in the study village are mainly with the problem of insects (96%), lack of resources (92%). Lack of technical knowhow (88%) and lack of pest control (80%) respectively. The other major constraints reported by the farmers are lack of irrigation facilities, lack of processing units near the growing area, shortage of labour and lack of extension services at significant levels during the reference year.

Similarly, in N. Longidang village, the problem of insects and lack of chemicals for controlling from pest and diseases is the prime constraint faced by the producers; next

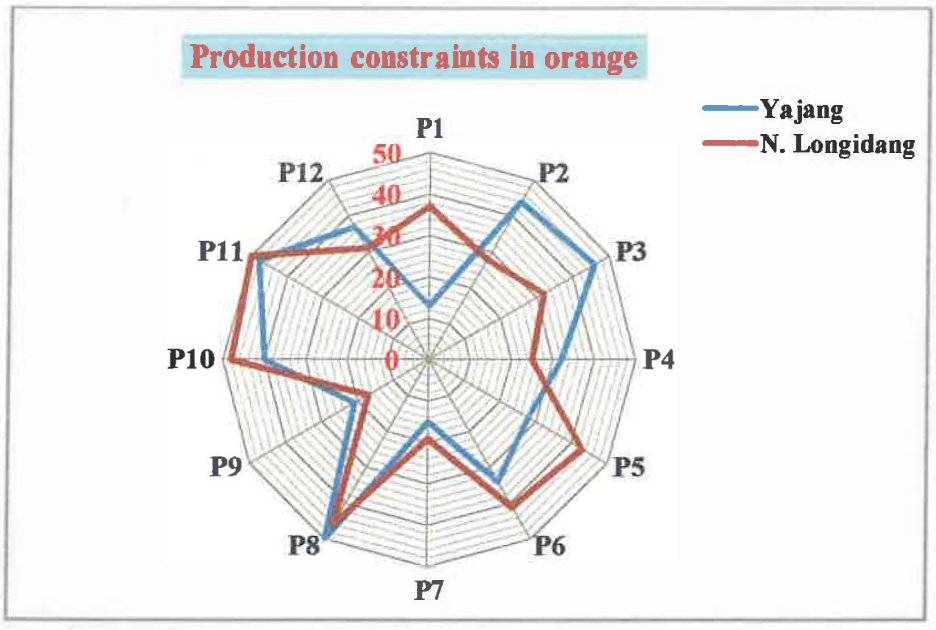
92 percent of the respondents responded to problem of lack of storage facilities and more than 82 percent responded to lack of extension services and lack of processing units near the growing the area. Other major problems faced by the sample respondents are poor infrastructure like un-surfaced road, poor electricity and water supply, lack of adequate resources to invest in more technical producing units, lack of irrigation facilities, poor of technical knowhow and shortage of labour. Figure 6.7 shows the production constraints in Yajang and N. Longidang village. In the radar diagram, the blue curve relates constraints to respondents in Yajang village and red curve relates N. Longidang village. P2, P3, P4, P8, P9, and P12 area the major constraints comparatively higher in Yajang village whereas P1, P5, P6, P10 and P11 constraints showing more positive respondents to orange growers in N. Longidang village.

Table 6.17: Constraints faced by the sample respondents in production and financing of orange

Constraints	No of respondents total expressed the problem	% to total (N=50)	No of respondents total expressed the problem	% to total (N=50)
Production	**Yajang**		**N. Longidang**	
Poor infrastructure (roads, electricity and water). P1	13	26.00	37	74.00
Lack of technical knowhow. P2	44	88.00	28	56.00
Lack of resources. P3	46	92.00	32	64.00
Shortage of labour. P4	32	64.00	25	50.00
Lack of extension services. P5	28	56.00	43	86.00
Lack of processing unit near the growing area. P6	34	68.00	41	82.00
Low productivity. P7	15	30.00	19	38.00
Lack of post harvest infrastructure in growing area. P8	50	100.00	46	92.00
High wage rate of hired labour. P9	21	42.00	17	34.00
Lack of insect-pest disease control. P10	40	80.00	48	96.00
Problem of insects. P11	48	96.00	50	100.00
Lack of irrigation facilities. P12	37	74.00	31	62.00
Financing				
Lack of Timely and sufficient availability of credit. F1	3	06.00	3	06.00
Problem faced by the farmer in dealing with banks. F2	3	06.00	1	02.00
Borrow from money lenders at high rate of interest. F3	14	28.00	11	22.00

Source: Based on Field Survey, 2012-13

Figure 6.7: Constraints faced by producers in production of orange in Yajang and N. Longidang village



(b) Constraints faced by producers in financing

Most of the orange grower in both the villages are marginal and small farmers and the rising cost of inputs for maintaining the farm have made them difficult to maintain the orange orchard. They have no sufficient capacity to invest in better production technology and their access to financial assistance has been beset with innumerable problems. More than 94 percent of the respondents have not responded to constraints related with financial aspects in both the villages (Table 6.17). Loan facilities provided by banks are found not popular among the farming communities and the lengthy procedure in dealing with banks are plying important role for this situation in both villages.

(c) Constraints faced by producers in marketing

The constraint faced by the sample respondents in marketing of oranges in both villages is given in the Table 6.18.

Table 6.18: Constraints faced by the sample respondents in marketing of orange

Constraints	No of respondents total expressed the problem	% to total (N=50)	No of respondents total expressed the problem	% to total (N=50)
	Yajang		N. Longidang	
Lack of market facilities. M1	-	-	35	70.00
Lack of transportation and road infrastructure. M2	15	30.00	32	64.00
Lack of regulated and co-operative marketing societies. M3	20	40.00	25	50.00
Lack of awareness about market news and intelligence. M4	41	82.00	18	36.00
Malpractice in selling method. M5	18	36.00	20	40.00
High charges of transportation. M6	-	-	41	82.00
Lack of market link road. M7	9	18.00	47	94.00
Presence of exploitative middlemen. M8	2	4.00	23	46.00
Market glut during peak season. M9	-	-	38	76.00
Lack of packing material. M10	-	-	24	48.00
Lack of remunerative price. M11	-	-	17	34.00
No facilities for personal stay at the market. M12	-	-	34	68.00
Marketing losses. M13	-	-	27	54.00
Risk of timely disposal of commodity.M14	21	42.00	37	74.00
Faulty weighed/ No correct weighing. M15	44	88.00	16	32.00
Bandh, blockage, strikes. M16	-	-	12	24.00
Dominance of traditional retailers. M17	-	-	22	44.00

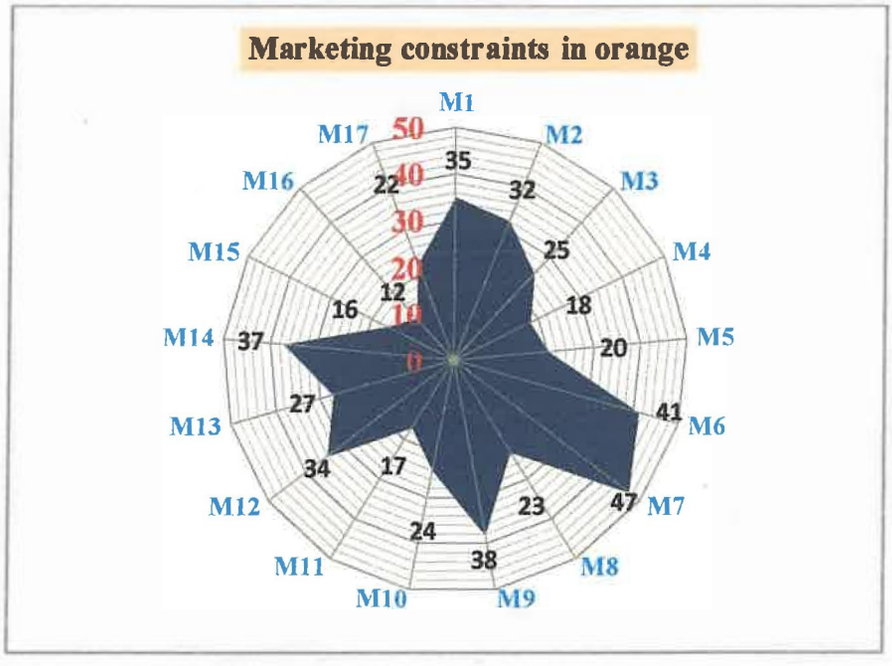
Source: Based on Field Survey, 2012-13

The foremost constraint faced by the orange grower in Yajang village is the faulty weighed reported by 88% and this is mainly due to absence of correct weighing instruments in the producing area, bulky and cost of time; the farmers are cheated by the traders by weighing at random. Similarly, lack of market intelligence is another problem at significant level for selling oranges in the market. Farmers market their surplus in the village and nearby assembling centers out of the ignorance of the price prevailing in the

main market centers and traders taking advantage place their bargaining position superior than the farmers. Risk of sale on time, lack of regulated and co-operative marketing societies, malpractice in marketing, lack of transportation and road infrastructure, lack of market link road and presence of exploitative middlemen are other problems reported by producers in marketing of orange in Yajang village.

In contrast to Yajang village, lack of market link road is the main constraint faced by the producers in N. Longidang village followed by transportation cost. The table further shows that more than 70 percent of the farmers responded positively to market glut during peak season, risk of not being able to sale on time and lack of market facilities. No facilities for personal stay at the market, lack of transportation and road infrastructure, marketing losses and lack of regulated and co-operative marketing societies are other major problems confronting the producers. Figure 6.8 presents the constraints faced by the farmers while marketing in N. Longidang village. M7, M6, M9, M14 and M1 are the major constraints responded by more the 70 percent of the producers in marketing.

Figure 6.8: Constraints faced by producers in marketing of orange in N. Longidang village



(d) Constraints faced by wholesaler

Table 6.19 shows that the risk of timely disposal of oranges (80%) is the main constraint faced by the wholesalers followed by market glut during peak season (70%), lack of storage facilities (60%) and inadequate market facilities (50%) in Mokokchung District. The other major constraints reported by the wholesalers are marketing losses, faulty weighed, malpractice, payment of unauthorized fees, high market fees, poor transportation facilities and risk of bandh, blockage and strikes. Similarly, in Wokha District, lack of storage facilities is the major problem as responded by 80 percent of the respondents followed by marketing losses (50%), payment of unauthorized fees (50%) and risk of timely disposal of oranges (50%). Inadequate market facilities, faulty weighed and malpractice in selling method are other problems in marketing faced by wholesalers.

Table 6.19: Constraints faced by the sample wholesalers in marketing of orange

Constraints	No of respondents total expressed the problem	% to total (N=10)	No of respondents total expressed the problem	% to total (N=10)
	Mokokchung		Wokha	
Lack of storage facilities	6	60.00	8	80.00
Marketing losses	4	40.00	5	50.00
Malpractice in selling method	3	30.00	1	10.00
Faulty weighed/ No correct weighing	4	40.00	2	20.00
Non-availability of marketing credit	3	30.00	2	20.00
Market glut during peak season	7	70.00	4	40.00
Poor transportation facilities	2	20.00	4	40.00
High market fees	2	20.00	3	30.00
Payment ofunauthorized fee (bribing)	3	30.00	5	50.00
Inadequate facilities at the market	5	50.00	2	20.00
Risk of timely disposal of commodities	8	80.00	5	50.00
Risk of Bandh, blockage, strikes	2	20.00	1	10.00

Source: Based on Field Survey, 2012-13

(e) Constraints faced by retailers

On the other hand, the marketing problems faced by the retailers in both the Districts is depicted in table 6.20 and the table indicates that, marketing loss is main problem in Mokokchung District as reported by 85 percent of retailers. The other major problems are market glut during peak season (80%), lack of storage facilities (70%) and risk of timely disposal (60%). About 55 percent of the retailers revealed problem to risk of bandh, blockage and strikes. However, the payment of unauthorized fees and non-availability of marketing credit problems are reported the least by retailers in the study area during the reference year.

Table 6.20: Constraints faced by the sample retailers in marketing of orange

Constraints	No of respondents total expressed the problem	% to total (N=20)	No of respondents total expressed the problem	% to total (N=20)
	Mokokchung		Wokha	
Lack of storage facilities	14	70.00	15	75.00
Marketing losses	17	85.00	12	60.00
Faulty weighed/ No correct weighing	9	45.00	13	65.00
Non-availability of marketing credit	3	15.00	5	25.00
Market glut during peak season	16	80.00	14	70.00
High market fees	5	25.00	14	70.00
Payment ofunauthorized fee (bribing)	3	15.00	7	35.00
Inadequate facilities at the market	10	50.00	7	35.00
Risk of timely disposal of commodities	12	60.00	16	80.00
Cheating by producers/wholesalers	4	20.00	8	40.00
Risk ofBandh, blockage, strikes	11	55.00	10	50.00

Source: Based on Field Survey, 2012-13

Similarly, in Wokha District, risk of sale on time is the foremost constraint confronted by the retailers. This is followed by lack of storage facilities (75%), market glut during peak season (70%), high market fees (70%) and marketing losses during transit (60%). About 50 percent of the retailers responded to risk of bandh, blockage and

strikes; 35 percent responded to problem of market glut and inadequate market facilities in the District and 25 percent responded to problem of non-availability of marketing credit.

Recapitulation

More than 80 percent of the surplus is marketed by the producers in market and the rest 20 percent is sold within village in the study area. Sale of oranges within village decline as farm size increases in both the District. Price per kg of cabbage is higher in Mokokchung whereas for chilli and orange, per kg price return is higher in Wokha District. Lack of regulated market and co-operative marketing societies, lack of transportation, lack of extension services, lack of market news and intelligence, risk of sale on time and market glut during peak season are major constraints faced by producers in production and marketing of cabbage, chilli and orange in both the Districts.

CHAPTER VII

SUMMARY AND CONCLUSION

CHAPTER VII

SUMMARY AND CONCLUSION

7.1 BACKGROUND

Nagaland emerged as a separate State, carved out of the Naga Hills districts of Assam and North Eastern Frontier Agency (NEFA) province in 1963 and agriculture is the main occupation of the people of Nagaland. Till recently, for most farmers horticulture has been mainly a backyard activity as they are generally busy throughout the year in cultivation of food crops and have little time for development of horticultural crops on a commercial basis. Nevertheless, it is only in the past decade that there has been a more focused attention to the development of horticulture in the State. The plantation and horticulture sector plays an important role in the development of the rural economy of the State. The diverse agro-climatic conditions, varied soil types and abundant rainfall prevailing in the State enables the cultivation of several plantation and horticultural crops covering fruits, vegetables, spices, flowers, mushrooms and medicinal and aromatic plants.

The agro-climatic condition in State of Nagaland is excellent for growing all types of fruits, vegetables, flowers, spices; aromatic and medicinal plants, plantation crops, etc., ranging from temperate to tropical crops under rain fed conditions. The fruits grown in the state range from tropical and sub-tropical fruits like citrus, pineapple, banana and mango to temperate fruits like apple, pear and strawberry. The state has rich diversity of different vegetable crops and the major vegetables grown in the State are sweet potato, cabbage, tomato, colocasia and other leafy vegetables. Ginger, chilli, garlic and onion are major species grown in the State while coffee, cashewnut and arecanut are major plantation crops. However, no systematic and accurate data available on area and

production of different horticulture crops in Nagaland, and the estimates made by various source also vary.

The marketing practices of the farmers are determined mainly on the basis of surplus available with them, after meeting own requirements. The market structure and behaviour on the other hand determine the incentives for the farmers to sell their surplus. Further, market structure and conduct depend on the quantity of surpluses available to be handled by the system. The estimation of marketable and marketed surplus assumes critical importance for farmers, marketing system as well as for framing suitable policy. Volume of marketable and marketed surplus product also affects the supplies and prices of commodity for the non-farm population and agro based industries. In this context, estimation of marketable and marketed surplus, marketing cost, market margin and marketing efficiency for different horticultural commodities and particularly of fruits, vegetables and spices has attracted the more attention of researchers and policy makers. This chapter highlights the major findings of the study analyzed in the preceding chapters in the context of the given objectives and hypothesis, and based on the empirical findings of the study few suggestion are proposed for the policy implications in the study area.

7.2 OBJECTIVES AND METHODOLOGY

The objectives of the present study is to estimate the marketable and marketed surplus of selected horticulture crops and the factors determining them; and to identify the types of marketing channel producers practice in disposing of their surplus thereby determine the cost in various channels and marketing margin received by various stakeholders. Analyzing the difference between the price received by the producers and price paid by the consumers in each subsequent channel is another focus of the study and find out the marketing efficiency through use of Conventional method, Shepherd's method and Acharya-Agarwal modified method; finally identify the constrains confronting producers in production and marketing of selected horticulture crops are the prime goal intended to be attained through this study.

Multistage stratified purposive random sampling technique is applied in the present study. Cabbage, chilli and orange crops are selected in the present study to draw a comparative analysis in Mokokchung and Wokha District of Nagaland, and from each District three villages are selected according to crop wise – Mokokchung District: Longkhum village (Cabbage), Longsa village (Chilli) and Yajang village (Orange); Wokha District: Soku village (Cabbage), Akuk village (Chilli) and N. Longidang village (Orange) respectively. The total respondent collected is 300 (50 from each respective village, thus 150 from each District) and a total of 180 intermediaries is collected (wholesalers: 10; and retailers: 20 from each District for each crops), making upto to 480 samples in the present study. The study relates to the crop year 2012-13.

7.3 MAJOR FINDINGS. The major findings of the study are as follows:

7.3.1 Area, Production and Productivity

The study has found that the average area under cabbage is greater in Longkhum village of Mokokchung District comparing to Soku village of Wokha District. The average production and yield per q/ha of cabbage is higher in Longkhum village as compared to Soku village The total production of cabbage in Longkhum village is more than double against the production in Soku village. Similarly, for chilli crops, the average area, production and productivity is greater in Longsa village comparing to Soku village. Production of chilli is about 1.2 times higher in Longsa village when compared to Akuk village.

On the other hand, for orange crop, there are three categories of farming group i.e. marginal, small and semi-medium farmers in Yajang village and two categories of marginal and small farmer growers in N. Longidang village have been cultivating orange crop during the reference year in both the Districts. Small farmers occupy 58 percent of the respondents in Yajang village while in N. Longidang village; marginal farmers occupy 84 percent of the respondents. The average area, production and productivity of oranges are comparatively high in Yajang village than their counterpart village. The total

production of orange in Yajang village is about 2.36 times higher than N. Longidang village.

7.3.2 Marketable Surplus and Marketed Surplus

The analysis reveals that in Longkhum village of Mokokchung District, total production of cabbage is 464.7 quintals and total retention is 15.95 quintals (3.43%); this left a marketable surplus of 96.57 percent. Post-harvest losses due to lack of storage infrastructure, mishandling, wastage and perishabilty accounted 10.19 percent and the actual marketed surplus is 86.38 percent. Whereas, in Soku village of Wokha District, the total production of cabbage is 236.7 quintals and total retention is 18.8 quintals (7.94%); this left a marketable surplus 92.06 percent. Post-harvest losses accounted 25.57 percent and the actual marketed surplus is 66.49 percent. Poor storage and poor market infrastructure, and wide gap between production unit and market centers accounted high losses and low marketed surplus in Soku village. The analysis further reveals that the percentage of self consumption, other use and losses due to spoilage and wastage is higher in Soku village then that of counterpart village. The percentage of marketed surplus to total production for cabbage is much higher in Longkhum village and its shows that production and marketing of cabbage is more economical in Longkhum village.

Similarly, in case of chilli crop, Longsa village in Mokokchung District reveals that the total production of chilli is 470.17 quintals and total retention is 44.66 quintals (9.5%); this left a marketable surplus of 90.7 percent. Post-harvest losses accounted 4.17 percent and the actual marketed surplus is 86.33 percent. Whereas, in Akuk village of Wokha District the total production is 369.88 quintals and total retention is 32.88 quintals (8.89%) and marketable surplus of 91.11 percent. Post-harvest losses accounted 2.72 percent and the actual marketed surplus is 88.39 percent. The result indicates that, the percentage of self consumption is high in Akuk village, while the percentage of other use is greater in Longsa village. Due to high moisture the nature of perishability of chilli is greater in Longsa village and as result of this; the percentage of marketed surplus is worst off in Longsa village than Akuk village. This excess moisture contain in chilli, the crop

rotten within couple of days becoming unsuitable for marketing in Longsa village adding to post-harvest losses whereas in Akuk village, durability is higher for more than three days. Thus, apart from perishability, lack of post-harvest storage infrastructure and mishandling is one reason for the 4 percent losses of chilli in Longsa village. The results further reveal that the production of chilli is highest (peak) in the month of July and lowest (lean) in August in both the villages. However, the producers have higher marketed surplus in August: this is due to fall in post-harvest losses, better handling, and rise in price of chilli bringing more quantity for sale in the market. Self consumption almost remains the same at 3% and 4% respectively for Longsa and Akuk villages, while gifts and religious payment decreases as production falls in both the villages.

Correspondingly, in case of orange in Yajang village of Mokokchung District, the total production of orange is about 7195 quintals and total retention is 337.35 quintals (4.69%); this left a marketable surplus is about 95.3 percent. Post-harvest losses accounted 21.62 percent and the actual marketed surplus is 73.69 percent. Whereas, in N. Longidang village of Wokha District, the total production of orange is about 3042.56 quintals and total retention is 215.62 (7.09%); this left a marketable surplus of 92.91 percent. Post-harvest losses accounted 15.69 percent and the actual marketed surplus is 77.22 percent.

The data analysis reveals that the percentage of self consumption and other use is higher in N. Longidang village and thus, the percentage of marketable surplus is higher in Yajang village. In spite of that the marketed surplus is more in N. Longidang village (77.22%) than their counterpart village of Yajang (73.69%) for the reason that vary in post-harvest handling of orange. The traditional old producers in Yajang village are ignorant, inefficient post-harvest management, no storage infrastructure in the village and most of all, distant and remoteness of the area adds up to high spoilage and wastage comparing to N. Longidang. The analysis further reveals that, there is positive relationship between farm size and production and on the other hand negative association with self consumption in both the villages. An average loss per farm is found to be high among the large farm size groups in both the villages which indicate that post-harvest

losses increases as farm size increases. The peak time for harvesting orange is in the month of December and the lean time is in January. The percentage of self consumption and marketed surplus to total production for all categories of farm size is high in the month of January. High marketed surplus in January is by the reason of drastic fall in post-harvest losses in both the villages.

7.3.3 Factors Affecting Marketed Surplus

The study further reveals that the factors determinant for marketed surplus in selected crops in selected villages indicates that family size, age of the respondents, education, area, production, self consumption, other use, post-harvest losses, commodity price, storage facility, climate condition, transportation, market links and marketing facilities and labour availability are some of factors associating with dependent variable and having expected sign. However, some factors have statistical significant with dependent variable and it differ in different crops and different villages during the reference year.

The regression analysis in case of cabbage crop in Longkhum village reveals that, production and storage facility have a positive association and are significant statistically at 1% and 5% probability levels on marketed surplus indicating that, a unit increase in these variables will raise marketed surplus by 896.88 kg and 43.50 kg respectively. While from other view, self consumption, post-harvest losses and labour availability have negative relationship on marketed surplus at 5%, 1% and 1% probability level respectively. On the other hand after dropping some dummy variables, area and production show positive relationship with marketed surplus at 1% probability level at the same time, post-harvest losses show inverse significance at 1% probability level. Marketed surplus of the respondents is significantly affected when there is an increase in post-harvest losses.

Similarly, in Soku village, the regression results illustrate that family size and production show statistical significance at 5% and 1% probability level. An increase in

family member increases home consumption reducing surplus; however, in the present study it shows positive relationship with surplus drawing that with more family member, larger area will be brought under cultivation thereby, bringing more marketed surplus. Self consumption, weather and availability are other variable having negative impact on marketed surplus. After dropping dummy variables, production alone shows significant with dependent variable positively, while self consumption has negative relationship at 10% significance probability level. The variables explain more than 98 percent of the variation in the dependent variable in both the villages.

In case of chilli crop, in Longsa village, out of thirteen variables seven variables depict significance at estimated p-value. Area, production, storage facility and transportation have a positive significance at 1% level; this means that, a unit increase in area will increase the volume of production, as a result will add on marketed surplus by 897.14 kg and 832.82 kg respectively. Chilli is a highly perishable commodity, thus a unit rise in storage and transportation facility will benefit the farmers with more marketed surplus. On contrary to that, the factors like age, self consumption and post-harvest losses obstinate and depict a negative relationship with marketed surplus. During the month of June, area, production, storage, transportation and market facility are major determinants for significant boosting on marketed surplus. Self consumption, other use and post-harvest losses are main variables having inverse affect on marketed surplus in the month of July while in August, only other use show opposite relationship with marketed surplus at 10% significance level. Whereas, price show positive significance in the month of July and August suggesting that, one unit rise in price will increase marketed surplus by 4.87 kg and 11.26 kg respectively. On the other hand after dropping dummy variables, area and production are the factors predominant for increasing marketed surplus having significance at 1% probability level. Similarly, during the month of June, July and August: area and production show positive significance at 1% level of significance and accept for area in August show at 10% level and price shows significance at 1% level in August. The adjusted R^2 is about 98 percent with all the variables and 96 percent after dropping dummy variables.

Similarly, in Akuk village the overall regression results taking all the variables together reveals that the factors like area, production and market link have a positive association and are statistically significant at 1% level on marketed surplus. Post-harvest losses has a negative and is significant at 10% level drawing that, marketed surplus of the respondents is significantly affected for a unit increase in this variable. During the month of June, July and August: area, production and market link are major determinants for significant increase in marketed surplus. After dropping dummy variables, the regression results indicates that area, production and self consumption have a positive relationship on marketed surplus while post-harvest losses have a negative relationship with dependent variable. Similarly, the month wise analysis reveals that the factors of area and production are the major determinants and show statistical significant on marketed surplus during the months of June, July and August. The explanatory variables explain 99 percent of the variation in the dependent variable.

In case of orange crop, the analysis of regression results reveals that in Yajang village taking all the variables together, the factors of area and other use are associating positively and significant statistically. Whereas, the price factor indicates negative association with marketed surplus is due to producers need for cash, lack of market links and remoteness of the village resulting to distress sale. Similarly, month wise analysis of results indicates that the factors like area and production have a positive association with dependent variable during the months of November and December while, post-harvest losses and market link have a negative relation on marketed surplus in the respective months. In the month of January, area, post harvest losses, price and storage shows statistical significance at 1% probability level on marketed surplus. In the overall regression results after dropping dummy variables, indicates that area and other use have a positive relationship on marketed surplus while price have an inverse relationship. Similarly, area and production show positive statistical significance on the months of November and December but, these variables do not have any statistical significance at the estimated value in January.

Unlike Yajang village, price factor show positive significance on marketed surplus along with area and production at 1% probability level in N. Longidang village with all variables together while post-harvest losses have negative significant at 1% level. Month wise analysis reveals that the factors of area and production are more predominant for increase marketed surplus at significant level. In the month of January, age, education and labour availability are shown positive relationship on marketed surplus. After dropping dummy variables, age, area, production, post-harvest losses and price are predominates and of which age of the respondents and post-harvest losses draw negative impact on the dependent variable. Similarly, the month wise analysis of regression results reveals that in the month of November, family size has a positive relationship with dependent variable and it implies that, marketed surplus will increase by 55 kg for a unit rise in the family size. The variable age is statistical significant at different degree of significance level in December and January. Education and price have positive significance at 10% probability level in January. Hence, higher the education level and price/kg, higher will be the marketed surplus. The variables explain more than 98 percent of the variations on marketed surplus accept in the month of January (88%).

7.3.4 Types of Marketing Channel

The Analysis further identified the different types of channels practice by the producers in both the Districts. In case of cabbage crop in Longkhum village of Mokokchung District, three types of channel were indentified for marketing of cabbage such as producer-consumer; producer-retailer/vendor-consumer and producer-wholesaler-retailer-consumer. Whereas, in Soku village of Wokha District, only two channels have identified for marketing of cabbage such as producer-consumer and producer-retailer/vendor-consumer. Similarly, in case of chilli, the study noticed that three types of channels have identified by the producers for marketing of chilli both in Longsa and Akuk village such as producer-consumer; producer-retailer/vendor-consumer and producer-wholesaler-retailer-consumer. However, in case of orange crop, in Yajang village of Mokokchung District, two channels such as producer-local seller-consumer and producer-wholesaler-retailer-consumer and three channels in their counterpart village of

N. Longidang of Wokha District such as producer-consumer; producer-retailer/vendor-consumer and producer-wholesaler-retailer-consumer have practiced for marketing of orange crop during the study year of 2012-13.

7.3.5 Disposal Pattern

The analysis of disposal pattern of surplus commodities through different channels reveals that in case of cabbage in Longkhum village, the prominent channel is channel II were the producers dispose 84.18 percent of their surplus followed by channel III (13.48%) and I (2.34%). Similarly, in Soku village channel II is predominant (79.78%) followed by channel I (20.22%). Whereas, in case of chill in both the villages channel II is more predominant than channel III and channel I. However, in case of orange crop, in Yajang village of Mokokchung the most prominent channel is channel II where the producers dispose of 82.26 percent of their surplus and least in channel I (17.74%) of their surplus produce. However, channel III (89.43%) is the most important channel in N. Longidang village followed by channel II and I.

7.3.6 Marketing Cost, Marketing Margin and Price Spread

The percentage of ***marketing cost*** to total cost incurred by the producers in marketing of all the selected horticulture crops diminishes as market intermediaries increases. The marketing cost of producers for chilli in Channel I is hundred percent which declined to 53 percent and 13.33 percent in channel II and I respectively (see Table 5.12). The expenses borne by the wholesaler and retailer in channel III were 62.09 percent and 24.58 percent. Similarly, in Akuk village the total marketing costs (100%) is incurred by producer in channel I followed by channel II (37.79%) and channel III (6.51%). This implies that, percentage of marketing cost of producers to total marketing cost decreases as market intermediaries increases. However, the percentage share of marketing cost in consumer's rupee increases as marketing channel increases in both the Districts.

Similarly, with respect to ***market margin***, the analysis reveals that the producers share in consumer's rupee decreases as marketing channel increases in both the Districts. The study brought out that the net price received by the producers for all the selected crops is highest in channel I when they sell directly to consumers and lowest in channel III. This is because, marketing margin increases as marketing channel increases which in turn will reduce producers share. The study further found that, per kg price received for cabbage is high among the respondents in Mokokchung District while, for chilli and orange, price per kg received is high in Wokha District.

In the same way, the study analysis with respect to ***price spread*** among the farmers across the crops reveals that in case of cabbage in Longkhum village, the difference between the price paid by the consumer and the price received by the producer is Rs 5.8/kg in channel II while it is Rs. 8.02/kg in Soku village. This shows that, price spread in marketing of cabbage is higher in Soku village of Wokha District. With the involvement of larger number of intermediaries, the difference in the two prices increases; that is, price spread in channel III is Rs 15.36/kg in Longkhum village. Whereas, in case of chilli crop in Longsa village, the difference between the price paid by the consumer and the price received by the producer is Rs 9.43/kg in channel II, and Rs. 23.13/kg while, it is Rs. 8.43/kg and Rs. 21.23/kg in channel II and III respectively in counterpart village of Wokha District. As we know, greater the price spread, lower will be the marketing efficiency. Hence, marketing of chilli is comparatively more efficient in Akuk village when compared to Longsa village. However, in case of orange crop, in Yajang village, the price spread in channel I is Rs. 11.95/kg and in channel II: Rs. 17.61/kg. This indicates that producers share in consumer's rupee decreases as marketing channel increases or market is less efficient because of the profit margin pocketed by the wholesalers. Similar results have found in N. Longidang village, the price spread is channel II is 11.21/kg and channel III it is 18.81/kg. Price spread is more in N. Longidang village when the producers are selling via wholesalers.

7.3.7 Marketing Efficiency

Marketing efficiency can be defined as the ratio of marketing output over input (Sheth et al. 2002)[121]. There has been concern in the recent years regarding the efficiency of marketing of horticulture crops in India. It is believed that poor efficiency in the marketing channels and poor marketing infrastructure is leading not only to high and fluctuating consumer prices, but also to only a small proportion of the consumer's rupee reaching the producers. According to Shepherd's method and Acharya-Agarwal modified method of marketing efficiency Index, channel I (Producer-Consumer) is the most efficient channel for marketing of cabbage, chilli and orange in both the Districts. The marketing efficiency in supply channel I was high on account of the fact that no middleman was involved and produce was directly sold to consumers. As compared to channel III, the marketing efficiency for all the selected crops was marginally high in supply channel II due to less number of the intermediaries in the latter. Though marketing efficiency in channel I was higher but its market share in total quantum sold is lower in both the Districts as this channel was not well developed for marketing the commodities in large volume.

7.3.8 Selling Behaviour

The analysis of selling behaviour of producers for marketing their surplus produce in selected crops reveals that in case of cabbage, the producers sell about 98% of crop in the market and only 2% within the village. Whereas, in case of chilli 93% in the market and 7% within village and in case of orange about 82% of crop sell in the market and 18% within village in Mokokchung District. Similarly, in Wokha District, the producers sell cabbage about 80% in the market and 20% within the village and chilli it is 86% in the market and 14% within the village whereas in case of orange about 98% sell in the market and only 2% within village. Thus, more than 82 percent of the marketed surplus is sold by the producers in the market and less than 18 percent within the village in

[121] Sheth, J.N., Sisodia, R.S and Sharma, A. (2002). Marketing efficiency: Issues and Analysis. *Journal of Business Research*. 55, 349-362.

Mokokchung District. On the other hand, more than 80 percent of the marketed surplus is sold in market and less than 20 percent within village in Wokha District. The study further reveals that the percentage of sale within village decreases as farm size increases in both the Districts.

7.3.9 Marketing Problems/Constraints

The major production and marketing constraints in case of cabbage in Mokokchung District is problem of insects and moth, lack of extension services and lack of storage infrastructure in the growing area. The other important constraints are risk of sale on time, high transport cost and lack of market intelligence inhibiting marketing. On the other hand in Wokha District, lack of storage facility, lack of extension service and lack of resources are major limiting factors followed by lack of regulated and cooperative marketing societies, market intelligence and lack of market link road hinders marketing. In case of chilli crop, lack of storage infrastructure, lack of extension service and excess monsoon, risk of sale on time, market glut and exploitative middlemen in marketing in Mokokchung District. Similarly in Wokha District, lack of extension service, risk of sale on time and lack of transportation are primary constraints faced by the farmers in production and marketing of chilli. In case of orange, the common problem encountered by the farmers in both the Districts is lack of post-harvest infrastructure, problem of insects and lack of adequate resources in production. Inadequate market information and intelligence in Mokokchung District; and lack of market link road and high transport charge in Wokha District are some other constraints reported by the famers in marketing their crops.

7.4 POLICY SUGGESTIONS/IMPLICATIONS

Improvement in market infrastructure such as cold storage, go downs, loading and unloading facilities mechanically, weighing facilities and improving transparency through supervision and making availability of up-to-date market information to the farmers is the

need of the hour. On the basis of findings emerged from the present study, some of the following policy implications are drawn out after discussion with different stakeholders in order to improve the production, marketing and enhance marketing efficiency of the selected horticulture crops in Nagaland.

7.4.1 Production Side

1. Extension services need to be streamlined in order to disseminate the technical know-how about the crops and producers should be given intensive training related to post harvest handling of the produce at government level. Such training should cover improved technologies including grading, packaging, pre-cooling, storage and transportation.
2. Construction of processing unit near the producing area is vital to ensure higher return to the producers.
3. Detailed assessment of the postharvest losses to be made along the entire production and marketing chain to identify the critical gaps and remedial measures. Thus, research on post-harvest management of the horticultural crops should be encouraged.
4. The storage facilities need to be created near the production area for storage of the surplus during the glut season which will help to decrease intra-seasonal price variation and to assure regular supply of the produce and reduction of wastage.
5. The government can give subsidy for constructing simple storage facilities so that producers can keep their surplus for some time when price is low in the market.
6. Provisions for credit facilities for farmers should be encourage to them and the procedure of financing should be made easy and convenient for the farmers in order to make it popular among them.
7. There is need for the provision of crop insurance in the region in case of natural calamities like flood, drought, and hail storm etc.

7.4.2 Marketing Side

1. Regulated markets should be developed. The State Government agencies should fix reasonable and remunerative prices for the produce in both the Districts.
2. The State Government should create more cooperative marketing societies and activate the Horticulture Department as well as APMC act in order to provide better marketing facilities for the producers and also to eliminate the role of middlemen.
3. There is need for strengthening and streamlining the arrangements for enforcement and inspection to ensure a regulated system of open auctions, trading practices and margins of intermediaries.
4. Bandh, blockade, strikes, etc. hinders business of stakeholders; therefore, the Government as well as the private organization should try to avoid such kind of unwanted situations as far as possible.
5. The Government should take measures to control the spurious malpractices prevailing in the market through exercising proper control over the markets by the Government officials
6. Local markets need to be established at block level in order to make the direct sale by farmers with minimum cost. For this, a farmer's market model may be developed with basic infrastructure such as store house, weighing, and night halt facilities etc. The system successfully integrates many producers with consumers/retailers, eliminates middlemen, reduces marketing cost, and provides good return of the producers share in consumer's rupee.
7. Currently packing materials used by producers in both the Districts are inadequate and inappropriate. Therefore, cheap and adequate supply of packing material should be ensured.

8. The level of market intelligence should be increased with adequate current information on demand, supply and highest & lowest prices of the various commodities in the markets. Improvement in the dissemination of such market information through all possible mass media communication aids for the welfare of the farming community.

7.4.3 Wholesalers/Retailers

Provision of adequate marketing facilities such as storage infrastructure, proper seating place, parking space for vehicles, clean environment etc. is vital so that, the retailers and the wholesalers do not face any difficulty in marketing the commodity. Since horticulture crops are highly perishable in nature and bulky, bandh, blockade, strikes, hinder business, therefore, such act should be discouraged. The retailers and the wholesalers have to pay unauthorized or illegal fees to many persons in order to market their produce. They should unite together and stand against these unauthorized fees at the same time government should punish those persons bribing from the retailers and wholesalers. There are constraints relating to weighing and cheating by the producers. Since there is no proper grading and also due to lack of time, the retailers and wholesalers directly buy the produce as already packed by the producers. Thus, damage crops are sometimes noticed in the package resulting in losses for middlemen. Adequate cold storage facilities should be established in the market as it is the key instrument to avoid marketing losses, market glut, and risk of sale on time.

7.5 CONCLUDING REMARK

Horticultural crops being highly seasonal, perishable and bulky in nature need care in handling and transportation. Their bulkiness makes the handling and transportation a difficult task, leading to huge post-harvest losses. According to the empirical findings of the study, market intermediaries reduce marketing efficiency of selected horticultural crops along the supply chain. Therefore, it is the role of the Nagaland Government to eliminate market intermediaries along the supply chain who

pocketed greater margins of producers. Moreover, producers could be able to maximize their margins if government intervened proactively in order to organize and streamline the marketing cooperative societies whereby producers can use these societies to sell their produce at profit. There is a need to create awareness and make the producers receptive to the new technology through farmers participating, demonstrations and training. Training facilities with respect to growing of horticultural crops and raising nursery has to be made available as per requirements. Therefore, there is a need for launching a sound marketing system with forward and backward linkage so that vast potential of horticulture crops can be exploited through adoption of improved production technology in the region.

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AnnexureI

All India area, production and productivity of Horticultural crops

Year	Area (in million ha)	Production (in million MT)	Productivity (in MT/ha)
2001-02	16.6	145.8	8.8
2002-03	16.3	144.4	8.9
2003-04	19.2	153.3	8.0
2004-05	21.1	170.8	8.1
2005-06	18.7	182.8	9.8
2006-07	19.4	191.8	9.9
2007-08	20.2	211.2	10.5
2008-09	20.7	214.7	10.4
2009-10	20.9	223.1	11.7
2010-11	21.8	240.5	11.0
2011-12	23.2	257.3	11.1
2012-13	23.7	268.8	11.3

Source: Indian Horticulture Database, 2013 [p.18]

Annexure II

District-wise population and decadal growth of Nagaland, 2001-11

State/District	Total population, 2011			Decadal growth, 2001-11		
	Rural	Urban	Total	Rural	Urban	Total
Nagaland	1,407,536	570,966	1,978,502	-14.6	66.6	-0.6
Mon	215,816	34,444	250,260	-11.6	107.6	-4.0
Mokokchung	138,897	55,725	194,622	-30.9	78.5	-16.1
Zunheboto	113,160	27,597	140,757	-14.0	19.6	-9.0
Wokha	131,339	35,004	166,343	6.3	-7.0	3.2
Dimapur	180,942	197,869	378,811	-6.5	72.7	22.9
Phek	138,843	24,575	163,418	2.6	91.0	10.3
Tuengsang	159,822	36,774	196,596	2.3	23.5	5.7
Longleng	42,871	7,613	50,484	-64.7	0.0	-58.5
Kiphire	57,517	16,487	74,004	-46.0	0.0	-30.6
Kohima	146,900	121,088	267,988	2.6	57.2	21.7
Peren	81,429	13,790	95,219	-10.3	0.0	4.9

Source: Census of India, Primary Census Abstract, Nagaland, 2011

AnnexureIII

Total Workers in Nagaland, 2011

Category	Mokokchung			Wokha		
	Male	Female	Total	Male	Female	Total
Total Work Force	57,084	42,983	100,067	42,096	36,316	78,412
Main workers	48,355	32,691	81,046	35,692	27,820	63,512
Cultivators	21,940	20,296	42,236	20,233	21,629	41,862
Agricultural labourers	3,013	1,850	4,863	1,298	1,077	2,375
Household Industries	777	1,162	1,939	409	465	874
Other workers	22,625	9,383	32,008	13,752	4,649	18,401
Main workers	8,729	10,292	19,021	6,404	8,496	14,900
Cultivators	2,666	4,023	6,689	2,019	3,592	5,611
Agricultural labourers	2,324	1,979	4,303	1,971	2,092	4,063
Household Industries	551	1,308	1,859	447	644	1,091
Other workers	3,188	2,982	6,170	1,967	2,168	4,135

Source : Census of India, Primary Census Abstract, Nagaland, 2011

AnnexureIV

Total Workers of selected villages in Mokokchung District, 2011

Category	Longkhum			Longsa			Yajang		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total Work Force	1,117	1,038	2,155	932	936	1,868	985	771	1756
Main workers	887	727	1,614	875	896	1,771	866	434	1300
Cultivators	595	633	1,228	718	787	1,505	620	374	994
Agricultural labourers	10	2	12	7	24	31	46	22	68
Household Industries	17	15	32	23	11	34	4	3	7
Other workers	265	77	342	127	74	201	196	35	231
Main workers	230	311	541	57	40	97	119	337	456
Cultivators	185	244	429	16	10	26	106	297	403
Agricultural labourers	6	6	12	3	3	6	6	13	19
Household Industries	7	15	22	3	1	4	2	2	4
Other workers	32	46	78	35	26	61	5	1	30

Source : Census of India, Primary Census Abstract, Nagaland, 2011

AnnexureV

Total Workers of selected villages in Wokha District, 2011

Category	Soku			Akuk			NLongidang		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total Work Force	71	53	124	997	933	1,930	475	569	1,044
Main workers	70	52	122	963	890	1,853	459	518	977
Cultivators	35	42	77	856	842	1,698	398	503	901
Agricultural labourers	0	0	0	6	3	9	0	0	0
Household Industries	1	0	1	5	10	15	1	1	2
Other workers	34	10	44	96	35	131	60	14	74
Main workers	1	1	2	34	43	77	16	51	67
Cultivators	0	0	0	1	2	3	11	40	51
Agricultural labourers	0	0	0	6	1	7	0	0	0
Household Industries	0	0	0	4	10	14	3	2	5
Other workers	1	1	2	23	30	53	2	9	11

Source : Census of India, Primary Census Abstract, Nagaland, 2011

AnnexureVI

Area of principal crops in to total cropped area in Nagaland

(in%)

Crops	Area/Production	2001-02	2010-11	2011-12	2012-13
Cereals	Area(inha)	70.49	67.09	66.65	65.94
Pulses	Area(in ha)	11.09	8.74	8.79	8.94
Oilseeds	Area(in ha)	16.0	16.71	16.69	16.50
Commercial	Area(inha)	2.42	7.46	7.86	8.62

Source: Compiled by researcher, 2014

Annexure VII

Area of principal crops in to total cropped area in Mokokchung District

(in%)

Crops	Area/Production	2001-02	2010-11	2011-12	2012-13
Cereals	Area(inha)	71.45	65.03	61.27	60.61
Pulses	Area (inha)	11.30	8.37	9.14	8.94
Oilseeds	Area(in ha)	14.90	17.08	18.61	18.55
Commercial	Area(inha)	2.35	9.51	10.98	11.91

Source: Compiled by researcher, 2014

AnnexureVIII

Area of principal crops in to total cropped area in Wokha District

(in%)

Crops	Area/Production	2001-02	2010-11	2011-12	2012-13
Cereals	Area(inha)	68.00	70.26	68.80	68.11
Pulses	Area(inha)	11.40	7.31	7.67	7.33
Oilseeds	Area (inha)	18.24	15.76	16.21	16.06
Commercial	Area (in ha)	2.37	6.67	7.33	8.50

Source: Compiled by researcher, 2014

Annexure IX

Gross State Domestic Product (GSDP) at constant price (2004-05) by industry of origin, 2004-05 to 2012-13

(In percentage)

Sector	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Primary	51.03	48.29	45.91	43.64	44.15	42.59	42.62	42.49	42.36
Secondary	10.60	11.48	12.38	12.91	13.62	14.35	14.33	14.73	15.07
Tertiary	38.37	40.24	41.71	43.45	42.23	43.06	43.05	42.78	42.57
GSDP(in corers)	5839	6436	6938	7445	7917	8463	8925	9379	9871

Source : Computed from Central Statistical Organization (CSO), (As on 01-08-2013)

AnnexureX

Gross State Domestic Product (GSDP) at constant price (2004-05)

(Rs. in crore)

Year	Nagaland		NER		India	
	GSDP	% Growth over previous year	GSDP	%Growth over previous year	GSDP	% Growth over previous year
2004-2005	5839	-	87742	-	2971464	-
2005-2006	6436	10.22	91971	4.82	3253073	9.48
2006-2007	6938	7.80	96919	5.38	3564364	9.57
2007-2008	7445	7.31	102612	5.87	3896636	9.32
2008-2009	7917	6.34	110175	7.37	4158676	6.72
2009-2010	8463	6.90	121565	10.34	4516071	8.59
2010-2011	8925	5.46	130635	7.46	4937006	9.32
2011-2012	9379	5.09	139645	6.90	5243582	6.21
2012-2013	9871	5.25	NA	NA	5505437	4.99

Source : Central Statistical Organization (CSO), (As on 01-08-2013)

AnnexureXI

Per capita Net State Domestic Product (NSDP) at constant price (2004-05)

(In Rupees)

Year	Nagaland		India	
	Per Capita NSDP	% Growth over previous year	Per Capita NSDP	% Growth over previous year
2004-2005	30441	-	24143	-
2005-2006	33072	8.65	26015	7.75
2006-2007	35074	6.05	28067	7.89
2007-2008	37317	6.40	30332	8.07
2008-2009	39041	4.62	31754	4.69
2009-2010	40590	3.97	33901	6.76
2010-2011	42511	4.73	36342	7.20
2011-2012	43267	1.78	38037	4.66
2012-2013	43967	1.62	39168	2.97

Source : Central Statistical Organization (CSO), (As on 01-08-2013)