A COMPARATIVE STUDY ON PRODUCTION AND MARKETING OF VEGETABLES UNDER SETTLED AND SHIFTING CULTIVATION IN DIMAPUR AND WOKHA DISTRICT OF NAGALAND

Thesis

Submitted to

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In partial fulfillment of requirements for the Degree
of
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by

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2014

STUDENTS DECLARATION

I, *BL. Mhalo Tungoe*, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form the basis of the award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree to any other University/ institute.

This is being submitted to Nagaland University in fulfilment for the degree of Doctor of Philosophy in Agricultural Economics.

27/Oct/2014.

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TO

MYSON YIDICUNG & DAUGHTER SAMLAM

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Dated: Dimapur, the 27th October 2014

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CERTIFICATE-I

This is to certify that the thesis entitled "*A comparative Study on the Production and Marketing of Vegetables under settled and shifting cultivation in Dimapur and Wokha District of Nagaland*" Submitted to Nagaland University in partial fulfilment of the requirements for the degree of DOCTOR OF PHILOSOPHY in the discipline of Agricultural Economics is a record of Research work carried out by Mr/ Miss/ Mrs *B. L Mhalo Tungoe* Registration No. 396/ 2009 under my personal supervision and guidance

All help received by him/her have been duly acknowledged.

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ABBREVATIONS

%	-	Percentage
Agri/Agril	-	Agriculture
Anon.	-	Anonymous
Approx.	-	Approximately
F	-	Female
Fig.	-	Figure
GOI	-	Government of India
Govt.	-	Government
Ha	-	Hectare
H.S	-	Higher Secondary
Kg	-	Kilogram
M	-	Male
M.T	-	Metric tonne
NEH	-	North East Hill
NER	-	North East Region
No.	-	Number
SHG	-	Self Help Group
T	-	Total
t	-	tonnes
q	-	quintal
viz.	-	Namely/ that is to say/ As follows

Chapter I
Introduction

INTRODUCTION

In the concept of Agriculture an ideal marketing system plays an important role for the production and planning. It safeguards the consumers as well as the producers. Adoption of modern technology may be risky and uncertain if the agricultural marketing process is inadequate, faulty and inefficient. It is therefore essential to identify the production and marketing system to bring about agricultural transformation. Proper identification of the problems is important as policies and programmes based on wrong diagnosis of the problems may cause additional problems in the process of marketing.

I.1. Importance of vegetables

Vegetable plays an important role in our day to day life. Vegetables are comparatively rich and cheaper source of vitamins. It forms an essential part of our diet and a meal without vegetable is incomplete. Besides that, vegetable contains all essential nutrients required for a balanced diet and have a medicinal and aesthetic value. Vegetable cultivation is therefore an important source of meeting the nutritional requirements of our population and beside these; it helps in earning foreign exchange as there is a huge demand in neighboring countries. The return from vegetables is generally higher than any other crops and diversification towards vegetable cultivation helps even the marginal and small farmers to earn sufficient income.

Vegetables are important constituents of Indian agriculture and nutritional security due to their short duration, high yield, nutritional richness, economic viability and ability to generate on-farm and off-farm employment. Our country is blessed with diverse agro-climates with distinct seasons, making it possible to grow wide range of vegetables. India is the second largest producer of fruits and vegetables in the world. Total area under horticultural crops is 21.83 million hectare and production is 240.53 million tonnes. Fruits and vegetables together contribute about 92 per cent of the total horticultural production in the country

Nature is providing us with all kinds of vegetable crops that can be grown in different seasons of the year in different region. Different kinds of vegetables provide leaf, stem, flower, fruit or seed for consumption. Considering vividness in the requirement of soil and season farmers can grow vegetable crops throughout the year for earning regular and steady income to meet the daily expenditure. There are vegetables of very short duration that can be grown as rally and intercrops in either agronomical crops or vegetable crops. There are vegetables which will improve soil and also provide fodder to cattle. Thus farmer has wide choice to select suitable crop to adjust in his cropping pattern in given situation. Climate and soil conditions of this region are conducive to grow different vegetables. Since cultivation of vegetable crops involves intensive cultural operations starting from sowing to marketing, it provides more and regular employment opportunities in rural areas.

The perishable nature of vegetables demand comprehensive planning for movement, Storage, processing and distribution of vegetable products. The growth of vegetable industry as a commercial proposition largely depends on mainly allied enterprises like storage, processing, marketing, maintenance and service enterprises to encourage vegetable growing.

1.2 Vegetable Scenario in the world and India

Major vegetable producing countries of the world during the year 2010-2011 were: China [473.06 million tonnes (46.74 per cent world production)], India [146.55 million tonnes (14.48 per cent world production)], USA [35.29 million tonnes (3.48 per cent world production)], Turkey [25.83 million tonnes (2.56 per cent world production)] and Egypt [19.51 million tonnes (1.92 per cent world production)]. India with vegetable production of 146.55 million tonnes is the second largest producer of vegetables contributing 14.00 per cent of world's vegetable production. With an area of 8.50 million hectares under vegetables, the average productivity of vegetables in India is 17.30 t / ha in 2010-11. Productivity of vegetables in India is seen to be lower than Spain (37.20 t / ha) and world average (18.80 t / ha), as India ranks first in production of okra in the world (73.00 per cent of world production) and second in other vegetables such as brinjal (27.55 per cent),

Table 1.1. Area, production & yield of vegetables in world and India (1991-2011)

SN	Year	WORLD			INDIA		
		Area (Million ha)	Production (Million t)	Productivity (t/ha)	Area (Million ha)	Production (Million t)	Productivity (t/ha)
1.	1991	32.16	469.19	14.59	4.86	49.97	10.27
2.	1992	32.62	486.25	14.91	4.42	50.47	50.47
3.	1993	516.98	516.98	15.09	4.71	52.96	11.24
4.	1994	35.34	539.60	15.27	4.45	54.18	12.16
5.	1995	38.02	571.04	15.02	5.62	56.53	10.05
6.	1996	39.29	605.77	15.42	5.05	57.26	11.34
7.	1997	39.77	618.11	15.54	4.95	54.11	10.94
8.	1998	42.00	649.44	15.46	5.32	63.82	11.99
9.	1999	44.49	707.46	15.90	5.47	70.98	12.97
10.	2000	46.70	777.28	16.65	5.47	72.28	13.22
11.	2001	47.95	804.99	16.79	6.02	78.90	13.10
12.	2002	48.88	833.18	17.04	5.76	69.18	12.00
13.	2003	51.51	863.52	16.76	7.18	79.04	11.02
14.	2004	50.83	875.42	17.22	5.40	65.56	12.14
15.	2005	51.86	898.42	17.32	5.84	71.45	12.23
16.	2006	52.55	931.77	17.73	6.33	81.88	12.93
17.	2007	52.46	962.34	18.34	6.56	87.98	13.41
18.	2008	52.76	994.65	18.85	6.80	91.73	13.49
19.	2009	54.01	1019.11	18.87	6.75	90.63	13.43
20.	2010	55.60	1044.38	18.78	7.26	100.41	13.84
21.	2011	56.69	1087.59	19.18	7.57	105.80	13.97

(Source: Vegetable statistics, Indian Institute of Vegetable Research, Indian Council of Agricultural Research, Varanasi - 221 305, Uttar Pradesh).

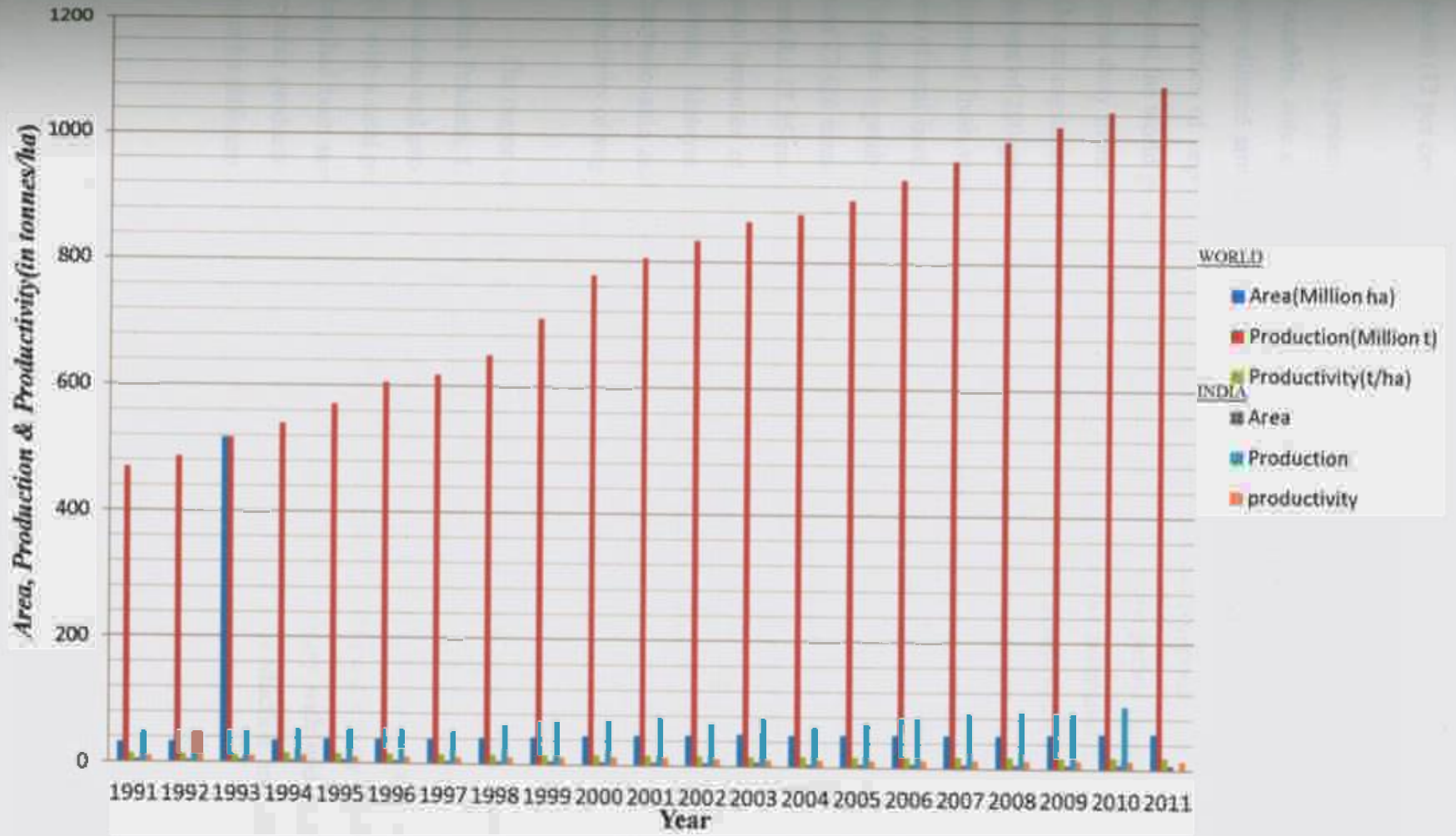


Fig. 1.1. Area, production & yield of vegetables in world and India (1991-2011)

cabbage (13.00 per cent), cauliflower & broccoli (36 per cent), onion (19.90 per cent), potato (13 per cent) and tomato (11.00 per cent), respectively.

At present more than 50 kinds of vegetables belonging to different groups, namely cucurbits, cole crops, solanaceous, root and leafy vegetables etc. are grown in different agro-climatic situations of the country. During the period from 1985-86 to 1993-94 the production of vegetables in India increased at an annual compound rate of 21.11 per cent against the world growth rate of 25.64 per cent for the same period (Sarma, 1999). The per capita daily intake of vegetables in India is much lower as compared to advance nations. The per capita availability of vegetables per day is 160 grams against the recommended amount of 280 grams per day per capita as suggested by the ICMR, during 1991-92. India export of fresh vegetables and vegetable products was at Rs. 205.25 crore i.e. 42.50 per cent of total horticultural export and 3.40 per cent of agriculture export (Swarup, 1994). The fresh vegetable export excluding onion during the year 1990-91, 1991-92 and 1992-93 were 27,426 tonnes, 41,757 tonnes and 34,000 tonnes respectively. In value terms these were Rs. 17.55 crore, Rs. 25.72 crore and Rs. 22.00 crore respectively (Chadha, 1994). The major importer of Indian vegetables and vegetables products were UAE, Saudi Arabia, Bahrain, Malaysia, Singapore, Bangladesh, German, Denmark, UK, New Zealand, Czechoslovakia and other European countries. Table. 1 shows the area, production and productivity of vegetables in India and World from 1991 to 2011.

The major vegetable growing states in India are West Bengal, Uttar Pradesh, Bihar, Andhra Pradesh, Gujarat, Karnataka and Tamil Nadu. The highest area under vegetable cultivation and production was West Bengal with an area of 1349.70 thousand hectares in 2011 with a total production of 21907.00 thousand tonnes and productivity of 19.80 t / ha. There had been uneven growth of vegetables across the country with wide variations in vegetable productivities in different states. Vegetable Area, production and productivity ranges for different states are given in Table. 2.

1.3 Vegetable scenario in North East Region

The North-Eastern region is characterized by hills and mountains with folded topography, plateaus and hills with near tropical to alpine climatic condition. Under these conditions, the mixed farming system with horticultural crop cultivation in particular occupied the prime position because of its economic viability as compared to other field crops.

The unique diversity in agro-climatic conditions coupled with fertile and well-drained soil makes this region suitable for growing a large number of horticultural crops like wide range of fruits, vegetables etc. Shadequel, 1989 viewed that the North-Eastern Region of India with a mixed terrain of hills and plains, intercepted by large number of small and big rivers, streams is nature's unique gift for production of number of horticultural crops. The North-East region produces 6503.80 thousand MT from an area of 405.80 thousand ha with productivity of 16.03 t/ha. Table. 3 show the area, production and productivity of vegetables in the North- East region for the year 2010-11.

1.4. Vegetable Scenario in Nagaland

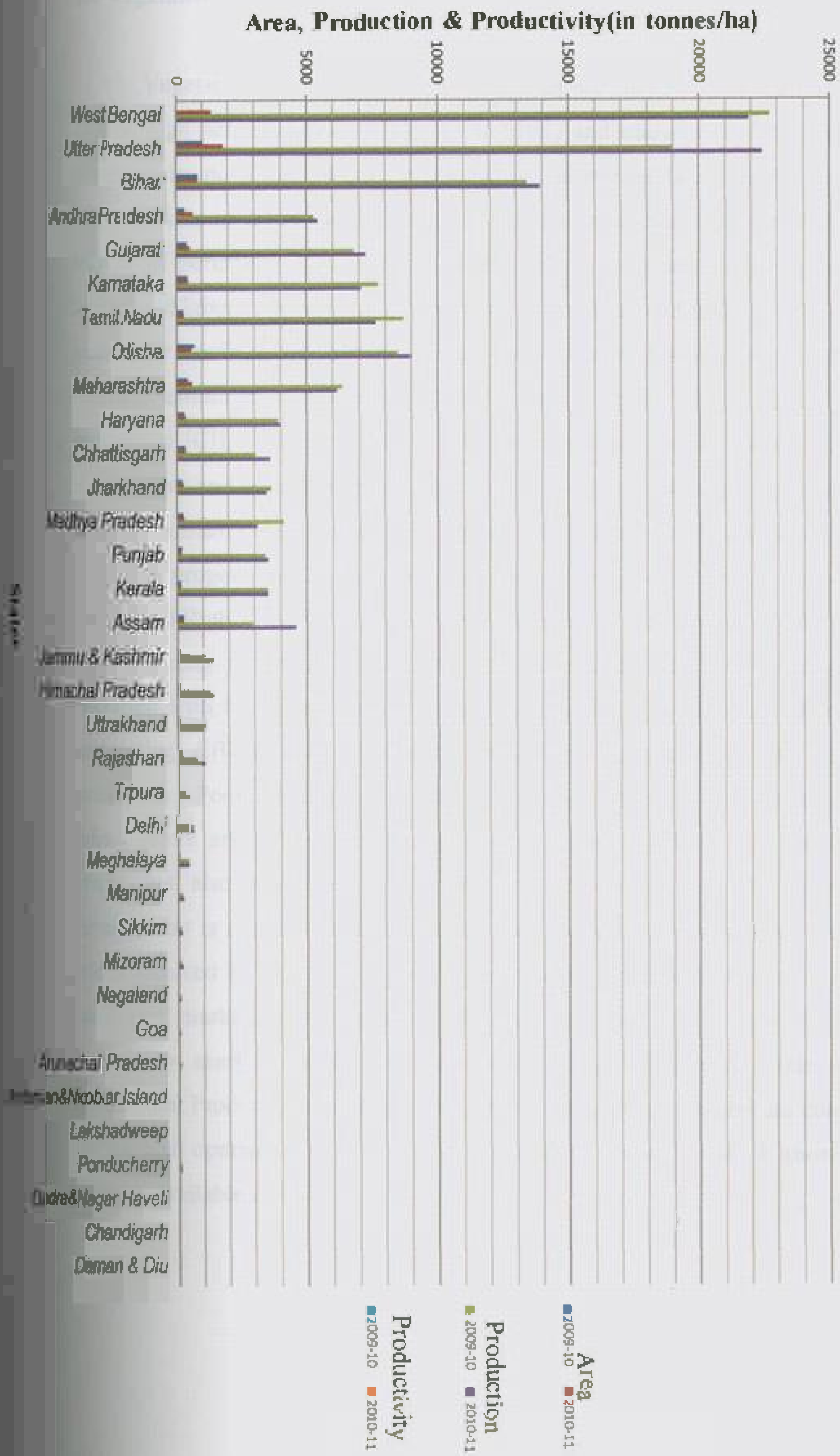
Nagaland produces 3,09,080.00 Metric tonnes from an area of 45,060 hectare with productivity of 6.85 t/Ha, Nagaland occupied 0.12 per cent of India total vegetable growing area while the production of vegetable in the state shared only 0.058 per cent. The state being endowed with varied topography and climatic condition number of vegetables can be grown throughout the year. The major vegetables grown in the state are cabbage, peas, beans, tomato, potato, pumpkin, cucumber, leafy vegetables, brinjal, chilly, etc.

Table 1. 2. State-wise area production and productivity of vegetables in India

SN	States / UTs	Area (000'ha)		Production (000't)		Productivity (t/ha)	
		2009-10	2010-11	2009-10	2010-11	2009-10	2010-11
1.	West Bengal	1302.7	1349.7	22704.3	21907.0	16.8	19.8
2.	Uttar Pradesh	1020.1	1 829.4	18950.1	22436.0	18.57	21.3
3.	Bihar	836.0	845.0	13385.7	13907.0	16.6	17.3
4.	Andhra Pradesh	331.3	651.2	5267.5	5426.2	16.4	18.2
5.	Gujarat	406.8	515.9	6807.1	7255.5	17.8	18.2
6.	Karnataka	441.2	466.3	7724.9	7082.2	16.1	19.4
7.	Tamil Nadu	263.7	277.3	8693.5	7627.7	28.9	29.9
8.	Odisha	694.2	553.8	8467.4	8963.6	12.9	14.1
9.	Maharashtra	451.8	611.0	6368.0	6172.6	13.7	12.3
10.	Haryana	300.9	346.4	3893.4	3987.0	13.3	13.4
11.	Chhattisgarh	315.4	345.8	3041.0	3601.1	11.4	12.3
12.	Jharkhand	212.1	259.5	3637.0	3469.2	16.4	15.8
13.	Madhya Pradesh	250.7	283.7	4105.8	31 12.6	12.4	13.0
14.	Punjab	183.3	174.1	3410.3	3522.5	19.2	20.6
15.	Kerala	151.6	149.5	3509.4	3518.1	23.2	22.7
16.	Assam	255.2	260.1	2916.7	4569.9	11.43	17.56
17.	Jammu and Kashmir	69.8	69.7	1023.6	1374.2	19.7	22.4
18.	Himachal Pradesh	79.8	80.4	1263.9	1390.7	17.4	18.3
19.	Uttrakhand	82.6	85.8	1077.6	997.3	12.1	12.0
20.	Rajasthan	131.9	140.3	736.7	1071.9	8.1	6.3
21.	Tripura	32.5	36.0	294.7	446.9	13.7	14.8
22.	Delhi	36.1	29.8	617.4	617.4	17.1	16.7
23.	Meghalaya	44.3	41.8	415.8	415.8	9.4	8.5
24.	Manipur	19.9	22.2	174.3	221.8	11.2	10.7
25.	Sikkim	28.7	23.9	98.0	147.7	5.1	5.1
26.	Mizoram	10.6	17.5	114.4	179.1	16.9	6.6
27.	Nagaland	10.4	10.7	78.3	78.3	7.5	7.4
28.	Goa	5.7	5.7	57.6	57.8	10.1	10.1
29.	Arunachal Pradesh	4.2	4.2	110	38.5	9.1	9.2
30.	Andaman & Nicobar Islands	5.2	5.7	30.8	41.5	8.0	6.1

31	Lakshadweep	0.4	0.4	14.1	14.1	31.7	35.3
32	Ponducherry	4.5	0.6	81.0	81.0	18.2	14.7
33	Dadra & Nagar Haveli	1.0	1.1	4.5	4.5	4.6	5.0
34	Chandigarh	0.1	0.1	1.7	1.7	17.0	17.0
35	Daman and Diu	0.2	0.0	0.2	0.0	1.2	-
	India	**7984.8**	**8494.6**	**106372.5**	**133738.0**	**16.7**	**17.3**

(Source: Vegetable statistics, Indian Institute of Vegetable Research (Indian Council of Agricultural Research) Varanasi-221305, Uttar Pradesh).



Area, Production & Productivity(in tonnes/ha)
0
5000
10000
15000
20000
25000
WestBengal
Utter Pradesh
Bihar
AndhraPradesh
Gujarat
Karnataka
Tamil Nadu
Odisha
Maharashtra
Haryana
Chhattisgarh
Jharkhand
Madhya Pradesh
Punjab
Kerala
Assam
Jammu & Kashmir
Himachal Pradesh
Uttrakhand
Rajasthan
Tripura
Delhi
Meghalaya
Manipur
Sikkim
Mizoram
Nagaland
Goa
Arunachal Pradesh
Andaman&Nicobar Island
Lakshadweep
Ponducherry
Dadra&Nagar Haveli
Chandigarh
Daman & Diu
States
Area
2009-10
2010-11
Production
2009-10
2010-11
Productivity
2009-10
2010-11

1.5 Vegetable Marketing

Vegetable being highly perishable in nature create serious problems in marketing. Due to high percentage of wastage in handling and transportation the marketing of these commodities need quick transportation and good storage facilities. At present, most of the rural markets in India do not have the basic infrastructures to attract the producers and buyers of perishable commodities. Horticultural crops are highly seasonal, perishable, capital and labour intensive and needs care in handling and transportation. Their bulkiness makes the handling and transportation a difficult task, leading to huge post- harvest loss which is estimated at around Rs. 23,000 crore or nearly 35 per cent of the total annual production (CII, Mckinsey, 1997). Their seasonal production pattern results in frequent market gluts and associated price risk, thereby forcing the farmers into distress sale to pre - harvest contractors and commission agents. The price spread along the marketing channel is directly proportional to the number of market intermediaries involved along the channel (Gupta and Rathode, 1998). The studies conducted in various parts of the country revealed that marketing facilities in India are exploitive, collusive, economically inefficient and operating with high profit margins. Involvement of large numbers of intermediaries for perfoming different activities takes away high margins from the price paid by the consumers. Poor efficieney in the marketing channels and inadequate marketing infrastructure are believed to be the cause of not only high and fluctuating consumer prices, but also too little of the consumer rupee reaching the farmer. Hortieuhure development is currently constrained by poor marketing arrangements. The gap between prices received by the farmers and those paid by urban consumers is largely reflecting inefficient marketing arrangements. Horticultural produce is typically collected from farmers by market agent, who sells it in organized markets established under the Agricultural Produce Marketing Acts. Unfortunately, these markets are controlled by a few traders and operate on a highly non-transparent basis. Table. 5 show the marketing facilities available in India.

Table 1.3. Area, Production and productivity of vegetables in NE for 2010-11

SN	States	Area (000' ha)	Production (000' MT)	Productivity (t / ha)
1.	Arunachal Pradesh	4.20	38.50	9.17
2.	Assam	255.2	4569.9	17.91
3.	Manipur	19.9	221.8	11.15
4.	Meghalaya	44.3	415.8	9.39
5.	Mizoram	10.6	179.1	16.90
6.	Nagaland	10.4	78.3	7.53
7.	Sikkim	28.7	147.7	5.15
8.	Tripura	32.5	446.9	13.75
9.	North east region	405.8	6503.8	16.03
10.	India	7984.8	133737.6	16.75

(Source: Indian Council Agricultural Research for NEH region, Barapani).

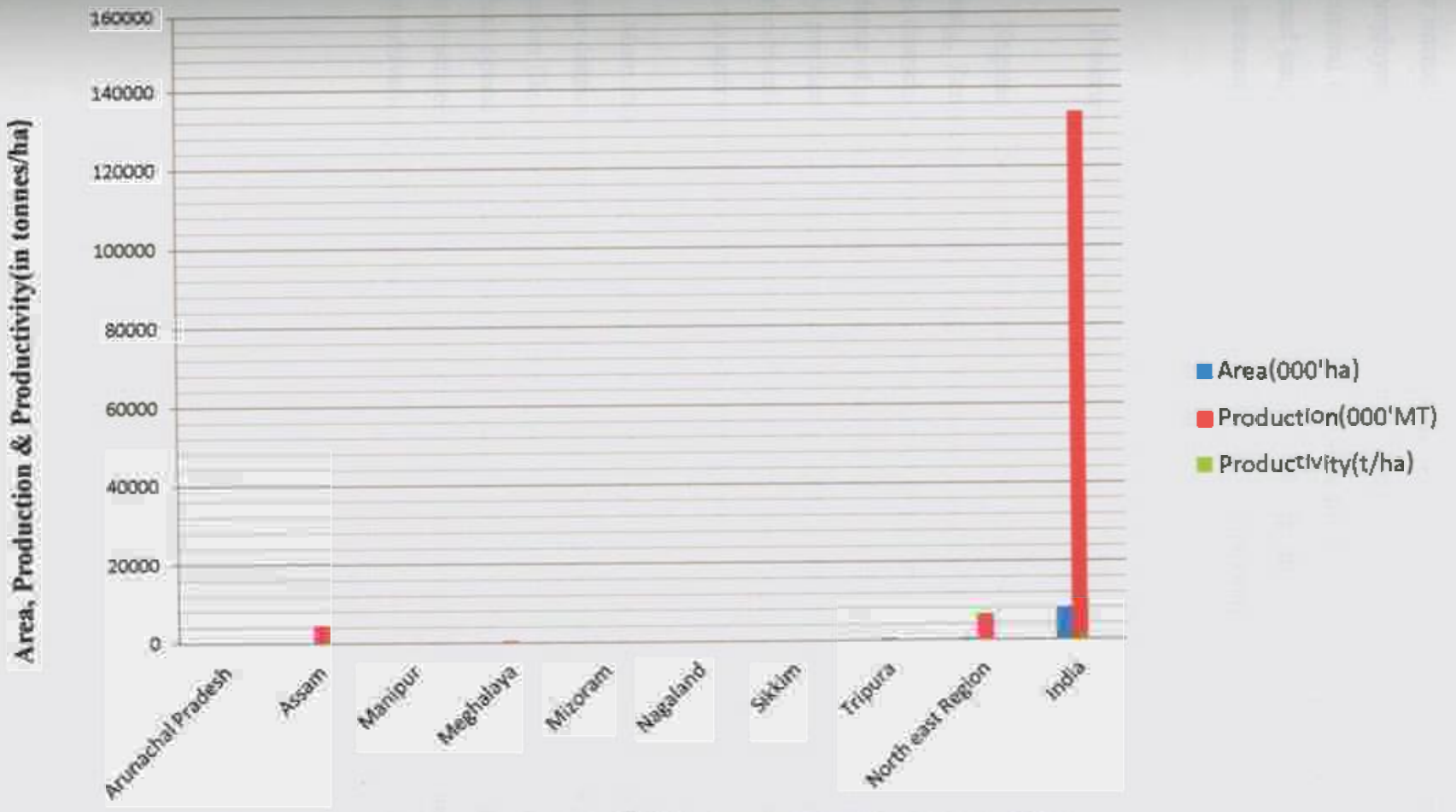


Fig. 1.3. Area, Production and productivity of vegetables in NE for 2010-11

Studies shows that, economic importance of vegetable has also increased and high labour intensity in the production of fruits and vegetables has makes them important from the employment angle as well (Sharma, 1991). Increase in area allocation under horticultural crops has often been suggested as a measure for agricultural diversification, increased employment and income (Malik, 1998). In the light of these issues, this study seeks to examine the market channels, marketed and marketable surplus.

1.6. Description of the study area

Nagaland comprises of eleven districts viz; Kohima, Wokha, Mokokchung, Tuensang, Zunheboto, Phek, Mon, Longleng, Dimapur, Kiphire and Peren. Out of the eleven districts two districts i. e; Wokha and Dimapur were selected for the study due to abundance of growing and marketing of vegetable. In Wokha district shifting cultivation is widely practiced and is the most dominant agricultural situation while in Dimapur district settled cultivation is widely practiced. The major land use pattern in Wokha and Dimapur district is agricultural land, forest land, fallow land etc.

More than 78.95 per cent and 48.05 per cent of the total population in Wokha and Dimapur district lives in rural areas most of whom are dependent on Agricultural and allied occupation like piggery, poultry, fishery, diary etc. Majority of the farmers are small and marginal operating below 2 hectares of land. In Wokha district shifting cultivation is widely practiced and is the most dominant agricultural situation while in Dimapur district settled cultivation is widely practiced.

Table 1.4. District wise Area & Production ofvegetables in Nagaland (2011-12)

SN	District	Area (ha)		Production		Productivity	
		2010-11	2011-12	2010-11	2011-12	2010-11	2011-12
1.	Kohima	3995	5510	31825	34855	7.96	6.32
2.	Wokha	3775	4560	29635	32940	7.85	7.22
3.	Mokokehung	3350	5120	31690	35820	9.45	6.99
4.	Zunheboto	3310	4180	26330	28795	7.95	6.88
5.	Tuensung	3625	4495	29080	28620	8.02	6.37
6.	Phek	3915	4455	29210	32435	7.46	7.28
7.	Mon	2940	3685	23610	22340	8.03	6.06
8.	Dimapur	3255	3905	21916	25555	6.73	6.54
9.	Kiphirie	2170	2815	17805	21410	6.87	7.60
10.	Longleng	2275	2620	15640	18140	6.87	7.58
11.	Peren	3345	3715	27855	28170	8.32	7.58
	Nagaland	31960	45060	284596	309080	8.9	6.85

(Source: Statistical handbook of Nagaland, 2012)

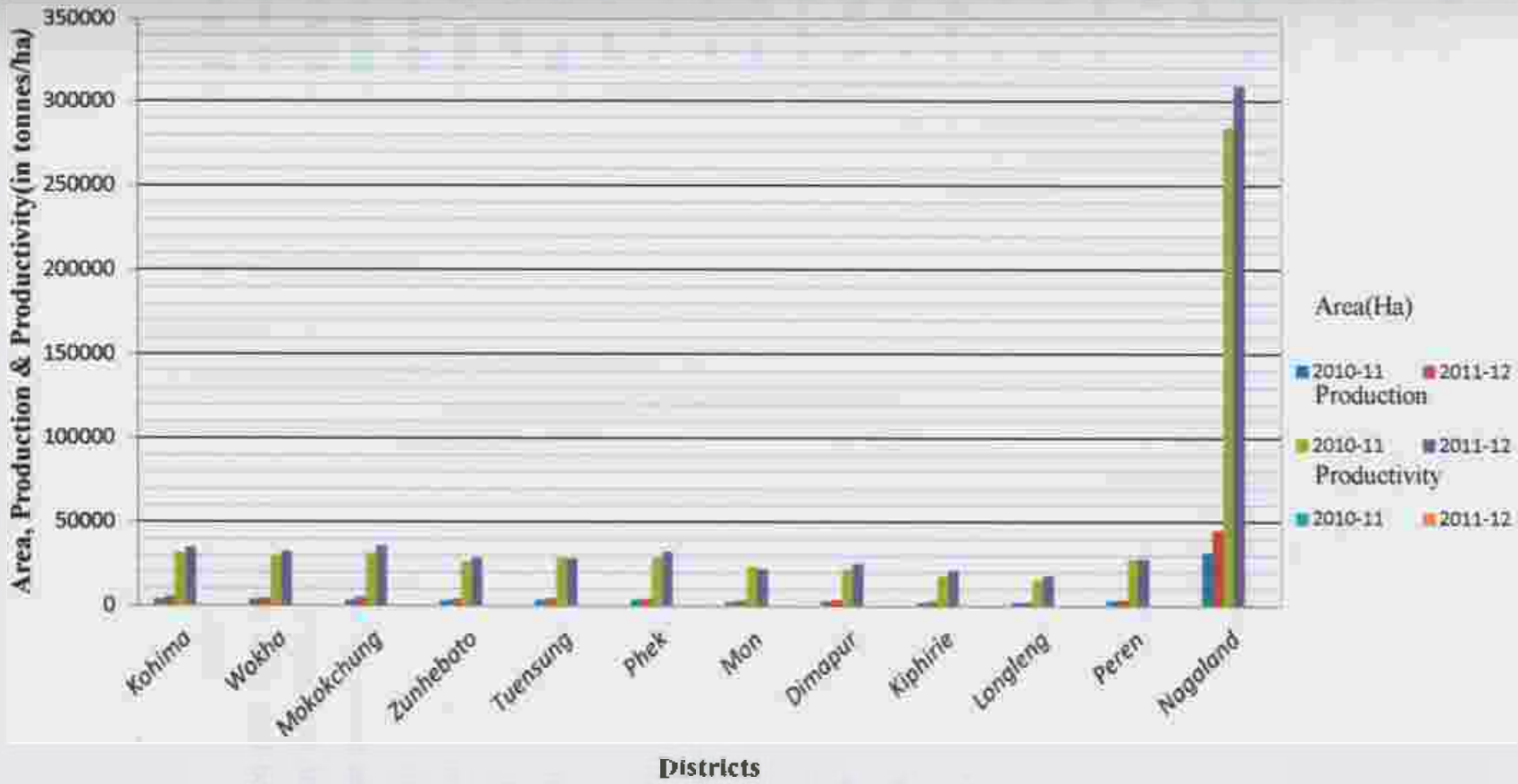


Fig. 1.4. District wise Area & Production of vegetables in Nagaland (2011-12)

1.7. Existing vegetable marketing scenario in the study area

The existing marketing pattern of vegetables in the study is not orderly and efficient. Harvested vegetables face the situation of market glut and depression in prices during peak season. In peak season when the arrivals become high, the prices of vegetables decrease to such a level that sometimes it cannot cover even the production cost. Markets lack infrastructural facilities, like proper market yards, scientific storage, processing plants etc for adding value to the product with quality. In many rural markets, farmers are compelled to display and sell their produce on the road side due to absence of proper market yards which accounts for deterioration of the produce and the farmers do not get remunerative price, vegetables being perishable in nature requires cold storage facilities, absence of which compels the farmers to sell their produce at throw away price. Produce are sold openly through bargaining without auction. Scientific grading of the produce is not done in the study area. During transportation the produce are generally packed in gunny bag, bamboo basket. The producers and traders have to transport their produce through head load, shoulder load, push cart, taxi, and Tata mobile from production site to the markets. Market information and intelligence service is not prompt in the study area, there is considerable variation in awareness among farmer regarding demand, supply and prices in nearby town and markets. Traders are the main source of market information. Some of the farmers sell their produce without knowing the prevailing prices in the market. The information supplied by traders is neither correct nor adequate. Even the published information of the market intelligence service does not serve the purpose of the farmers due to high illiteracy and lack of facilities. Since vegetables is grown in almost all parts of the state and the system of farming is dominated by shifting cultivation but till now no details study has been carried out to evaluate and compare the production and marketing system of vegetables, as markets and marketing plays a crucial role in agriculture development and economic upliftment. Therefore, the present study will be undertaken keeping in mind the various aims and objectives included in the study.

Table 1.5. **State-wise marketing facilities in India**

SN	States	Food parks	Agri export zones	Comm. Exchanges	Pack Houses
1.	Andhra Pradesh	-	-	-	-
2.	Arunachal Pradesh	0	0	0	0
3.	Assam	1	1	0	0
4.	Bihar	1	3	0	2
5.	Chhattisgarh	1	0	0	0
6.	Goa	0	0	0	0
7.	Gujarat	0	3	4	6
8.	Haryana	2	0	0	0
9.	Himachal Pradesh	0	1	0	1
10.	Jammu & Kashmir	3	2	0	1
11.	Jharkhand	0	1	0	0
12.	Karnataka	4	4	1	4
13.	Kerela	4	2	2	0
14.	Madhya Pradesh	6	5	2	0
15.	Maharashtra	7	8	4	89
16.	Manipur	2	0	0	0
17.	Meghalaya	0	0	0	0
18.	Mizoram	1	0	0	0
19.	Nagaland	1	0	0	0
20.	Odisha	1	1	0	0
21.	Punjab	1	3	1	1
22.	Rajasthan	4	2	1	0
23.	Sikkim	0	2	0	0
24.	Tamil Nadu	2	4	0	1
25.	Tripura	1	1	0	0
26.	Uttar Pradesh	5	4	4	0
27.	Uttarakhand	-	4	-	-
28.	West Bengal	8	6	1	0
	All India	56	62	20	111

(Source: Compiled from the data of DMI, MoA, GOI, Faridabad)

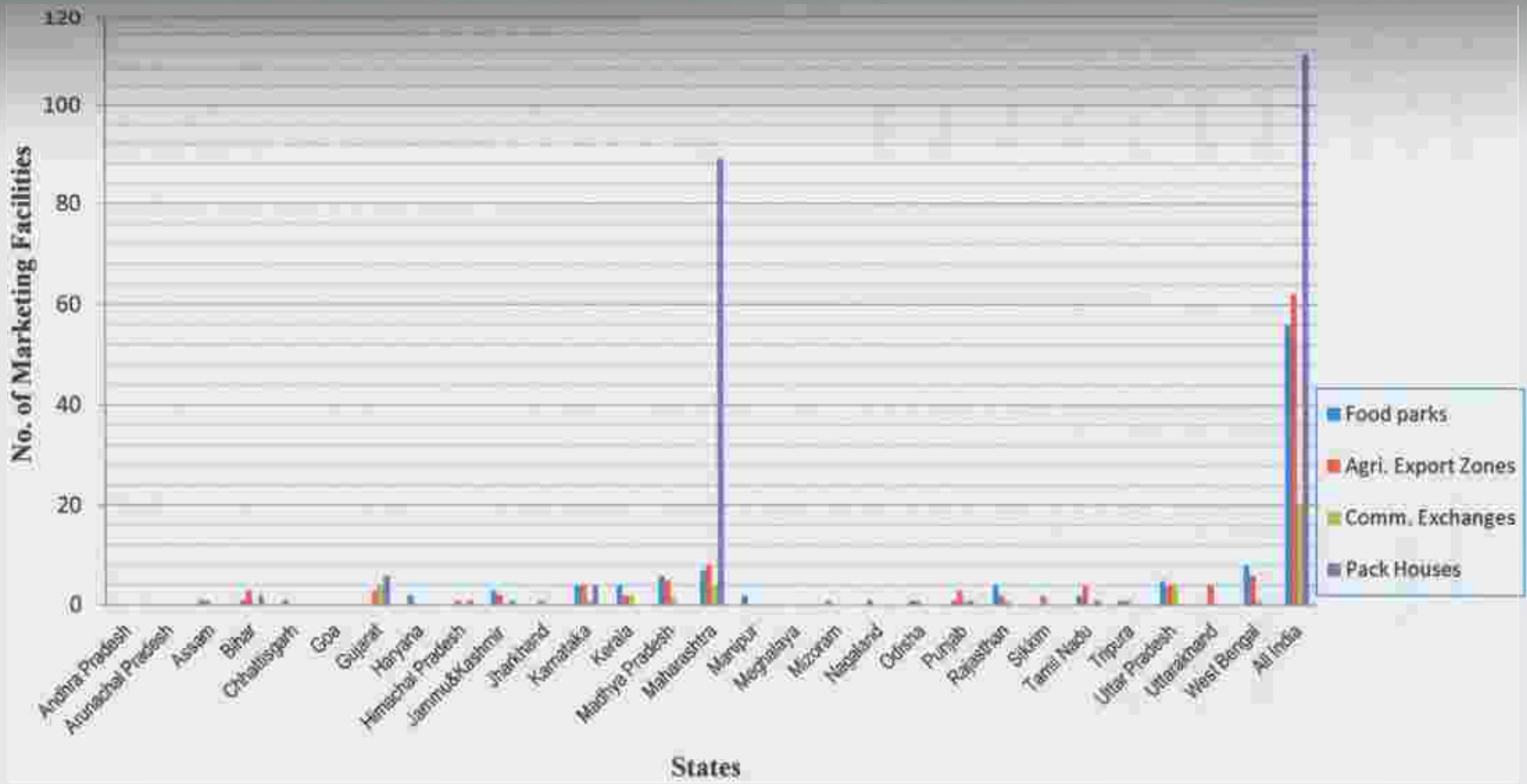


Fig. 1.5. State-wise marketing facilities in India

1.8. Objectives of the present study

The present study is undertaken in Wokha district and Dimapur district of Nagaland keeping in view the production aspects and marketing features of vegetables with the following objectives:

1. To study the economics of vegetable under shifting Cultivation
2. To study the economics of vegetable under settled cultivation.
3. To study the vegetable market channels, marketed and marketable surplus in shifting and settled cultivation.
4. To find out the extent of marketing system under shifting and settled cultivation.
5. To suggest measure for increasing farm income and employment under shifting and settled cultivation.

Chapter II
Review of Literature

REVIEW OF LITERATURES

In any study it is necessary to review the early research works. A detail review of studies related to the problems under consideration is attempted in this chapter. Brief reviews of the early studies are presented under the following broad headings:

2.1 Economics of Vegetables production.

2.2 Marketed and marketable surplus and factors affecting them.

2.3 Marketing Channel, Cost, Margin and Price Spread.

2.4. Measure for Increasing Farm Income and Employment.

2.1 Economics of Vegetables production:

Vegetable is an enterprise of higher relative returns and can be undertaken on small piece of land in comparison to other food grain crops. The employment opportunities of human labour are also high in vegetable cultivation than that of pulses and cereals.

Garg and Prasad, 1974 study on comparative economics of vegetable crops in the vicinity of Kanpur city found that cultivation of tomato could earn 1.5 times greater net return per hectare over wheat. The return per rupee investment and return per day were also found higher in tomato cultivation. The employment of labour days per hectare was 144 days for tomato and 113 days for wheat cultivation.

Rathore *et al.*, 1974 study an economic analysis of some vegetable crops of temperate region and estimated returns per unit of paid out cost for tomato growers of Satan as high as 5.83, closely followed by the chilli producers of Mandi (5.71), Similar returns to french-bean, ginger and potato growers were 3.18, 2.76 and 2.57 respectively.

Tewari *et al.*, 1974 study the input requirements, such as fertilizers, chemicals, water and human labour per unit area are correspondingly high in vegetable cultivation, vegetable cultivators, on an average, invested more than four times on fertilizers and

manures than the cereal cultivators. On the other hand, increase in vegetable productivity from such intensive use of inputs is more in proportion to the expense and hence the net return is considerably enhanced.

Rojamony *et al.* 1985 studied the economics of growing cucurbitaceous vegetables in summer rice fallow land in Kerela and found that out of 7 cucurbits, cucumber was the most economic crop, giving a net return of Rs. 17,750 per hectare followed by watermelon (Rs. 8,990 / ha) and snakegourd (Rs. 8,979 / ha). The benefit cost ratios were found 2.79 for cucumber, 1.89 for watermelon and 1.63 for snakegourd.

Thakur *et al.*, 1985 study on economics of vegetable cultivation and diversification of farming in Himachal Pradesh and observed that the total return and capital requirements of vegetable crops were quite high as compared to other crops. Tomato grown twice during the year exhibited the highest gross income exceeding Rs. 1.77 lakhs per hectare as well as the highest net income of above Rs. 1.22 lakhs. This was followed by cauliflower for seed purpose, hill-capsicum and peas. On an average, income earned from vegetable cultivation, accounted for 74 to 75 per cent of the total household income. They also observed that the fixed costs were quite high and important in vegetable cultivation. Among variable costs, human labour was the most important followed by FYM, bullock labour, fertilizers, chemicals and staking materials.

Anon, 1989 study the Agricultural Economic Research Station at University of Delhi on price spread in the marketing of vegetables in Delhi and found vegetable cultivation as a useful source of subsistence of the marginal farmers. The study reported that the vegetable cultivation was economically profitable vis-a-vis other crops, particularly near metropolitan centers and hence emphasized to enhance the area under vegetable crops.

Srivastava, 1993 study on production, marketing and export potential of vegetables in Bihar worked out per hectare expenditure to be Rs. 11094 in vegetable production taking all vegetables taken together, in which operating cost constituted 73 percent of the total cost. The contribution of family labour was as high as 25. 26 per cent of the total cost. Expenditure on seed, fertilizers, plant protection, irrigation and marketing taken together was worked out to be 43.92 per cent. Among different crops, cost of cultivation per hectare was the highest (Rs 13,051) for cowpea and the lowest (Rs 8,227) for

"other green vegetables", which included lady's finger, bittergourd, brinjal, leafy vegetables, radish and tomato.

Jairath, 1994 study on production and disposal pattern of sweet potato in two agro ecological zones *viz.* Sub Humid Ganga Alluvial Plains (SHSGA) and Arid Western Plains (AWP). He worked out total production cost of sweet potato in SHSGA to be Rs. 6,716 per hectare of which material and labour inputs shared 24.00 and 43.00 per cent, respectively. Among the material inputs, the cost of planting material was the highest sharing 15.00 per cent of the total cost of production, followed by FYM (5 per cent) and the chemical fertilizer (4.00 per cent). The net income was Rs. 3,369 per hectare with a return of investment of about 50.00 per cent. Total cost of production in AWP zone was Rs 7,857 per hectare, 21 per cent and 54 per cent of which were shared by inputs and labour, respectively, fixed cost, interest on capital and repair and maintenance was only about 17.00 per cent. A higher net income of Rs. 9,943 per hectare with 127 per cent return on investment was observed in this zone because of higher farm gate prices.

Khemnar *et al.*, 1994 study per hectare cost of cultivation of tomato at Ahmed Nagar district of Maharastra to be Rs. 60,379. The cost A was estimated to be Rs. 34341 per hectare sharing 56.88 per cent of total cost. The rental value of own land was found to be 35.65 Percent of total cost. The average per hectare marketing cost, gross return and return were Rs. 41,948, Rs. 1, 29,145 and Rs. 26,816. The output input ratio was found 1.26.

Pathak, 1996 study the cost and returns of some vegetable crops in Barpeta District of Assam. He observed that the per ha cost of cultivation to be highest in tomato (Rs. 27234.60) and lowest in radish (Rs. 12131.87). He also found that the per ha net return is highest in tomato (Rs. 49791.07) and lowest in radish (Rs. 7134.31).

Thakur, 1994 study that tomato, cauliflower, cabbage, capsicum and peas were prominent off season vegetables in the hills of Himachal Pradesh. He found in the study that variable costs were 56.00 to 63.00 per cent for most of the vegetables whereas fixed costs were 37.00 to 44.00 per cent of the total cost of vegetables production. Both total cost and gross income were the highest for tomato followed by cauliflower, cabbage, capsicum and peas. The net income from tomato cultivation per hectare was found as high as Rs. 1, 45,962.

Thakur *et al*., 1994(a) study the vegetable cultivation as highly capital and labour intensive. The cost of paid out inputs accounted for 43.00 to 50.00 per cent of the total cost of production. Human labour accounted for 28.00 per cent of total cost; out of which 8.00 per cent were for hired labour while 20.00 per cent were family labour.

Thakur *et al*, 1994(b) study on vegetable revolution and economics in Himachal Pradesh and viewed that vegetable production was cost intensive with high rate of return. The production, costs and income of farmers in Solan were higher as compared to farmers of Kulu Valley due to the use of all the recommended package of practices. The per hectare net income of farmers of Solan were as high as Rs. 1.45 lakhs from tomato and Rs. 75,752 from cauliflower seed production.

Pathak, 1996 study the cost and returns of some vegetable crops in Barpeta District of Assam. He observed the per ha cost of cultivation to be highest in tomato (Rs 27234.60) and lowest in radish (Rs 12131.87). He also found that the per ha net return is highest in tomato (Rs 49791.07) and lowest in radish (Rs 7134.31).

More, 1999 studied the economics of production and marketing of banana in Marathwada region of Maharashtra state. It was found that the cost of cultivation of banana per ha was higher in small farmers (Rs 32,294.72) as compared to larger farmers (Rs76,610.06), which was due to more utilization of bullock labour, machine labour, human labour, manure and fertilizer. Further, indicated the gross income per hectare was higher in larger farmers (Rs 1,42,885.30) as compared to small farmers (Rs 1,40,696.80).

Prasad, 2001 study on vegetable and marketing in Bihar. The study reveals that the operational cost on account of human labour and seed / seedlings forms major part of cost of cultivation on Potato. Among the green vegetable, tomato is the most labour intensive crop accounting for 39.72 per cent of the total cost.

Pramanik *et al.*, 2003 studied the economics of production and marketing of vegetables in Andaman and Nicobar Island. Result indicate that the yield of ginger, cucumber, bitter gourd, chilly etc; were higher, correspondingly the total cost of cultivation was observed to be higher for ginger, bitter gourd, chilly etc. It was also found that the yield of all the vegetable were higher in hilly land than in valley land. The vegetable cost benefit ratio was higher for chilly followed by cucumber, bhendi etc..

Rohile *et al.*, 2006 studied to determine the economics of banana (*Musa paradisiaca*) production in Sindhudurg district, Maharashtra. The average area devoted to banana was 0.40 ha in mixed cropping and 1.08 ha in sole cropping, the per hectare cost of cultivation of banana was Rs 61.592 and Rs 57,352 in mixed cropping and sole cropping, respectively. The net returns in mixed cropping were Rs 60,278 and Rs 58,043 in sole cropping.

Chinchmalatpure *et al.* 2009 studied that the training effectiveness index sums to be high in the case of the IPM training programme because of the efficient conduct of the training programme in terms of trainees participation as well as the courage of need- based subject matters, as compared to the training on organic farming.

Kumar *et al.*, 2010 studied that the extension functionaries involved in the Agricultural Technology Management Agency (ATMA) and revealed that the important constraints they face in the implementation of the ATMA programme are too many schemes and vacancies; less demonstrations on the existing farming systems in the district; and lack of technological training on different farming systems pertaining to agriculture and allied departments.

Bala *et al.*, 2011 Study on Cost and Return structure for the promising enterprise of off season vegetables, viz. tomato, cabbage, cauliflower and peas in two vegetable dominated development blocks of the district Kullu in Himachal Pradesh. The study has reveled that per hectare cost A1 was highest in Tomato, followed by cabbage, cauliflower and lowest for peas, among the selected vegetables. However, per quintal cost of cultivation has been found to be highest in peas, followed by cauliflower, tomato and cabbage. Cost on plant protection measures have been the major constituent of cost A_1 in all the crops, followed by expenditure on seed and fertilizers. Vegetable being the labour intensive crops have incurred significantly high costs on human labour, Rs. 13200–

Rs.15600/ha. Gross returns as well as net returns per hectare have been observed to be highest for tomato, followed by cauliflower, cabbage and peas.

2.2 Marketed and marketable surplus and factors affecting them:

The study of marketed and marketable surplus is important for economic development. Since agricultural sector is the supplier of raw materials to majority of the industries, a sustained generation of marketed surplus is a key for industrialization, information on marketed surplus is important for policy maker also as he needs to know how much surplus is generated from different categories of farmers and the change in marketed surplus due to changes in diverse economic variables.

Dantwala, 1952 study from time to time on market structure for various agricultural commodities by the Directorate of Marketing and Inspection and the State Departments of Agriculture. These studies constitute the pioneering efforts in studying marketing structure for agricultural commodities and are quite helpful as first hand task for the researchers and administrators for immediate solutions of the problems. However, most of the study reports are quite outdated in changing economic environment which are based on unscientific and weak analytical tools.

Narain, 1961 study two types of food grains marketable surplus by size groups of farmers. Certain studies based on indirect estimation on aggregate data and others are micro level studies based on direct estimation. The pioneering macro level study in this field during the year 1950-51 at national level, however, the studies on marketed and marketable surplus of vegetable crops are all based on direct observations at micro level.

Krishnaswamy, 1971 study that the degree of seller concentration of food grain marketing in Ganganagar area of Rajasthan by using Lorenz curve and coefficient of inequality and concluded that the food grain trade was fairly competitive.

Chauhan and Singh, 1973 study on wheat markets in Rajasthan during 1969-70 and 1970-71. He stated that only a few farmers handled more than 50 percent of the total wheat purchases in spite of a large number of traders operated in the market. The new entry in the market was also stated to be unfavourable.

Deen, 1977 study on potato in Farrukhabad district of Utta Pradesh in 1975-76 in four different markets. He fouad a high degree of concentration in market share amongst both buyers and sellers. The situation varied from highly concentrated to slightly concentrated oligopoly and the potato market in Farukhabad district was far from perfect competition.

Bhide *et al*., 1981 studied the distribution of buyers and sellers of arecanut in Manglore district of Karnataka state by using markov chain during eight years period from market was imperfect in the initial years. The number of buyers and sellers did not seem to be affected significantly by changes in volume of transactions.

Talukdar, 1984 study the Directorate of Marketiag and Inspection estimated the marketed surplus of various food grains in India based on market arrivals. These surveys were not based on any scientific sample designs and hence the estimates cannot treat as consistent as or better than intelligent guesses.

Rizvi and Singh, 1987 study on production pattern and marketing of potato in Soraon Development Block of Allahabad and found the average household marketable and marketed surpluses of potato as 225.36 quintals and 217.75 quintals, respectively for the total sample potato growers. On average, farmers disposed off 96.62 percent of their marketable surpluses. The highest percentage of their marketed surpluses was noted in case of small farmers.

Bhuyan *et al*., 1990 study in the field of market regulatiott in Assam with an examination of existing market structure for paddy, jute and mustard. Their findings implied that all the different markets considered for the study were imperfect with a tendency towards oligopolistic market condition.

Prasad, 1993 study on two vegetables market in Bihar observed that very small portion of total production was retained by the growers for meeting requirements of seed, family consumption, kind payment to labourers and other uses. The total marketed surplus of all vegetables in different categories of growers varied between 79.68 per cent and 91.12 per cent in Ranchi agricultural market and between 77.63 per cent and 91.38 per cent in Jamshedpur agricultural market. The study further revealed that the proportion of home consumption was, by and large, inversely related to the farm-size groups.

Jairath, 1994 study on disposal pattern of sweet potato reported that about 93 percent of total sweet potato production was marketed in Arid Western Plains Zone (AWP) of India. The marketed surplus was 81.45 per cent of total production in sub Humid Sutlej Ganga Alluvial Plains (SHSGA). The home consumption varied from 1.32 per cent to 2.15 per cent between the two zones where as wage payments, gifts and wastage was 14.99 per cent of total production in SHSGS and only 4.31 per cent in AWP zone.

Krishna, 1994 study on some emerging aspects of production and marketing of vegetable in Bihar and found that marketed surplus of different vegetable crops varied from 79.68 to 91.12 per cent in Ranchi market and from 77. 63 to 91.23 per cent in Jamshedpur agricultural market, the study suggested for rational modification Government policy with a view to facilitate regulatory measured to protect the interest of vegetable growers.

Sharma *et al*. 1995 study on marketing of vegetables in Himachal Pradesh tried to quantify the factors affecting marketed surplus of vegetable crops using liner regression model and found total production to be positively related with marketed surplus. The percent losses during assembling to marketing were also found to be an important factor affecting marketed surplus of all the vegetable crops excepts beans. However, in their study, they considered only two main variables viz; total production of crop and percent losses of the crop along with two dummy variables for educational level. Both the dummy variables were found insignificant for all the crops under study.

Gogoi, 1996 study on marketing and processing of arecanut in Assam found that wholesale market of arecanut was imperfect in nature. The study on seller's and buyer's concentration indicated that the sellers were more concentrated than buyers. The coefficient of inequality was 0.63 for sellers and 0.56 for buyers.

Thakur *et al.*, 1997 study the problems of agricultural marketing in the hills in Kangra and Mandi districts. The study shows that the farmers are now market-oriented with sufficient marketable and marketed surplus. The supply response is positive for all crops. The small farmers are more responsive in increasing marketed surplus with increased production than the large farmers. Farmers encounter many agricultural marketing problems.

Begum and Raha, 2002 study the existing marketing system for bananas in selected areas of Bogra district, Bangladesh. The results revealed that banana marketing is a profitable venture, and that retailers had higher profits than the other intermediaries. Major marketing problems are price instability, lack of capital, inadequate facilities, and lack of adequate market information.

Ali *et al.*, 2002 observed that the lack of marketing, transport, storage facilities and insufficiency of capital and information system is not strong enough to meet the need of bridging poor and illiterate farmers with the latest technical know-how.

Njoku and Nweke, 2003 studied on Marketing system and spatial price differiantion of ginger in Nigeria. The study was conducted to determine the level of pricing efficieney of the marketing system for ginger in Nigeria and specifically to: Describe the domestic marketing system for ginger; Determine the relationship between ginger prices in different markets as a measure of market integration; Determine the marketing costs and returns including margins for ginger and Recommend support mechanisms for the improvement of ginger marketing.

Radha and Chowdhry, 2004 study reveals that the economics of maize seed production vis-a-vis commercial maize production as well as marketing of maize seed in the private and public sectors in Karimnagar district, Andhra Pradesh, India. Data were collected from 30 farmers engaged in maize seed production, 30 farmers involved in commercial maize production, 2 carrying and forwarding agents, 5 wholesalers and 5 retailers. The cost of maize seed production was Rs. 11986 per acre, while the cost of commercial maize production was Rs. 104049 per acre. The gross returns were Rs. 14049 per acre in seed production and Rs. 8456 per acre in commercial production. Maize seed was sold at Rs. 2708 per quintal in private sector and Rs. 1365 per quintal in the public sector. The producer's share in the consumer's rupee was higher in the public sector (48.35 percent) compared to the private sector (26.77 per cent) because of the lesser number of middle man involved.

Chauhan and Amit, 2005 study on the production, marketed surplus, disposal channels, margins and price-spread for maize cultivation in the Hamirpur district of Himachal Pradesh. A multi-stage stratified sampling technique has been used to select the sample of blocks (2), villages (10) and maize growers (120) for the year 2001–02. The study on factors affecting marketed surplus, and cost & margins in the marketing of maize has revealed that farm-level marketable surplus is comprised of 53.21 per cent of the total production. The practices of storing maize for some time and selling at a later date for higher price have led to storage losses to the extent of 0.16 quintal (2.80) per cent of marketable surplus), much of the marketable surplus of maize (66.92 per cent) was disposed of by a majority of farmers (74.56 per cent) during the first quarter (October to December). Producer → Local trader → WS/CA → Processor / Consumer has been found as the main channel in the marketing of maize followed by about 71.93 per cent farmers, accounting for about 70 per cent of the produce. The producer's share in consumer's rupee has been estimated at 78.01 per cent in this channel.

Babu, 2007 studied the knowledge on vegetable marketing of 90 farmers in Ranga Reddy district, Andhra Pradesh, India. Results revealed that 52.22 per cent of the respondents had a medium level of knowledge while 47.78 per cent had a high level of

knowledge. It is suggested that relevant training will definitely improve the knowledge levels of the growers.

Halder *et al.* 2007 studies were conducted in Ramgarh, Khagrachari, Bangladesh during 2004-05 and 2005-06 in kharif season to find out the optimum marketing structure. The highest net income return and the highest marginal rate of return were obtained with the application of 3kg B/ha and 4.5kg Zn/ha, which was economically profitable for ginger production in South-eastern hilly regions of Bangladesh.

Ramana and Kuberudu, 2010 analyzed the input costs and net returns/farm business income in vegetable cultivation as well as the marketing channels and price spreads and the factors affecting vegetable production in the Godavari delta region, Andhra Pradesh, India. Farm-level data were collected using a pre-designed questionnaire from 100 randomly selected farmers. The farmers find vegetable growing to be remunerative and profitable compared with other crops like cereals. However, results show that the returns were low due to high input costs. Consequently, the vegetable growers face problems at the time of produetion and marketing.

Deliya *et al.*, 2012 studied the supply chain Management which not only helps in cutting costs, but also adds to maintain and improve The Quality of fruits and vegetables marketed. In marketing fruits and vegetables, which are Perishable in nature, supply chain plays a crucial role. The very nature of land holding by the farmers, Varied climate conditions, production spread over wide geographical area, mainly in remote villages, diversified consumptions patterns and poor infrastructure makes SCM for fruits and vegetables complicated. Marketing of Fruits and Vegetables are challenging because of the perishability, seasonality and bulkiness and consumption habits of the Indian Consumers. In addition to this, poor infrastructure, poor equity in SC and conventional small scale unorganized retailers, make state of the art supply chain challenging in the present scenario. The Indian retail market is mainly dominated by unorganized retailers. The unorganized retailers are homogeneous group. As per this paper important drawbacks of the current supply chain are number of intermediaries, high level of wastage, quality degradation, poor infrastructural facilities and high cost.

2.3 Marketing Channel, Cost, Margin and Price Spread:

Gupta and Ram, 1981 study on price spread behavior of vegetables in Delhi and found that producers received only 37.6 per cent of the consumer's price for all vegetables and the intermediaries shared 10.7 per cent for wholesaler, 24.3 per cent for retailer and 2.6 per cent for commission agent. This indicated high profit margin of the intermediaries and a wide price spread.

Niwas and Singh, 1982 studying the economic aspects of cole crops in the hinterland of Hissar City, worked out the price spread of cauliflower and cabbage for different seasons in the producer-commission agent-retailer-consumer channel. The marketing cost borne by the producers were identical and accounted for Rs. 13.13 per quintal for all the three seasons i.e; early, mid and late, the per quintal marketing cost incurred by the retailer was Rs. 16.72 for early cauliflower, Rs. 13.13 for mid season cauliflower and Rs. 10.17 for late season cauliflower. In case of cabbage, producer's marketing cost per quintal was found to be same (Rs. 13.23) for both early and late season crop was worked out to be Rs. 11.16 and Rs. 7.00, respectively.

Anon, 1989 study through Agricultural Economic Research Centre, University of Delhi on vegetable marketing in Delhi identified 10 formal and informal channels but considered none as perfect in all respects. The semi-government and co-operative trade channels handled a very small amount vegetable. The margin of the middlemen in private trade channels handled a very small amount of vegetable. The margin of the middlemen in private trade channels were found very high and producer's share in consumer's rupee was hardly 40 per cent. The study showed the need for improvement of marketing network, the co-operative bodies and regulation of the margin of the middlemen.

Nawadkar *et al*, 1991 study on marketing of vegetable in western Maharastra reported that per quintal costs of marketing of tomato, cabbage, cauliflower, brinjal and lady's finger were Rs. 87.41, Rs. 34.65, Rs. 64.22, Rs. 44.49 and Rs. 62.34 in Bombay market and Rs. 48.69, Rs. 22.53, Rs. 31.06, Rs. 25.99 and Rs. 32.93 in Pune market, respectively. The important items of marketing cost were packing, transport and

commission charges. The producer's share in consumer's rupee was varied from 41.10 to 58.79 per cent for the vegetables sold in Pune market and from 23.07 to 42.78 per cent in Bombay market. Producer's share was the lowest for tomato in both the market and the highest for brinjal. The margins of intermediaries were more when sold in the Bombay market than in the Pune market.

Selvaraj and Krishnamoorthy, 1990 study on cabbage and carrot identified four marketing channels which were: (i). Producer-NCMS-wholesaler-retailer-consumer; (ii). Producer-mandies-wholesaler-retailer-consumer (iii).Producer-NVGC-wholesaler-retailer-consumer and (iv).Producer-per-contractor-wholesaler-retailer-consumer. The producer's share in consumer's rupee was maximum (55.42 per cent) in channel-III, followed by channel I, II and IV recording 51.44, 48.67 and 30.46 percent, respectively for cabbage. Producer's shares in consumer's rupee for carrot were 68.09, 66.36, 72.01 and 52.62 per cent in channel I, II, III and IV, respectively.

Prasad, 1993 study on vegetables marketing in Bihar observed that producer's share in consumer's rupee for different vegetables in Ranchi market varied between 59.98 to 74.28 per cent and between 56.00 to 68.15 per cent in Jamshedpur market. A very high retailer's margin was observed in both the markets which varied from 17.85 to 21.30 per cent of consumer's rupee in Ranchi and from 13.80 to 23.50 per cent of consumer's rupee in Jamshedpur market. The share of marketing cost in consumer's rupee was 4.52 per cent for pumpkin and 8.45 per cent for tomato in Ranchi market and 7.70 per cent for pumpkin and 8.85 per cent for lady's finger in Jamshedpur market.

Jairath, 1994 study on sweet potato identified three marketing channels viz; farmers-traders / commission agent-sub dealer (Masakhor)-retailers-consumers, farmers-village merchants-commission agents-subdealers-retailers-consumers and farmers-pre harvest contractors-commission agents-sub dealers-retailers for Arid Western Plains (AWP). Three different channels were identified for sub-Humid Sutlej Ganga Alluvial Plains (SHSGA) viz, farmers-village merchants-assembler-city traders-sub dealer (Masakhor)-retailers-consumers, farmers-agents and city traders-sub dealer-retailers-consumers and farmers-rural consumers.

Kasar *et al*, 1994 study on marketing of bitter ground found per kilogram cost of marketing in Bombay market to Rs. 1.48, costs of marketing increased due to transportation cost, commission charges and packing charges, which accounted for 80.98 per cent of total marketing cost. Transportation cost including loading and unloading charges and losses during transit alone shared 44.50 per cent of the total marketing cost. The producer's share in consumer's rupee worked out to 41.49 per cent. The margins of wholesaler and retailer increased to the extent of Rs. 74.04 and Rs. 85.37 per quintal, respectively.

Kushwaha *et al*., 1994 study that higher marketing cost for potato were mainly due to higher transportation charges, which accounted 61.64 and 67.42 per cent for the year 1980-81 and 1993-94, respectively, in Mazaffarpur district of Bihar. The producer's share in consumer's rupee was 59.62 per cent in 1980-81 and 51.10 per cent in 1993-94. They recommended the implementation of provisions of market regulations to increase the grower's share in consumer's rupee.

Parmar *et al*, 1994 study the marketing cost of important vegetables in Surat and Navsari markets of South Gujrat and found that per quintal marketing costs of brinjal, tomato, cabbage, okra and cluster bean were Rs. 67.13, Rs. 72.23, Rs. 60.37, Rs. 90.24 and Rs. 98.73 in surat market and Rs. 38.92, Rs. 43.39, Rs. 30.94, Rs. 46.98 and Rs. 50.38 in Navsari market respectively, Transportation cost was the major item for the produce sent to Surat market, In Navsari market the commission charges accounted for the largest share of marketing cost. Producer's share in consumer's rupee varied from 38.14 per cent to 60.77 per cent in Navsari, while it varied from 43.82 per cent to 55.59 per cent in Surat market fordifferent vegetables considered in the study.

Thakur, 1994 study and identified four marketing channels for off season vegetables viz., producer-primary wholesaler or commission agent-secondary wholesaler-retailer-consumer, producer-forwarding agent or commission agent-wholesaler-retailer-consumer, producer- retailer-consumer and producer-consumer. He observed that most of the farmers (above 50 per cent) used the first marketing channel to sell above 60.00 per cent of their produce. Producers share in consumer's rupee was comparatively higher in crops like pea and capsicum, which were less prone to damage and spoilage during

marketing and transit, followed by cabbage and cauliflower and was quite low (less than 50.00 per cent) for tomato.

Agarwal and Saini, 1995 study oil vegetables marketing in Jaipur Market (Rajasthan) and identified two major channels for marketing of cauliflower and cabbage viz; producer-commission agent-retailer-consumer and producer-commission agent-mashakhores-retailer-consumer. Out of these the second channel was more prominent. The total marketing cost in selling of cauliflower and cabbage through first channel was Rs. 42.87 and Rs. 40.05 per quintal respectively while Rs. 47.26 and Rs. 43.35 per quintal respectively in second channel. Charges for transport, commission, value of quantity loss and market / mandi fees were the main cost items of marketing. The total marketing cost was higher in second channel due to more number of middlemen involved. The marketing cost accounted for 8.00 to 9.00 per cent of consumer's price while the marketing margin accounted for 37.00 to 39.00 per cent of it. The producer's share in consumer's rupee was around 55.00 per cent in first channel and 52.00 per cent in second channel.

Arya, 1995 study on pricing efficiency in the marketing of potato crop in Gujrat and observed that producer's share was fluctuating over the years. In 1987-88, producer's share ranged between 51.76 to 60.61 per cent in different seasons with an average of 54.72 per cent which increased by 8 per cent in 1988-89. Wholesaler's margin ranged between 2.38 to 3.02 per cent in different seasons of the year 1987-88 which increased in the year 1988-89 and decreased in 1989-90. Retailer's margin in 1987-88 ranged between 30.90 to 38.74 per cent and decreased in 1988-89, which again increased and moved between 33.35 to 35.76 per cent in 1989-90. Marketing costs of retailers were quite higher than the marketing costs of producers and wholesalers in all the seasons of all the three years of study.

Nawadkar *et al*., 1995 study on tomato marketing in un-organized sector worked out per quintal cost of marketing of tomato to Rs. 96.04, Rs. 95.90 and Rs. 94.55 for small, medium and large size groups of farms, respectively. Major components of marketing cost of cultivators were packing, transport and commission charges. Cost of packing was the highest and it alone shared 42.33, 42.52 and 42.31 per cent of total marketing costs for small, medium and large farms respectively. Hamali, weighing charges, rent and postage were negligible in the total marketing costs for all categories of farms.

Saikia and Borah, 1998 study on 'Marketing of Pineapple and Citrus (Orange) in Assam and Meghalaya'. They found four marketing channels for orange in Tinsukia market i.e. Channel-I: Producer- Retailer -Consumer, Channel-II: Producer-Middlemen/Commission agent- Retailer-Consumer, Channel-III:Producer-Middlemen/Commission agent –Wholesaler-Retailer-Consumer and Channel-IV: Producer- Middlemen/Commission agent - Merchant Wholesaler-Wholesaler- Retailer-Consumer. They found that the grower's net share in consumer's rupee was highest in channel-I (47.48 per cent) followed by 39.50 per cent in channel-II , 39.50 per cent in channel-III, and 39.50 per cent channel-IV. The middlemen's/commission agents margin was 16.47 per cent in channel II, 8.35 per cent in channel-III and 1.94 per cent in channel-IV. The wholesaler's margin was 12.80 per cent in channel-III and 6.33 per cent in channel-IV. The retailer's margin was found at 47.12 per cent in channel-I, 39.71 percent in channel-II, 33.59 per cent in channel-III and 33.96 per cent in channel IV.

Sen and Maurya. 1998 studied the marketing of vegetables in Sewapuri block of Varanasi city. It included ten sample villages for 10 vegetables and 150 sample farmers; it was conducted during 1993-94. The study revealed that for the total marketing charges (including cost of transport) payable, 65.92 per cent and 66.98 per cent were payable by the sellers (producers), 12.22 per cent and 11.84 per cent by wholesalers and 21.86 per cent and 21.18 per cent by retailers in Chandwa and Kamachcha markets, respectively, and a little more than 28 per cent and 31 per cent of the marketing charges were accounted for by the cost of transport in the two markets. While studying, price spread between the price received by producers in selected villages and that paid by the consumers in Varanasi city included all the marketing charges (including commission and transport charges) paid by the wholesalers and retailers. It was, also observed that the produce's share in consumer's rupee for the vegetables was the lowest for tomato and highest for brinjal in both the markets. Totally, the share of the producers was highest for vegetables with less perishability or with facilities of cold storage while it was lowest for vegetables with greater perishability. The margin of wholesalers and retailers for such vegetables (like tomato, green pea) was highest. Finally, the price spread accounted for more than 33 per cent of the price paid by the consumer for major vegetables under study.

Devaraja, 1998 study in Hassan district on channels and price spread in potato marketing. He selected 200 farmers from 30 villages and 40 market intermediaries

indexing 15 commission agents, 15 retailer vendors and 10 cart vendors. The study identified 3 supply chains, first chain included commission agent and retailer for the movement of produce from producer and consumer in the nearby market of Hassan. Second chain included commission agent and retailer for the movement of produce from producer and consumer to the distant market of Bangalore and third chain included commission agent and cart vendor from producer to consumer. The price spread analysis revealed that producers got 48.57, 51.15 and 52.32 per cent of the consumer's rupee in first, second and third supply chain respectively. In third chain representing distant market Bangalore, the consumer's rupee was the highest. Hence selling of produce at the distant market was found to be more profitable to the farmers. The study also revealed that the producer's net price could be increased by taking suitable measures by the Government like (a) providing cold storage facilities to producers (b) the existing system of collecting commission charges from producers should be stopped (c) providing support price facilities to producers when there is heavy price fluctuations in peak seasons (d) efficient and cheap means of transportation by the market committee (e) fluctuations in the market prices of potatoes may be eliminated by regulating and streamlining the supply by establishing potato processing plants in the vicinity of production centre for manufacturing of processed potato products.

Anon, 2001 study on marketing cost, margin and price spread had been the forces of attention in many studies as these are the measures of marketing efficiency. In India, the Directorate of Marketing and Inspection, Ministry of Food and Agriculture, Government of India and also the National Commission on Food Marketing conducted studies on price spread, costs and margins. These studies were lacking scientific base of sampling and data collection and hence the estimates were over or underestimated. After this, numbers of studies were conducted in sixties and this issue was taken up by the economists to examine pricing efficiency after the initiation of green revolution in India.

Radha and Prasad, 2001 studied the economics of production and marketing of vegetables and reported that there were three main channels for marketing of potato viz; (i) producer-consumer, (ii) producer-retailer-consumer and (iii) producer-primary wholesaler-secondary wholesaler-retailer-consumer. About 90 per cent of the vegetables produced were marketed through channel-III. The producer's share in consumer's rupee was highest

in channel-I (88.30 per cent) followed by channel-II (81.99 per cent) and channel-III (79.29 per cent).

Pandey *et al.*, 2003 estimated the price spread and producers and market intermediaries share in the consumer price in the channel: Producer – commission agent – retailer – consumer in potato marketing at Shimla. For the study samples of 25 potato growers, 10 commission agents and 25 retailers were selected purposively. The result showed that the producer realized around 73 per cent share in consumer's price. The retailer and commission agent earned profit of about 3.5 and 8.0 per cent of the consumer's rupee. The price spread and marketing efficiency was found to be about 27 per cent and 3 per cent, respectively.

Verma and Singh, 2004 data are presented on world banana trade in 1991-2001 as well as on the quantity, value, unit price, and destinations of Indian banana exports in 1999-2000 to 2001-02. Data on banana marketing costs in four major Indian markets are also presented, and different marketing channels in these markets are identified. The paper concludes by identifying the current demands of consumers (e.g. high quality) and highlighting the need for research and development in the Indian banana sector (e.g. to increaseproductivity and yields and improve disease resistance.

Ravikumar *et al.*, 2005 studied on production and marketing scenarios of oilseeds in the era of Globalization in India. The export scenarios of oilseeds (primary) and process products (oils and cakes) were studied by analyzing the growth of export both in terms of quantity and value. They studied the growth pattern of export for the overall reference period 1970 to 2002 and again during two sub-period *viz.* 1970 to 1990 (period before trade liberalization) and 1991 to 2002 (period after trade liberalization). They showed that export were regular for all the commodities in the post liberalization period when compared to pre liberalization period except for groundnut shelled and sesame seed where, more or less continuous export were done during the overall reference period. During the post liberalization period, the growth in exports both in terms of quantity and value showed significant positive trends for all the selected commodities except soyabean seed and safflower seed (non significant) and for castor beans negative growth rates were experienced. In case of sesame seed, positive growth rates were experienced both in terms

of quantity and value of exports for the past three decades period indicating its export potential in the international market.

Singh *et al.*, 2005 studied the cost structure and marketing efficiency of two most important off-season vegetables of the state of Himachal Pradesh in India, namely, tomato and pea. Specifically, the study analyzes the cost and returns from growing important off-season vegetables; analyzes the existing vegetable marketing system and its efficiency; and analyzes the problems of farmers in cultivation and marketing; and suggests an appropriate policy framework for increasing the production of off-season vegetables.

Singh *et al.*, 2006 studied the resource use efficiency and the marketing system for tomatoes and peas in Himachal Pradesh, India, and points out the areas where policy measures are needed to promote vegetable cultivation and streamline the current practices in vegetable cultivation. Inter-farm category differences in farm incomes of the selected vegetable grower's points out differences in the quantity and use pattern of various resources by the vegetable growers. These farms differ in their resource use efficiency. It thus becomes imperative to strengthen the network for the dissemination of technical know-how to the farmers, and for optimum use of the resources. The study suggests a critical review of the existing vegetable marketing system to fully harness the off-seasonality advantage.

Jain and Nichit, 2007 study based on data collected from 62 farmers and 29 market intermediaries, this study identifies the marketing channels for fruits and vegetables; estimates the quantities sold through the different channels; and analyses the costs, margins and efficiency of marketing fruits and vegetables in Raipur district, Chhattisgarh, India.

Ramesh and Murughan, 2007 studied on prospects of the Indian edible oil market. In their study they want to evaluate the edible oil position with regard to its production, demand and supply, preferences by the regional groups in the country and its nutritional significance. They concluded that the consumption was growing faster. The demand for edible oils being highly income and price elastic, the increase in population coupled with rise in income levels had led to demand growth at a little over six per cent per annum in the last couple of years. Under normal circumstances, India's edible oil consumption demand is expected to grow by anything between 5.00 and 6.00 per cent per annum over the next 5 - 10 year timeframe.

Singh, 2007 observed that one of the important measures of marketing efficiency is the share of producer in the price paid by the ultimate consumer-buyer. The study revealed that the farmer-producer of tomato, cabbage, cauliflower and cucumber received less than 50 per cent price paid by the consumer-buyer, the range being 37.26 per cent (tomato) to 49.6 per cent (cauliflower). The share of producer includes the marketing cost which is very high. The decomposition of retail price into share of producer and market functionaries revealed that i) grower's share generally rises from low priced to high priced vegetables ii) with increased perishability of vegetables the grower's share declines iii) the share of retailer is very high, in few cases even higher than that of produeer iv) the marketing cost of vegetables is very high in hill regions.

Kakaty, 2009 study entitled, "Potentialities of Horticultural Crops and Market Accessibilities in Assam and Meghalaya with special reference to Technology Mission for Integrated Development of Horticulture" worked out the price spread for orange in Guwahati Market. He found three marketing channels for orange (i) Producer-Retailer-Consumer, (ii) Producer-Commission Agent -Retailer - Consumer, (iii) Producer - Commission Agent-Wholesaler-Retailer-Consumer. He found that the growers' net share of consumers' rupee was highest in channel(i) (47.45 per cent) followed by 39.00 per cent in channel (ii) and 35.50 per cent in channel (iii). The commission agent's margin was 21.80 per cent in channel (ii) and 14.35 per cent in channel (iii). The wholesaler's margin was 12.65 per cent in channel (iii). The retailers' margin was found at 45.75 per cent in channel (i), 34.45 per cent in channel (ii) and 31.75 per cent in channel (iii).

Kerutagi *et al*., 2009 studied the marketing of sapota in Northern Karnataka in two districts *viz*. Belgum and Dharwad purposively. Two marketing channels were identified, viz. Channel I: Producer - Commission agent - Retailers - Consumer Channel II: Producer - Pre-harvest contractor cum Wholesaler - Retailer - Consumer Producer's share in consumer's rupee in channel I was higher (59.58 per cent) than in channel II (48.14 per cent). Price spread in channel I was less (26.32 per cent) compared to channel II (42.11 per cent).

Pawar *et al.*, 2010 studied the marketing of banana and found that the highest quantity of banana production (30.38 per cent) was marketed through Channel III (producer-trader-wholesaler-retail shop owner-consumer). The per-quintal price paid by the consumer was highest (Rs. 800.00) in Channel III, followed by Rs. 650.00 in Channel II (producer-merchant-retailer-consumer) and Rs. 530.00 in Channel I (producer-vendor-consumer). The producer's share in the consumer's rupee was highest (92.98 per cent) in Channel I, followed by 78.77 percent in Channel II and 69.77 percent in Channel III. The price spread was also highest (Rs. 241.82) in Channel III, followed by Rs. 138.00 in Channel II and Rs. 37.20 in Channel I.

Kakaty and Borah, 2011 study on Impact of emerging marketing channels in Agriculture – benefit to producers-sellers and marketing cost and margins of orange and potato in Assam observed that measure of marketing efficiency for orange in TMC was found at 0.97 for channel-I, 0.90 for channel-II and 0.78 for channel-III while for EMC, it was found at 4.63 for channel-I and 2.08 for channel-II. The modified measure of market efficiency with respect to potato in TMC was found at 2.39 for channel-I, 1.67 for channel-II and 1.18 for channel-III while for EMC, it was found at 10.00 for channel-I. From the analysis of field level data and observation, it may be concluded that farmers enjoyed better margin through EMC marketing for both the crops as compared to marketing through TMC.

Dastagiri *et al.*, 2012 studied to estimates the market costs, market margins, price spread, the producer's share of the consumer's rupee and the market efficiency of horticultural commodities under different supply chains, and suggests measures to improve marketing efficiency, in the several states covering 29 crop types. The study revealed that, in the case of most commodities, marketing costs, marketing margins, transport costs and labour charges adversely affect marketing efficiency, and open market price, volume of produce handled and net price received increase market efficiency or have a positive effect. The highest marketing efficiency was found in the producer-to-consumer channel.

Gunwant *et al.*, 2012 Study entitled 'A Comparative study on production and marketing practices of Vegetables in Nainital and U.S Nagar district of Uttarkhand. The study revealed that vegetable was a high income generating crops grown by farmers in

both Rabi and kharif which collectively covered 20 to 25 percent of total cropped area in both the districts. Tomato, pea, cabbage and potato were the very important vegetables crops of the study area. Regarding disposal of the produce Channel I (producer → village commission agent/wholesaler → retailer → consumer) was the important one being followed 52.2 to 58.9 per cent vegetable producers of both of districts who could dispose more than 60 percent of the total produce. In channel-II (producers → cooperative/retailer → consumer) can play an efficient role in terms of farmer's high return in Nainital and U.S. Nagar district while the producers share in consumers rupee is (39.85 per cent) and (39.28 per cent) respectively. And channel III (Producers → Consumer) may be plays a good role for small farmers of both of district who dispose there produce directly farm level to consumer and get a good amount 42.80 to 46.50 per cent in consumers rupee but the numbers of these farmers were very limited.

Sangolkar, 2012 examined the banana production in India and also Maharashtra. An attempt was made to identify the channels and to estimate the marketing cost, marketing margins and price spread and marketing efficiency in marketing of banana. The per quintal total marketing cost was higher (Rs. 165.65) in channel-II compared to channel-I (Rs. 138.23) and marketing efficiency under channel-I was 2.22 and for channel-II was 1.93 and from the efficiency index, it could be observed that channel-II was more efficient than channel-I.

Dastagiri *et al.*, 2013 study on Indian vegetables, production trends, marketing efficiency and export competitiveness area under total vegetables cultivation is grown at the rate of 4.12 per cent and production growth rates was 6.48 per cent. Indian vegetables production depicted glorious past and expected promising future. The most common marketing channel for majority of the crops is that Producer-Wholesaler-Retailer-Consumer. The results further showed that the producer share in consumer rupee was highest in Punjab, Tamil Nadu and Manipur compared to Andhra Pradesh, West Bengal and Rajasthan. It varies from 46 per cent to 74 per cent in Andhra Pradesh, 26 per cent to 60 percent in West Bengal, 33 per cent to 60 per cent in Rajasthan, 85 per cent to 88 per cent in Manipur 91 per cent to 95 per cent in Tamil Nadu and 100 per cent in Punjab. The study clearly shows that majority of the horticultural commodity markets are operating efficiently. The highest marketing efficiency found to be producer to consumer channel.

Hence, government policies should promote direct marketing models for efficient horticultural marketing. The results showed that in most of the commodity cases marketing cost, marketing margin, transport cost, labour charges are adversely affecting marketing efficiency and open market price, volume of the produce handled and net price received are increasing marketing efficiency. The trends of fresh vegetables show that its export quantity increased 18.3 per cent and 22.2 per cent during two periods respectively. The results show that Indian vegetables are huge potential for exports. The results show that for all vegetables the Nominal Protection Coefficient is less than 1 indicating they are competitive in the international markets. The study suggests that Indian government should give priority to vegetable production, processing and exports.

Hedge and Madhuri, 2013 study entitled 'A Study On Marketing Infrastructure for Fruits and Vegetables in India' revealed that at Kolar APMC, the absolute price received by the tomato growers per kg is' 5.86/kg and consumers' price is 19.87/kg accounting to farmer's share of 29.49 per cent showing that the rest 70.51 per cent of the consumer rupee is distributed among the intermediaries in the marketing channel. In case of Junner APMC market, the farmers' absolute priee for tomato is ' 7.86 and consumer price is ' 22.87/kg. Runtime in the farmers' share in the consumer rupee of 34.37 per cent and rest 65.63 per cent of the consumer rupee share is distributed among the consolidator, commission agent, wholesaler and retailer.

2.4. Measure for Increasing Farm Income and Employment:

Sharma *et al.*, 1992 studied the interdependence of retail prices of potatoes, vegetables and pulses in five important Indo-Gangetic regions of India, a region which accounts for more than 85 per cent of national potato production. The analysis showed a strong relationship between price movements in potatoes and vegetables and to a lesser extend between potatoes and pulses.

Cornejo *et al.*, 1994 study on off-farm income, technology adoption, and farm economic performance at U.S.A reported that a farm operator's off-farm employment and off-farm income vary inversely with the size of the farm. Operators of smaller farm operations improve their economic performance by compensating for the scale disadvantages of their farm business with more off-farm involvement. An adoption of

Agricultural innovations that save managerial time is associated with higher off-farm income.

Kushwahs *et al*., 1994 study on marketing of potato in Muzaffarpur district of Bihar and reported that lack of adequate and timely supply of inputs at reasonable price, high transportation cost, high price fluctuation between peak and off season, unsatisfactory storage capacity, and marketing. To improve production and marketing environment the urged upon they government regulatory measures on price through implementation of support priee system as well as ceiling price, government interference to regularize the transport charges, establishment of factory to increased industrial used of potato, improvement of storage facilities, enhancement of export and development of new Varity to reduce bulk supply of potato at peak period.

Thakur *et al*., 1994 studied the main problems of the vegetable growers in Kullu--Manali and Sproon valley in Himachal Pradesh. They found that the farmers faced many problems on production and marketing fronts of vegetables. Lack of mobile soil testing laboratory was found to be the limiting factor in these two districts. This was followed by lack of technical know-how extension, irrigation, non-availability of fertilizers in time, lack of finance and loans.

Dahiya and Sharma, 1995 study reveals that the competitiveness of the potato marketing system in India with a view to suggesting a suitable strategy for the development of potato sector. They found that the marketing system is not competitive mainly because of transport and storage bottle-necks. An effective market intervention scheme would assist the development of the potato sector.

Bhople and Ambadkar, 1996 studied the production and constraints of vegetable growers in Akola districts of Maharashatra. They found that non availability of improved seeds, high costs of inputs and inadequate source of finance were some of the important constraints as in counter by the vegetables growers. In addition problem of water storage in summer, non-availability of labour, availability of FYM, supply of chemical fertilizers and insecticides in time, non-availability of money for application of fertilizers and insecticides were also faced by farmers.

Bonny and Prasad. 1996 studied some constraints relating to commercial production of vegetables in Pannachery and Pathur panchayts of Trichur district of Kerela the study revealed that increased cost of plant protection chemical was reported by 98.00 per cent of the respondents as the most important constraint. This was followed by inadequate market facilities (88.00 per cent), poor storage and other post harvest facilities (74.00 per cent) non availability of inputs and services was reported by 10 per cent of the respondents which was found to be at the bottom in the order rank.

Bhukta and De, 1997 study in West Bengal to investigate the two ways relationship between potato production and cold storage capacity. Results were discussed and indicated that the argument that storage capacity is dependent on production did not hold true but ratherthat an interdependent relationship exist between the two.

Sharma *et al.*, 1997 studied the situation of cold storage of potatoes in Bihar with regard to cold storage capacity and requirements at district and state level, seasonal wholesale price fluctuations and profitability of cold storing potato. Profitability analysis by month indicated that farmers could substantially increased income by means of cold storage. In view of cold storage defect (43 per cent in 1993) in Bihar, it was recommended that the state should immediately take suitable measures to increase cold storage capacity by 339000 tonnes and regulated an annual growth rate of 15000 tonnes in the future.

Shiyani *et al.*, 1998 studied the marketing of vegetables in south Saurashtra zone of Gujarat. They found that marketing of vegetable possess more problems compared to other agricultural commodities as they have a high degree of perishability, bulkiness, higher proportion of retailers margin and concentration of trade in few hands. The finding of this study revealed that overall marketed surplus was more than 90 per cent of the total vegetable production. The commission charged, transportation cost, value of season and spoilage cost turned out to be the most important components among all the items of marketing costs. The producers share in consumer's rupee range from 56.87 per cent in tomato to 62.38 per cent.

Malik *et al*, 1999 study on marketing patter of rape seed and mustard seed in Haryana found that more than 80 percent of the total arrivals are concentrated in the peak season when prices are low. They suggested that farmers can get better price by postponing the sale of rape seed and mustard from peak season when prices are low. Farmers can get

better prices by postponing the sale of rapeseed and mustard from peak season to mid and lean seasons if they are provided adequate storage and financial facilities through agencies like warehousing eorporation, FCI, State Cooperative Banks, Co-operative Societies, etc.

Das and Banerjee, 2000 studied the farm size and labour use pattern in Midnapore (W) and Birbhum district of West Bengal. They observed inverse relationship between size and productivity and also size and total labour utilization in their study area. The farmers of higher groups would not use labour beyond the point at which the marginal productivity of labour starts going down below the market wage rate, whereas no sueh eonsideration generally apply to the smaller farms which are mainly dependent on family labour. On the other hand, variation in the utilization of attached labourers in crop husbandry in different zones and size groups can mainly be attributed to the cropping pattern of the zone and psychological makeup of the farmers. Casual labourers and family labours have negative influence while application of bullock pair has positive influence on attached labour absorption.

Haque, 2000 contract farming in the case of tomato farmers practiced by the Hindustan Lever Limited in Punjab. The results of the case study on contract farming in Punjab for tomato indicated that the contract farming helped in increasing the yield and income of the farmers because of the availability of high quality seeds and assured market for the produce. He found that per acre net income of tomato contract farmers was Rs.20,000.00 for Amritsar district, Rs.9,940.00 for Hoshiyarpur district, Rs.13,000.00 for Jullandhar district, Rs.14,535.00 for Kapurthal district and Rs.8,125.00 for Ludhiana district while per acre net income of potato for non-contract farmers was Rs.10,200 for Amritsar district, Rs.6,440 for Hoshiyarpur district, Rs.6,885 for Jullandhar district, Rs.8,075 for Kapurthal district and Rs.5,600 for Ludhiana district.

Susanta, 2000 study on integrated post production management and food processing in India with the national objective. The study findings identifies that India produces over 200 million tones of food grains and about 132 million tonnes of fruits and vegetables. The unnecessary wastage of valuable commodities can be checked if they are processed into value added products or adequately distributed in different parts of the country and by improving the post harvest distribution and processing facility. If fresh fruits and vegetables and also processed fruits are evenly marketed from the place of

abundance to the place of scarcity, not only will the consumer get the produce at a reasonable price but also the producer will not be found to sell at throw away prices. He further identified some of the techniques, which are not followed in our country like primary processing packing station, on farm storage, packaging, pollicisation, containerization, cool/cold chain etc.

Radha and Prasad, 2001 study in Karimnagar district of Andhra Pradesh. The selected farmers were conducted through opinion survey for analyzing the problems in production as well as in the marketing of growers. In addition problem of water storage in summer, non-availability of labour, availability of FYM, supply of chemical fertilizers and insecticides in time, non-availability of money for application of fertilizers and insecticides were also faced by the farmers.

Radha and Prasad, 2001 study in Karminagar district of Andhra Pradesh. The selected farmers were conducted through opinion survey for analyzing the problems in production as well as in the marketing of vegetables. Though there was improved technology availability for vegetable production, majority of farmers expressed problems with respect to the availability of seed, storage facility as well as lack of remunerative prices of their produce.

Sharma, 2002 observed that the middlemen exploiting growers in the field. Archic and abysmal storage and ware housing facilities for agricultural produce, lack of transport facilities from the countryside to the urban markets, tilt the balance against the farmers. A look into the balance of marketing imperfection in the North East region of the country is needed.

Kumar and Kaptan, 2004 studied that in India is now seeing at dramatic shift towards prosperity in rural households. The lowest income class (Rs. 25,000 and below) is estimated to swank from more than 60 per cent in 1994-95 to 50 per cent in 2006-2007.

Ramesh and Murughan, 2007 studied on prospects of the Indian edible oil market. In their study they want to evaluate the edible oil position with regard to its production, demand and supply, preferences by the regional groups in the country and its nutritional

significance. They concluded that the consumption was growing faster. The demand for edible oils being highly income and price elastic, the increase in population coupled with rise in income levels had led to demand growth at a little over six per cent per annum in the last couple of years. Under normal circumstances, India's edible oil consumption demand is expected to grow by anything between 5.00 and 6.00 per cent per annum over the next 5 - 10 year timeframe.

Kiran and Shenoy, 2010 studied that the farmers with high extension participation, high risk orientation and high scientific orientation who had undergone more number of trainings were more inclined to take up innovative measures for agricultural production

Pokreal, 2010 study on comparison of farm production and marketing cost and benefit among selected vegetable pockets in Nepal observed that the genuine problems related to production system such as diseases and pests severities, deteriorating soil environment, lack of year-round irrigation and poor quality of seed and fertilizer materials in the input market hinder vegetable farmers from realizing optimum crop productivity. Likewise, marketing related problems such as fluctuating prices due mainly to frequent bandhas in the recent context, a high weight margin for containers in market centres and poor availability of price information to farmers compared to traders contribute to market imperfectness.

Gunwant et al., 2012 Study revealed that on the basis of higher priority, the respondent of district Nainital were largely faced problems related with production e.g. lack of irrigation, lack of information, manpower, finance/credit, inputs, production levels, insect/pest, diseases, poor linkages with extension agencies inadequate soil testing facilities, risk aversion, Problems related to marketing included transportation, standardisation and grading, infrastructure, unfair deductions, storage, market-related information, bargaining and low price received by the farmers for the produces. There were also other, less important problems. Farmers were aware about most of problems but unfortunately they had no access by which they could overcome these constraints. While U.S. Nagar district is much better due to easy Transportation, Infrastructure and market availability. Maximum middlemen faced problems related to the uncertainty of the arrival of producers and consumers, the arrival of quantities of produce, standardisation and

grading, storage, information on the market prices, quality of produce, varied mixture in produce and highly perishable nature of produce.

Garming *et al*, 2013 collective marketing is a proven strategy to improve market access for small-scale producers and reduce poverty through increased income. A baseline assessment of the groups' social capital endowments during the pre-marketing phase is compared with their marketing success after two years. Results show that the groups' different initial levels of social capital were not directly linked with market success. All groups built up relevant social capital during the establishment phase with external support, although some members left the groups.

Chapter III
Research Methodology

RESEARCH METHODOLOGY

The sampling technique adopted the nature and the sources of data used and the analytical tools and technique employed in fulfilling the various objectives are discussed in these chapter.

3.1. Selection of vegetables for the study

Based on the area of under cultivation, four important vegetables viz; pea, cabbage, tomato and beans were selected for the study and analyses was confined to these vegetables only.

3.2. Selection of study area

The study was based both on primary and secondary data. In the first stage two districts having major vegetable cultivation were selected, i. e; Dimapur and Wokha. From each district two R. D. blocks namely, Dhansiripar & Chumukedima block from Dimapur district and Wokha & Baghty block from Wokha district were selected for the present study due to maximum number of vegetable production. Then five villages from each block were selected randomly based on the area and production of vegetable cultivation. The categorizations of household farmers into marginal, small and medium group were done on the basis of their operational land holdings as follows:

Marginal	: Less than ha
Small	: 1.01 to 2ha
Medium	: 2.01 & above

While in the final stage of sampling four important vegetables market were selected. Two each from Dimapur district viz; Chumukedima bazaar & Purana bazaar and two from Wokha district viz; Wokha bazaar & Baghty bazaar respectively were selected due to large concentration of vegetables, easy transportation and good market facility. Further a list of 15 village traders, 15 local traders and 15 local wholesalers were being selected from each District for the study purposively.

3.3. Sampling of Plan

Three stage sampling techniques were employed; selection of blocks (stage I), villages (stage II) and farmers (stage III) from the selected districts of Wokha and Dimapur of the state.

3.4. Selection of blocks and Villages

After the selection of districts, the selection of vegetables growing two blocks was done with help of officers of the state horticulture department. After the selection of the blocks, a complete list of villages in each of the selected block of the sample districts was taken from the respective block office. In consultation with the respective local officers of agriculture / horticulture department, a list of villages growing vegetables viz; pea, tomato, beans, cabbage was prepared. Then five villages from the list of vegetable growing villages of each block were selected by simple random sampling without replacement. Thus a total of twenty villages were selected for further selection of respondent farmers in stage II.

3.5. Selection of sample farm household

A complete list of farmers along with their holding size was prepared from each of the selected villages with the help of village headman / Chairman / pradhan of the respective villages. While preparing the list due consideration was given to those farmers who have devoted at least twenty percent of their net sown area to the particular selected vegetables for inclusion in the final list of the selected household. In the third stage farmers

was selected randomly each from a selected village to get optimum sample size. Finally, the farmer respondents were classified into different categories or marginal, small and medium size groups.

3.6. Selection of market functionaries

To study the channels of distribution, marketing margins, cost and price spread, market functionaries at different levels of marketing were selected. It comprised of 15 petty traders, 15 local traders and 15 local wholesalers were selected for both the district.

3.7. Data Collection

The study was based on Primary and secondary data. The primary data were collected with the help of a specially designed pre tested scheduled personal interview method. The primary data was collected for the year 2010-11. The secondary data was collected from various offices viz; Economics and Statistics Directorate, Directorate of Agriculture, Directorate of Horticultufe, Block Office, KVK, Wokha and various published and unpublished sources. Among the different vegetables grown in the study area, four important vegetables viz; pea, tomato, beans and cabbage were selected for the study. Data on different items viz; cost of cultivation, fixed asset, yield, feturn and marketing costs was collected through a pre-tested questionnaire from the sample farmers as well as from different market functionaries.

3.8. Analytical techniques and tools

Collected data were scrutinized, tabulated and processed systematically according to the objective laid down for the study. Tabular and functional analysis was used to meet the objective of the study as and when needed.

3.9. Economics of vegetables cultivation

The cost of cultivation was worked out by using the standard cost concepts as defined and used in the economics of farm management for estimation of the cost of cultivation as under:

Cost A_1 = Cost of hired human labour, bullock labour, manures, fertilizers, seed, PPC, irrigation interest on working capital, depreciation, land revenue & taxes and other miscellaneous charges.

Cost A_2 = Cost A_1 + Rental value of leased in land.

Cost B = Cost A_2 + Rental Value of owned land

Cost C = Cost B + imputed value of Family Labour

3.9.1. Income concepts

Gross farm income= Total output including byproducts x farm harvest price.

Net income = Gross farm income – Cost C

Farm business income = Gross farm income - Cost A_1

Owned farm business income= Gross farm income - Cost A_2

Family labour income= Gross farm income – Cost B

Farm investment income= Net income+ interest on owned fixed capital+ rental value of owned land.

3.9.2 Output input ratio

i) On the basis of total cost= $\frac{\text{Gross farm income}}{\text{Cost C}}$

ii) On the basis of paid out cost = $\frac{\text{Gross farm income}}{\text{Cost } A_1}$

3.10. Marketed and Marketable Surplus

The term "marketable surplus" is an extent concept referring to the surplus, planned to be marketed in accounting sense and the term marketed surplus is an exposit concept referring to the actual amount marketed during a period (usually a marketing year). Marketable surplus is the excess of output over sectorial retentions. Those retentions can be termed as on farm consumption or on farm utilization. Thus, the marketable surplus can be redefined as excess of output over on farm utilization. On the other hand, marketed surplus explicitly refers to the quantity of produce which the producer farmers actually sell in the market, irrespective of their requirements for family consumption, farm needs and other payments. Marketed surplus may be more, less or equal to the marketable surplus. A portion of marketable surplus may not be marketed or on the contrary, even a portion of or whole on farm utilization has to be marketed during a period as a distress sale.

The Marketable surplus will be expressed through the following formula:

$$M = Q - C$$

Where, M is marketable surplus, Q is output and C is total on farm consumption of the output.

3.11. Marketing channels, marketing cost, marketing margin and price spread

3.11.1 Marketing Channels of Vegetables

The Marketing channels of vegetables were identified based on the intermediaries involved from the point of production to the point of ultimate consumer.

3.11.2. Marketing costs and marketing margins

Marketing cost was calculated by estimating the cost incurred in the process of marketing of vegetables. The cost incurred after harvesting of the crop till it reaches the consumers hand generally constitutes the marketing cost.

It includes transportation cost, handling cost, storage cost, market fees, weighing charges and labour charges for packing, loading and unloading. The marketing cost at various stages were of marketing was calculated and finally the total marketing costs was computed.

Marketing margins at any stages of marketing was calculated as fallows.

$$MM_i = SP_i - (PP_i - MC_i)$$

Whereas:

MM_i = Marketing margin of the i - th middlemen

SP_i = Selling price of the i - th middlemen

PP_i = Purchase price of the i - th middlemen and

MC_i = Marketing cost incurred by the i - th middlemen

After the calculation of the marketing margins at different stages, finally the total marketing margins were calculated.

3.11.3 Price spreads

Price spread is the difference between the price paid by the consumer and the price received by the producer. It mainly consists of marketing costs and margins the price spread analysis was carried out as follows:

$$\text{Producer's share in consumer's rupee} = \frac{\text{Producer's price}}{\text{Consumer's price}} \times 100$$

Similarly the share of total marketing costs and the total marketing margins were also estimated to analyze the price spread.

3.12. Marketing efficiency

The efficiency of various identified marketing channels was calculated through the shepherd's formula. The formula is given below:

$$ME = V / I - 1$$

Whereas:

ME =Index of marketing efficiency

V =Value of goods sold (consumer's price)

I = Total marketing cost.

3.13. Measure for Increasing Farm Income and Employment

The response of the farmers to various problems faced by the sample farmers in production and marketing of vegetables were estimated through frequency simple percentage and ranking were estimated to examine the problems and measure for increasing farm income and employment were included.

Chapter IV
Brief profile of the State
&
Study Areas

BRIEF PROFILE OF THE STATE AND THE STUDY AREA

4.1. The State

Nagaland, "The Switzerland of the East", became the 16th constituent State of the Indian Union, on 01st December 1963. The magical valley is situated in the eastern sentinel of the Indian sub-continent, located between 25°6'N to 27°4'N latitude and 93°20'E to 95°15'E longitude. Nagaland is bounded by Assam in the West, Myanmar in the East, Arunachal Pradesh and part of Assam in the North and Manipur in the South. The state is blessed with pleasant sub alpine climate all the round with average annual rainfall of2,000 mm to 2,500 mm (approx).

There are 11 districts viz; Dimapur, Kiphire, Kohima, Longleng, Mokokchung, Mon, Peren, Phek, Tuensang, Wokha and Zunheboto. Kohima is the state capital. The state has a rich oral tradition that had been handed down the generation. It covers an area of 16,579 sq. km (approx) (Annon, 2013).

The total population of Nagaland as at 0:00 hours of 01st March 2011 stood at 19.80,602 as per the provisional results of the Census of India 2011. In terms of population, Nagaland shares merely 0.16 per cent of the total population of the country. The State has registered the lowest growth rate of population during the period 2001-2011 with population growth rate of - 0.47 per cent. The sex ratio (i. e; the number of females perthousand males) was recorded as 931. The total literacy of the State rose to 80.11 per cent in 2011 from 67.11 per eent in 2001 Census.

4.2. Brief profile of Dimapur District

4.2.1. The District (The Study Area)

Dimapur District was inaugurated as the 8th district of Nagaland in December 1997 from Kohima District. The District draws its name from the Kachari dialect; 'di' - meaning river, 'ma' - meaning great or big, and 'pur' - meaning city, together connoting 'the city near the great river'.

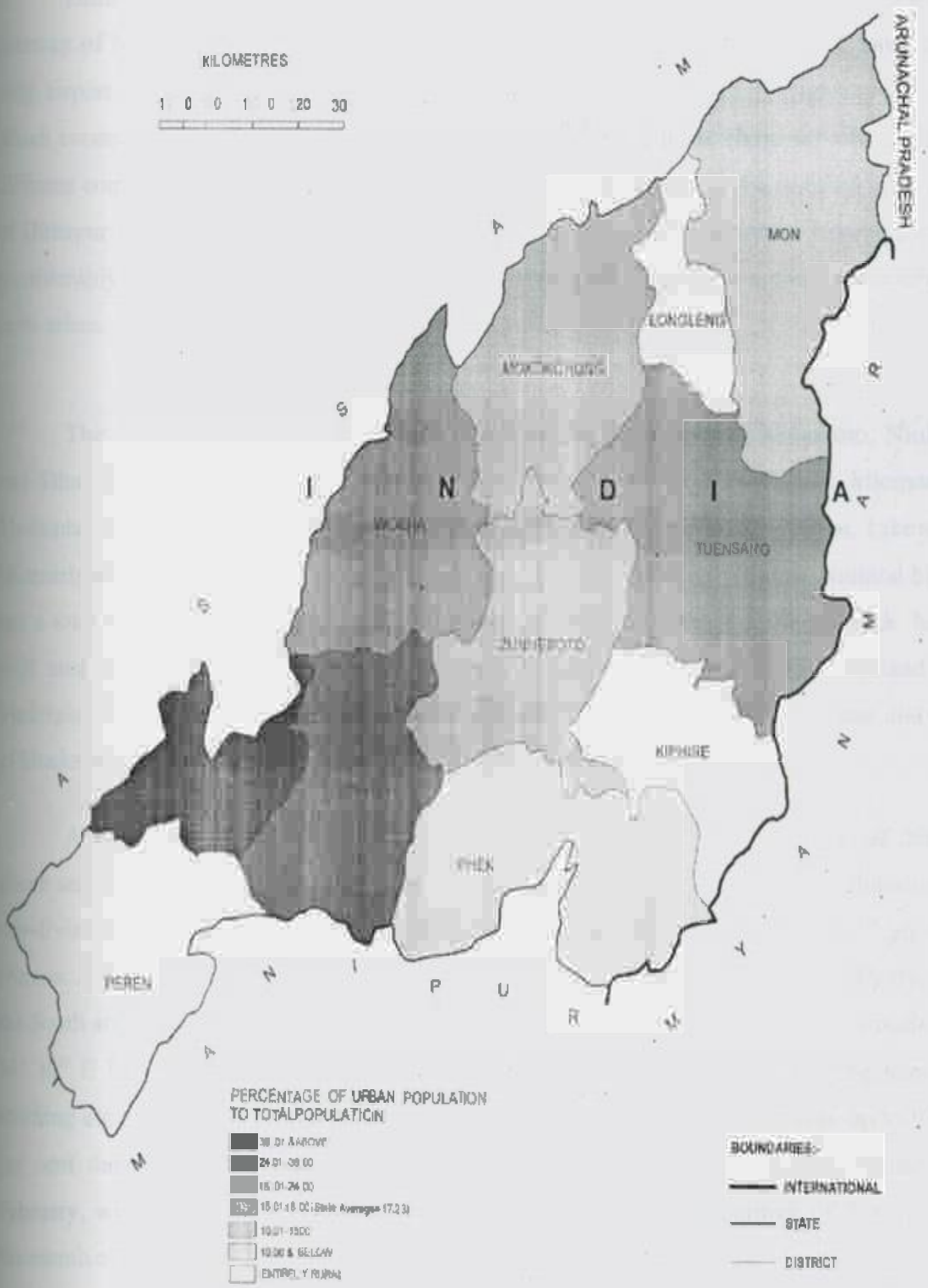


Fig. 4.1 Map of Nagaland

Dimapur today is the commercial hub of the state, besides being referred to as the gateway of Nagaland and Manipur. The infrastructure developed is unequaled, having the only airport in Nagaland, an important railhead, besides the National Highway No. 29, which connects it to other districts. Dimapur town is distinct in its character where all the different communities have congregated into a mini India. Although the notified town area ofDimapur has remained the same, the neighboring villages / settlements have expanded considerably over the years merging with the town boundary to form a continuous urban / semi urban.

The district has four blocks / sub division viz. Medziphema, Kuhoboto, Niuland and Dhansiripar and 11 agricultural circles with an area of 927 Square kilometers. Medziphema block has a total area of 345 sq. km. with 67 revenue villages. Likewise, Dhansiripar block is spread over 130 sq. km. area with 28 revenue villages, Niuland block has a total area of 305 sq. km. with 59 revenue villages whereas Kuhuboto block has a total area of 147 sq. km. with 38 revenue villages. Of the four blocks Niuland and Medziphema sub-divisions are managed by an Additional Deputy Commissioner and rest of blocks are manned by SDO (Civil).

A large area of the District is in the plains with an average elevation of 260 m above sea level excepting the Medziphema sub-division and a few villages of Dhanisiripar sub-division, which are located in the foothills. The total area of Dimapur is 927 Sq. Km (Annon. 2011). The district is bounded by Kohima District on the East, Peren District on the South and the State of Assam on the North and West. It lies 25° 54' 45" N Latitude 93° 44' 30" E Longitude. Dimapur Climate is hot and humid in the plains during summer reaching a maximum of 36° C during July to August, with maximum humidity up to 93.00 per cent during July to August and a minimum of 53.00 per cent during January to February, while the winter months are cool and pleasant with a minimum of 7° C during the month of January to February.

The average annual rainfall is 1594.7 mm. The District has a heterogeneous population with the majority comprising Naga tribes from all over Nagaland. The total population of the district is 3,79,769 with a population density of 410 as per Census report 2011. Dimapur, consisting of people of all Naga tribes and communities from different parts of India, celebrates all National and tribal festivals.

Table 4.1. Demographic over View of Dimapur district

Total Geographic Area	927 sq. km. (92,700 ha)
Location	25°48' & 26°00'North latitude and 93°30' & 93°54' East longitude
Number of villages	204
Number of households	28,762
Population	3,79,769
a) Male	1,98,163
b) Female	1,81,606
c) Male / female ratio (per 1000 male)	916
Density of population	410 per sq km
Literacy (%)	85.44 Per cent
a) Male	88.07 Per cent
b) Female	82.54 Per cent
Climate	Subtropical
Temperature	10° to 40° C
Soil pH	4.5 to 6.0
Rainfall	1,500 to 2,000 mm
Altitude	140 to 600 m (ASL)
Major rivers	Dhansiri, Diphu, Chathe, Zubza

(Source: Statistical handbook of Nagaland 2011)

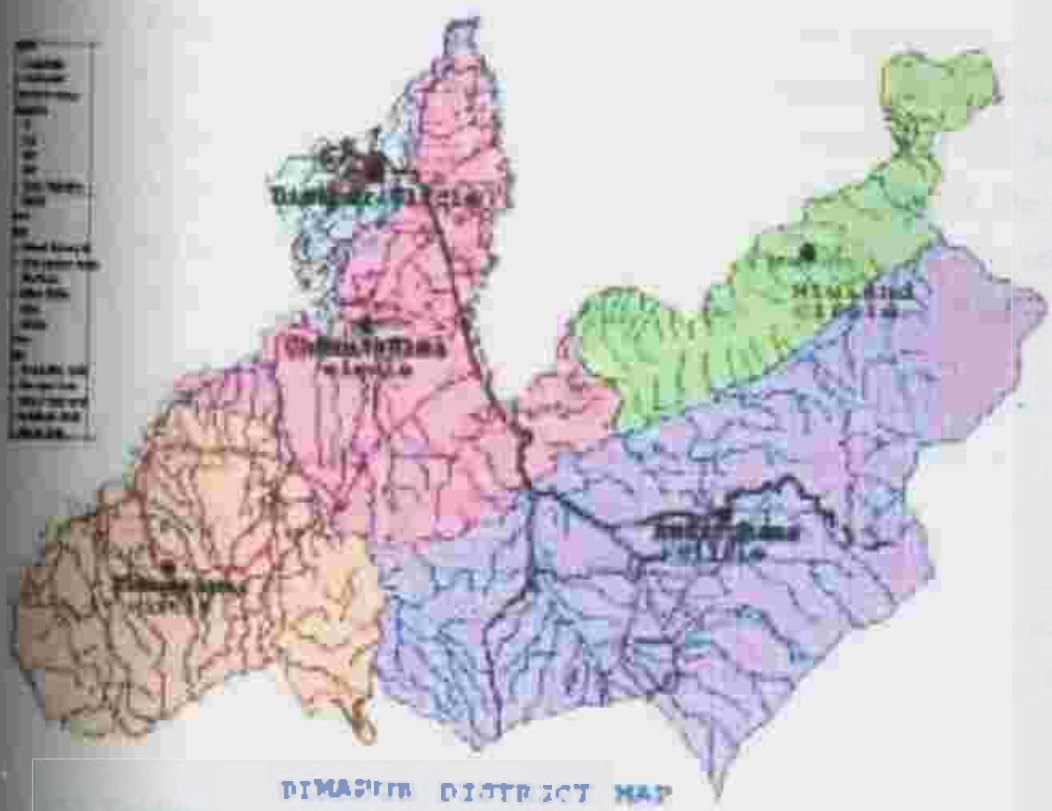


Figure 4.2. Dimapur District Map

(Source: BDO, Office Medziphema Block)

4.2.2. Historical Genesis of the District

The district has heterogeneous population with majority comprising of Naga tribes from all over the Nagaland. There is sizeable population of non-tribal living in the town areas. Although notified town of Dimapur district has remained the same, the neighboring villages / settlement have expanded considerably over the years merging with town boundary to form a length of more than 13 km. In addition, there is sizeable rural population in the Sub-Division of Niuland, Kuhoboto, Dhansiripar and Medziphema blocks. The total population of the district as per 2001 census is 3,79,769. The main factor contributing to large increase in population of the district is migration from other parts of state. There is also considerable migration from the neighboring state of Assam.

Dimapur town is the commercial hub of the state and is the magnet around which the economic and developmental activities of the district are centered; it is one of the fastest developing townships of the North East. The business of the town can trace their history to British times. The town is also a gateway to Nagaland and Manipur state. It is an important rail head and also has an airport. The National Highway No. 29 that connects Kohima, Imphal and International border of Myanmar (Moreh) runs through Dimapur District.

4.2.3. Traditional, cultural and social identity of district

The name Dimapur comes from the Kachari dialect etymologically Di means "River", Ma means "big" and Pur "city" which means thecity near the big river. The Ahoms called it Che-din-chi-pen, or "the brick city". It was also called Che-dima, meaning "city on the Dima River" and it was once the ancient capital of 13th century Kachari rulers. "Dimapur" is a later appellation.

The ancient Kachari ruler capital Dimapur is one of the important sites of the megalithic culture. Most of the ruins appear to be contemporizing with the Kachari civilization, established before the Ahom invasion in the 13th century A.D. There is also evidence of a touch of Hindu influence on most of them, though these are predominantly

Non-Aryan, with elaborate rituals and the cult of fertility. Besides the monoliths the ancient Kachari capital Dimapur contains other ruins of temples, embankments and tanks.

Dimapur city, the major commercial hub in Nagaland, has a heterogeneous mix of people from all over India, and for which it is also known as "mini India". Besides the dominant Naga tribes, who comprise about 50 per cent of the city's population, other prominent groups include Bengalis, Assamese, Nepalese, Biharis, Marwaris, Punjabis and also Tamils and Keralites. In the last two decades, Tibetan traders have also settled in the city.

In Dhansiripahar sub-division, the tribes inhabiting the area is predominantly Angami, Sumi, Kachari and Chakhesang while in Medziphema sub-division, the Angami tribe is predominant although a few Kuki and Sumi villages are also found. In Kuhoboto and Niuland sub-divisions, the Sumis are the predominant tribe inhabiting the areas. All these tribes have their own customary laws which dominate their social life. The Village Councils are the local bodies through, which such customary laws are enacted. The norms and traditions regarding marriage, divorce, inheritance, death etc are governed by such customary laws. Disputes regarding land, water and such resources and even personal disputes are very often resolved based on these customary laws.

4.2.4. Agriculture in Dimapur district

The agriculture in the district is TRC, rainfed and traditional. By and large mono cropping is practiced in the district. The TRC paddy alone covers an area of 32,900 ha where as Jhum covers about 7,800 ha. Besides it, the second important crop in the district is Kharif Maize which covers about 2,500 ha. Maize is generally grown as a intercrop with jhum paddy. Winter maize is also grown in certain blocks of the district which covers about 460 ha.

Important Pulses are also grown in the district which includes pea, lentil, black gram, beans, green gram, arhar. These are grown over an area of 1,36 0 ha, in both Kharif and Rabi season.

Table 4.2. Area, Production and Productivity of different agricultural crops

S.N.	Crop	Area (ha)	Production (mt)	Productivity (q/ha)
1.	Jhum paddy	9,360.00	14,080.00	15.04
2.	TRC paddy	25,720.00	41,170.00	16.01
3.	Maize	1,082.00	1,807.00	16.70
4.	Jowar	220.00	200.00	9.09
5.	Small millets	3,720.00	2,280.00	6.13
6.	Wheat	400.00	280.00	70.00
	Total Cereal	50,240.00	76,080.00	100.00
1.	Tur / Arhar	3,160.00	3,670.00	11.61
2.	Urd/ Moong	330.00	480.00	14.54
3.	Naga Dal	500.00	650.00	13.00
4.	Beans	290.00	330.00	11.38
5.	Kharif Pulses	300.00	380.00	12.67
6.	Pea	1,070.00	1,310.00	12.24
7.	Lentil	640.00	730.00	11.40
8.	Gram	60.00	90.00	15.00
9.	Other Rabi pulses	1,210.00	1,390.00	11.49
10.	Black gram	610.00	730.00	11.97
11.	Rajmash	170.00	200.00	11.76
	Total pulses	8,340.00	9,960.00	-
1.	Groundnut	150.00	140.00	9.33
2.	Soyabean	5,130.00	6,170.00	12.03
3.	Sesame	850.00	550.00	6.47
4.	Sunflower	690.00	610.00	8.84
5.	Niger	320.00	260.00	8.12
6.	Rapeseed / Mustard	14,400.00	11,430.00	7.94
7.	Linseed	2,210.00	1,650.00	7.47
	Total oilseed	23,740.00	20,810.00	-
1.	Sugarcane	2,360.00	1,35,880.00	575.76
2.	Cotton	180.00	30.00	1.66
3.	Jute	1,430.00	4,840.00	33.84
4.	Potato	640.00	5,850.00	91.41
5.	Tea	340.00	1,820.00	53.53
6.	Ginger	500.00	4,390.00	87.80
7.	Cardamom	280.00	430.00	15.36
	Total Commer. Crops	5,730.00	1,53,240.00	-

(Source: Statistical handbook of Nagaland 2007)

With the favorable agro climatic condition, oilseeds such as groundnut, soybean, sesame, sunflower, mustard, linseed etc. are grown in an area of 5,800 ha. Commercially viable crops such as sugarcane, ginger, jute, turmeric, tea, potato etc are also grown in the district covering an area of 1,580 ha. Mechanized farming is encouraged, by providing 50 per cent subsidy on power-tillers.

4.2.5. Horticulture of Dimapur district

In Nagaland, fruits and vegetables are produced in 25,000 and 26,300 ha respectively with the total production of 25,600 to 32,000 tonnes, respectively of which Dimapur district contributes major portion of production. Commercial cultivation of pineapple, banana, cashew nut and lemon is also followed in the district. The Horticulture Technology Mission (HTM) has helped to a great extent in popularizing the cultivation of horticultural crops including floriculture.

4.2.6. Horticulture Potential

The state of Nagaland in general and Dimapur in particular has been gifted with a unique topography and varied agro-climatic and soil conditions, which offers opportunities to cultivate a variety of horticultural crops like vegetables and fruits. Among vegetables spring (cucurbits, bhindi beans), summer (cucurbits, bhindi, beans) as well as winter vegetables (cabbage, cauliflowers, carrot, radish, palak, pea, etc;) are being cultivated in the districts. Fruits like pineapple, guava, lemon, litchi, and mango are the major fruits grown in the district. Among floriculture, the commercial crop is Anthurium.

4.2.7. Animal Husbandry in Dimapur

Under our socio-economic and socio-cultural condition, the state needs job-led economic growth strategy based on pro-nature, pro-poor and pro-women policies of orientation and its dissemination. The role of livestock and poultry farming in livelihood earning of farmers is enormous. Dairy farming is being practiced by a number of farmers in the district. The milk is being collected by the Dimapur Milk Union Limited at 4th Mile Dimapur and is processed for the production of milk products like milk packets, curd and ghee etc. The dairy farming is mainly practiced by Nepalese and other people living in the state. Pig and poultry is very common in the district. In rural areas of the district each and every household has minimum 1-2 pigs and 5-6 nos. of poultry birds in the backyard of

Table 4.3. Area, Production and Productivity of Horticultural crops

S.No.	Crop	Area (ha)	Production (mt)	Productivity (q/ha)
		Vegetable and Spices		
1.	Sweet Potato	20	50	25.00
2.	Cabbage	20	40	20.00
3.	Cauliflower	65	71	10.92
4.	Brinjal	22	23	10.45
5.	Chilly	100	170	17.00
6.	Pea	42	341	81.20
7.	Beans	30	50	16.67
8.	Bhindi	30	31	10.33
9.	Tomato	100	50	50.00
10.	Ginger	200	750	37.50
11.	Garlic	30	25	8.33
12.	Radish	30	25	8.33
13.	Cotocasia	100	1.050	105.00
14.	Black pepper	34	4	1.33
15.	Turmeric	40	60	15.00
16.	Leafy Vegetable	200	450	22.50
17.	Others	100	1.000	100.00
		Fruits		
18.	Orange	100	55	5.50
19.	Lemon	500	150	3.00
20.	Pomelo	40	90	22.5
21.	Pomegranate	20	20	10.00
22.	Papaya	42	43	10.24
23.	Banana	43	160	37.21
24.	Guava	30	140	46.67
25.	Mango	30	10	3.33
26.	Litchi	100	50	5.00
27.	Jaek-fruit	60	70	11.67
28.	Pineapple	400	1,570	39.25
29.	Others	30	300	100.00

(Source: Statistical Handbook of Nagaland 2007)

house. Besides poultry, duck is being reared in the district. Goat and rabbit is limited to small number only.

4.2.8. Cattle production system

In the district most of the farmers leave their cattle for free grazing except during paddy cultivation period. However some farmers' follow stall fed system.

4.2.9. Mithun production System

The Mithuns are not reared in the district. But in Mezdiphema, block National Research Centre on Mithun was established in 1988. The 76 Mithuns of Nagaland, Manipur, Mizoram and Arunachal Strains are being maintained by NRC-M for experimental purposes.

4.2.10. Goat production system

For goat rearing free grazing system is followed.

4.2.11. Pig production system

In pig production both loose and stall fed system is practiced. In piggery, most of the farmers follow stall fed system with kitchen waste and locally available feeds like Colocacia leaves and stem, rice polish, wheat bran etc. The Veterinary department is trying to provide the health services by organizing the veterinary camps and trainings. There animals are examined, vaccinated and medicines are provided as per need. (Photo-pig rearing).

4.2.12. Poultry Production System

Most of the farmers follow backyard system of poultry rearing, however, some farmers with higher number of poultry birds follows deep litter system. In case of backyard poultry system, the birds are fed with broken rice / maize seeds in morning and evening. The birds are more prone to diseases due to unhygienic conditions.

Table 4.4. Total production of Milk meat and eggs in Dimapur district (2008)

Produce	Total requirement (mt)	Production (mt)	Short fall (mt)
Meat ('000 mt)	13,582.33	11,500.00	(-) 2,082.33
Milk ('000 mt)	23,912.56	34,716.00	(+) 10,803.44
Egg (lakh in numbers)	398.54	269.02	(-) 129.52

(Source: Department of Veterinary and Animal Husbandry, Kohima)

Table 4.5. Carcass yield of meat animals

Species	Av. slaughter age (month)	Av. live weight (kg)	Av. carcass weight (kg)
Cattle	36	150 to 180	130
Buffalo	36	200 to 250	175
Pig	12	100 to 120	75
Sheep / Goat	12	40 to 50	22
Poultry	2	2 to 5	1.5 kg

(Source: Department of Veterinary and Animal Husbandry, Kohima)

Table 4.6. Milk yield by type of Animals

S. No.	Type of Animals	Milk yield (litres / day)
1.	Cross Bred Cattle	3.78 to 5.40
2.	Indigenous Cattle	0.950 to 1.556
3.	Buffalo	0.925 to 1.515
4.	Goat	0.140 to 0.426

(Annon. 2011)

4.3. Brief Profile Of Wokha District

4.3.1. The District (The Study Area, Wokha District)

Wokha District is the home of the Lothas Naga tribe. **WO** in Lotha means Number of People and **KHA** means the Counting. So the place in which Lotha ancestors had gathered together and counted their numbers was named WOKHA. In December 1973, Wokha was raised to the status of a separate District. Earlier to this it was one of the sub-division under Mokokchung District.

The district has five blocks/ Sub-Division viz. Wokha, Chukitong, Sanis, Wozhuro/Ralan and Bhandari. The Wokha District is situated in the mid western part of Nagaland State, adjacent to Sibsagar plain of the Assam State. It is bounded by Mokokchung District in the North, Kohima District in the South. Zunheboto District in the East and the State of the Assam in the West. The Wokha District is situated at a latitude of26° '8' North and a longitude of94° '18' East.

The Topography of the district is more or less similar with that of other district in the state having ranges and ridges di-sected by seasonal streams. The altitude ranges from 304.3 Mtrs to 1313.67 Mtrs (MSL). The climate is warm in the lower plain areas, moderately warm in the upper region during summer but cold in winter. The monsoon starts from May and continues till October. The average annual rainfall varies from 2000 cm to 2500 mm.

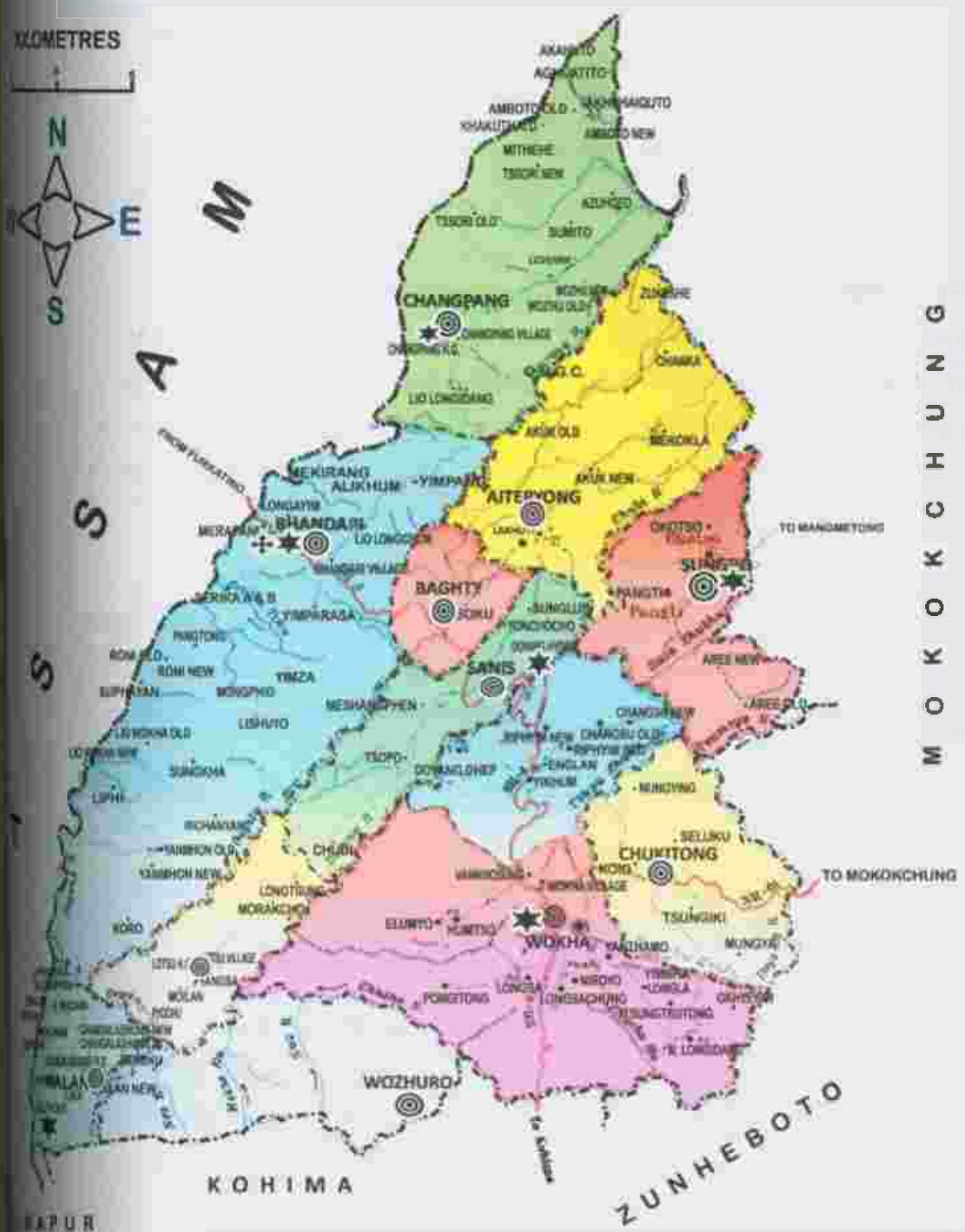
The District is divided into three (3) ranges, which are as follows:

1. Wokha Range or Upper Range, which falls in the upper North Eastern parts of the district.

2. Sanis Range or Middle Range, which covers the middle part of the district.

3. Bhandari Range or Lower Range is the outer most part of the district which extends from the Japukong range of Mokokchung District and gradually slopes down to the Assam plains in the North Western side. Two of the most fertile valleys are in this range and they are the Baghty and churung valleys.

MAP OF WOKHA DISTRICT



LEGENDS

- BOUNDARY
- DIST H.Q.
- SUB H.Q.
- POLICE STATION/OUTPOST
- AR H.Q.
- NATIONAL HIGHWAY
- STATE HIGHWAY
- RIVERS AND STREAMS

SOME BASIC INFORMATION OF THE DISTRICT

1.	LOCATION/CO-ORDINATES	26°06'N 94°16'E
2.	ALTITUTE (in meters)	1,313.69
3.	TOTAL AREA OF THE DISTRICT(in Sq. Km.)	1,628
4.	TOTAL POPULATION AS PER 2011 CENSUS	1,66,239
5.	TOTAL NUMBER OF VILLAGES IN THE DISTRICT	129
6.	NUMBER OF ADMINISTRATIVE CIRCLES	11
7.	NUMBER OF POLICE STATIONS	04
8.	NUMBER OF POLICE OUTPOSTS	03

Fig: 4.3. District Map of Wokha

The highest mountain peak is the Mount Tiyi Enung, with an altitude of 1970 mtrs. Important rivers which flow through the District are Doyang, Nzhu and Nruk. The district lies in a seismically active earthquake zone.

The soil types are recent Alluvium, old Alluvium Mountains valley Lateritic soil, brows forest and podzolie soils.

Agriculture and allied activities are the principal means of livelihood for the vast majority of the population residing in the rural area. Rice is the major food crop and occupies 77 per cent of the total cultivable area. Other major crops grown are maize, tapioca, pulses, soya beans and variety of organic vegetables, which are available in the local market year around.

The staple food diets of the people are Rice, Bamboo shoot of various types, fermented of dried fish, Yam, Molasses, Vegetables and meat, which is a delicacy. Foods are mostly boiled and spices are rarely used. They are very particular, both in their food preparation and habit of taste.

The people of the district also practice certain traditional cottage Industries mostly during the off season to meet their local requirements, like black smithy, traditional weaving, carpentry and handicraft etc. minerals like coal and crude oil are found at Changpang area in the lower range.

4.3.2. Climate in Wokha District

Wokha district enjoys a monsoon climate, cold in winter and warmer in summer. In winter the night temperature is between 2^0 C to 32^0 C. December and January are the coldest months. The average temperature in summer is approximately 27^0 C (80^0F.). Towards the end of the winter the wind starts blowing throughout the day and night, it flows so high that sometimes damage is caused to building and trees. The wind generally flows from southwest and sometimes its velocity rises up to 100 Kilometers per hour. Towards the end of March the wind slowly dies out. Southwest monsoon set in the middle of June and continues up to the middle of September. The district received

average annual rainfall of 2000 mm and rains for about six months in the year with greatest concentration in July and August.

During summer the average humidity is 85 per cent, which goes sometimes up to 95 per cent to 100 per cent and as such it is very damp during monsoon.

4.3.3. Agriculture in Wokha district

Agriculture is one of the main occupations of the people of this district. More than 80 per cent of the people depend on agriculture for their livelihood. The main type of cultivation in this district is Jhum, which mean shifting cultivation. The cultivation is done with the help of spade and hand hoe and not with plough of any type because the area is hilly. It has to be noted here that bullocks or buffalo drawn plough is used in Merapani plain, Doyang valley and Baghty valley where wet rice cultivation is practiced, as in the plains of Assam. The other form of cultivation is terraced, but negligible as it is seen only in a small area. But as a result of Govt. efforts, the area under terrace is increasing.

Under the system of Jhum cultivation the selected area for cultivation is cleared of its shrubs and the smaller trees are felled where big trees are preserved. This clearing work is generally done in the month of October and November. The felled trees, slashed branches and cleared shrubs etc after drying they are burned in the month of February and March. Cares are taken so that the fire may not engulf the uncultivated jungles. Within a day or two the field which is burnt is cleared off the un-burnt and half burnt logs are placed orderly in such a way that the loose earth is protected from being washed away by rain water.

After the land being prepared properly, the paddy is sown in the month of March and April depending on pre-monsoon showers. In spite of the practice of cultivation in monsoon, crop never fails here due to drought unlike other States of India. Whenever sometimes ill distribution or insufficient rainfall may sometimes affect the growth of the crops adversely, but still the crop never fails totally. After a month of sowing the seeds, the weeding is done, two to three time till the plants are fully grown up. The paddy ripens and is ready for harvesting in August and September.

A Jhum field can be cultivated more than once if the same is sufficiently fertile and then it is kept for seven to ten years depending on the fertility of the land and availability of others land, after which the same land is cultivated again. Maize, millet and other crops such as taro, French beans, pumpkin, cucumber, bitter gourd etc. are grown along with the paddy in the same field.

Terrace cultivation is more advantageous than the Jhum, but due to hilly condition of the area terrace is not practiced everywhere in the district. In spite of this people are trying their best to find purpose of terrace cultivation; water is brought from a nearby stream to the field for cultivation during the rainy season. Sometimes water from road side nalla is also channel to the terrace field. When the field is thus ready, the paddy plants are pulled out from the seed bed and planted in the field, this is done in June-July.

The water is allowed to remain in the field the whole period of the growth of the plants, and just before harvesting the water are drain out. Harvesting is done in the month of October-November. Unlike Jhum no other crops are grown along with paddy in the terrace.

4.3.4. Horticulture in Wokha District

Wokha is also famous for fruits like Oranges, Passion fruits, Plum and Bananas. Important vegetables grown in the district are beans, peas, colocasia, brinjal, pumpkin, chilly, tomato, leafy vegetables etc.

4.3.5. Animal Husbandry in Wokha district

Livestock rearing and animal husbandry play a very important role in the overall economy of the district. Almost every household has got a few livestock and cattle. It provides supplementary income and also generates gainful employment in the rural sector particularly small and marginal farmers and less privileged and socially disadvantaged strata of the society. The sector not only provides the basic motive power of the various agricultural operations it is also a constant source of protein and food item. Cattle, buffalo

goat, pig and dog are reared both for motive power and meat while mithun is reared in its wild form for meat only.

4.3.6. Forestry in Wokha district

The district abounds in forests. Inside the district, jungle clad mountain in their verdant colour stand, but being located far from human habitation, the jungles with thick vegetation form the home of wild animals. There are varieties of orchids blossoming in different seasons of the year. From the forest, people get all sorts of building materials such as timber, thatch, cane, bamboo etc. Sappers, creepers, barks, wild vied, tubers, bamboo and cane have multifarious use connected with the manufacture of rain proof coats, rain hats, baskets and ropes etc. Wokha district consists of both deciduous and evergreen forest. In the lower altitude the trees are more evergreen than deciduous. Various species of trees and plants found in the district viz; Champa (*Michelia champaca*), Bonsum (*Ploebe parensis*), Amari (*Amora wallichii*), Sam (*Arthocarpers chaplasha*), Simul (*Bombox ceiba*) Gamari (*Gmelina arborea*); Mango (*Mangifera indica*), Hollock (*Terminalia myriocarpa*), Gogra (*Schima wallichii*), Walnut (*Juglans regia*) Jamuk (*Syzygium cumini*), Urium (*Biscotia javanica*), Bogi poma (*Chikrassia*) etc.

Chapter V
Result & Discussion

RESULTS AND DISCUSSION

The data collected for the study were analyzed with reference to the objective set and the results are presented and discussed in these chapter. For better understanding of the various facts of the subject the results are presented in the following headings:

5.1. Socio economic characteristics of the sample farmers.
5.2. Economics of vegetable cultivation under shifting and settled cultivation.
5.3. Marketing Channel for shifting and settled cultivation.
5.4. Marketed and marketable surplus for shifting and settled cultivation.
5.5. Marketing Costs, margins, price spread for shifting and settled cultivation.
5.6. Marketing efficiency in shifting and settled cultivation.
5.7. Measures for increasing farm income and employment in shifting and settled cultivation.

5.1. Socio economic characteristics of the sample farmers

Socio-economic variable is also important parameters that determine the entrupernial development of the farmers and the farm. This is because, the enterprise vary in their level and types of resources requirements like labour, land, capital and the managerial skill which is indirectly related to their level of education also effect the farm income and nature of farm business. Hence a discussion on the socio economic variables of the sample farmer of vegetables growers such as level of education, occupational pattern, land resources and its utilization, available labour force, cropping pattern are discussed below:

5.1.1 Farm family size and the level of education

Educational standard of the farmer is also an important parameter that determines the productivity of different crops grown by the farmers. It helps the farmers in judicious

allocation of different inputs for better productions performances. Table 5.1.1. reveals that the family size and the level of education standard with respect to different size groups of sample farmer. The table shows that the average family size of vegetable growers was 6.36 in the sample area. Among the various size group the average family size groups was highest in marginal group (6.99) and lowest in medium group (5.79) of farmers.

It was observed from the table that 7.72 per cent of the total population was illiterate. Out of the literate group 25.34 percent had studied up to primary level, 43.51 per cent had studded up to P.U / H.S level and 23.42 per eent had studied up to graduate level and above. The literacy percentage was highest in marginal group of farmers (93.50 per cent) and lowest in small group of farmers (90.52 per cent). It was also observed that 92.32 per cent of the sample populations were literate. The proportion of male and female literate were 94.61 per cent and 89.02 per eent respectively. The above finding indicates that the rate of literacy was very high in the study area as compare to the state as a whole. P.U / HS level education was found to be most prevalent (43.51), followed by primary level (25.34 per cent) and graduate and above (23.42 per cent).

5.1.2. Distribution of sample population according to economic status

The results of the distribution of sample population according to economic status are given in table 5.1.2. The table show that workers constituted about (37.35) of the total sample population. Male worker constituted about (26.80) per cent while female worker constituted about (10.55) per cent of the total sample population. The percentage of workers in different size groups were 31.19 in marginal group, 42.07 in small group and 51.43 in medium group of farmers. In the sample 15.64 per cent were earner dependent and 46.99 per cent of the sample populations were dependent.

The above findings highlighted the fact that the percentage of workers increased with the inerease in size of holdings. It also shows that dependent constituted the major share in the working force followed by workers with 37.35 per eent. Male workers out numbered the female workers in the sample population of the study area.

Table 5.1.1. Distribution of Sample Population according to Educational Standard for different Size Groups

S N	Size groups	Nos of House holds	Av family Size	Total population			Illiterate			Primary Level			P.U. / H.S.			Graduate & Above			Total Literate		
				M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
1.	Marginal	165	6.99	695 (60.22)	459 (39.77)	1154 (100.00)	34 (4.80)	41 (8.9)	75 (6.50)	157 (22.5)	79 (17.21)	236 (39.71)	352 (30.50)	227 (19.67)	579 (50.17)	152 (13.17)	112 (24.40)	264 (22.87)	661 (95.10)	418 (91.03)	1079 (93.50)
2.	Small	87	6.310	315 (57.37)	234 (42.62)	549 (100.00)	21 (6.66)	31 (13.24)	52 (9.47)	112 (35.50)	79 (33.76)	191 (34.70)	114 (36.20)	54 (23.07)	168 (30.60)	73 (23.17)	65 (27.80)	138 (25.10)	299 (94.90)	198 (84.60)	497 (90.52)
3.	Medium	48	5.79	142 (50.89)	136 (48.74)	278 (100.00)	12 (8.45)	23 (16.91)	35 (12.54)	43 (30.28)	32 (23.52)	75 (26.97)	63 (44.36)	52 (38.22)	115 (41.36)	24 (16.90)	38 (27.94)	62 (22.30)	130 (91.54)	122 (89.70)	252 (90.64)
Total		300	6.36	1152 (100.00)	829 (100.00)	1981 (100.00)	62 (5.38)	91 (10.97)	153 (7.72)	312 (27.08)	190 (22.91)	502 (25.34)	529 (45.92)	333 (40.17)	862 (43.51)	249 (21.61)	215 (25.93)	464 (23.42)	1090 (94.61)	738 (89.02)	1828 (92.32)

(The figures in parentheses indicates percentage to the total)

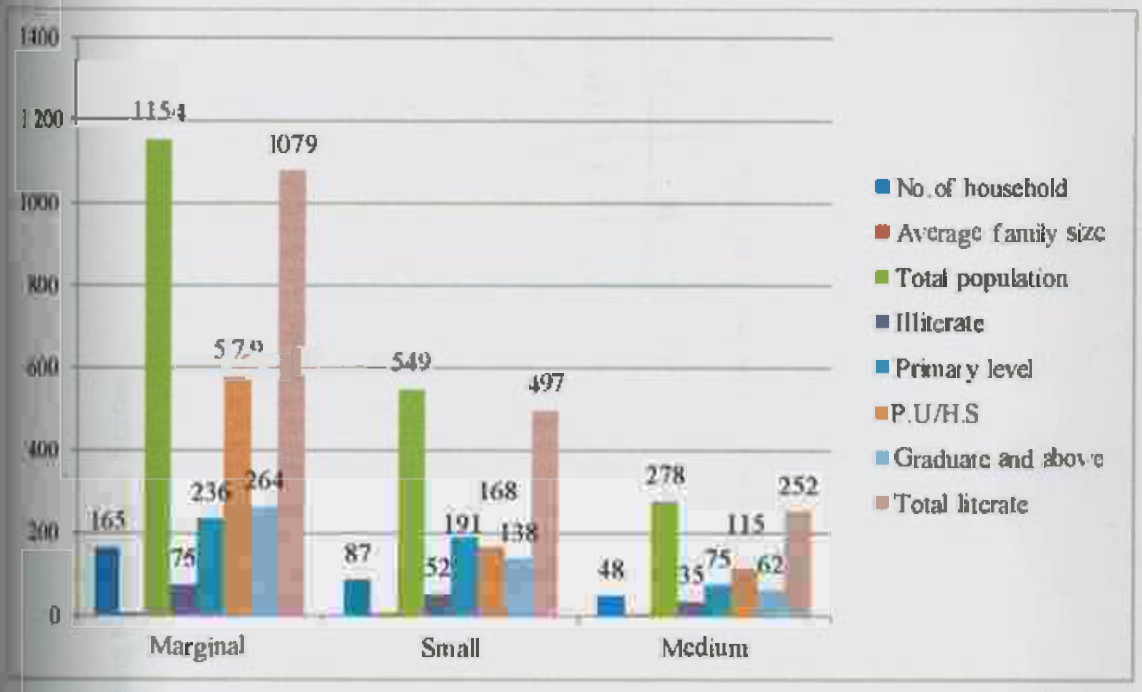


Fig 5.1. Distribution of sample population according to educational standard for different size groups

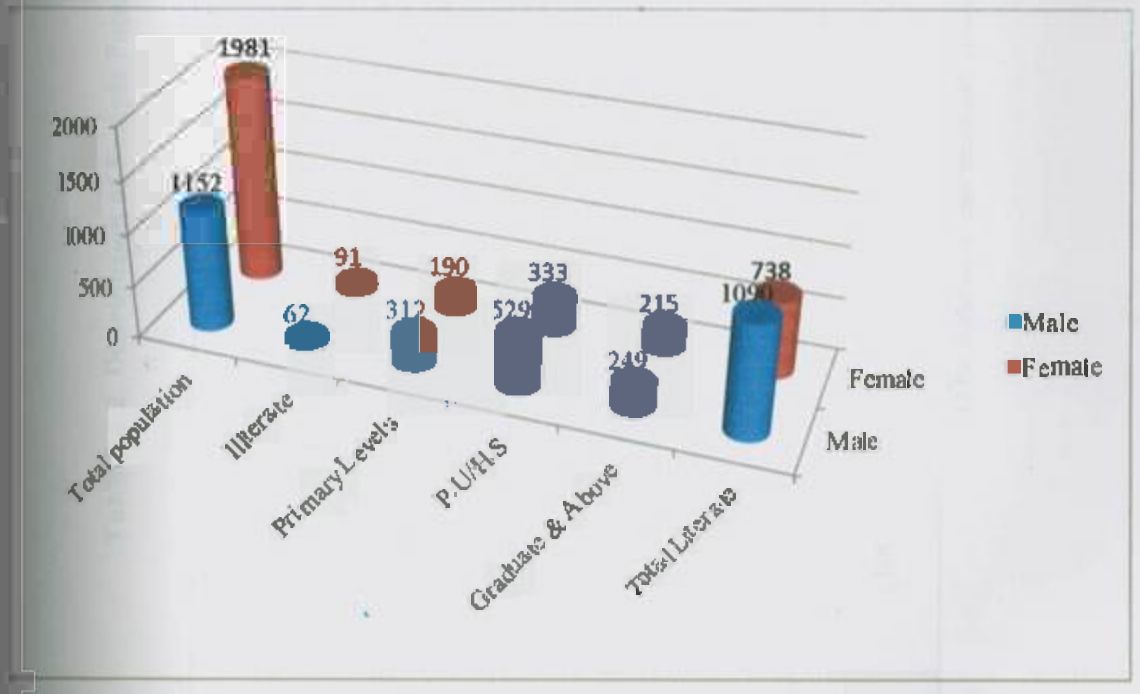


Fig. 5.2. Distribution of sample population according to educational standard for male and female of different size groups

Table 5.1.2. Distribution of Sample Population According to Economic Status

S. N	Size groups	Total population	Workers / Earners			Earner Dependent			Dependent		
			Male	Female	Total	Male	Female	Total	Male	Female	Total
1.	Marginal	1154	280	86	366	59	84	143	345	300	645
		(100.00)	(24.87)	(7.47)	(31.19)	(5.11)	(7.27)	(12.39)	(29.89)	(25.99)	(55.89)
2.	Small	549	152	79	231	49	74	123	115	80	195
		(100.00)	(27.68)	(14.38)	(42.07)	(8.92)	(13.47)	(22.40)	(20.94)	(14.57)	(35.5)
3.	Medium	278	99	44	143	12	32	44	41	50	91
		(100.00)	(35.61)	(15.82)	(51.43)	(4.31)	(11.51)	(15.82)	(14.74)	(17.98)	(32.73)
Total		1981	531	209	740	120	190	310	501	430	931
		(100)	(26.80)	(10.55)	(37.35)	(6.05)	(9.59)	(15.64)	(25.29)	(21.70)	(46.99)

(The figures in parentheses indicates percentage to the total)

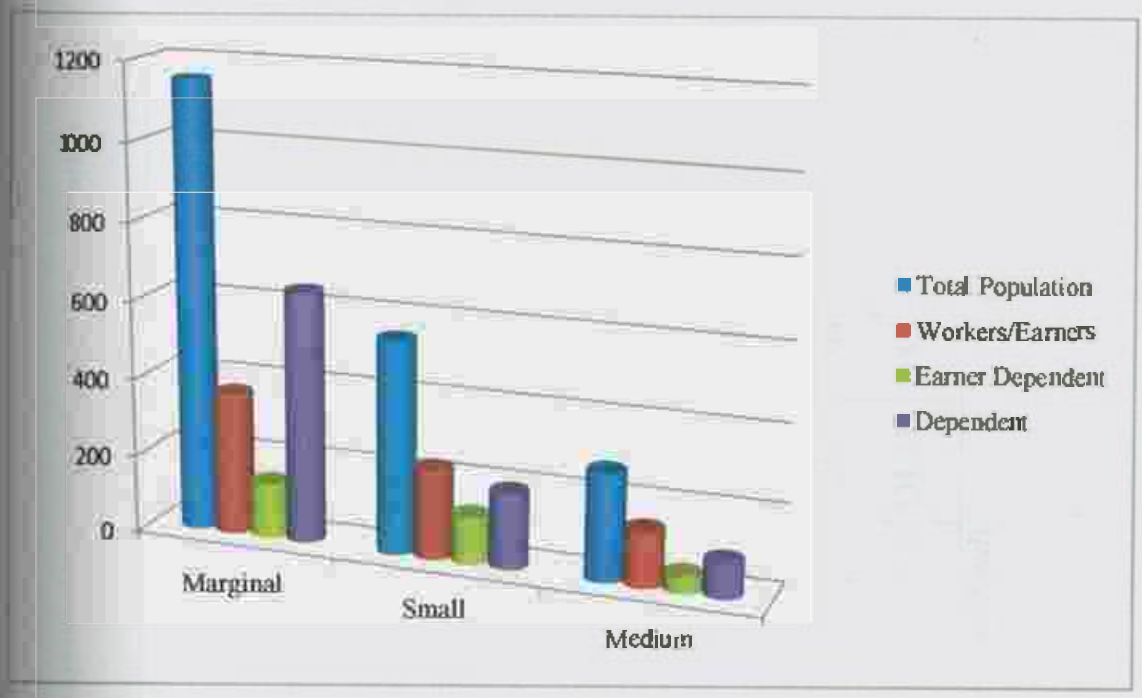


Fig.5.3. Distribution of sample population according to economic status

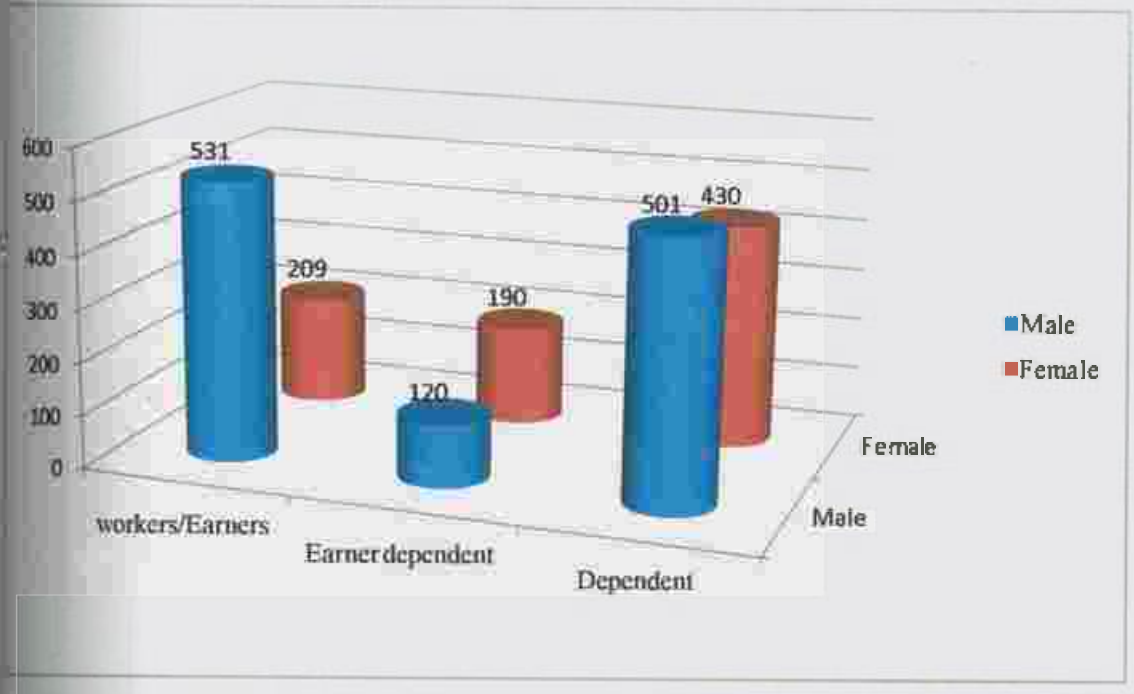


Fig. 5.4. Distribution of sample population according to economic status on gender basis

Table 5.1.3. Occupational pattern of the farm family working forces for various size groups of vegetable cultivation

S .N	Size Groups	Total workers			Main Occupation								
					Agriculture			Service			Others		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
1.	Marginal	280	86	366	129	74	203	87	17	104	46	13	59
		(76.51)	(23.49)	(100.00)	(35.24)	(20.21)	(55.46)	(23.77)	(4.64)	(28.4)	(12.56)	(3.51)	(16.12)
2.	Small	152	79	231	63	48	111	67	14	81	22	17	39
		(65.80)	(34.19)	(100.00)	(41.44)	(60.75)	(48.05)	(44.07)	(17.72)	(35.06)	(14.47)	(21.51)	(16.88)
3.	Medium	99	44	143	32	23	55	36	10	46	31	11	42
		(69.23)	(30.76)	(100.00)	(32.32)	(52.27)	(38.46)	(36.36)	(22.72)	(32.16)	(31.31)	(25.00)	(29.37)
	Total	531	209	740	224	145	369	190	41	231	99	41	140
		(71.75)	(28.24)	(100.00)	(42.18)	(69.37)	(49.86)	(35.78)	(19.61)	(31.21)	(18.64)	(19.61)	(18.91)

(The figures in parentheses indicates percentage to the total)

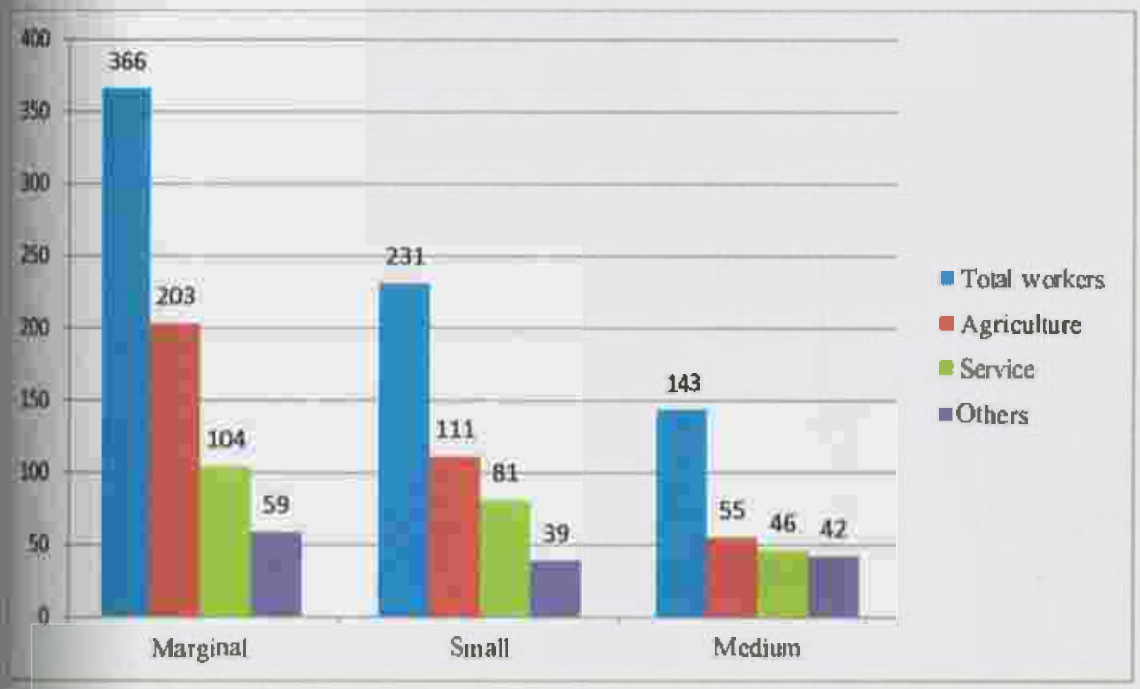


Fig.5.5. Occupational pattern of the farm family working forces for various size groups of vegetable cultivation

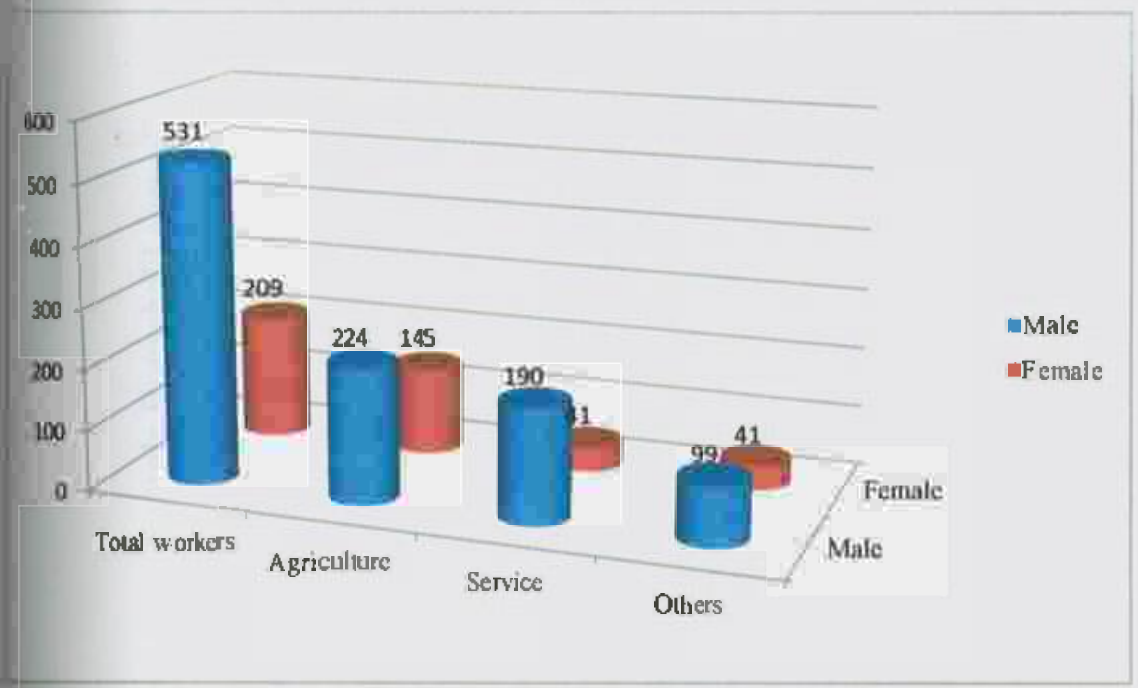


Fig. 5.6. Occupational pattern of the farm family working forces for various size groups of vegetable cultivation on gender basis

Table 5.1.4. Distribution of Sample Household according to operational holding of land across various size groups (in ha)

S.N	Size groups	No of household	Owned land	Leased in land	Leased out land	Total Area	Average
1.	Marginal	165	395	149.6	26.3	570.9	3.46
2.	Small	87	404.82	105.84	53.21	563.76	6.48
3.	Medium	48	322.13	176.16	87.31	585.6	12.20
Total		300	1121.95	431.6	166.82	1720.26	7.38

(The figures in parentheses indicates percentage to the total)

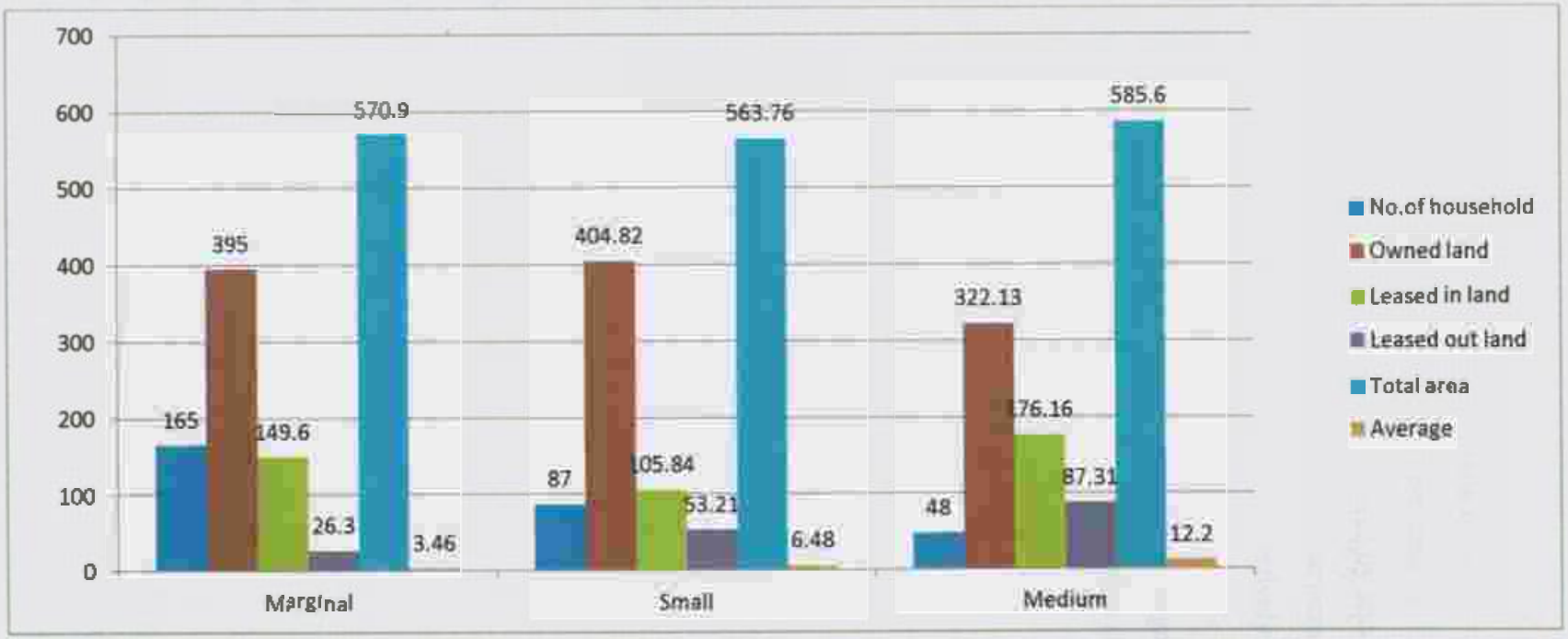


Fig. 5.7. Distribution of Sample Household according to operational holding of land across various size groups (in ha)

5.1.3 Farm family working force and its occupational pattern

The working force and its occupational pattern of various size groups are given in table 5.1.3. From the table it shows that 49.86 per cent of the working population had agriculture as their main occupation. This was followed by services which include services like Government servants and others private sectors services and others like business, accounting about 31.21 per cent and 18.91 per cent respectively.

Above finding shows that woman population engaged themselves more in agriculture with the percentage of 69.37 than other occupation (19.61 per cent).

5.1.4 Distribution and utilization pattern of land

Table 5.1.4 reveals that the distribution and utilization pattern of sample farmers according to different size group from the table. The average size of operational holding was **3.46, 6.48** and **12.20** ha for marginal, small and medium. In the aggregate level, average size of operational holding was **7.38**. Among the various size groups of farms, the land holding showed an increasing trend with increase in size. The total land owned by different group are, marginal group (**570.9** ha), small group (**563.76** ha) and medium group (**585.6** ha) respectively.

5.1.5 Land use pattern

Table 5.1.5 Represents land used pattern of the sample farmer. It is observed from the table the average operational holding constituted about 76.34 per cent of the total land available for use. Out of the total operational holding 44.42 per cent (583.59 ha.) was taken up by cultivated holding followed by vegetable cultivation with 33.12 per cent (434.94 ha.) and plantation having 22.44 per cent (294.83 ha.) respectively. The average size cultivated holding was found to be 2.47 hectare. It was lowest in marginal group (1.29 ha) and highest in medium group (3.88 ha). The average area under vegetable cultivation was found to be 2.006 hectare. The average area under vegetable cultivation was found to be lowest in small group (0.90 ha.) and highest in medium group (3.18 ha). Table also reveal that the average area under home streets and animal husbandry to total operational holding. The marginal farmers were having 7.80 per cent of total land under home stead, where as it

was 5.39 per cent and 3.27 per cent respectively for small and medium size farmers. Out of total land available 8.71 per cent, 6.53 per cent and 4.59 per cent were under animal husbandry for marginal, small and medium respectively. Out of the total land available for use 11.58 per cent was kept fallow.

5.1.6 Cropping pattern of samples farmers

The cropping pattern of sample farmers for different size groups is presented in table 5.1.6. Rice was found to be the dominant crop covering 44.36 per cent of the total crop area. It was followed by vegetable cultivation (42.70 per cent) oilseeds (3.83 per cent), maize (3.16 per cent), sugarcane (3.13 per cent), potato (2.87 per cent), ginger (2.57 per cent) and pulses (1.06 per cent) respectively. The average cropping intensity was found to be 174.53 per cent. Cropping intensity was found to be highest with 192.38 per cent in small group and lowest with 163.12 per cent in medium group of farmers in the study area.

5.1.7 Existing live stock pattern of sample farmers

The life stock pattern of the sample farmers across various size groups are presented in table 5.1.7. The sample farmers were found to rear animals or birds such as poultry, pig, rabbit, goat, cow, and fishery. Poultry was found to be the most important bird in terms of number of live stock. (3.96 bird per farm) this was followed by pig (1.76), rabbit (1.60), goat (1.03), cow (0.91), and fishery (0.61) respectively. The important of these live stocks across various size groups was found to be more prevalent in small group of farmers. The result of the live stock asset of sample farmers reveal a picture of a very uneconomic size of live stock among the average size group of farmers.

5.2. Economics of vegetable cultivation under shifting and settled cullivation

In this section, an attempt is made to work out the economics of vegetable cultivation. Attempt was also made on cost and return of vegetable cultivation production across various size groups.

Table 5.1.5. Distribution household sample according to land use pattern across various size groups (in ha)

S N	Size group	Total land available for use	Land under homestead	Land under animal husbandry	Permanent fallow land	Total operational holding	Land under plantation crop	Land under Vegetable cultivation	Cultivated holding	Average area under Vegetable	Av. cultivated holding
1.	Marginal	570.9	44.55 (7.80)	49.75 (8.71)	72.83 (12.75)	403.77 (70.72)	40.77 (10.09)	148.5 (36.77)	214.5 (53.12)	0.9	1.29
2.	Small	563.76	30.44 (5.39)	36.86 (6.53)	64.39 (11.42)	432.07 (76.64)	80.59 (18.65)	168.78 (39.06)	182.7 (42.28)	1.94	2.1
3.	Medium	585.6	19.2 (3.27)	26.88 (4.59)	62 (10.58)	477.52 (81.54)	173.47 (36.32)	117.66 (24.63)	186.39 (39.03)	3.18	
Total		1720.26	94.19 (5.47)	113.49 (6.59)	199.22 (11.58)	1313.36 (76.34)	294.83 (22.44)	434.94 (33.12)	583.59 (44.42)	2.006	2.47

(The figures in parentheses indicates percentage to the total)

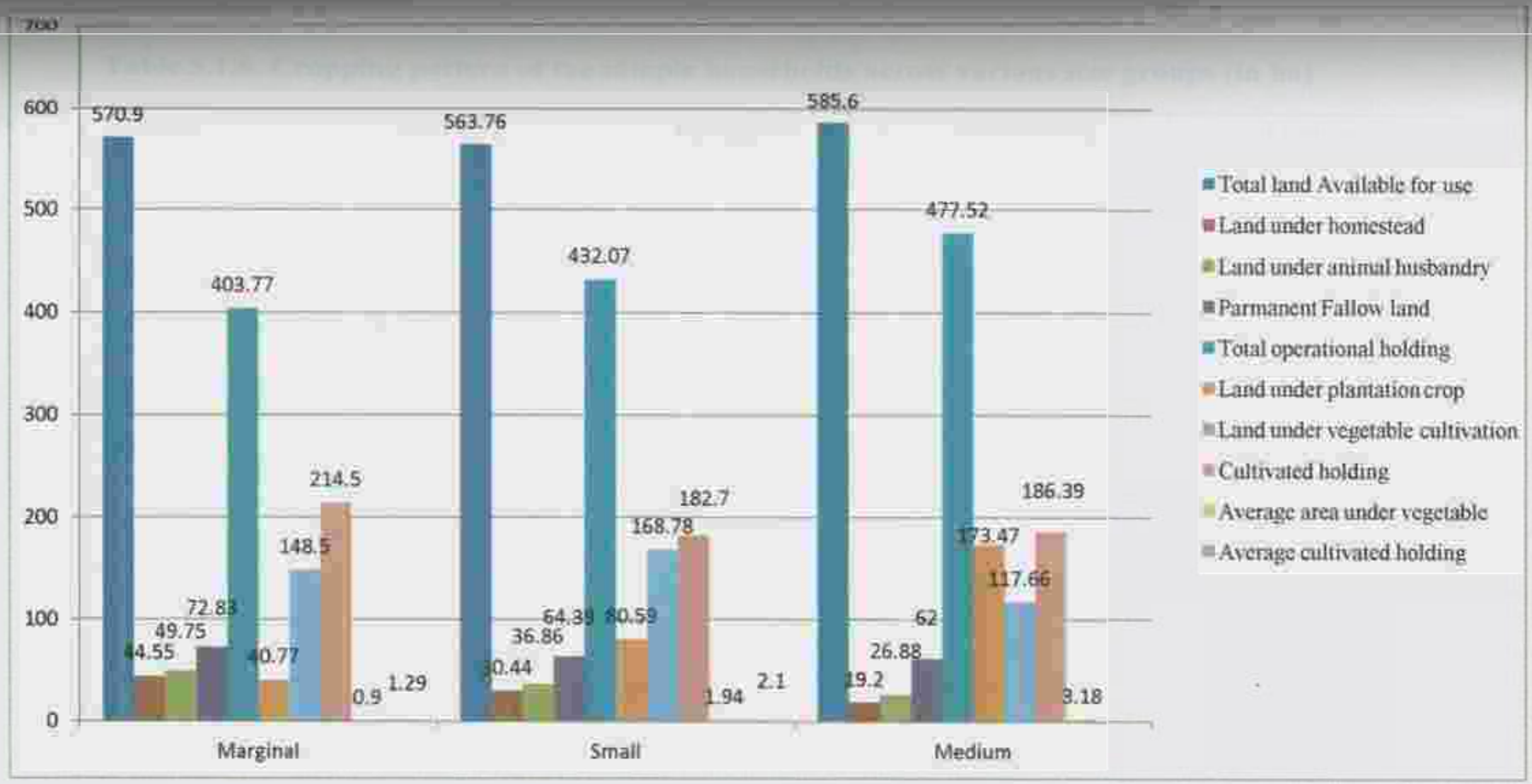


Fig.5.8. Distribution household sample according to land use pattern across various size groups (in ha)

Table 5.1.6. Cropping pattern of the sample households across various size groups (in ha)

S N	Crop	Group I		Group II		Group III		Average	
		Area	Percent	Area	Percent	Area	Percent	Area	Percent
1.	Rice	156	42.99	154.2	43.87	142.39	46.83	150.06	44.36
2.	Vegetables	148.5	40.90	168.78	48.01	117.66	38.69	144.98	42.70
3.	Maize	13.6	3.74	4.1	1.16	14.45	4.75	10.72	3.16
4.	Ginger	7	1.92	5	1.42	14.25	4.68	8.75	2.57
5.	Oilseeds	14.67	4.04	9.1	2.51	15.30	5.03	13.02	3.83
6.	Potato	12.43	3.42	10.3	2.93	6.56	2.15	9.76	2.87
7.	Pulses	3.6	0.99	-	-	-	-	3.6	1.06
8.	Sugarcane	7.2	1.98	-	-	3.44	1.13	10.64	3.13
9.	Gross cropped area	363	100.00	351.48	100.00	304.05	100.00	339.51	100.00
10.	Net cropped area	214.5	-	182.7	-	186.39	-	194.53	-
Cropping intensity		169.23	-	192.38	-	163.12	-	174.53	-

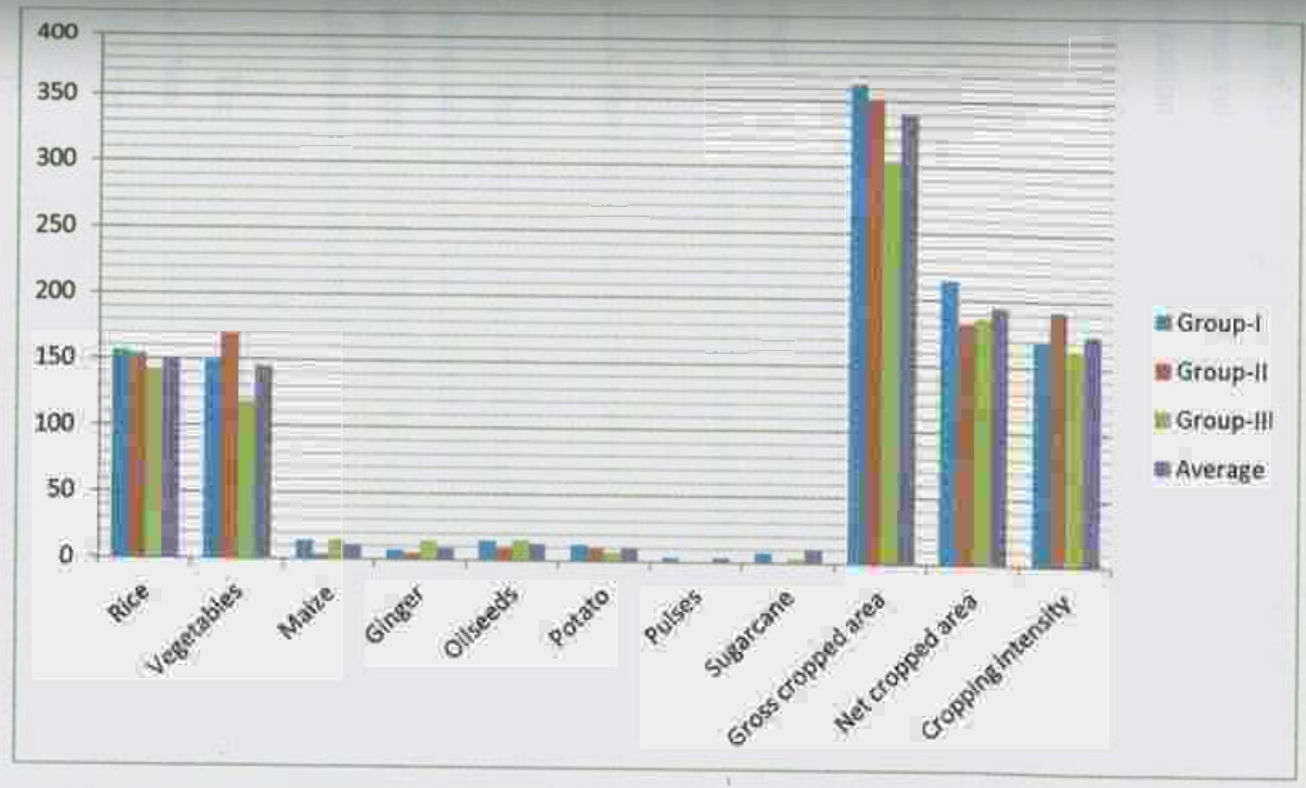


Fig. 5.9. Cropping pattern of the sample households across various size groups (in ha)

The economics of selected vegetable crops computed on per hectare basis under shifting cultivation and settled cultivation is presented in table 5.2.1 and 5.2.2 are discussed below vegetable wise. The cost of production includes the cost of inputs like seeds, human labour. marketing and transportation cost, interest on working capital, rental value of land at the prevailing rate in the study area, deprecation on implements and interest value on owned fixed assists. The estimate of the per hectare total cost of vegetable production under shifting cultivation and settled cultivation on sample farmers is presented in table 5.2.1 and 5.2. 2.

5.2.1. Economics of vegetables cultivation:

The economics of selected vegetables crops computed on per hectare basis is presented in table 5.2.1 and 5.2.2 respectively for shifting cultivation and settled cultivation respectively and discussed below.

5.2.1.1. Economics of Pea cultivation

The cost of cultivation amounted to be Rs. 39927.39 per ha at an average under shifting cultivation. It was higher for medium farmer (Rs. 40597.21 per ha) followed by small farmer (Rs. 40192.21 per ha) and marginal farmer (Rs. 36508.36 per ha). It was higher in medium and small farmer due to increased in hired labour.

The cost of cultivation under settled cultivation came to about Rs. 67407.25 per ha and it was higher in medium farmer (Rs. 76428.68 per ha) followed by small farmer (Rs. 67611.3 per ha) and marginal farmers (Rs. 53395.08 per ha).

The cost of cultivation was found to be higher in settled cultivation on an average due to use of inputs like FYM, plant protection measure and hired labour.

5.2.1.2. Economic of Tomato cultivation

The cost of tomato cultivation amounted to be Rs. 53577.71 per ha on an average under shifting cultivation. It was higher for small farmers (Rs. 54429.38 per ha) followed by medium farmer (Rs. 52800.71 per ha) and marginal farmer and for settled cultivation it comes to about Rs. 94192.48 per ha at an average. Cost of cultivation was found to be higher in medium farmer (Rs. 103832.4 per ha), followed by small farmer (Rs. 97857.79 per ha a) and marginal farmer (Rs. 77987.88 per ha) respectively.

The cost of cultivation was found to be much higher in settled cultivation due to more expenditure on plants protection measures, fertilizers, hired labours and seeds. Resultantly the net returns realized per hectare were also found to be higher in settled cultivation.

5.2.1.3. Economics of Beans cultivation

The cost of cultivation for beans turned out to be Rs. 44568.95 per ha at an average .The cost was found to be lower in medium farmer followed by marginal farmer and was higher in small farmers (Rs. 43424.25 per ha) and for the settled cultivation, the average cost was found to be Rs. 79905.46 per ha. The cost of cultivation was highest in medium farmers (Rs. 90314.53 per ha) followed by small farmers (Rs. 82091.74 per ha) and marginal farmers (Rs. 64410.22 per ha) respectively. The cost of cultivation was high in small and medium farmers due to use of more inputs like seeds, fertilizers etc.

In beans also, the cultivation cost was found to be higher in settled cultivation in compare to shifting cultivation due to use of inputs like fertilizers, seeds and plants protection measures.

Table 5.1.7. Livestock pattern of the sample farmers across various size groups

S N	Size group	No. of household	Chicken		Pig		Rabbit		Goat		Cow		Fishery	
			No	Per farm	No.	Per farm	No.	Per farm	No.	Per farm	No.	Per farm	No.	Per farm
1.	Marginal	165	561	3.4	214.5	1.3	148.5	0.90	99	0.60	69.3	0.42	57.74	0.35
2.	Small	87	304.5	3.5	217.5	2.5	200.1	2.30	87	1	12.8	1.4	87	1
3.	Medium	48	240	5	96	1.5	-	-	72	1.5	-	-	24	0.5
Total		300	1105.5	3.96	528	1.76	348.6	1.60	258	1.03	82.1	0.91	168.74	0.61

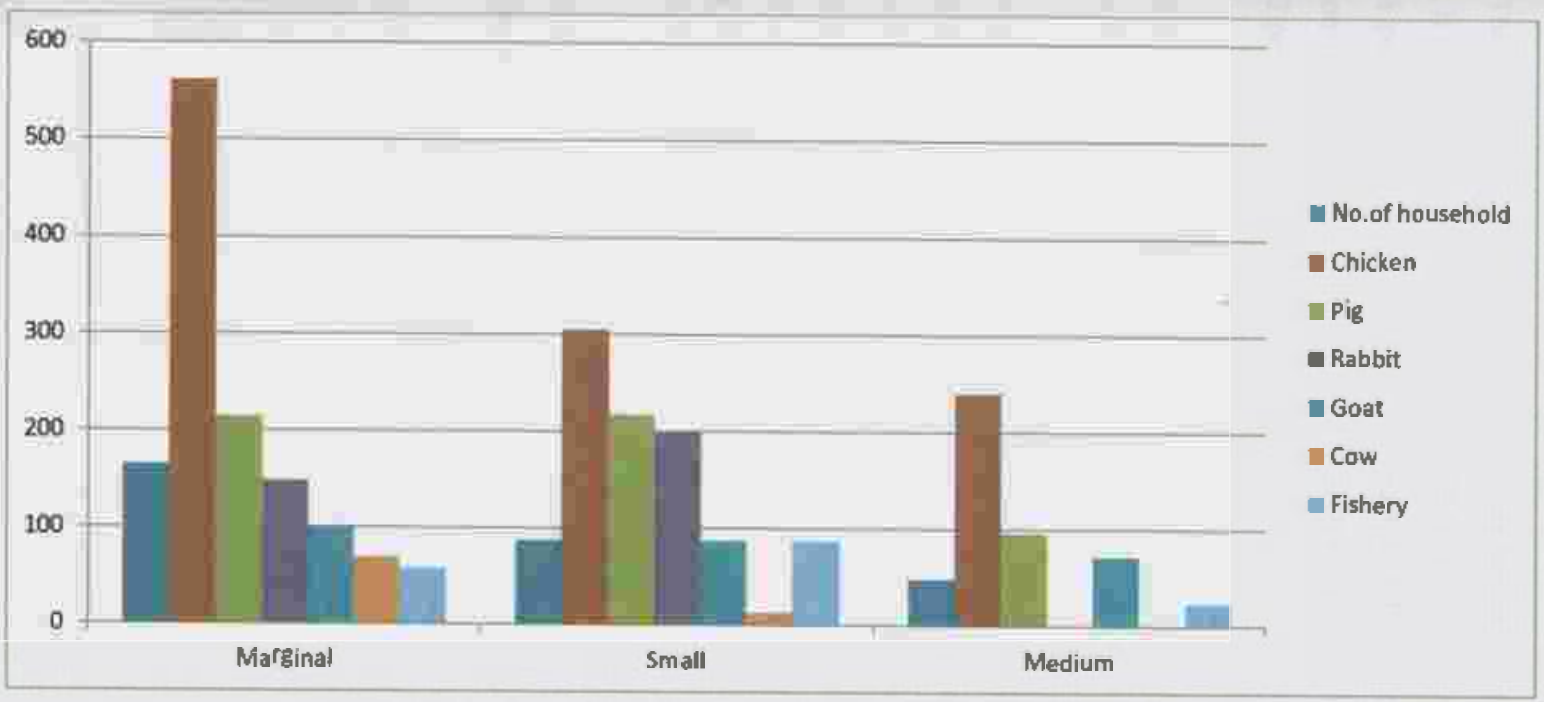


Fig. 5.10. Livestock pattern of the sample farmers across various size groups

5.2.1.4. Economics of Cabbage cultivation

The cost of cultivation for cabbage was found to be Rs. 72948.48 per ha at an average, It was higher in medium farm (Rs. 77590.45 per ha) and lowest in small farm (Rs. 66580.48 per ha) under settled cultivation and for shifting cultivation the average cost of cultivation turned out to be Rs. 42436.15 per ha, It was highest in medium farm (Rs. 43292.62 per ha) and lowest in marginal farm (Rs. 40631.03 per ha).

In case of settled cultivation for cabbage also the cost of cultivation was found to be higher in settled cultivation as compare to shifting cultivation.

The comparative economics of shifting and settled cultivation depicted in table 52.1 and 5.2.2 respectively show the total cost of cultivation and it shows that the total cost of cultivation was found to be higher in settled cultivation as compare to shifting cultivation due to use of more inputs like seeds, fertilizer, Plants protection measure, and vegetables wise the cost of cultivation was highest in tomato followed by beans, cabbage and peas in shifting cultivation and under stilled cultivation it was found to be highest in tomato followed by beans, cabbage and peas.

5.2.2. Cost and return structure of selected vegetables under shifting and settled cultivation in various size groups

Different compounds of cost of production for the selected vegetables crops were estimated and have been presented in table 5.2.3 and 5.2.4 respectively for shifting cultivation and settled cultivation, actual inputs use, crop –wise and farm size has been estimated.

Table 5.2.1 Per hectare Cost of cultivation for different vegetables under shifting cultivation (in Rs).

Items of cost	Peas				Tomato			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Seeds	3770 (10.32)	3699 (9.11)	3466.6 (8.62)	3645.2 (9.12)	10665 (20.56)	11725 (21.54)	12160 (23.02)	12015 (22.42)
FYM	-	2000 (4.92)	1560 (3.88)	1780 (4.40)	3000 (5.78)	3450 (8.33)	3657 (6.92)	3369 (6.28)
Fertilizer	-	-	-					
Plant protection measures	-	300 (0.73)	450 (1.10)	375 (0.93)	-	-	-	-
Stacking materials	--	-	-		1230 (2.37)	1400 (2.57)	1000 (1.89)	1210 (2.25)
Labour i)Haired	7006.5 (19.19)	8619.5 (21.23)	9785 (24.34)	8470.33 (21.21)	8308.5 (16.01)	9930.5 (18.24)	10940.7 (20.72)	9726.56 (18.15)
Deprecation, repair of implements etc.	410.74 (1.12)	662.55 (1.63)	754.55 (1.87)	609.28 (1.52)	358.81 (0.69)	408.45 (0.75)	457.79 (0.86)	424.64 (0.79)

Contd-

Item of cost	Peas				Tomato			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Interest on working capital	671.12 (1.83)	916.86 (2.25)	760.96 (1.8)	892.78 (2.23)	1413.73 (2.72)	1614.83 (2.96)	1692.92 (3.20)	1604.71 (2.99)
Total cost A1	11858.36 (32.48)	16197.91 (39.89)	16777.11 (41.74)	15772.59 (39.50)	24976.04 (48.15)	28528.78 (52.41)	29908.41 (56.64)	28349.92 (52.91)
Cost A2	11858.36 (32.48)	16197.91 (39.89)	16777.11 (41.74)	15772.59 (39.50)	24976.04 (48.15)	28528.78 (52.41)	29908.41 (56.64)	28349.92 (52.91)
Rental value of owned land	1295 (3.54)	1200 (2.95)	1150 (2.86)	1215 (3.04)	1200 (2.31)	1300 (2.30)	1250 (2.36)	1250 (2.33)
Cost B	13153.36 (36.02)	17397.91 (42.85)	17927.11 (44.60)	16987.59 (42.54)	26176.04 (50.46)	29828.78 (54.80)	31158.41 (59.01)	29599.92 (55.24)
Imputed value of family labour	23355 (63.97)	23199.3 (57.14)	22265.1 (55.39)	22939.8 (57.09)	25690.5 (49.53)	24600.6 (45.19)	21642.3 (40.98)	23977.8 (44.75)
Cost C	36508.36 (100.00)	40597.21 (100.00)	40192.21 (100.00)	39927.39 (100.00)3	51866.54 (100.00)	54429.38 (100.00)	52800.71 (100.00)	53577.71 (100.00)

Contd-

Item of cost	Beans				Cabbage			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Seeds	8734.3 (20.75)	9299.9 (21.41)	7296.9 (18.01)	8443.7 (18.9)	2300 (5.66)	1870.89 (4.37)	1765.57 (4.07)	1978.79 (4.66)
FYM	-	-	-	-	2000 (4.92)	2100 (4.90)	2300 (5.31)	2133.3 (5.02)
Fertilizer								
Plant protection measures	-	-	-	-	-	-	-	-
Stacking materials	800 (1.90)	700 (1.61)	560 (1.38)	3086.6 (6.9)	-	-	-	-
Labour i)Haired	7628 (18.12)	7686.5 (17.70)	8153 (20.12)	7822.5 (17.15)	7997.5 (19.68)	8317.9 (19.44)	8619.5 (19.90)	8311.63 (19.58)
Deprecation, repair of implements etc.	474.34 (1.12)	508.27 (1.17)	558.98 (1.38)	526.85 (1.18)	670.65 (1.65)	641.43 (1.49)	543.54 (1.25)	618.54 (1.45)

Contd-

Item of cost	Beans				Cabbage			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Interest on working capital	1041.81 (2.47)	1091.68 (2.51)	994.13 (2.4)	1192.77 (2.67)	778.08 (1.91)	775.81 (1.81)	793.71 (1.83)	982.53 (2.31)
Total cost A1	18678.45 (44.37)	19286.35 (44.41)	17563.01 (43.35)	21072.42 (47.28)	13746.23 (33.83)	13706.03 (32.08)	14022.32 (32.38)	14024.79 (33.04)
Cost A2	18678.45	19286.35	17563.01	21072.42	13746.23	13706.03	14022.32	14024.79
Rental value of owned land	1300 (3.08)	1250 (2.87)	1300 (3.20)	1283.33 (2.87)	1350 (3.30)	1400 (3.27)	1400 (3.20)	1383.33 (3.20)
Cost B	19978.45 (47.46)	20536.35 (47.29)	18863.01 (46.56)	22355.75 (50.15)	15096.23 (37.15)	15106.03 (35.30)	15422.32 (35.62)	15408.12 (36.60)
Imputed value of family labour	22109.4 (52.53)	22887.9 (52.70)	21642.3 (53.43)	22213.2 (49.84)	25534.8 (62.84)	27679 (64.69)	27870.3 (64.37)	27028.03 (63.69)
Cost C	42087.85 (100.00)	43424.25 (100.00)	40505.31 (100.00)	44568.95 (100.00)	40631.03 (100.00)	42785.03 (100.00)	43292.62 (100.00)	42436.15 (100.00)

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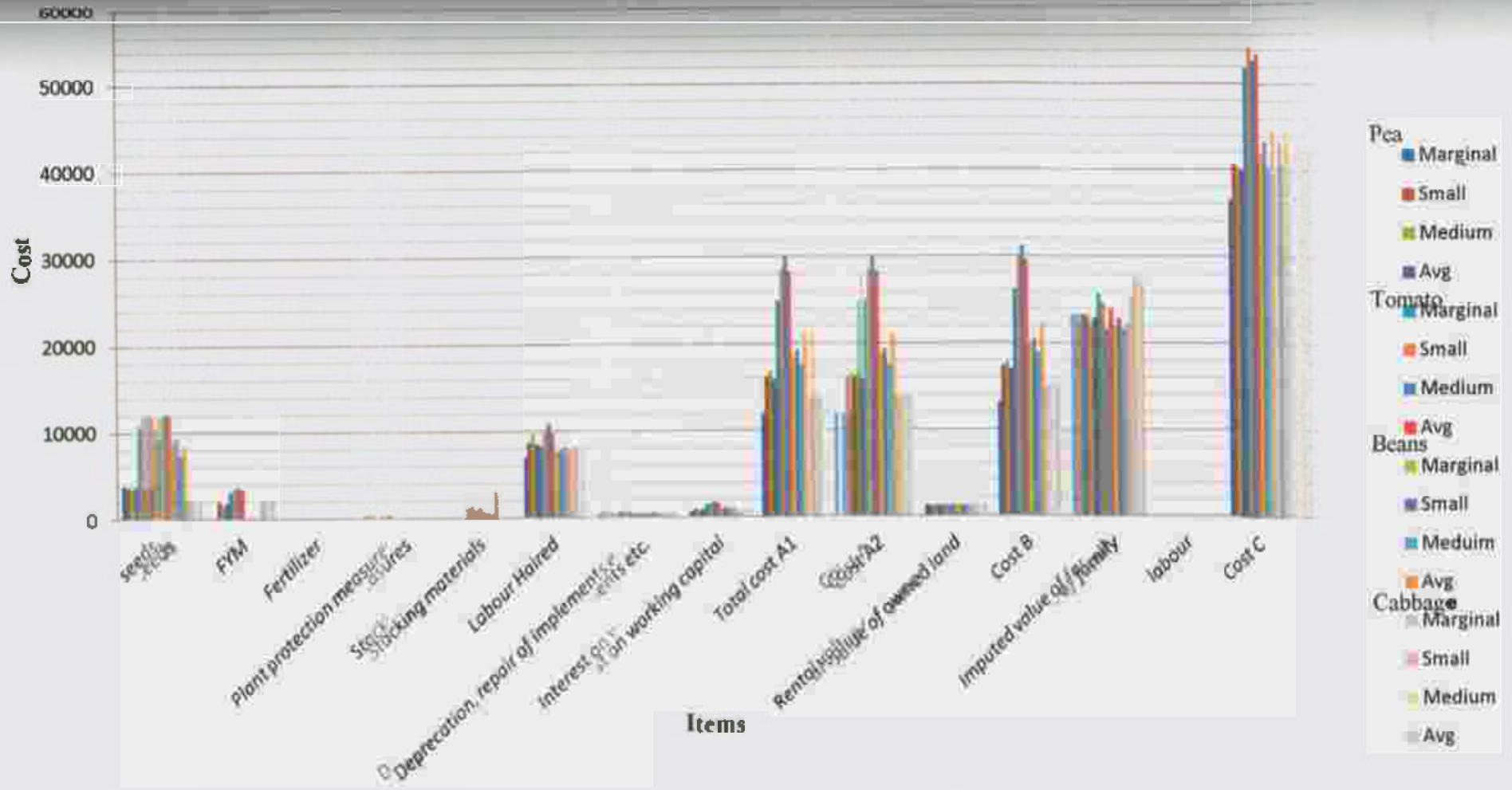

Fig. 5.11.1. Cost of cultivation of different vegetables under shifting cultivation (in Rs).

Table 5.2.2. Per hectare Cost of cultivation structure for different vegetables under settled cultivation (in Rs.)

Items of cost	Peas				Tomato			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Seeds	5660 (10.60)	6550 (9.68)	7392 (9.67)	6534 (9.69)	18559 (23.79)	18701 (19.1)	18218 (17.54)	18492.67 (19.63)
FYM	-	2000 (2.95)	1560 (2.04)	1780 (2.64)	3000 (3.85)	3450 (3.52)	3657 (3.52)	3369 (3.57)
Fertilizer	2100 (3.93)	6500.25 (9.61)	8400.32 (10.99)	5666.857 (8.40)	1200 (1.54)	9456.78 (9.66)	12208.90 (11.78)	7621.89 (8.09)
Plant protection measures	678.4 (1.27)	1345.98 ((1.9)	2000 (2.62)	1341.46 (1.99)	1228.75 (1.57)	2566.6 (2.62)	3276.6 (3.15)	2357.31 (2.50)
Stacking materials	--	-	-					
Labour i)Hired	6000 (11.23)	6750 (9.98)	9250 (12.10)	7333.33 (10.87)	9250 (11.86)	12500 (12.77)	13250 (12.76)	11666.67 (12.38)
Deprecation, repair of implements etc.	910.74 (1.70)	1062.55 (1.57)	1094.55 (1.43)	1022.66 (1.51)	358.81 (0.46)	408.45 (0.41)	457.79 (0.44)	408.35 (0.43)

Contd

Item of cost	Peas				Tomato			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Interest on working capital	920.94 (1.72)	1452.52 (2.14)	1781.81 (2.33)	1420.69 (2.10)	2015.79 (2.58)	2824.96 (2.88)	3064.09 (2.95)	2634.95 (2.79)
Total cost A1	16270.08 (30.47)	25661.3 (37.95)	31478.68 (41.18)	25098.95 (37.23)	35612.35 (45.66)	49907.79 (51.00)	54132.38 (52.13)	46550.84 (49.42)
Cost A2	16270.08 (30.47)	27961.3 (37.95)	34978.68 (45.76)	27998.95 (41.53)	35612.35 (45.66)	52207.79 (53.35)	57632.38 (55.50)	49450.84 (52.49)
Rental value of owned land	3375 (6.30)	3400 (5.05)	3450 (4.51)	3408.3 (5.05)	3375 (4.32)	3400 (3.47)	3450 (3.32)	3408.3 (3.61)
Cost B	19645.08 (36.79)	31361.3 (46.38)	38428.68 (50.28)	31407.25 (46.59)	38987.35 (49.99)	55607.79 (56.82)	61082.38 (58.82)	52859.14 (56.11)
Imputed value of family labour	33750 (63.20)	36250 (53.61)	38000 (49.71)	36000 (53.90)	39000 (50.01)	42250 (43.17)	42750 (41.17)	41333.33 (43.88)
Cost C	53395.08 (100.00)	67611.3 (100.00)	76428.68 (100.00)	67407.25 (100.00)	77987.35 (100.00)	97857.79 (100.00)	103832.4 (100.00)	94192.48 (100.00)

Contd

Item of cost	Beans				Cabbage			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Seeds	10200 (15.83)	15540 (18.93)	16299 (18.04)	14013 (17.53)	7447 (11.18)	7899 (11.00)	8109 (10.45)	7818.33 (10.72)
FYM	-	-	-	-	2000 (3.00)	2100 (2.92)	2300 (2.96)	2133.3 (2.92)
Fertilizer	2345.89 (3.64)	7343 (8.94)	7251 (8.02)	5646.63 (7.06)	6894 (10.35)	7175 (9.99)	7251 (9.34)	7106.66 (9.74)
Plant protection measure	525.45 (00.81)	1000 (1.20)	1500 (1.66)	1008.48 (1.26)	898.81 (1.35)	942.31 (1.31)	1774.25 (2.28)	1205.12 (1.65)
Stacking material	4000 (6.21)	4500 (5.48)	6000 (6.64)	4833.33 (6.04)	-	-	-	-
labour hired	6780 (10.52)	9450 (11.51)	12340 (13.66)	9523.33 (11.91)	6250 (9.38)	7250 (10.10)	9000 (11.59)	7500 (10.28)
Deprecation, repair of implements etc	474.34 (0.65)	508.27 (0.61)	585.98 (0.64)	522.86 (0.65)	760.65 (1.14)	883.43 (1.2)	943.54 (1.22)	862.54 (1.18)

Contd

Item of cost	Beans				Cabbage			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Interest on working capital	1459.54 (2.26)	2300.47 (2.80)	2638.55 (2.92)	2132.85 (2.66)	1455.02 (2.18)	1574.98 (2.19)	1762.66 (2.27)	1597.55 (2.19)
Total cost A1	25785.22 (40.03)	40641.74 (49.50)	46614.53 (51.61)	37680.49 (47.15)	25705.48 (38.60)	27824.72 (38.76)	31140.45 (40.13)	28223.51 (38.68)
Cost A2	25785.22 (40.03)	42941.74 (52.30)	50114.53 (55.48)	40580.49 (50.78)	25705.48 (38.60)	30124.72 (41.97)	34640.45 (44.64)	31123.51 (42.66)
Rental value of owned land	3375 (5.23)	3400 (4.14)	3450 (3.81)	3408.3 (4.26)	3375 (5.06)	3400 (4.73)	3450 (4.44)	3408.3 (4.67)
Cost B	29160.22 (45.27)	46341.74 (56.45)	53564.53 (59.30)	43988.79 (55.05)	29080.48 (43.67)	33524.72 (46.70)	38090.45 (49.09)	34531.81 (47.33)
Imputed value of family labour	35250 (54.72)	35750 (43.54)	36750 (40.69)	35916.67 (44.94)	37500 (56.32)	38250 (53.29)	39500 (50.90)	38416.67 (52.66)
Cost c	64410.22 (100.00)	82091.74 (100.00)	90314.53 (100.00)	79905.46 (100.00)	66580.48 (100.00)	71774.72 (100.00)	77590.45 (100.00)	72948.48 (100.00)

(Figure in the parentheses indicate percentage to the total)

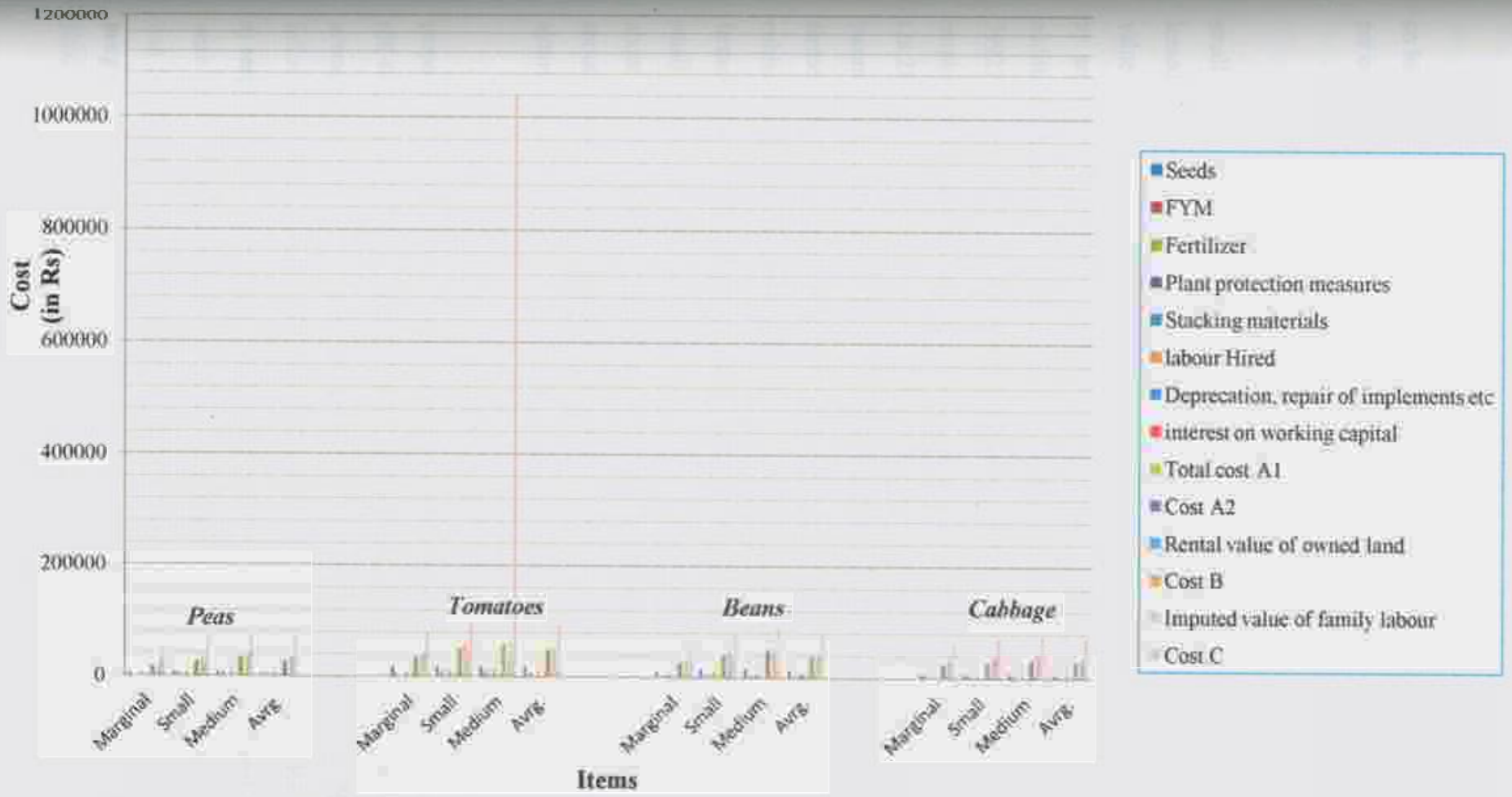

Fig. 5.12. Per hectare Cost of cultivation structure for different vegetables under settled cultivation (in Rs.)

5.2.2.1. Cost and return structure of Peas

The overall cost of pea production turned out to be Rs. 39927.21 /ha. Expenditure on hired labour accounted for a major proportion (16.01 per cent) followed by seeds (9.12 per cent) and FYM (4.4 per cent).

The cost of hired human labour was more on medium farmer (24.34 per cent) than small and marginal farmers in shifting cultivation. Cost A_2 which included the rent on leased-in land was nil or negligible in shifting cultivation. Cost B which include the rental value of owned land was found to be highest in marginal farmers (3.54 per cent) followed by small (2.95 per cent) and medium farmers (2.86 per cent). The cost C give the additional impression of the inputs cost of the family labour which amounted to Rs. 39927.30 per ha. This also indicated that vegetables cultivated could generate sufficient employment. The average yield was 26.06 t per ha. Yield was highest in marginal farmers (28.28 t/ha) followed by small (25.53 t/ha) and medium farmers (24.39 t/ha). The gross income for pea comes to about Rs. 104240 per ha at an average. It was highest in marginal farmers followed by medium and small farmers. The net return for pea under shifting cultivation at an average was Rs. 64312.6 per ha. The net return was highest in Marginal farmers (Rs. 73076.64 per ha) followed by medium farmers (Rs. 70562.79 per ha) and small farmers (Rs. 58331.54 per ha) and the net return per quintal at an average came to about Rs. 2467.86. Average BC ratio for pea cultivation under shifting cultivation came to about 1: 2 and it was highest in marginal farmers (1:3) and for small and medium it was almost equal (1: 2).

In settled cultivation, investment on hired human labour accounts for highest proportion (10.87 per cent) at an average followed by seeds (09.69 per cent) and fertilizers (08.40 per cent). The total cost of cultivation i.e cost C was Rs. 67407.68 per ha at an average. Cost of cultivation was highest in Medium farmers (Rs. 76428.68 per ha) followed by small farmers (Rs. 67611.3 per ha) and marginal farmers (Rs. 53395.08 per ha a) respectively. The average yield per hectare for marginal, small and medium farmers were 63.38 q/ha, 65.34 q/ha and 67.45 q/ha respectively and the average yield for all farm was 58.38 q/ha. The average price per q for all farms was Rs. 2170. It was highest in marginal farmer (Rs. 2300 /q) followed by small (Rs. 2212 /q) and medium farmers (Rs. 2000/q). The gross income for all farms was Rs. 126684.6 per ha. It was highest in

marginal farmers (Rs. 145774 per ha) and lowest in medium farmers (Rs. 134900 per ha). The average net income for all farm was Rs.59277.35 per ha. The highest net income was observed in marginal farmers (Rs. 92378.92 per ha) followed by small (Rs. 76920.80 per ha) and medium farmers (Rs. 58471.32 per ha). The BC ratio on paid out cost was 1:5 at an average. It was highest in marginal farmers (1:8) followed by small (1:5) medium farmers (1:4) and BC ratio on total cost was 1: 2 for marginal and small farmer and 1: 1 for medium farmer. The average BC ratio on total cost was 1:1.

The study shows that the cost of cultivation was highest in settled cultivation as compared to shifting cultivation. In both cases expenditure on hired human labour was observed to be highest which was followed by seed. In shifting cultivation it was observed that use of fertilizers and chemicals was almost negligible. The comparative study shows that the return from cultivation of pea was more in shifting cultivation (Rs. 64312.6 per ha) than in settled cultivation (Rs. 59277.35 per ha).

5.2.2.2. Cost and Return Structure of Tomato

The overall total cost on tomato production turned out to be Rs. 53577.71 per ha. Expenditure on seeds accounted for a major proportion (22.42 per cent) of the cost followed by cost on hired human labour (18.85 per cent) and FYM (6.28 per cent). The cost of hired human labour was more on medium farmers (20.72 per cent) followed by small farmers (18.24 per cent) and marginal farmers (16.01 per cent). Labour was generally hired during the time of transplanting and intereultural operation. The cost A_2 which include the lease in land came out to be Rs. 28349.92 per hectare at an average. The cost Band C gives and additional impression of the rental value of owed land and imputed value of family labour which amounted to Rs. 53977.71 per ha at an average under shifting cultivation. This also indicated that vegetables cultivation is intensive and could generate sufficient employment in the rural area. The gross income for tomato cultivation at an average comes to about Rs. 292282.51 per ha and the return over cost C turned out to be Rs.238674.48 per ha at an average. The net return over cost C was highest in marginal farmers (Rs. 257133.46 per ha) and lowest in medium farmers (Rs. 222969.29 per ha). The B:C ratio on total cost comes to about 1:5.45 at an average. It shows that tomato cultivation is quite profitable and can be taken up for cultivation.

The comparative cost of vegetables cultivation under settled cultivation is given in Table 5.2.3. Its shows that the cost of cultivation is much higher in settled cultivation. Cost of cultivation for tomato at an average was Rs. 103611.72 per Hectare. Expenditure on seeds accounted to 19.65 per cent followed by hired human labour (12. 38 per cent) and fertilizer (8.09 per cent) at an average. The average yield per hectare for tomato was 98.70q and average price for tomato was Rs.3061.67 per hectare. The gross income from tomato cultivation comes to about Rs. 302186.82 per hectare at an average. The net return from tomato cultivation comes to Rs. 207994.30 per ha, in medium farmers it was Rs. 272550 per ha followed by marginal farmers Rs. 255262.7 per ha. BCR on total cost at an average came to 1:32 under settled cultivation.

The comparative cost and return between shifting and settled cultivation shows that the cost of cultivation was much higher in settled cultivation (Rs.103611.72 per ha) then shifting cultivation (Rs. 53577.71 per ha). The comparative study shows that tomato cuhivation is quite profitable in shifting cultivation than in settled cultivation. It is mainly due to income from hired labour were more expensive than seeds, FYM and plant production measures in settled cultivation.

5.2.2.3. Cost and Return Structure of Beans

In beans also cost and investment on seeds constitute the highest proportion (18.9 per cent) at an average under shifting cultivation. It was followed by hired human labour (17.55 per cent) and FYM (6.9 per cent). The cost of cultivation was highest for small farmers Rs. 43424.25 per ha then marginal farmers Rs. 42087.87 per ha and medium farmers Rs. 40505.31 per ha. The lower cost of cultivation for medium and marginal farmer was due to efficient use of resources. The net return over cost C was about Rs. 131432.15 per ha at an average. The net return was highest in small farmers Rs. 155266 per ha and lowest in medium farmers Rs. 133702.12 per ha. The average yield per quintal for all farm was 55.64q per ha. Yield was highest in marginal farmers (58.80q/ha) followed by small farmer (54.65q/ha) and medium farmer (52.45q/ha). The gross income for all farms at an average was Rs.176001.1 per ha and the net return at an average came to about Rs. 131432.12 per ha. Net income was observed to be highest in small farmers Rs. 155266

per ha and was lowest in medium farmers Rs. 133702.12 per ha. Farm labour income for beans at an average was Rs. 153645.35 per ha, it shows that cultivation of beans is a labour intensive. The BCR on total cost came to about 1:3 at an average. The BCR on total cost for small, marginal and medium farmers was 1: 4.2, 1: 4.06 and 1: 4.3 respectively.

In case of settled cultivation the cost for beans at an average came to about Rs. 79905.46 per hectare. Cost on seed (17.53 per cent) was the highest followed by hired human labour (11.91 per cent) and fertilizers (7.06 per cent). The average yield per quintal for settled cultivation was 68.09, it was highest in medium farmers (74.72q/ha) followed by small farmer (72.75q/ha) and marginal farmer (71.80q/ha) respectively. The net return over cost C came to about Rs. 165785.70 per ha. The net return was highest in marginal farmers (Rs. 288689.80 per ha) and lowest in medium farmers (Rs. 143185.50 per ha). The farm business income per ha for marginal, small and medium farmers was Rs. 297314.80, Rs. 192158.30 and Rs. 186885.50 respectively and the average was Rs. 208010.70 per ha. The BCR on total cost at an average came to about 1:3, BCR on total cost for marginal, small and medium farmers was 1:5.01, 1: 2.83 and 1: 2.58 respectively.

The comparative economic shows that cost of cultivation was high in settled cultivation than shifting cultivation, but the yield is higher in settled cultivation, the return from both the cultivation is quite similar and it is also quite profitable in both the cultivation.

5.2.2.4. Cost and Return Structure of Cabbage

The cost of seeds accounted for 10.72 per cent of the total cost followed by hired labour (10.28 per cent) and FYM (9.74 per cent) at an average under settled cultivation. Cost A_1 for cabbage at an average was Rs. 28223.51 per ha. Cost B which includes the rental value of owned land came to about Rs. 34531.81 per ha at an average. Cost B was highest in medium farmers (Rs. 38090.45 per ha) followed by small farmer (Rs. 33524.72 per ha) and marginal farmer (Rs. 29080.48 per ha) respectively. The imputed value of family labour was highest in medium farmer (Rs. 39500.00 per ha) and lowest in marginal farmer (Rs. 37500 per ha) respectively. The total cost i.e cost C was higher in medium farmers (Rs. 77590.45 per ha) as compared to small (Rs. 71774.72 per ha) and marginal farmers (Rs. 66580.48 per ha) respectively. The average yield per quintal was 115.5 q/ha.

Table 5.2.3 Per Hectare yield, cost and return of various vegetables across size group in shifting cultivation (in Rs).

Particulars	Peas				Tomato			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Average yield (q)	28.28	25.53	24.39	26.06	257.5	243.7	239.8	247
Average price (per q)	3875	3875	4250	4000	1200	1200	1150	1183.33
Gross income per hectare	109585	98928.75	110755	104240	309000	292440	275770	292287.51
Net Income	73076.64	58331.54	70562.79	64312.6	257133.46	238010.62	222969.29	238674.48
Net returns (Rs/q)	2584.03	2284.82	2893.10	2467.86	1758.57	1921.65	1957.81	1874.47

Contd

Particulars	Peas				Tomato			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Farm business income	97726.44	82730.84	93977.89	88467.41	284023.46	263911.22	245861.59	210324.56
Farm labour income	96431.64	81530.84	92827.89	87252.41	282823.96	262611.22	244611.59	262682.59
Farm investment income	74371.64	59531.54	71712.79	65527.6	259747.19	240925.45	225912.21	242194.95
B:C Ratio on paid out cost	1:9	1:6	1:6	1:6	1:12.37	1:10.25	1:9.22	1:10.30
B:C Ratio on total cost	1:3	1:2.43	1:2.75	1:2.61	1:5.90	1:5.37	1:5.22	1:5.45

Contd.

Particulars	Beans				Cabbage			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Average yield (q)	58.80	54.65	52.45	55.64	85.6	82.3	78.17	82.02
Average price (per q)	3012	3245	3321.4	3192.8	1523.1	1632.4	1689.7	1615.067
Gross income per hectare	177105.6	176690.25	174207.43	176001.1	130377.36	134346.52	132083.85	132467.79
Net Income	135017.75	155266	133702.12	131432.15	89746.33	91561.49	88791.23	90031.63
Net returns (Rs/q)	2296.22	2841.09	2549.13	2362.18	1048.43	1112.53	1135.87	1097.67

Contd.

Particulars	Beans				Cabbage			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Farm business income	158427.15	157403.9	156644.42	154928.68	116671.33	120640.49	118061.53	118443
Farm labour income	1757127.15	153671.08	155344.42	153645.35	115281.13	119240.49	116661.53	117059.67
Farm investment income	1300	156516	135002.1	132715.5	91096.33	92961.49	90191.23	91414.96
B:C Ratio on paid out cost	1:9.48	1:9.16	1:9.91	1:9.50	1:9.48	1:9.80	1:9.41	1:9.44
B:C Ratio on total cost	1:4.2	1:4.06	1:4.3	1:3.94	1:3.2	1:3.1	1:3.05	1:3.12

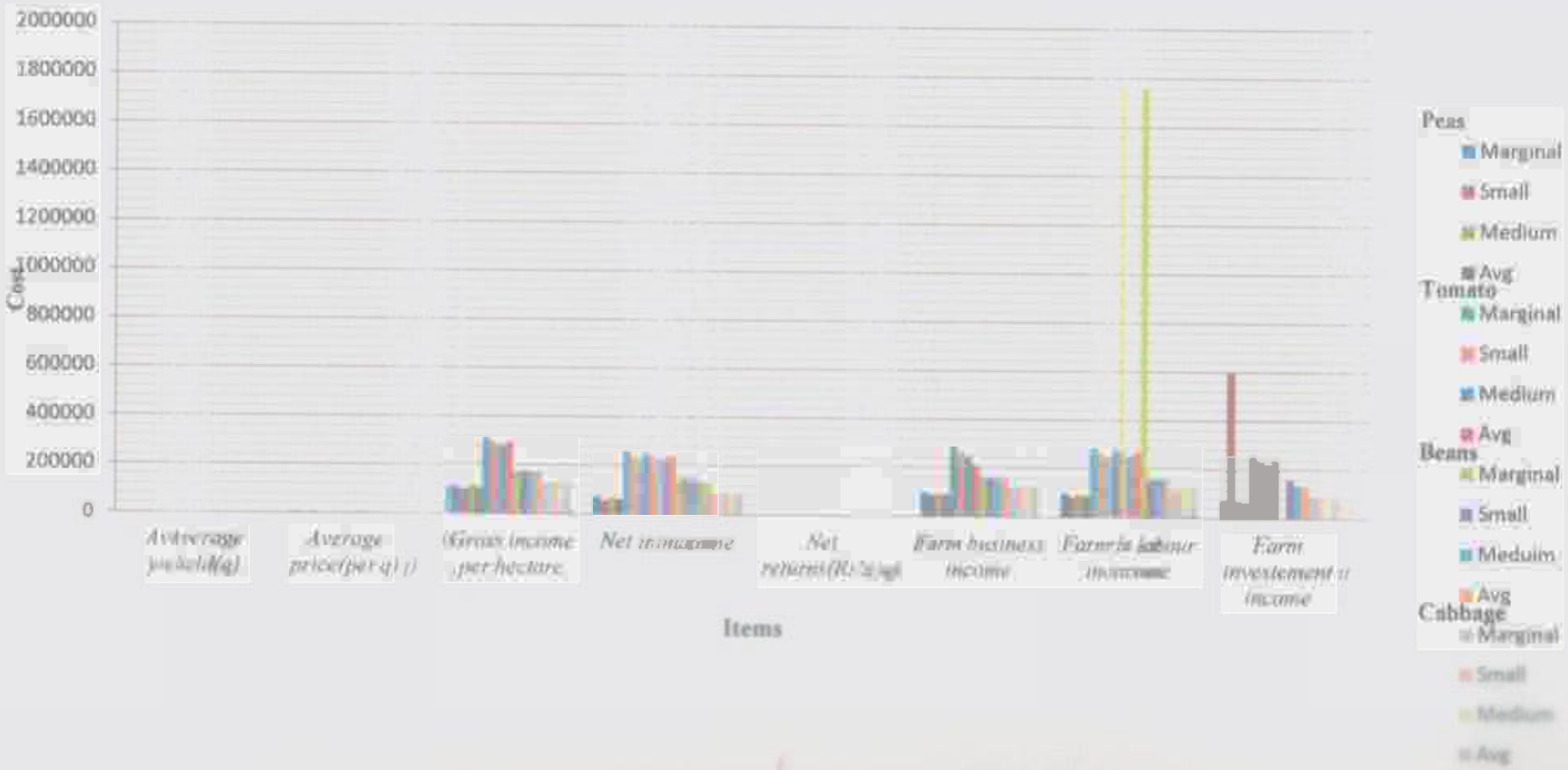

Fig. 5.3.13. Per hectare yield, cost and return of various vegetables across size groups in shifting cultivation (in Rs).

Table 5.2.4 Per hectare yield, cost and return of various vegetables across size group Under settled cultivation (in Rs.)

Particulars	Peas				Tomato			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Average yield (q)	63.38	65.34	67.45	58.38	107.5	114.8	123.81	98.70
Average price (per q)	2300	2212	2000	2170	3100	3045	3040	3061.67
Gross income per hectare	145774	144532.08	134900	126684.6	333250	349566	376382.4	302186.82
Net Income	92378.92	76920.8	58471.32	59277.35	255262.7	251708.2	272550	207994.3
Farm business income	129503.9	118870.8	103421.3	101585.7	297637.7	299658.2	322250	255636
Family labour income	126128.9	113170.8	96471.32	95277.35	294262.7	293958.2	315300	249327.7
Farm investment income	95753.92	80320.8	61921.32	62685.65	258637.7	255108.2	276000	211402.6
BCR on paid out cost	1:8.91	1:5.63	1:4.28	1:5.04	1:9.35	1:7	1:6.95	1:6.49
BCR on total cost	1:2.73	1:2.13	1:1.76	1:1.87	1:4.27	1:3.57	1:3.62	1:3.2

contd

Particulars	Beans				Cabbage			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Average yield	71.80	72.75	74.72	68.09	122.3	124.3	128.9	115.5
Average price (per Q)	4500	3200	3125	3608.33	1660	1500	1652	1604
Gross income per hectare	323100	232800	233500	245691.18	203018	186450	212942.8	200803.6
Net income	258689.8	150708.3	143185.5	165785.7	136437.5	114675.3	135352.4	127855.1
Farm business income	297314.8	192158.3	186885.5	208010.7	177312.5	158625.3	181802.4	172580.1
Family labour income	293939.8	186458.3	179935.5	201702.4	173937.5	152925.3	174852.4	166271.8
Farm investment income	262064.8	154108.3	146635.5	169194	139812.5	118075.3	138802.4	131263.4
BCR on paid out coast	1:12.5	1:5.78	1:5	1:6.52	1:7.8	1:6.7	1:6.8	1:7.1
BCR on total coast	1:5.01	1:2.83	1:2.58	1:3.07	1:3.04	1:2.59	1:2.74	1:2.75

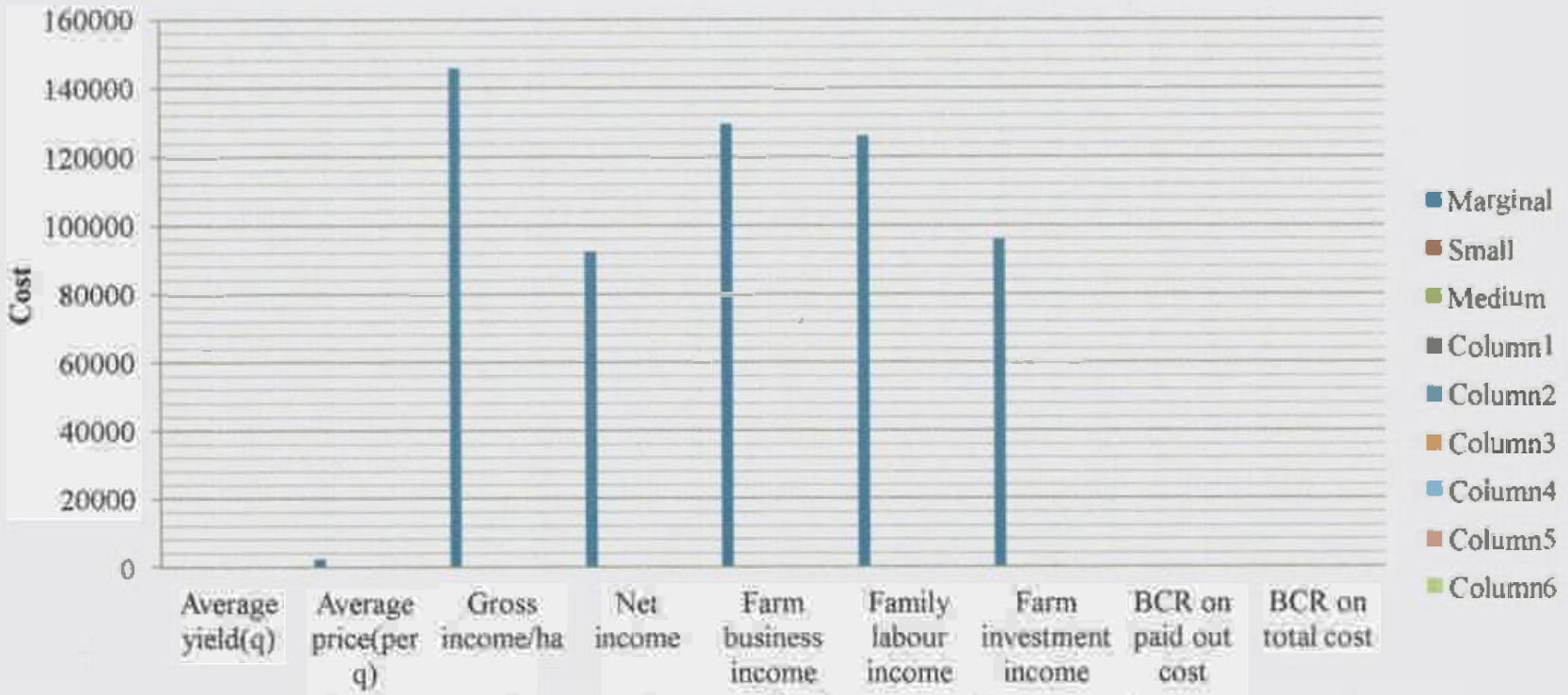

Fig. 5. 14. Per hectare yield, cost and return of various vegetables across size group in settled cultivation (in Rs).

It was highest in medium farmers (128.90q/ha) and lowest in marginal farmers (122.30q/ha). The gross income at an average came to about Rs. 200803.60 per ha. It was highest in medium farmers (Rs. 212942.80 per ha) and lowest in small farmer (Rs. 186450.00/ha) and for marginal farmer it was Rs. 203018.00 per ha. The net return over cost C at an average was Rs. 1278551.1 per ha. The net return was higher in marginal farmers (Rs. 136437.5 per ha) and the BCR on total cost at an average was 1:2.75 under settled cultivation and for marginal farmer, small farmer and medium farmer it was 1: 3.04, 1:2.59 and 1: 2.74 respectively.

While for shifting cultivation the cost of production over cost C came to about Rs. 42436.15 per hectare at an average. Expenditure on hired human labour came to about (19.58 per cent) followed by FYM (5.02 per cent) and seeds (4.66 per cent). The labour cost was shown to be highest in shifting cultivation. The gross income at an average was Rs. 132467.79 per ha and the net return over cost C came to an about Rs. 40031.63 per ha at an average. It was highest in small farmers (Rs. 91561.49 per ha) and lowest in medium farmer (Rs. 88791.23 per ha). The BCR on total cost was 1:3.12 at an average. The BCR on total cost for marginal farmer was 1: 3.2, for small farmer it was 1:3.1 and 1: 3.05 for medium farmer respectively.

The comparative cost and return shows the yield per ha was more or high in settled cultivation (115.5 q/ha) then shifting cultivation (82.02 q/lla) at an average. The cost of cultivation was also more in settled cultivation. The study has revealed that cost A_2 was highest in tomato in both the cases and lowest for cabbage in shifting cultivation and was lowest in peas in settled cultivation. The similar result was obtained in study conducted in the district of Himachal Pradesh and Brij Bala et al (2007-08)

A very small difference was registered between cost A and cost A_2, which implied that the leasing in and leasing out of land was practiced at small scale and it was almost nil or negligible in shifting cultivation.

A considerable high jump was seen in cost B to cost C in all the crops in both cases i.e shifting cultivation and settled cultivation which indicated that the vegetable production is a labour intensive venture. Similar result was reported by Kumar (1999) and also by Sharma et. al (2004).

The gross return as well the net return over cost C was maximum for tomato and minimum for peas. Thakur (1994) has also reported that the total cost as well as the marginal was highest for tomato in both the cases. However the average yield per q was high for all vegetables in settled cultivation than shifting cultivation but the BC ratio was high in shifting cultivation as compared to settled cultivation due to high cost of cultivation in settled cultivation.

5.3. Marketing Channels of vegetables under shifting and settled cultivation

Marketing channels are the paths through which goods are movedfrom the hands of producers to the hands of ultimate consumers. It involves various middlemen who facilitate the flow of goods and services from the producers to the consumers. The length of channels varies from commodity to commodity and depends on the quantity to be moved, the nature and degree of specialization in production.

In the marketing of vegetables in Wokha and Dimapur district, three channels were found to be in operations which are represented in Fig 5.25.1, 5.25.2, 5.25.3, 5.25.4, 5.25.5, 5.25.6, 5.25.7 and 5.25.8. respectively.

Channel I. Producers → Consumers

Channel II. Producers → Village traders → Consumers

Channel III. Producers → Village traders → Retailers → consumers.

Channel I

Under this channel. 12.45 per cent of pea, 20.70 per cent of tomato, 21.99 per cent of beans and 20. 48 per cent of cabbage was transacted respectively. Through these channel marginal farmers transect 14.15, 31.51, 49.75 and 47.72 per cent of their produce and small farmers transect 12.78, 14.26, 7.33 and 4.57 per cent of their produce respectively. Medium farmers usually transact less through this channel and the amount they transacted through these channel were 9.45, 16.34, 8.89 and 9.16 per cent respectively. This was the most effective channel for marginal for cabbage and beans. Majority of the marginal farmers having less marketable surplus disposed their produce

through these channel but for small and medium farmers they prefer to sell their produce through channel II and Channel III. Here in these channel the producers sold their produce directly to consumers.

Under settled cultivation, in channel I 33.47, 17.93, 34.34 and 37.51 of pea, tomato, bean and cabbage were disposed respectively. Channel I was the most effective channel for marginal farmers where they disposed 58.76, 28.98, 72.34 and 43.74 percent of their produce and it's the less effective channel for medium farmers 16.30, 12.39, 11.73 and 20.56 of their products were sold respectively.

Channel II

These is the most predominance channel for Pea and Tomato, through which 47.59 and 41.33 per cent of the produce are disposed and it's the second most important channel for beans and cabbage and through these channel 37.94 and 31.56 per cent of the produce are disposed. The marginal farmers disposed 47.78, 67.85, 29.09 and 32.16 per cent respectively for pea, tomato, beans and cabbage. Small farmers disposed 64.96, 32.98, 36.71 and 39.98 per cent of pea, tomato, beans and cabbage and medium farmer 30.03, 23.16, 48.08 and 22.56 per cent of their produce respectively. This is the most effective channel, where farmers sell their produce to village traders and from village traders to consumers.

In settled cultivation this is the most important channel where 36.79 (pea), 49.09 (tomato), 37.80 (Bean) and 38.73 (cabbage) percent of the produce are transacted through these channel. The channel followed is producer to Village trader and to consumer. Through these channel marginal farmers transect 25.81 per cent pea, 47.58 per cent tomato, 22.60 per cent beans and 29.58 per cent of cabbage and medium farmers transact 36.68 per cent (pea), 33.68 per cent (tomato), 23.54 per cent (bean) and 39.50 per cent (cabbage) respectively.

Table 5.3.1 Effectiveness of various marketing channel for vegetables under shifting cultivation according to different size groups.

Channels		Peas				Tomato			
		Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
I	q	65.31	47.24	28.26	46.93	1347.2	678.56	479.43	835.06
	(%)	14.15	12.78	9.45	12.45	31.51	14.26	16.34	20.70
II	q	220.5	240.12	89.78	183.4667	2900.3	1569.23	679.12	1124.47
	(%)	47.78	64.96	30.03	47.59	67.85	32.98	23.16	41.33
III	q	175.6	82.24	180.96	146.26	-	2518.3	1773.95	2146.12
	(%)	38.06	22.25	60.52	40.27	-	52.82	60.49	37.77
Total	q	461.48	369.6	299	376.69	4274.5	4758.09	2932.5	3988.36
	(%)	100	100	100	100	100	100	100	100

Contd.

Channel		Beans				Cabbage			
		Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
I	q	436.23	69.34	43.45	176.34	482.15	65.12	105.19	217.48
	(%)	49.75	7.33	8.89	21.99	47.72	4.57	9.16	20.48
II	q	255.12	347.23	234.76	279.03	324.89	569.23	259.023	384.381
	(%)	29.09	36.71	48.03	37.94	32.16	39.98	22.56	31.56
III	q	185.43	529.21	278.21	330.95	203.19	789.12	783.43	591.01
	(%)	21.14	55.95	56.93	46.67	20.11	55.43	68.26	47.9
Total	q	876.78	945.78	488.69	770.4167	1010.23	1423.5	1147.65	1193.793
	(%)	100	100	100	100	100	100	100	100

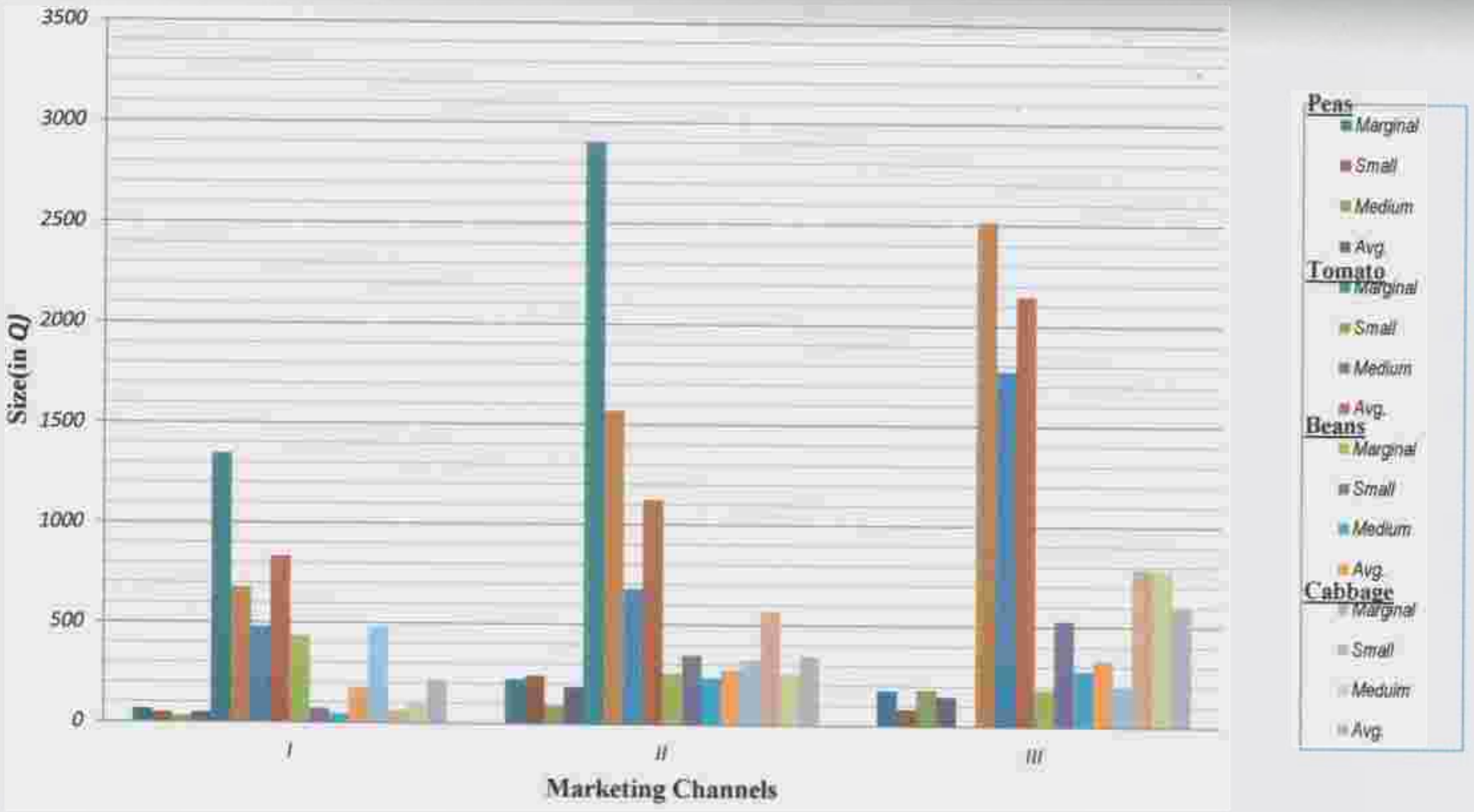

Table 5. 15. Effectiveness of various marketing channel for vegetables under shifting cultivation according to different size groups

Table 5. 3.2. Effectiveness of various marketing channel for vegetables under settled cultivation according to different size groups.

Channels		Peas				Tomato			
		Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
I	q	478.66	215.26	62.20	252.04	845	437.4	289.5	523.9
	(%)	58.76	25.34	7.67	30.63	28.98	12.42	12.39	17.93
II	Q	210.3	400.30	297.42	302.67	1387	2325.1	785.95	1499.35
	(%)	25.81	47.50	36.68	36.79	47.58	66.02	33.68	49.09
III	Q	125.6	227.00	451.20	267.93	683.06	489.00	1258	810.02
	(%)	15.41	26.94	55.64	32.56	23.43	13.88	53.91	30.40
Total	Q	814.56	842.56	810.82	822.64	2915.06	3521.5	2333.25	2506.7
	(%)	100	100	100	100	100	100	100	100

Contd

Channel		Beans				Cabbage			
		Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
I	q	829.32	274.78	139	405.36	686.36	775	439.23	633.53
	(%)	72.34	18.53	11.73	34.34	37.85	35.86	20.56	33.94
II	Q	259.10	799.63	279	445.91	536.36	889.23	843.56	723.05
	(%)	22.60	53.92	23.54	37.80	29.58	41.14	39.50	38.73
III	(q)	57.95	408.36	766.99	411.1	590.41	496.88	852.72	646.67
	(%)	5.05	27.54	64.72	34.85	32.56	22.99	39.93	34.64
Total	(q)	1146.37	1482.77	1184.99	1179.36	1813.13	2161.11	2135.51	1866.47
	(%)	100	100	100	100	100	100	100	100

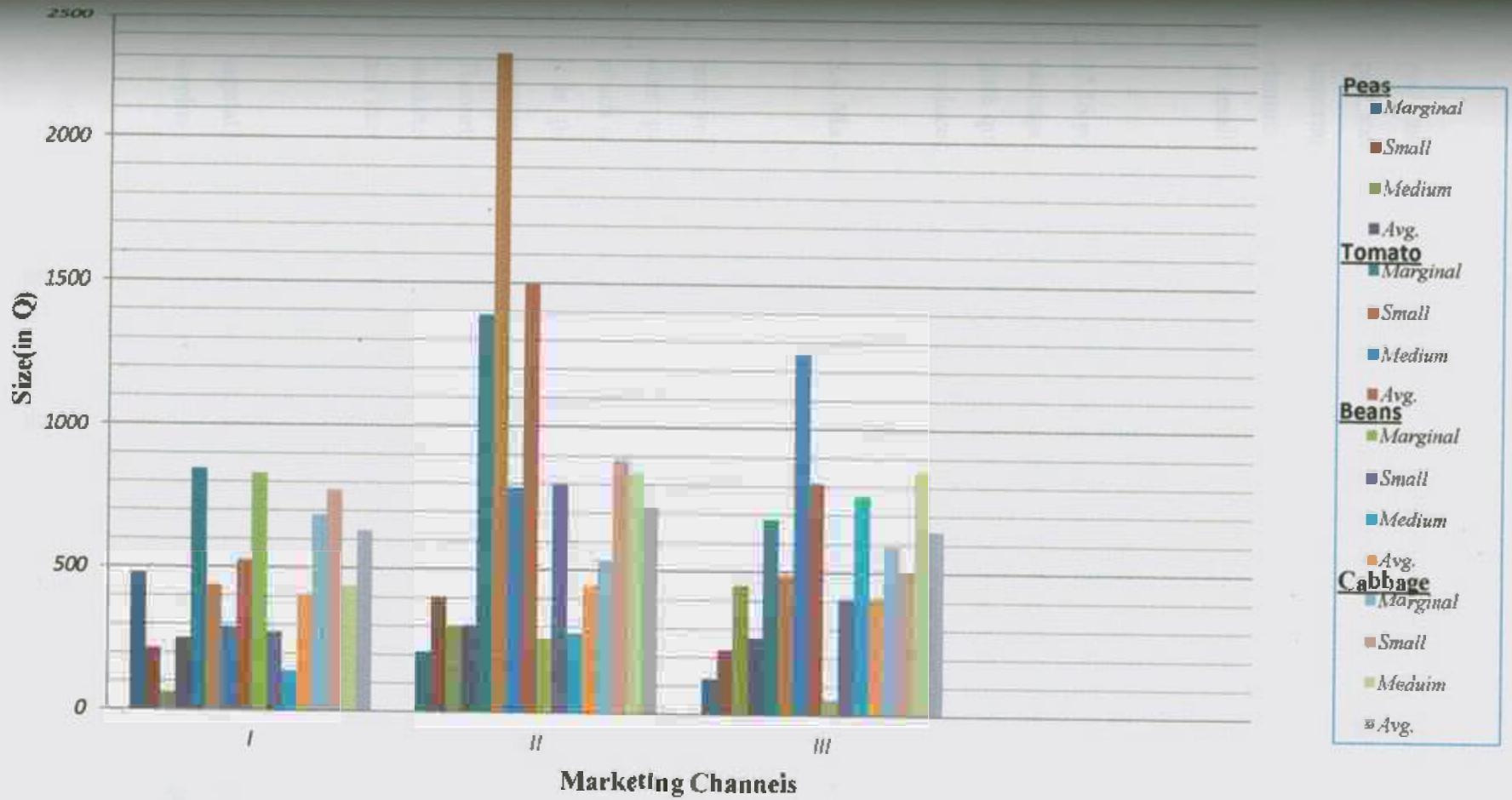

Fig 5. 16. Effectiveness of various marketing channel for vegetables under settled cultivation according to different size groups.

Channel III

This is a second important channel through which 40.27, 37.77, 44.67 and 27.90 per cent of the produce are disposed by the farmers respectively. The channel followed is producer to village trader to retailers and from retailers to consumers. This was the most important channel for disposing of beans and cabbage. Medium farmers usually use these channel to dispose their product as the marketable surplus are relatively higher in compare to small and marginal farmer.

In settled cultivation also these is the second most important channel, where 32.56 percent of pea, 30.40 percent of tomato, 34.85 percent of beans and 34.64 percent of cabbage are disposed through these channel. Marginal and small farmers usually disposed little quantity through these channel but majority of the medium farmers disposed their produced through these channel.

5.4. Marketed surplus and marketable surplus

Marketed surplus is the actual amount of produce which the producer sold out of their year's production irrespective of his requirements, Family consumption, wastage and other payments. On the other hand, marketable surplus is that quantity of the produce which is left with the produce after meeting his consumption and other farm requirements. It is the residual left with the producers after meeting his requirements for family consumption and other requirements such as seeds, feed and payments to labour etc. Theoretically these two words are often used interchangeably. For perishable commodities marketed surplus may be equal to the marketable surplus when the farmers retains more or less than his requirements.

Table 5.4.2.1 and 5.4.2.2. represent the area, production, average area under vegetables, non market transaction, marketable surplus etc. The marketable and marketed surplus for shifting and settled cultivation are discussed in detail vegetables wise.

5.4.1. Marketed and Marketable Surplus for Pea

In shifting cultivation the table revels that the average area under pea was 48 Ha and average per ha production was 26.06 q/ha. The average yields was highest in marginal farmers (28.28q/ha) followed by small (25.53q/ha and medium (24.39q/ha) farmers. The per ha marketed surplus was almost equal in all categories. The average per hectare marketed surplus was 22.94q/ha.

Under settled shifting the table reveals that the average area under pea was 13.16 Ha and average per ha production was 114.80 q/ha. The average yields was highest in medium farmers (67.45 q/ha) followed by small (65.34 q/ha and marginal farmers (63.38q/ha). The per ha marketed surplus was highest in medium farmers (64.41 q/ha). The average per hectare marketed surplus was 53.13 q/ha.

5.4.2. Marketed and Marketable Surplus for Tomato:

The operational land holding under tomato were 0.21 ha, 0.45 and 0.56 respectively for marginal, small and medium farmers and the average was .41 ha. The average yield under tomato was 2479/ha. The per hectare marketed surplus was highest in marginal (248.51q/ha) followed by small (239.34q/ha) and medium (236.70q/ha) for shifting cultivation.

In settled cultivation the operational land holding under tomato were 0.21 ha, 0.45 and 0.56 respectively for marginal, small and medium farmers and the average was 17.82 ha. The average yield under tomato was 98.70/ha. The per ha marketed surplus was lowest in marginal (100.97 q/ha) followed by small (111.26 q/ha) and highest in medium farmers (120.76 q/ha).

5.4.3. Marketed and Marketable Surplus for Beans

The area under beans for shifting cultivation were 0.22 ha, 0.44 ha, 0.5 ha respectively for marginal, small and medium farmers respectively and the average production was 55.64q/ha. The per hectare marketed surplus for beans were 46.72q/ha, 46.99q/ha and 42.49q/ha respectively for marginal, small and medium farmers respectively. The marketed surplus was highest in small farmers in shifting cultivation.

Table 5.4.1 Area, production, marketed and marketable surplus for vegetables under shifting cultivation across various size groups

Particulars	Peas				Tomato			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Area	20.52	23.81	15.5	19.94	17.53	19.88	13	16.80
Production(q)	580.30	600.21	378.04	519.52	4513.97	4834.21	3117.4	4149.5
Average area under vegetable	0.24	.54	.67	.48	0.21	0.45	.56	.41
Per ha production (q)	28.28	25.53	24.39	26.06	257.5	243.7	239.8	247
Requirement for family consumption	168.89	133	80.5	71.22	299.6	241.8	220.7	254.03
Non market transaction	41.5	19.8	9.2	70.5	56.44	34.32	19.55	36.77
Marketable surplus	369.91	447.41	288.34	368.55	4157.93	4558.09	2877.15	3858.7
Marketed surplus	461.48	369.6	299	376.69	4274.5	4758.09	2932.5	3988.363
Per ha marketed surplus	22.49	15.52	19.29	18.89	243.83	239.34	225.57	237.40

Contd

Items of cost	Beans				Cabbage			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Area	18.56	19.71		16.59	15.6	19.88	12	15.82
Production(q)	1091.33	1077.15	603.17	917.43	1335.36	1636.12	1278.17	1416.54
Average area under vegetable	.22	.44	.5	0.38	0.19	0.45	0.52	0.38
Per ha production (q)	58.80	54.65	52.45	55.64	85.6	82.3	78.17	82.02
Requirement for family consumption	349.4	272.6	142.49	254.76	307.5	201.2	130.6	213.1
Non market transaction	74.7	78.23	81.13	78.02	109.78	83.34	18.4	70.51
Marketable surplus	767.23	826.32	379.69	584.65	918.08	1351.58	1129.17	1114
Marketed surplus	876.78	945.78	488.69	770.4167	1010.23	1423.5	1147.65	1193.793
Per ha marketed surplus	47.24	50.95	42.49	46.44	64.75	73.02	95.68	77.81667

Contd.

Table 5.4.2 Area, Production, marketed and marketable surplus for vegetables under settled cultivation across various size groups

Particulars	Peas				Tomato			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Area	13.29	13.72	12.48	13.16	28.87	31.65	19.32	26.61
Production(q)	880.98	896.46	841.77	768.28	3103.5	3633.42	2392.00	2626.40
Per ha production (q)	63.38	65.34	67.45	58.38	107.5	114.8	123.81	98.70
Requirement for family consumption	66.42	35.1	19.75	40.42	123	68.8	37.5	76.43
Non market transaction	51.5	18.8	11.2	28.66	65.44	43.12	21.25	43.27
Marketable surplus	814.56	842.56	810.82	699.2	2915.06	3521.5	2333.25	2506.7
Marketed surplus	814.56	842.56	810.82	699.2	2915.06	3521.5	2333.25	2506.7
Per ha marketed surplus	61.29	61.41	64.96	53.13	100.97	111.26	120.76	94.2

Contd

Particulars	Beans				Cabbage			
	Marginal	Small	Medium	Avg.	Marginal	Small	Medium	Avg.
Area	17.82	21.42	16.31	18.58	16.31	18.71	17.35	17.45
Production(q)	1279.47	1558.30	1233.62	1265.11	1994.71	2325.65	2236.41	2015.47
Per ha production (q)	71.80		74.72	68.09	122.3	124.3	128.9	115.5
Requirement for family consumption	98.4	47.3	27.5	57.73	111.8	101.2	42.5	85.16
Non market transaction	34.7	28.23	21.13	28.02	69.78	63.34	58.4	63.84
Marketable surplus	1146.37	1482.77	1184.99	1179.36	1813.13	2161.11	2135.51	1866.47
Marketed surplus	1146.37	1482.77	1184.99	1179.36	1813.13	2161.11	2135.51	1866.47
Per ha marketed surplus	64.33	69.22	71.77	63.47	111.15	115.5	123.08	106.96

Under settled cultivation the area under beans were 17.82 ha, 21.42 ha and 16.51 ha respectively for marginal, small and medium farmers and the average production was 68.09 q/ha. The per hectare marketed surplus for beans were 71.77 q/ha, 69.22 q/ha and 64.33 q/ha respectively for medium, small and marginal farmers. The marketed surplus was highest in medium farmers.

5.4.4. Marketed and Marketable Surplus for Cabbage

In Shifting cultivation the marketed surplus per ha for cabbage was 65.26q/ha, 73.01q/ha and 74.08q/ha respectively for marginal, small and medium farmers. The average was 70.76 q/ha.

In settled cultivation the marketed surplus per hectare for cabbage was 123.08 q/ha, 115.5 q/ha and 111.15 q/ha respectively for medium, small and marginal farmers. The average was 106.96 q/ha.

5.5. Marketing Costs, margins, price spread for shifting and settled cultivation

5.5.1. Marketing Cost of Vegetables

Table 5.5.1 and 5.5.2 represent the marketing cost incurred by intermediaries in different marketing channels in shifting and settled cultivation. In the present study transportation charges, loss during transportation and weighting and others charges have been considered as marketing cost.

In case of shifting cultivation, Marketing cost of pea through channel I was found to be Rs. 125.23/q, tomato Rs. 150/q, beans Rs. 126.89/q and for cabbage it was found to be Rs 200/q and channel II marketing coast pea was Rs. 460.3/q, tomato Rs. 530.8/q, beans Rs. 437.1/q and cabbage Rs. 483.94/q and in channel III marketing cost of pea was Rs. 847.26/q tomato Rs. 968.35/q, beans Rs. 838.31/q and cabbage Rs. 853.52 per/q. It was estimated from the table 5.4.1 that the marketing cost was lowest in channel I in all vegetables and highest in channel III for all the vegetables. In channel I marketing cost was low as the producers sold their produce directly to the consumer and was high in channel III due to involvement of more intermediaries.

In settled cultivation, marketing cost of pea was Rs. 81.66/q, tomato Rs. 111.25/q, beans Rs. 75/q and Rs. 88/q respectively. In channel II marketing cost of pea was Rs. 318.8/q, tomato Rs. 383.36/q, beans Rs. 319.45/q and cabbage Rs. 350.76/q respectively and for channel III, the marketing cost of pea was Rs. 635.76/q, tomato Rs. 731.91/q, beans Rs. 619.83/q and Rs. 626.37/q respectively. In case of settled cultivation also marketing cost was high in channel III and lowest in channel I.

5.5.2. Marketing margin of vegetables

Channel I

In channel I the producer sold their produce directly to the consumer.

Channel II

In shifting cultivation, the marketing margin retained by village traders in pea was Rs. 485.94/q, tomato Rs. 574.94/q, beans Rs. 501.24/q and cabbage Rs. 682.87/q. The margins retain by villages traders was more in cabbage Rs. 682.87/q and less in pea Rs. 485.94/q.

The marketing margin earned by the village trader in settled cultivation are as followed pea Rs. 385.92/q, tomato Rs. 474.94/q, beans Rs. 411.24/q and cabbage Rs. 441.92/q.

The comparative study shows that marketing margin incurred by village traders in all the vegetables was more in shifting cultivation than settled cultivation in channel II. In these channel, the village traders directly sold their produce to the consumers.

Table 5.5.1. Marketing cost of intermediaries in vegetable marketing system in different marketing channel (Rs/q).

Under shifting Cultivation

Intermediaries involved in Marketing channels	Marketing cost											
	channel I				Channel II				Channel III			
	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage
Producer	125.23 (100.00)	150 (100.00)	126.89 (100.00)	200 (100.00)	217.33 (60.31)	243.33 (56.48)	186.48 (55.31)	222.98 (58.07)	217.33 (33.57)	243.33 (31.66)	186.48 (29.21)	222.98 (26.12)
Village Traders	-	-	-	-	242.97 (39.68)	287.47 (43.51)	250.62 (44.68)	260.96 (41.92)	370.18 (41.74)	409.66 (40.30)	369.39 (42.20)	371.18 (41.49)
Retailers									259.75 (24.68)	315.36 (20.02)	282.44 (28.58)	259.36 (24.38)
Total marketing cost	125.23 (100.00)	150 (100.00)	126.89 (100.00)	200 (100.00)	460.3 (100.00)	530.8 (100.00)	437.1 (100.00)	483.94 (100.00)	847.26 (100.00)	968.35 (100.00)	838.31 (100.00)	853.52 (100.00)

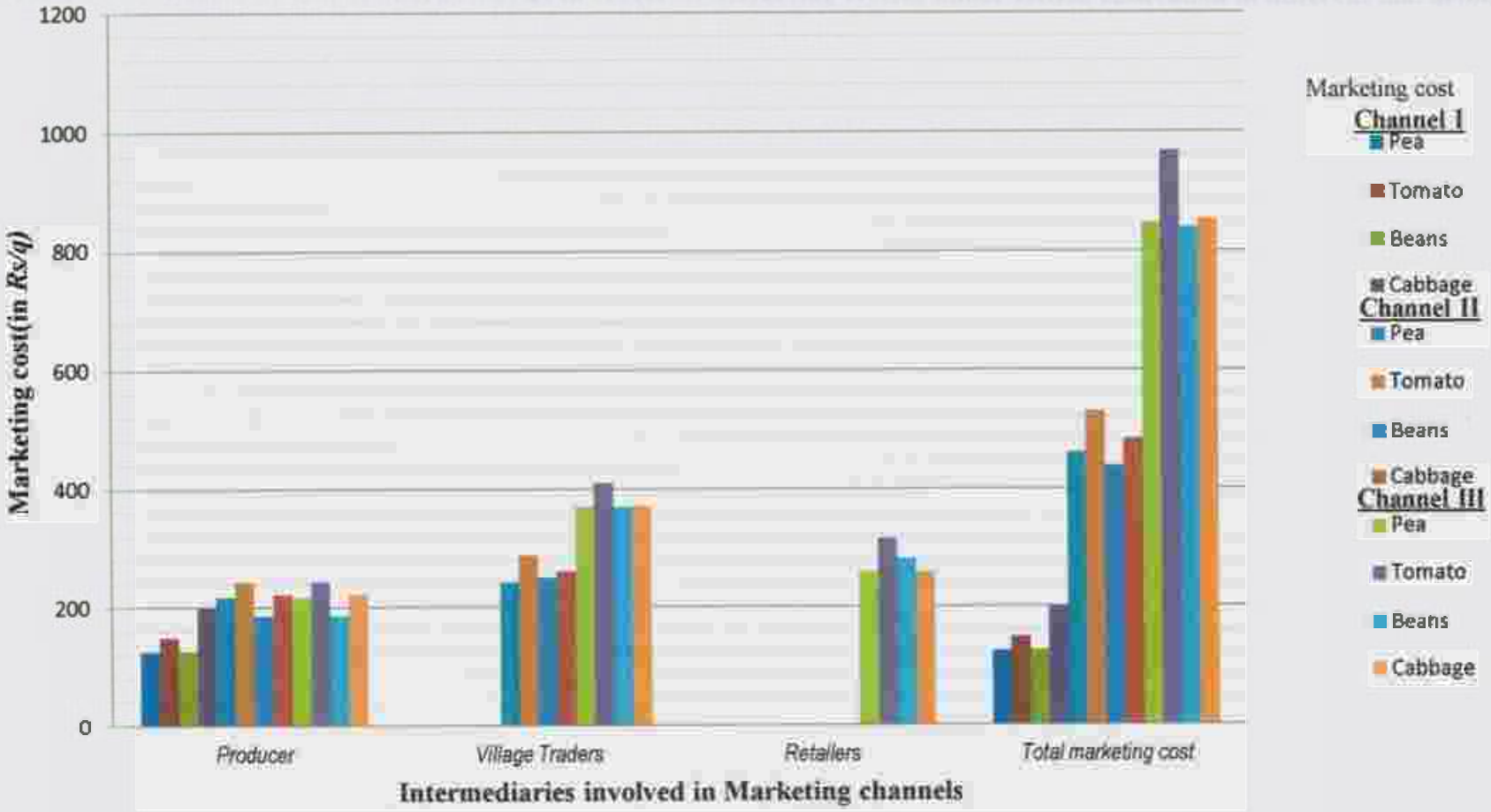

Fig 5.17. Marketing cost of intermediaries in vegetable marketing system in different marketing channel (Rs/q) Under shifting Cultivation

Table 5.5.2. Marketing cost of intermediaries in vegetable marketing system under settled cultivation in different marketing channel (Rs/q).

Intermediaries involved in Marketing channels	Marketing cost											
	channel I				Channel II				Channel III			
	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage
Producer	81.66 (100.00)	111.25 (100.00)	75 (100.00)	88 (100.00)	175.83 (55.15)	195.89 (51.09)	158.83 (49.71)	170 (48.43)	175.83 (27.65)	196.89 (26.90)	158 (25.49)	185.83 (29.66)
Village Traders	-	-	-	-	142.97 (44.84)	187.47 (48.90)	160.62 (50.28)	180.96 (51.56)	300.18 (47.21)	319.66 (43.67)	279.39 (45.07)	281.18 (44.89)
Retailers	-	-	-	-	-	-	-	-	159.75 (25.12)	215.36 (29.42)	182.44 (29.43)	159.36 (25.44)
Total marketing cost	81.66 (100.00)	111.25 (100.00)	75 (100.00)	88 (100.00)	318.8 (100.00)	383.36 (100.00)	319.45 (100.00)	350.96 (100.00)	635.76 (100.00)	731.91 (100.00)	619.83 (100.00)	626.37 (100.00)

(Figure in the parentheses indicate percentage to the total)

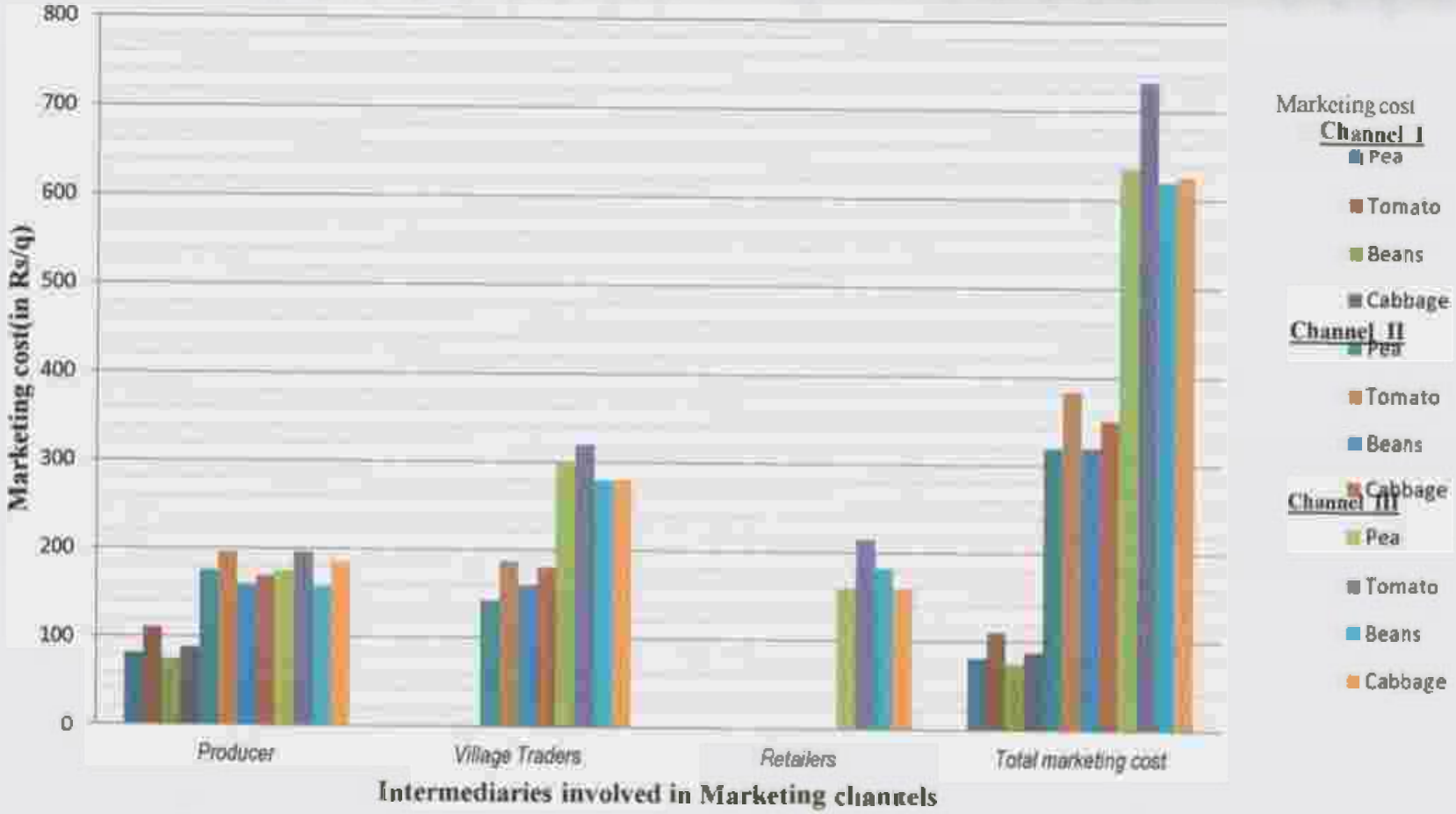

Fig. 5.18. Marketing cost of intermediaries in vegetable marketing system in different marketing channel (Rs/q) under settled cultivation.

Channel III

In channel III, the marketing margin retained by village traders in shifting cultivation for various vegetables are as follows, pea Rs. 740/q, tomato Rs. 819.32/q, beans Rs. 738.78/q and cabbage Rs. 518.72/q and retailer retained Rs. 579.9/ q for pea, tomato Rs. 630.72/q, beans Rs. 564.88/q and cabbage Rs. 518/q respectively.

In settled cultivation marketing margins retained by village traders are Rs. 670.36, Rs. 729.32, Rs. 648.78 and Rs. 652.36 for pea, tomato, beans and cabbage. The margin retained by retailer were pea Rs. 119.5/q, tomato Rs.530/q, beans Rs. 464.88/q and cabbage Rs. 418.72/q. In channel three also the margin retains by retailers were more in tomato and it also shows that marketing margin was more in shifting cultivation in compare to settled cultivation for all the vegetables.

5.5.3. Price spread of vegetables

The term price spread has been variously defined and understood according to its usage, it refers to the difference between the two prices, i.e. the price paid by the consumer and the prices received by the producers. A study of the price spread involve not only the ascertainment of the actual prices at various stages of marketing channel, but also the costs incurred in the process of the movement of the produce from the farm to the consumer and the margins of various intermediaries. Greater the number of intermediaries, higher is the value of gross margins. Higher is the value of gross margins, higher the value of price spread. And higher is the value of price spread, lower is the marketing efficiency as the producers share in the consumers rupee becomes lower. Price spread and marketing efficiency varies from channel to channel, region to region and crop to crop.

Table 5.5.6 and table 5.5.7 represent the price spread analysis of different channels in vegetables under shifting and settled cultivation.

In shifting cultivation the table shows that the producers share in consumer rupee was highest in channel I for all the vegetables i.e pea (96.96 per cent), tomato (88.74 per cent), beans (96.17 per cent) and cabbage (88.98 per cent) and lowest in Channel III, pea (82.52 per cent), tomato (54.99 per cent), beans ((79.20 per cent) and cabbage (65.42 per cent). The producer's share in consumer rupee was high in Channel I because no intermediaries were involved in channel I.

Under settled cultivation, the price spread analysis shows that the producer's share in consumer rupee was 97.96 per cent, 96.53 per cent,
97.96 per cent and 94.79 per cent respectively for pea, tomato, beans and cabbage in channel I and in channel II it was 86.81 per cent for pea, 87.95 per cent for tomato, beans 91.17 per cent and cabbage 79.95 per cent and in channel III it was observed that the producers' share in consumer price was 76.76 per cent for pea, tomato 79.27 per cent, beans 84.18 per cent and cabbage 69.08 per cent. It was observed that Channel I has the highest producers' in consumer rupee and channel III has the lowest. Among the vegetable the highest was observed in beans and lowest in cabbage.

In both the cultivation the producers' share in consumer rupee was highest in Channel I and lowest in channel III for all the vegetables. The comparative study shows that the producers' share in consumer rupee was more in settled cultivation than in shifting cultivation.

5.6 Marketing efficiency of vegetables

Marketing efficiency indicates the extent to which the marketing agencies able to move the goods from producers to the final consumers at minimum cost and extending maximum services to the producers. On the other hand, the cost involved in marketing of vegetables through different channels shows their relative efficiencies. The efficiencies of different marketing channels were worked out by using Shepherd formula and presented in table 4.6.1 and 4.6.2 respectively. It is evident from the table that marketing efficiency was inversely related to total marketing cost. As the number of intermediaries increased cost and margin also increased resulting in decrease in the marketing efficiency.

Table 5.5.3. Marketing margins of intermediaries in vegetable marketing system in different marketing channel (Rs/q).

Intermediaries involved in Marketing channels	Marketing margins											
	channel I				Channel II				Channel III			
	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage
Producer	0	0	0	0								
Village Traders	0	0	0	0	485.94	574.94	501.24	682.87	740.36	819.32	738.78	742.96
Retailers	0	0	0	0					519.5	630.72	564.88	518.72
Total marketing margins	0	0	0	0	485.94	574.94	501.24	682.87	1259.86	1450.04	1303.66	1261.68

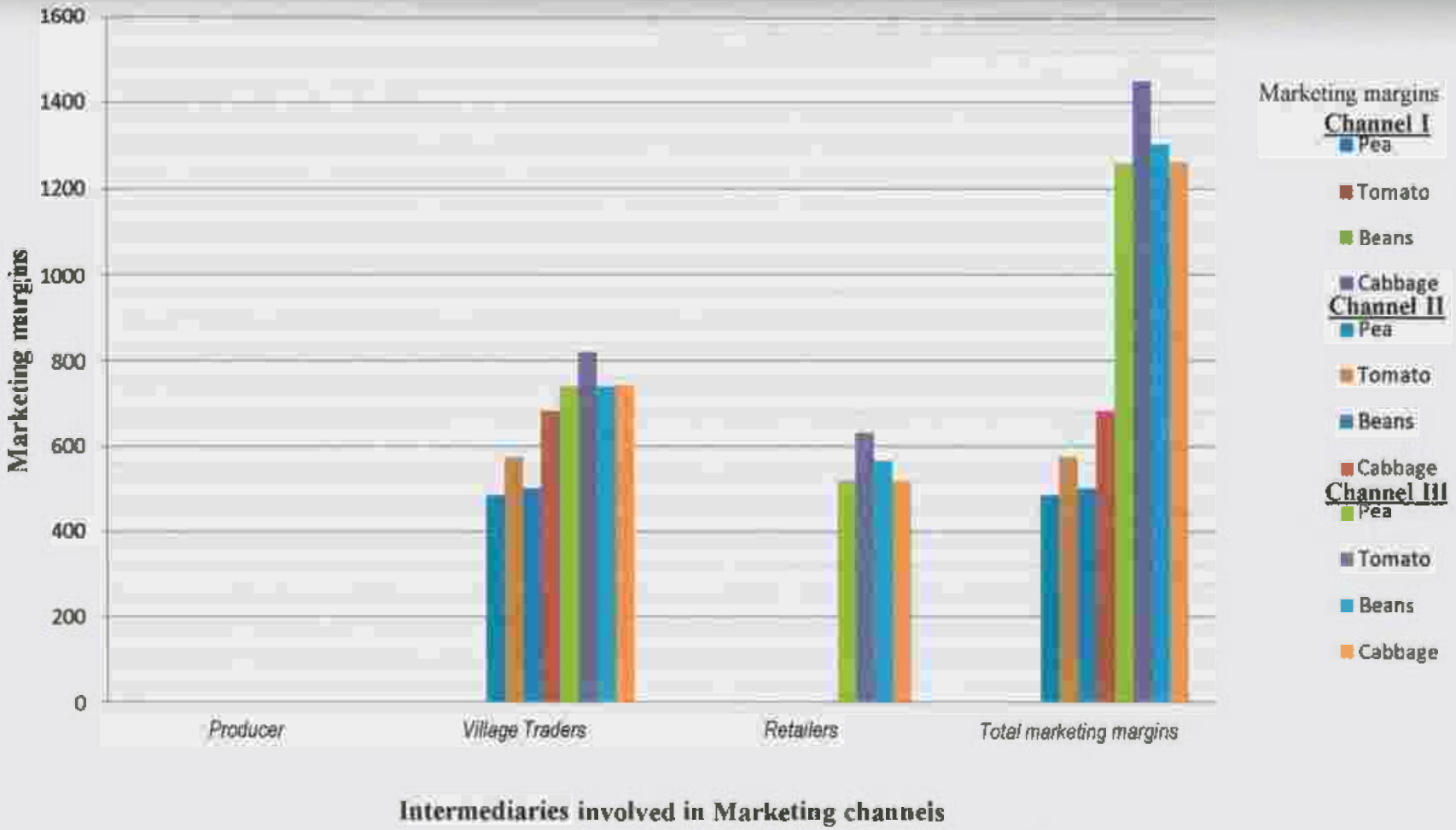

Fig.5.19. Marketing margins of intermediaries in vegetable marketing system in different marketing channel (Rs/q) under shifting cultivation.

Table 5.5.4. Marketing margins of intermediaries in vegetable marketing system under settled cultivation in different marketing channel (Rs/q).

Intermediaries involved in Marketing channels	Marketing margins											
	channel I				Channel II				Channel III			
	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage
Producer	0	0	0	0								
Village Traders	0	0	0	0	385.92	474.94	411.24	441.92	670.36	729.32	648.78	652.36
Retailers	0	0	0	0	-	-	-	-	119.5	53062	464.88	418.72
Total marketing margins	0	0	0	0	385.92	474.94	411.24	441.92	789.86	1259.94	1113.66	1071.08

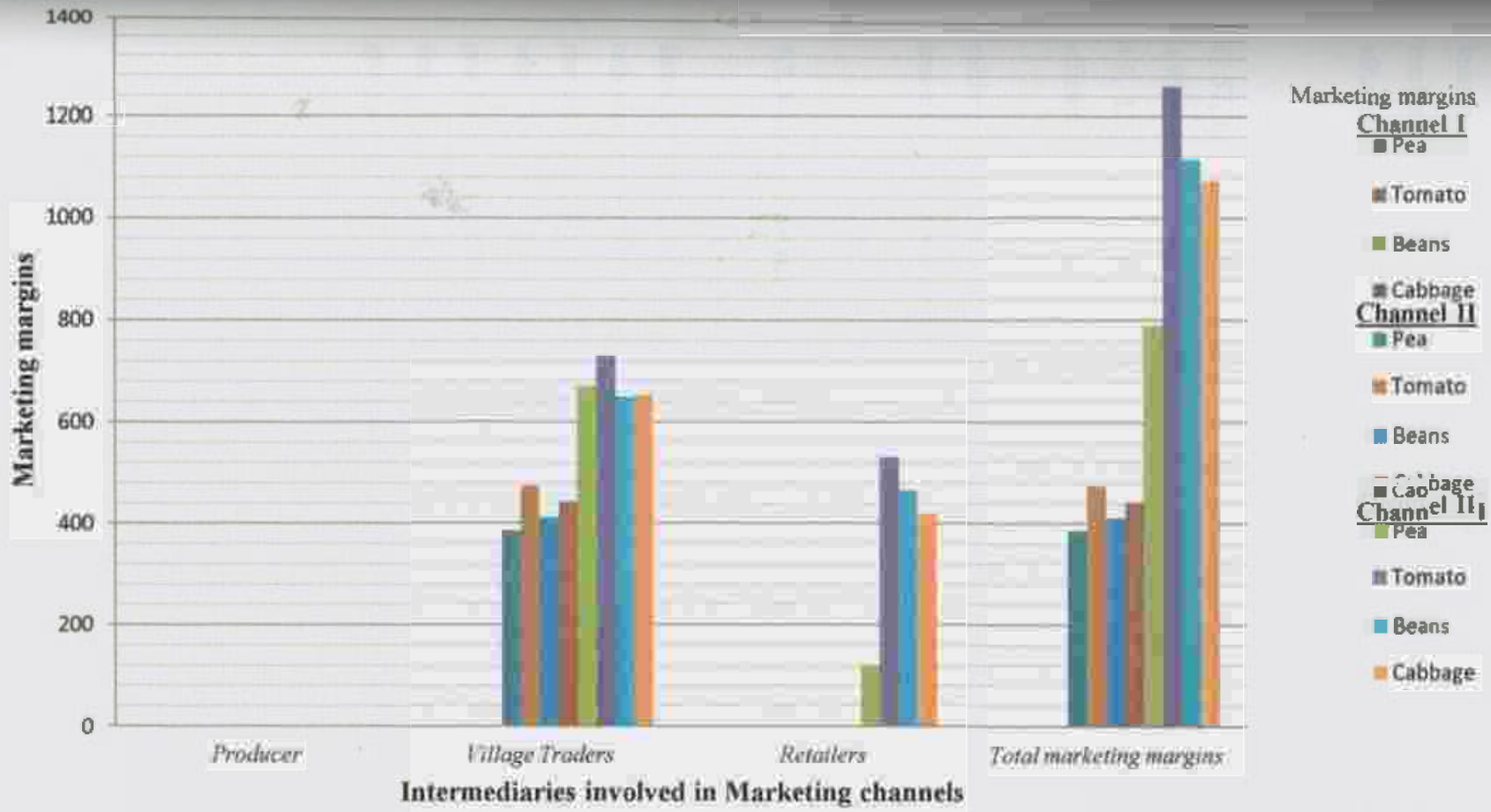

Fig. 5.20. Marketing margins of intermediaries in vegetable marketing system in different marketing channel (Rs/q) under Settled cultivation.

Under shifting cultivation the marketing efficiency were 32.94 for pea, tomato 8.88, beans 26.16 and cabbage 9.07 for channel I and for channel II it were 4.71 for pea, tomato 1.29, beans 3.88 and cabbage 1.93 and in channel III it was observed that the marketing efficiency were Pea 2.3, tomato 0.88, beans 1.88 and cabbage 1.16. Marketing efficiency was highest in channel I and lowest in channel III in shifting cultivation.

In settled cultivation the marketing efficiency for various vegetables are pea 27.57, tomato 28.86, beans 49.11 and cabbage 19.22 and in channel II it was 3.43, 3.7, 4.95 and 2.2 for pea, tomato, beans and cabbage. Marketing efficiency in channel III were 1.9, 1.77, 2.26 and 1.19 respectively for pea, tomato, beans and cabbage. Marketing efficiency was highest in channel I and lowest in channel III in settled cultivation.

It is evident from the table that marketing efficiency was more in settled cultivation than in settled cultivation and channel I was more efficient and channel III was less efficient for vegetable.

5.7. Measure for Increasing farm Income and Employment

In the present study an attempt was made to identify the problem faced by the farmers in production and marketing of vegetables in shifting and settled cultivation in order to suggest measure for increasing farm income and employment. The problems are presented in the descending order of their relative important in the table 5.7.1 and 5.7.2, with the help of frequency, simple percentage and ranking. The ranking of various problems of vegetable production and marketing was found to be similar across various size groups of farmers. Therefore, problems are not discussed according to different size group of farmers. The table represents the problems of sample farmers as a whole.

Table 5.5.5. Price spread analysis for different marketing channel under shifting Cultivation

Items in Marketing channels	Price spread											
	Channel I				Channel II				Channel III			
	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage
Consumer's price in (Rs/q)	4125.23	1333.33	3319.69	1815.067	4460.3	1426.66	3649.7	2259.96	4847.26	2151.68	4031.11	2468.587
Total marketing cost (Rs/ q)	125.23	150	126.89	200	460.3	530.8	437.1	483.94	847.26	968.35	838.31	853.52
Total marketing margins (Rs/q)	0				485.94	574.94	501.24	682.87	1259.86	1450.04	1303.66	1261.68
Producer's share in consumer rupee	96.96	88.74	96.17	88.98	89.68	82.94	87.48	71.46	82.52	54.99	79.20	65.42

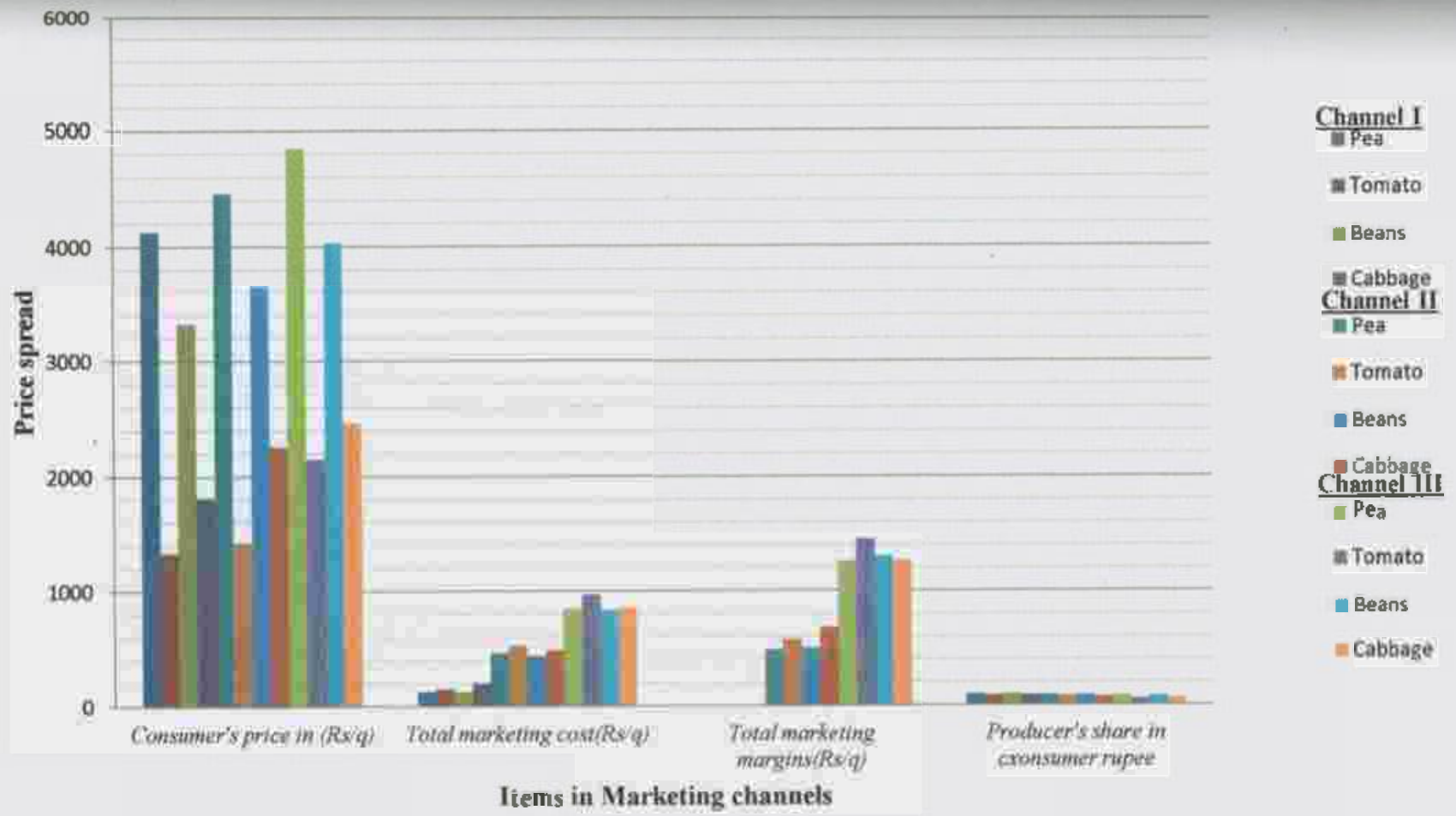

Fig. 5.21. Price spread analysis for different marketing channel in Shifting Cultivation.

Table 5.5.6. Price spread analysis for different marketing channel under settled cultivation

Items in Marketing channels	Price spread											
	Channel I				Channel II				Channel III			
	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage
Consumer's price in (Rs/q)	2251.66	3211.25	3683.33	1692	2418.8	3183.36	3619.45	1750.96	2735.76	3531.91	3919.83	2026.37
Total marketing cost (Rs/ q)	81.66	111.25	75	88	318.8	383.36	319.45	350.96	635.76	731.91	619.83	626.37
Total marketing margins (Rs/q)	0	0	0	0	385.92	474.94	411.24	441.92	789.86	1259.94	1113.66	1071.08
Producer's share in consumer rupee	96.37	96.53	97.96	94.79	86.81	87.95	91.17	79.95	76.76	79.27	84.18	69.08

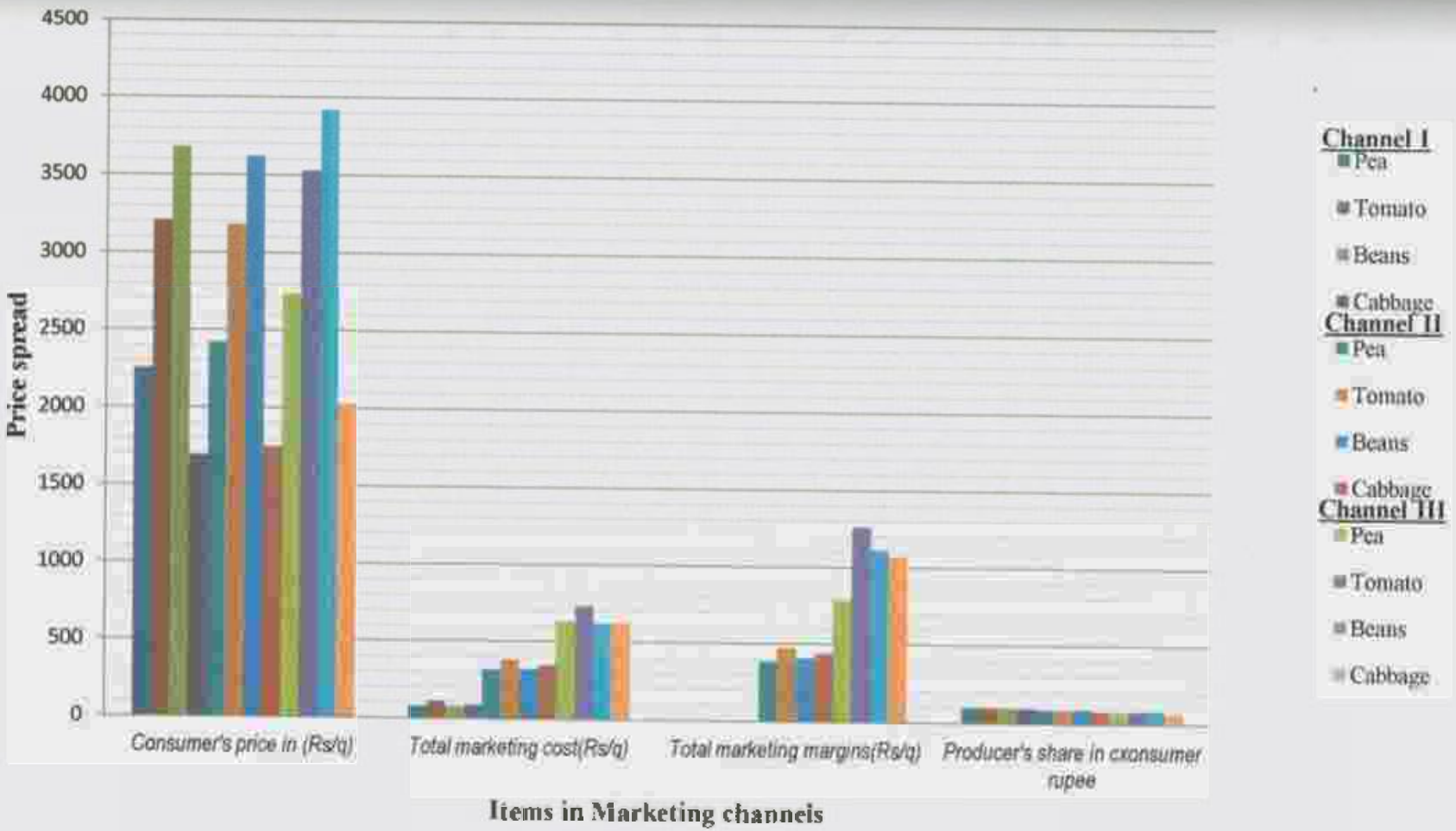

Fig. 5.22. Price spread analysis for different marketing channel under settled cultivation

5.7.1. Problems faced by farmers in production of vegetables under shifting cultivation and Settled cultivation

Among the various problems of vegetable production, seed was the most felt one. Good seeds of improved varieties were reported to be scarce. The government provides seed to the farmers but it was untimely and not of good quality which lead to low productivity. Moreover the seed obtained from the market are not of good quality and costly.

Another important problem faced by the farmers was lack of knowledge of recommended package and practices. The farmers still fallows the old traditional system of cultivation which affects the yield of vegetables

Scarcity of Labour was another problem which the growers were facing. Vegetable cultivation is an intensive farming and needs high labour. Labour cost is very high in the study area and it leads to increase in cost of cultivation.

Vegetable cultivation requires high investments. Farmers needed financial support from the financial institutions. Non availability of credit was a major problem faced by the farmers. No farmers were found who availed credit facilities from financial institution for cultivation.

Vegetable requires proper irrigation facilities and good water source, non availability of irrigation facilities and shortage of water during the growing period was another problem faced by the farmers in the study area.

The next important problem identified by the farmers was lack of knowledge about plant protection measures. Due to incidence of pest and diseases in the vegetable field it hinders in the production and lack of knowledge on its protection measures leads to low productivity.

Another problem was non availability of fertilizer and lack of knowledge about the recommended doses. Most of the farmers do not have knowledge about fertilizers and its application and if they want to apply also it is not available in the market and because of these reason the farmers usually don't apply fertilizes.

Table 5.6.1. Estimates of marketing efficiency under different marketing channels for Vegetables under Shifting Cultivation

Items in Marketing channels	Marketing efficiency											
	Channel I				Channel II				Channel III			
	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage
Consumer's price in (Rs/q)	4125.23	1333.33	3319.69	1815.067	4460.3	1426.66	3649.7	2259.96	4847.26	2151.68	4031.11	2468.587
Total marketing cost (Rs/ q)	125.23	150	126.89	200	460.3	530.8	437.1	483.94	847.26	968.35	838.31	853.52
Total marketing margins (Rs/q)	0				485.94	574.94	501.24	682.87	1259.86	1450.04	1303.66	1261.68
Marketing efficiency	32.94	8.88	26.16	9.07	4.71	1.29	3.88	1.93	2.3	0.88	1.88	1.16

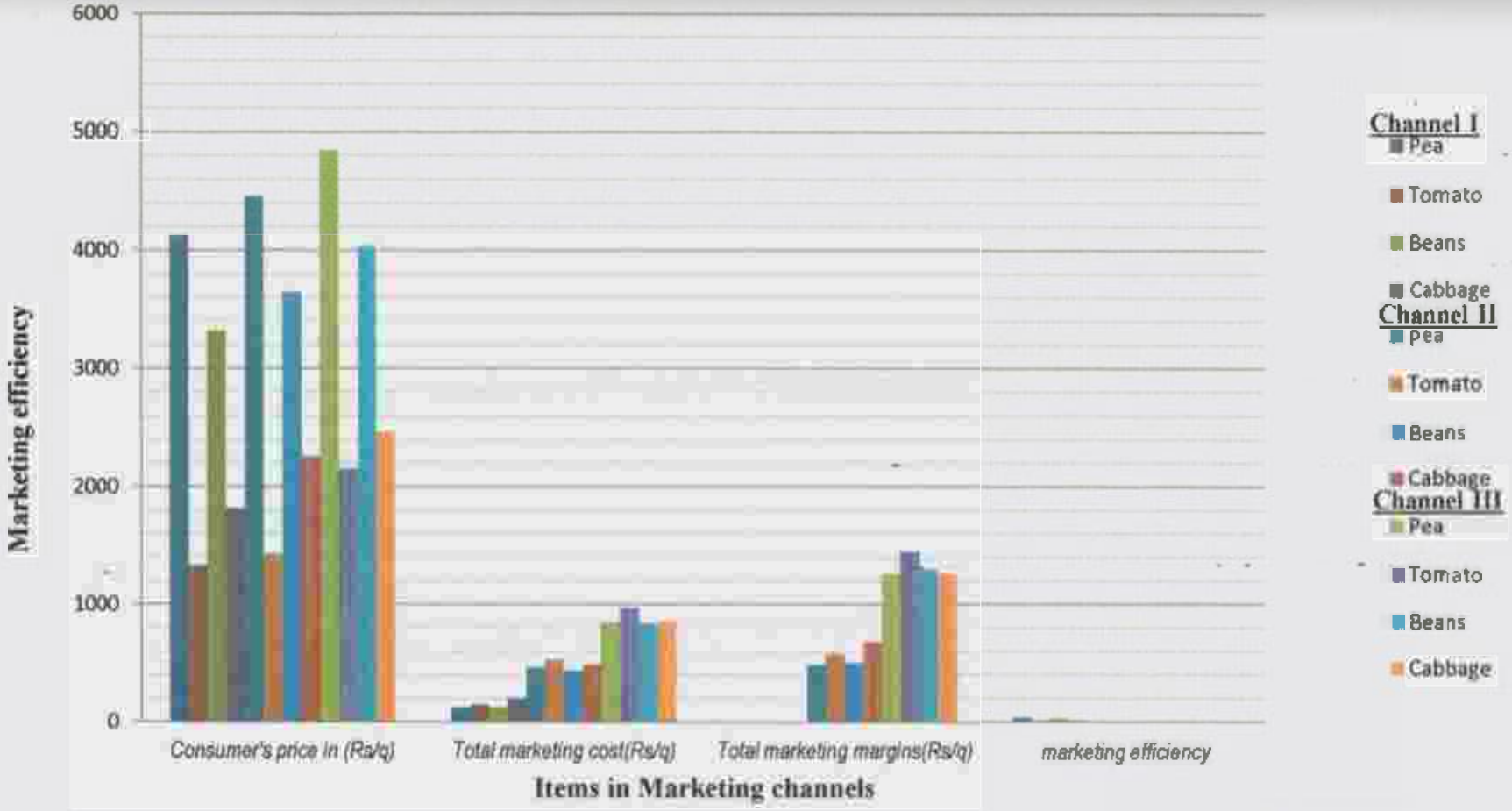

Fig. 5.23 Estimates of marketing efficiency under different marketing channels under shifting cultivation for Vegetables

Table 5. 6. 2. Estimates of marketing efficiency under different marketing channels for Vegetables under settled cultivation

Items in Marketing channels	Marketing efficiency											
	Channel I				Channel II				Channel III			
	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage	Pea	Tomato	Beans	Cabbage
Consumer's price in (Rs/q)	2251.66	3211.25	3683.33	1692	2418.8	3183.36	3619.45	1750.96	2735.76	3531.91	3919.83	2026.37
Total marketing cost (Rs/ q)	81.66	111.25	75	88	318.8	383.36	319.45	350.96	635.76	731.91	619.83	626.37
Total marketing margins (Rs/q)	0	0	0	0	385.92	474.94	411.24	441.92	789.86	1259.94	1113.66	1071.08
Marketing efficiency	27.57	28.86	49.11	19.22	3.43	3.7	4.95	2.2	1.9	1.77	2.26	1.19

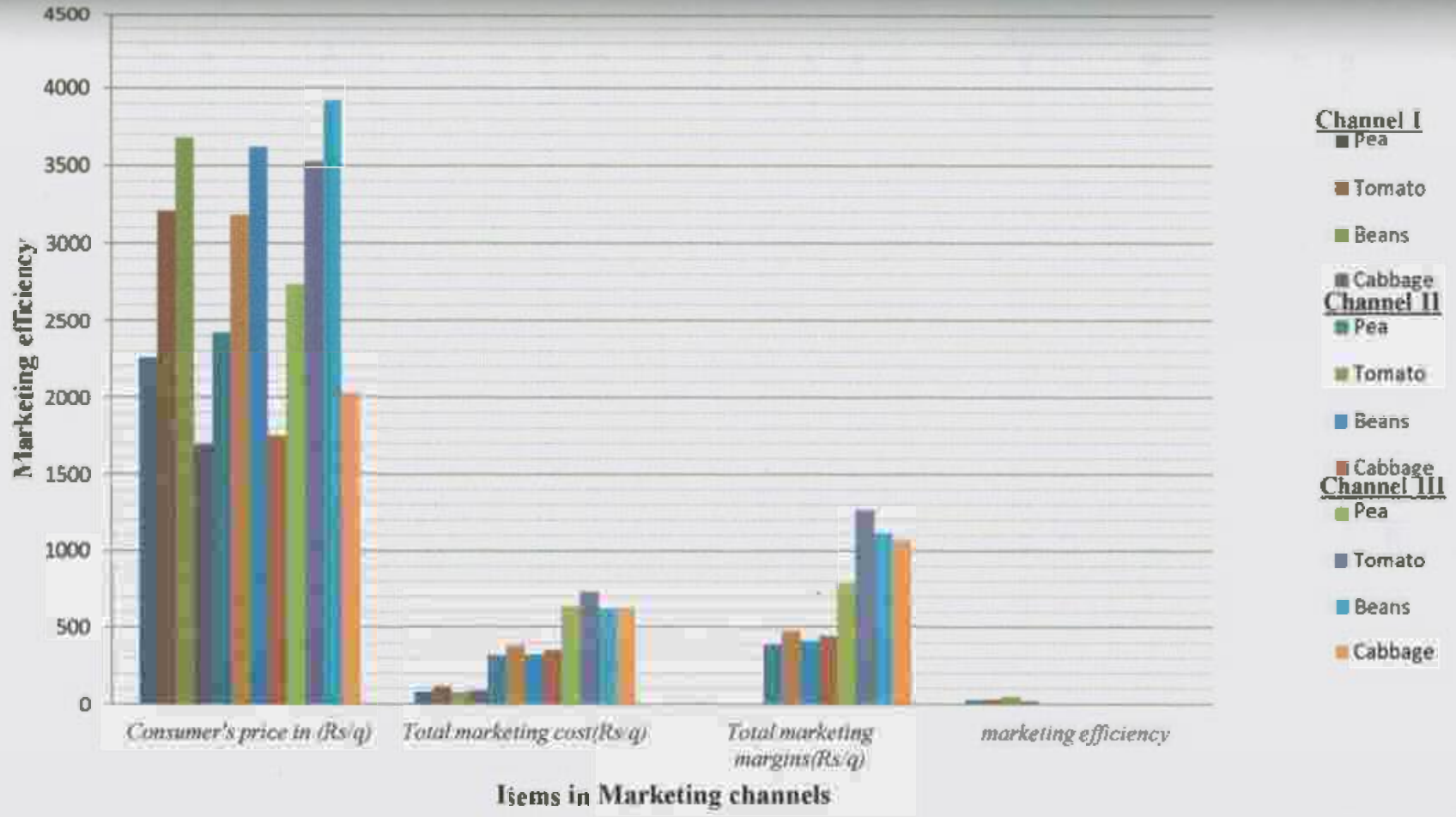

Fig 5.24. Estimates of marketing efficiency under different marketing channels for Vegetables under settled cultivation

The next problem was production instability which is very common. The production fluctuates every year and they could not predict the production in advance.

Another problem identified by lack of training and demonstration on vegetable cultivation which was felt by the farmers is very much needed. Both on and off farm training should be provided for various packages of practices.

5.7.2 Constraints faced by farmers in marketing of vegetables:

Different constraints faced by vegetable growers in the marketing of vegetables were identified and are presented in the descending order of their relative importance in table 5.7.2.

The first constraint identified by the farmers was lack of proper market and poor market facilities in the area. Lack of regulated market facilities was also identified in the study area. Farmers had to sell their produce in the open markets or have to sell from door to and because of these sometimes they have to sell their produce at throw away prices.

Lack of transportation facilities was ranked third in the order of importance. Organized and efficient transport facilities are vital for marketing which is lacking in the study area. The farmers faced these problems especially for those who are staying far away from the main towns.

An efficient system of marketing which supply accurate market information regarding the price ruling in a market from time to time is lacking. Thus the traders took their upper hand as they are the only source of information to the producers.

According to farmers, low marketable surplus was another problem. Though marketed surplus was found much higher than the marketable surplus, the farmers felt that they could have earned more and entered in the potato wholesale market if they had huge amount of produce.

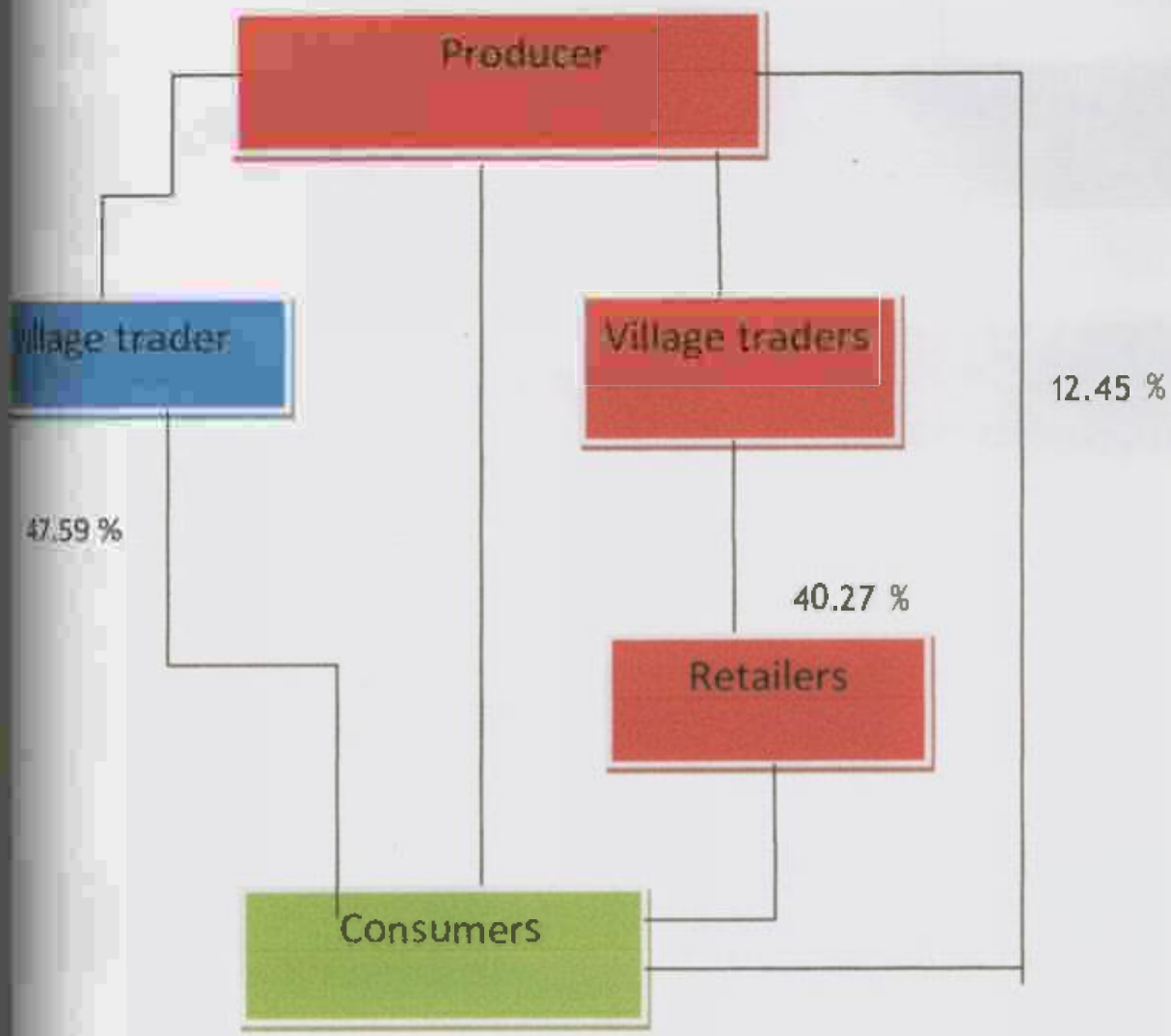

Fig 5.25.1: Flow chart for marketing of Pea under shifting cultivation.

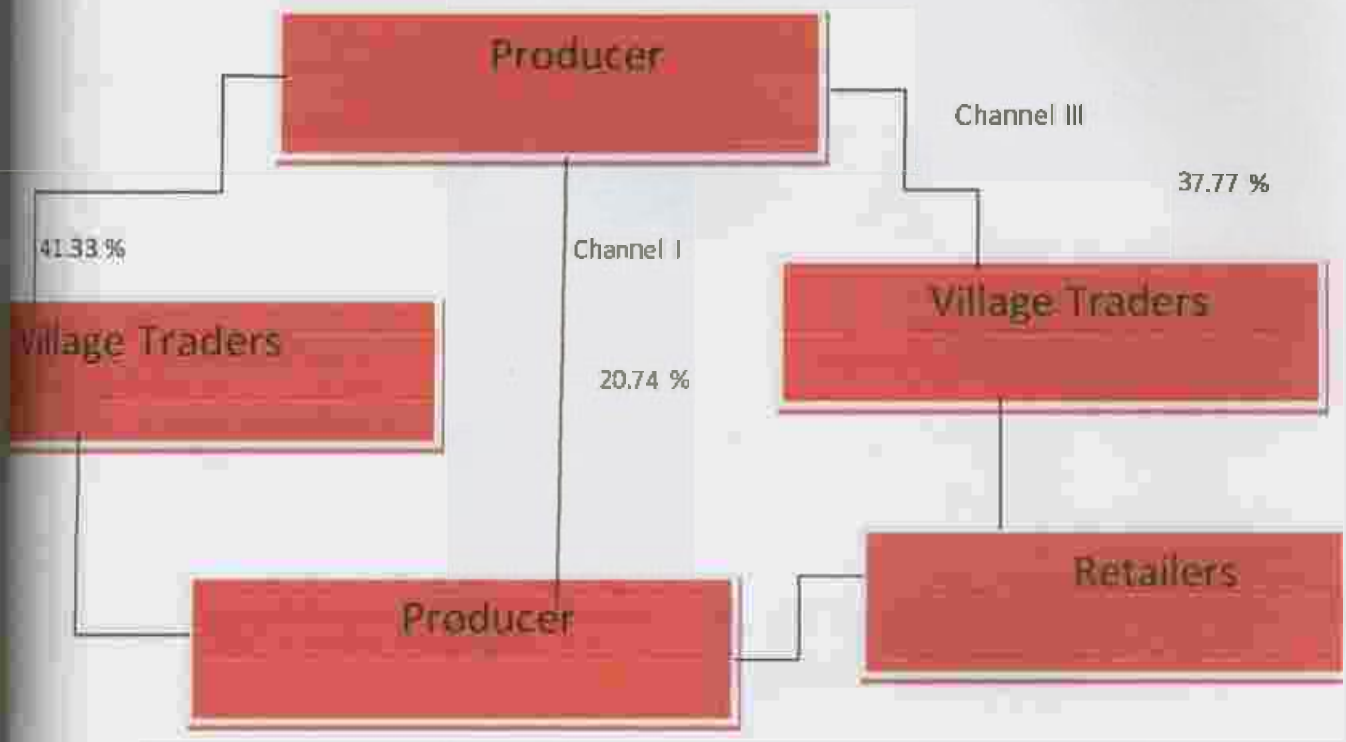

Fig 5.25.2 : Marketing channels of Tomato Under shifting cultivation

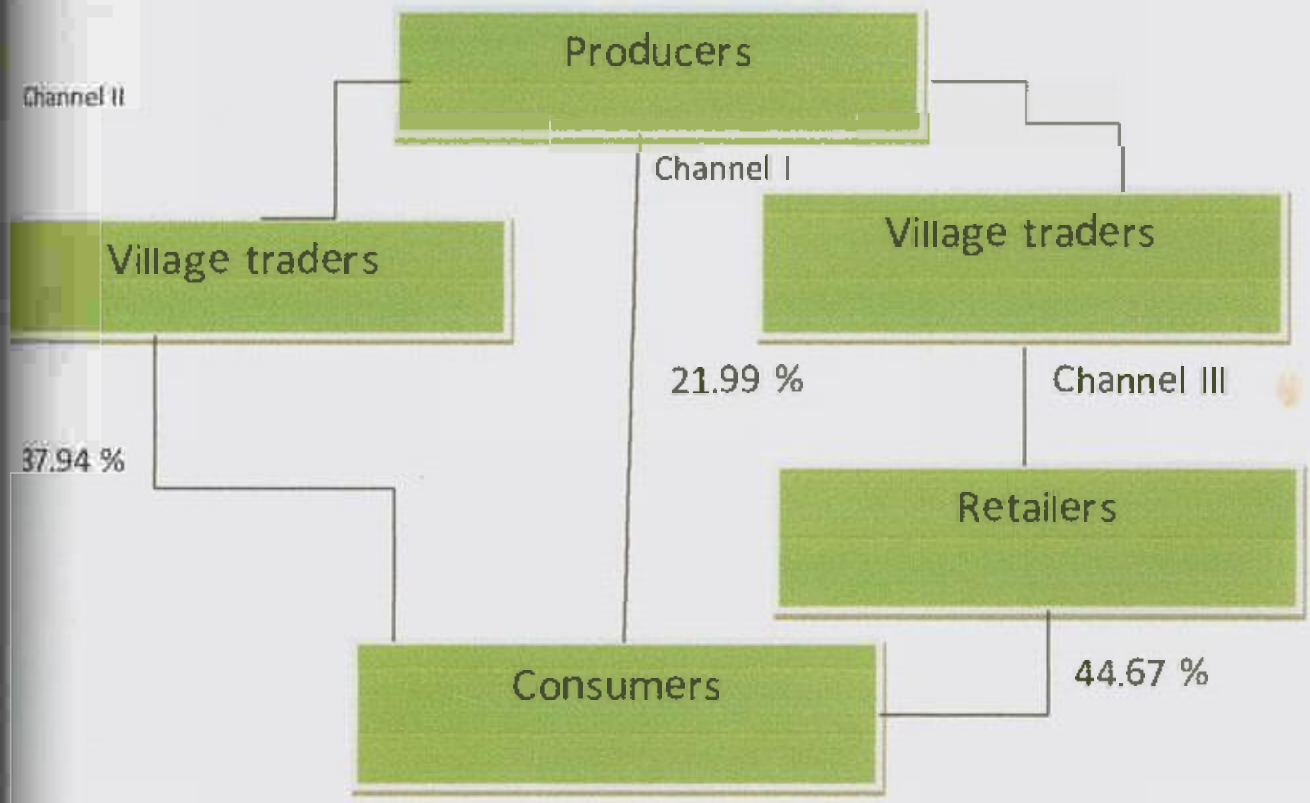

Fig 5.25.3 : Marketing channels of Beans Under shifting cultivation

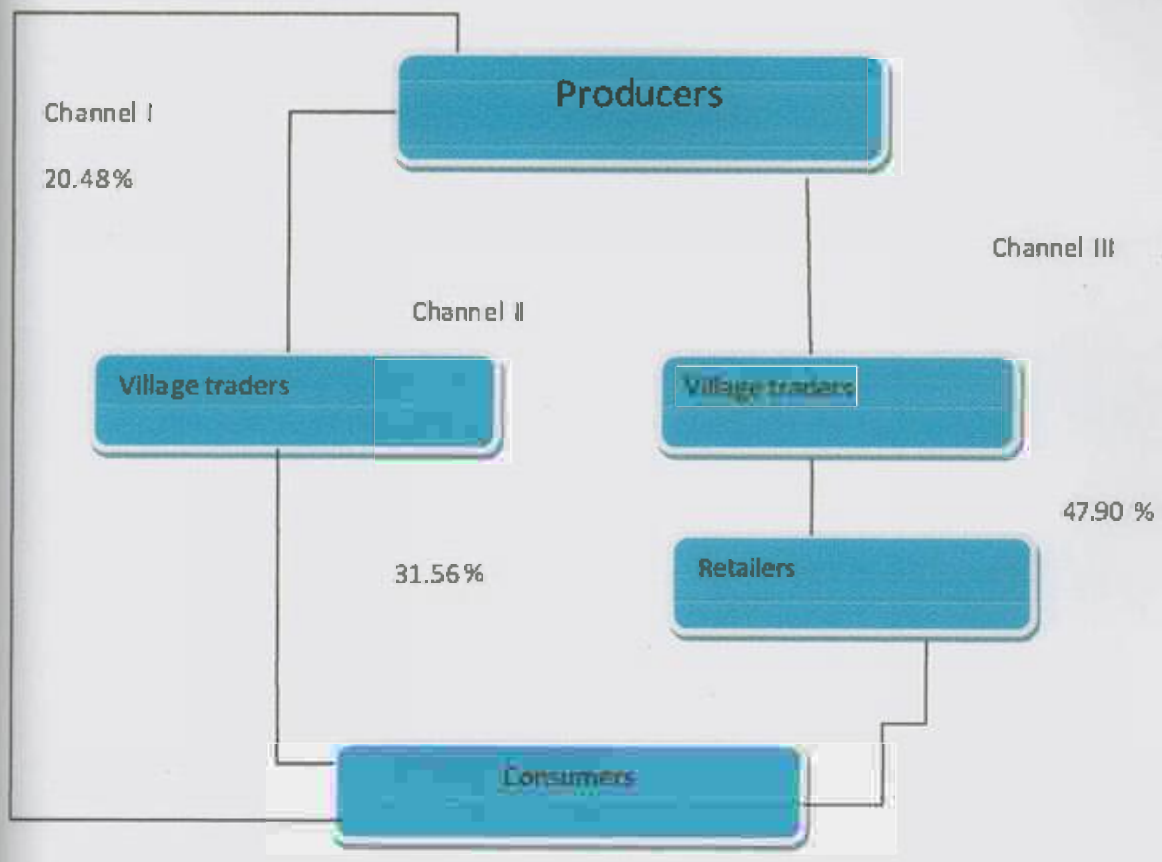

Fig 5.25.4: Flow chart for Marketing Channels of cabbage Under Shifting Cultivation

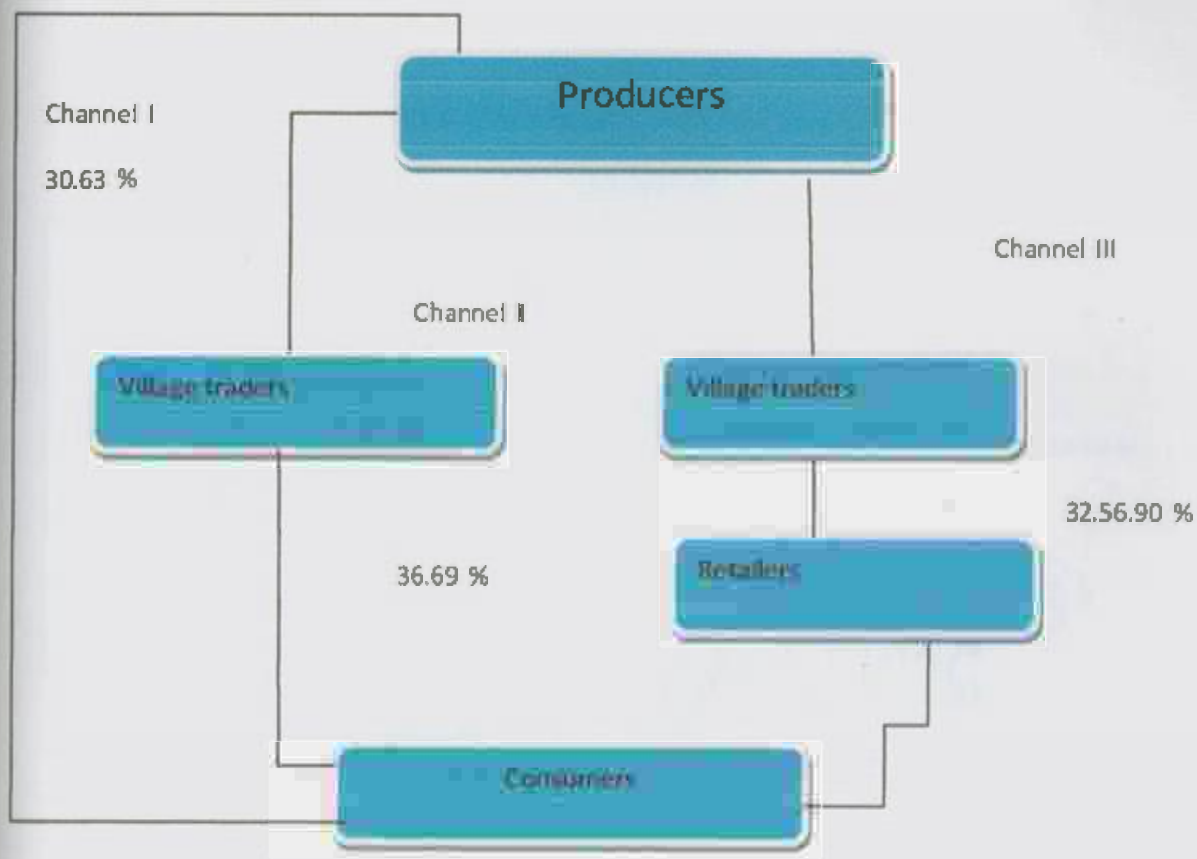

Fig 5.26.1 : Flow chart for Marketing Channels of Pea Under Settled Cultivation

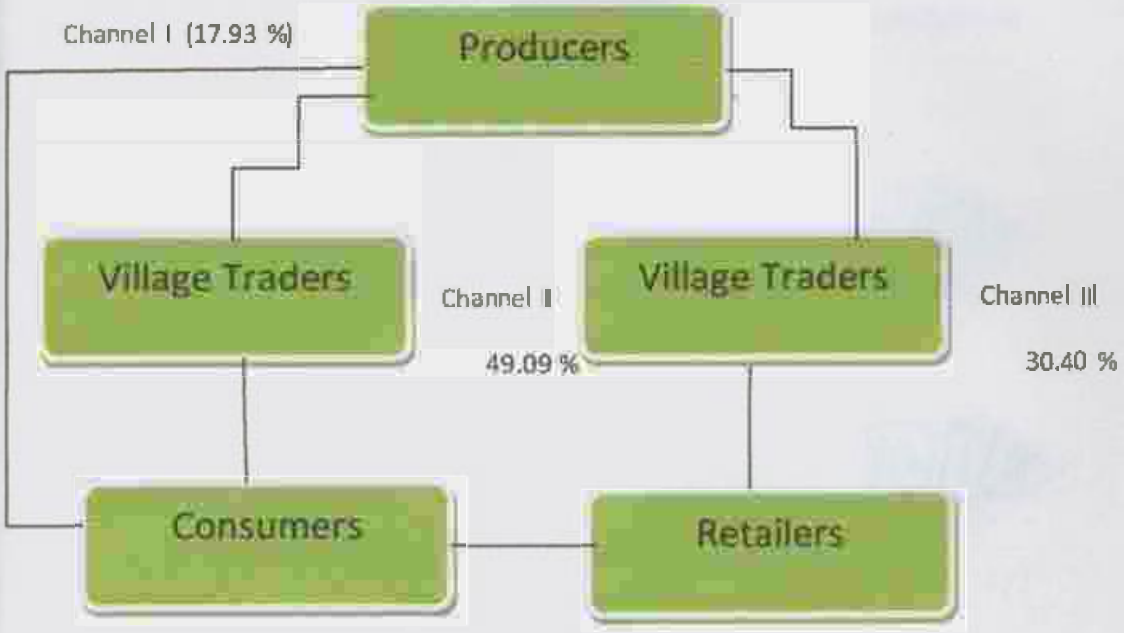

Fig 5.26.2 : Flow chart for marketing Channels of Tomato Under settled cultivation.

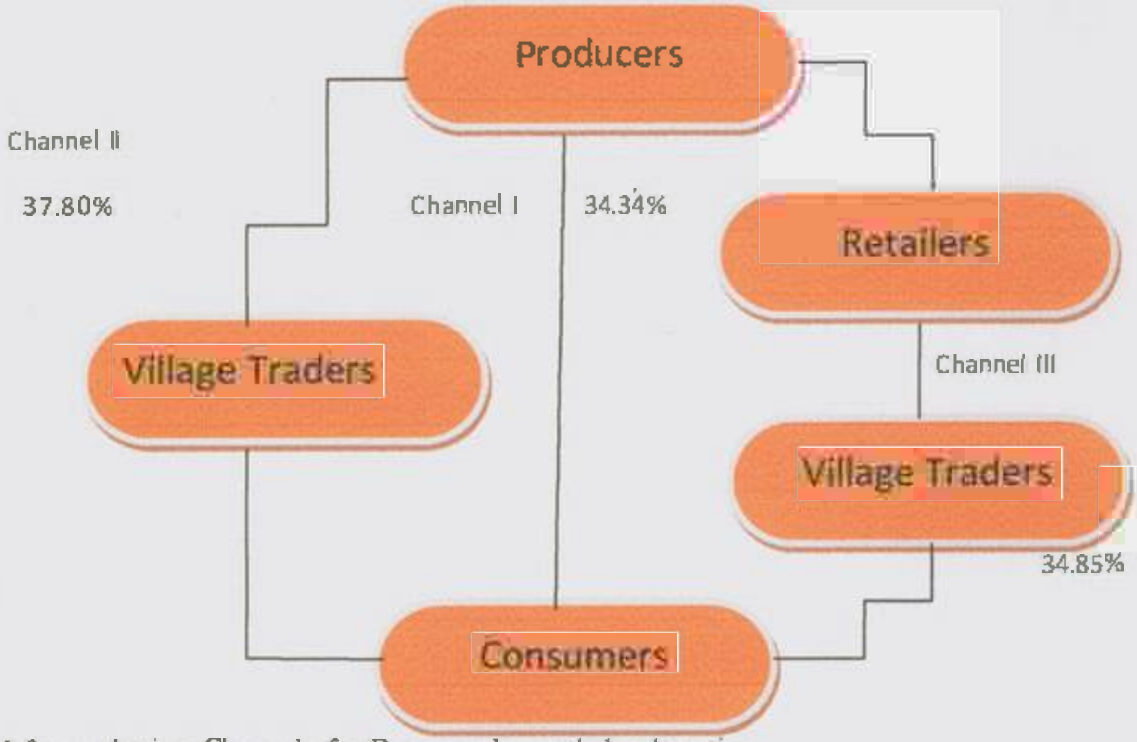

Fig 5.26.3 : marketing Channels for Beans under settled cultivation

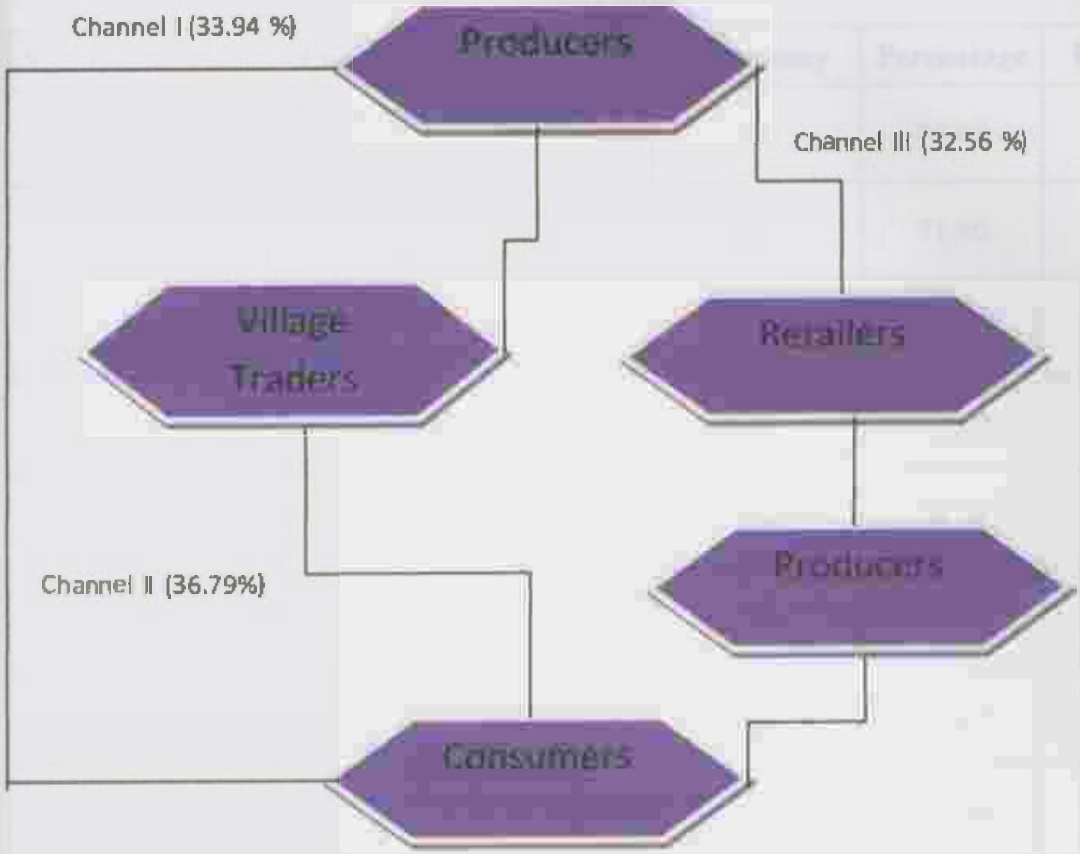

Fig 5.26.4 : Marketing Channels for Cabbage under Settled Cultivation

Table 5.7.1. Constraints in production of Vegetables in Shifting and Settled Cultivation in Dimapur & Wokha district.

S. N.	Constraints	Frequency	Percentage	Rank
1	Non availability of seed on time and lack of seeds	52	86.66	I
2	Lack of technical knowledge of recommended packages and practices	43	71.66	II
3	High labour cost	37	61.66	III
4	Non availability of credit facilities	36	60.00	IV
5	Lack of irrigation facilities specially during winter season.	35	58.33	V
6	Lack of knowledge about plant protection measures.	34	56.67	VI
7	Non application of fertilizers and non-availability of adequate fertilizers.	26	43.33	VII
8	Production instability & lack of training and demonstration	21	31.66	VIII

Table 5. 7. 2. Constraints in marketing Vegetables in Shifting and Settled Cultivation in Dimapur & Wokha district.

S. N.	Constraints	Frequency	Percentage	Rank
1	Lack of proper domestic markets and poor market facilities	53	88.33	I
2	Inadequate transportation facilities	38	63.33	II
3	Inefficient marketing facilities	34	56.67	III
4	Low marketable surplus	31	51.67	IV
5	Unorganized marketing system	27	45.00	V
6	Lack of suitable Government policy	26	43.33	VI
7	Price Uncertainty	25	38.33	VII
8	Lack of organization among producers	21	35.00	VIII

The farmers felt that the government must have some policy regarding marketing and transportation of their produce and because of these they can't produce in a large scale.

Price uncertainty was another problem faced by the farmers. They got less prices when there were heavy arrivals in the local markets.

The farmers are lacking behind in collective organization among themselves to safeguard their own interest. An individual farmer freely deals in his own produce, with his low bargaining power he sells his produce either in bulk or in small quantity to the village traders or to the consumers directly. The main reason for lack of organization was the difference in their operational holdings and lack of proper policy for marketing.

Chapter VI
Summary & Conclusion

SUMMMARY AND CONCLUSIONS

6.1 Summary of the findings:

A brief summary of the silent findings of the research study is presented in this chapter. The present study was undertaken for vegetable crop in Wokha and Dimapur district of Nagaland. From each district two R. D. blocks namely, Dhansiripar & Chumukedima block from Dimapur district and Wokha & Baghty block from Wokha district were selected for the present study due to maximum number of vegetable production. Then five villages from each block were selected randomly based on the area and production of vegetable cultivation. The categorizations of household farmers into marginal, small and medium group were done on the basis of their operational land holdings as follows:

Marginal	: Less than ha
Small	: 1.01 to2ha
Medium	: 2.01 & above

The overall objective of the study was to make a comperative study on Production and marketing of vegetablesinsettled and shifting cultivation in Wokha and Dimapur district of Nagaland. The specific objectives were to estimate the economics of vegetable production, to identify the marketing channels, analysis the price spread of vegetable and to study the constraints faced by the in production and marketing of vegetables.

The study compromised of 300 sample farmers Multistage random sampling method was adopted for the selection of farmers. At the first stage, two development blocks of Wokha district was taken into consideration. At the second stage, 5 villages from each block were selected and in the last stage 6 farmers from each village were selected randomly and were stratified into 3 size group, viz; small (0.1 - 1.00), medium (1.1 - 3.00) and large 3 and above respectively based on the area under potato cultivation. Primary data from the selected farmers were collected for fulfilling the various objectives of study.

6.1.1 Socio economic characters

Socio economic variables like level of education, occupational pattern, land resources and its utilization pattern, cropping pattern, livestock pattern and plantation crop pattern were examined. The average family size of vegetable growers was 6.36 in the sample area. Among the various size group the average family size groups was highest in marginal group (6.99) and lowest in medium group (5.79) of farmers.

It was observed from the table that 7.72 per cent of the total population was illiterate. Out of the literate group 25.34 per cent had studied up to primary level, 43.51 per cent had studded up to P.U / H.S level and 23.42 per cent had studied up to graduate level and above. The literacy percentage was highest in marginal group of farmers (93.50 per cent) and lowest in small group of farmers (90.52 per cent). It was also observed that 92.32 per cent of the sample populations were literate. The proportion of male and female literate were 94.61 per cent and 89.02 per cent respectively.

The occupational pattern of the working force showed that agriculture, business and services were the main source of employment in the sample study area. Agriculture is taken as primary occupation. About 49.86 per cent of the total working force has agriculture as their main occupation

The average size of operational holding was 3.46, 6.48 and 12.20 for small, medium and large groups of farmers in the study area. In aggregate level, average size of operational holding was 7.38. The operational holding increase with the increase in farm size.

In regard to land use pattern of the sample farmers it was observed that 44.42 per cent was taken up by cultivated holding followed by vegetable cultivation with 33.12 per cent and plantation 22.44 per cent respectively. The average cultivated holding was found to be 2.47 ha and the average area under vegetable cultivation was 2.006 ha.

Rice was the dominant crop covering 44.36 per cent of the total crop area. It was followed by vegetable cultivation (42.70 per cent), oilseeds (3.83 per cent), maize (3.16 per cent), sugarcane (3.13 per cent), potato (2.87 per cent), ginger (2.57 per cent) and pulses (1.06 per cent) respectively. The average cropping intensity was found to be 174.53 per cent. Cropping intensity was found to be highest with 192.38 per cent in small group and lowest with 163.12 per cent in medium group of farmers in the study area.

6.1.2 Existing live stock pattern of sample farmers:

The life stock pattern of the sample farmers across various size groups are presented in table 4.1.7. The sample farmers were found to rear animals or birds such as poultry, pig, rabbit, goat, cow, and fishery. Poultry was found to be the most important bird in terms of number of live stock. (3.96 bird per farm) this was followed by pig (1.76), rabbit (1.60), goat (1.03), cow (0.91), and fishery (0.61) respectively.

6.1.3 Economics of vegetable cultivation:

The cost of cultivation amounted to be Rs 39927.39 at an average under shifting cultivation for pea and cost of cultivation under settled cultivation came to about Rs 67407.25. The cost of tomato cultivation amounted to be Rs 53577.71 on and average under shifting cultivation and for settled cultivation it comes to about Rs 94192.48 at an average and for beans it was Rs 44568.95 at an average and for the settled cultivation, the average cost was found to be Rs 79905.46. The comparative economics of shifting and settled cultivation depicted in table 4.2.1 and 4.2.2 show the total cost cultivation and it shows that the total cost of cultivation was found to be higher in settled cultivation as compare to shifting cultivation due to use of more inputs like seeds, fertilizer, Plants protection measure, and vegetables wise the cost of cultivation was highest in tomato followed by beans, cabbage and peas in shifting cultivation and under settled cultivation it was found to be highest in tomato followed by beans, cabbage and peas.

6.1.4 Cost and return structure of selected vegetables under shifting and settled cultivation various size groups:

Tomato: The comparative cost and return between shifting and settled cultivation shows that the cost of cultivation was much higher in settled cultivation (Rs. 103611.72) then shifting cultivation (Rs. 53577.71). The comparative study shows that tomato cultivation is quite profitable in shifting cultivation than in settled cultivation. It is mainly due to income

CHANNEL I : Producer - Consumer

CHANNEL II : Producer – Village trader – Consumer

CHANNEL III : Producer – Village trader – Retailers –Consumer.

Channel I: under these channel, 12.45 percent of pea, 20.70 percent of tomato, 21.99 percent of beans and 20. 48 percent of cabbage was transacted. Through these channel marginal farmers transect 14.15, 31.51, 49.75 and 47.72 percent of their produce respectively and small farmers transect 12.78, 14.26, 7.33 and 4.57 percent of their produce respectively.

Under settled cultivation, in channel I33.47, 17.93, 34.34 and 37.51 of pea, tomato, beans and cabbage were disposed respectively. Channel I was the most effective channel for marginal farmers where they disposed 58.76, 28.98, 72.34 and 43.74 percent of their produce respectively and its the less effective channel for medium farmers where 16.30, 12.39, 11.73 and 20.56 of their products were sold rspectively.

Out of the total marketed surplus, 41.08, 30.65 and 28.27 per cent was transacted through channel I, channel II and channel III respectively. Channel I was the most effective channel through which 41.08 percent was transacted. Channel II was the least effective channel. The small and medium group of farmers mostly preferred to sell their product through channel I than the other channels. This might be due to the fact that they had a small amount and channel I fetched more price and they preferred to sell directly to the consumers. On the other hand, large group of farmers preferred the traders and retailers to sell their produce. The highest marketing cost was observed in channel III (Rs. 245.06 per qt.) and lowest was incurred in channel I (Rs. 75.00 per qt). The cost incurred by intermediaries ranged from 36.42 percent to 60.17 percent of total marketing cost in various marketing channels. The marketing margins were highest in channel III (Rs. 220.00 qt). This might be due to more number of intermediaries involved in the channel.

hired labour more expensive seeds, FYM and plant production measures in settled cultivation. The net return over cost C in shifting cultivation was highest in medium farmers and lowest in marginal farmers. The B.C ratio comes to about 1:9.64 at an average. It shows that tomato cultivation is quite profitable and can be taken up for cultivation. The net return from tomato cultivation comes to Rs. 207994.30 per Ha in medium farmers (Rs. 272550) followed by marginal farmers (Rs. 255262.7) per Ha. BCR on total cost at an average was 1:32 under settled cultivation.

Beans: In beans also cost and investment on seeds constitute the highest proportion (18.9%) at an average under shifting cultivation. It was followed by hired human labour (17.55%) and FYM (6.9%). The cost of cultivation was highest for small farmers (Rs.43424.25) then marginal farmers (RS.42087.87) and medium farmers (Rs.40505.31). The lower cost for medium and marginal farmer is due to efficient use of resources. The net return over cost C was about Rs. 131432.15 atan average. The net return was highest in small farmers (Rs. 155266) and lowest in medium farmers (Rs. 133702.12). The BCR came to about 1:3 at an average. In case of settled cultivation the cost of cultivation for beans at an average was Rs. 79905.46. Cost on seed (17.53%) was the highest followed by hired human labour (11.91%) and fertilizers (7.06 %). The net return over cost C was Rs. 165785.70. The net return was highest in marginal farmers (Rs.288689.80) and lowest in medium farmers (Rs.143185.50. The BCR at an average came to about 1:3.

Cabbage: The net return over cost C at an average was Rs. 1278551.1. The net return was higher in marginal farmers (Rs. 136437.5) and the BCR an average was 1:2 under settled cultivation while for shifting cultivation the cost of production over cost C came to about Rs. 42436.15 at an average. Expenditure on hired human labour was highest (19.58%) which was followed by FYM (5.02%) and seeds (4.66%). The labour cost was shown to be highest in shifting cultivation. The net return over cost C was Rs.40031.63 at an average. It was highest in small farmers (Rs. (1561.49) and the BCR was 1:3 at an average.

6.1.4 Marketing Cltannels of vegetables under shifting and settled cultivation:

In the present study three marketing channels of vegetables in Wokha and Dimapur District ofNagaland are identified. The three channels are as fallows:

6.1.6. Marketed surplus:

Marketed surplus was much higher than marketable surplus for all groups of farmers. This is due to the fact that potato is a voluminous and semi-perishable item with seasonal production but it is demanded through the year for consumption. Due to lack of cold storage facilities in the study area the sample farmers had to sell their produce right after harvest thus, distress sell was observed and marketed surplus becomes higher than the marketable surplus. The per hectare marketed surplus for small, medium and large group of farmers were 44.37, 52.57 and 55.55 respectively.

6.1.7. Marketing Cost:

In shifting cultivation Marketing cost of pea through channel I was found to be Rs. 125.23 per q, tomato Rs. 150/q, beans Rs. 126.89 per q and for cabbage it was found to be Rs. 200per q and channel II marketing cost pea was Rs.460.3 per q, tomato Rs. 530.8 per q, beans Rs. 437.1 per q and cabbage Rs. 483.94 per q and in channel III marketing cost of pea was Rs. 847.26 per q tomato Rs. 968.35 per q, beans Rs. 838.31 per q and cabbage Rs 853.52 per per q respectively. It was estimated from the table the marketing coast was lowest in channel I in all the vegetables and highest in channel III, in channel III in all the vegetables. In channel I marketing cost was low as the producers sold their produce directly to the consumer and was high in channel III due to involvement of more intermediaries.

In settled cultivation, marketing cost of pea was Rs. 81.66 per q, tomato Rs. 111.25 per q, beans Rs. 75 per q and Rs. 88 per q. In channel II marketing cost of pea was Rs. 318.8 per q, tomato Rs. 383.36 per q, beans Rs. 319.45 per q and cabbage Rs. 350.76 per q and for channel III, the marketing cost of pea was Rs. 635.76 per q, tomato Rs. 731.91 per q, beans Rs. 619.83 per q and Rs. 626.37 per q. In case of settled cultivation also marketing cost was highest in channel III and lowest in channel I.

6.1.8. Price spread for vegetables:

In shifting cultivation the table shows that the producers share in consumer rupee was highest in channel I for all the vegetables i.e pea (96.96 per cent), tomato (93.31 per cent), beans (96.17 per cent) and cabbage (88.98 per cent) and lowest in Channel III, pea (82.52 per cent), tomato (68.38 per cent), beans ((79.20 per cent) and cabbage (65.42 per

cent) respectively. The producer's share in consumer rupee was high in Channel I because no intermediaries were involved in channel I.

Under settled cultivation, the price spread analysis shows that the producer's share in consumer rupee was 97.96 per cent, 96.53 per cent, 97.96 per cent and 94.79 per cent for pea, tomato, beans and cabbage in channel I respectively and in channel II it was 86.81 per cent for pea, 87.95 per cent for tomato, beans 91.17 per cent and cabbage 79.95 per cent and in channel III it was observed that the producers' share in consumer price was 76.76 per cent for pea, tomato 79.27 per cent, beans 84.18 per cent and cabbage 69.08 per cent. It was observed that Channel I has the highest producers' share in consumer rupee and channel III has the lowest. Among the vegetable the highest was observed in beans and lowest in cabbage.

In both the cultivation the producers' share in consumer rupee was highest in Channel I and lowest in channel III for all the vegetables. The comparative study shows that the producers' share in consumer rupee was more in settled cultivation than in shifting cultivation.

6.1.9 Marketing efficiency:

The marketing efficiency of vegetables through various channels was done by using Shepherd's formula. Under shifting cultivation the marketing efficiency were 32.94 for pea, tomato 14.96, beans 26.16 and cabbage 9.07 for channel I respectively and for channel II it were 4.71 for pea, tomato 2.37, beans 3.88 and cabbage 1.93 and in channel III it was observed that the marketing efficiency were Pea 2.3, tomato 1.26, beans 1.88 and cabbage 1.16. Marketing efficiency was highest in channel I and lowest in channel III in shifting cultivation.

In settled cultivation the marketing efficiency for various vegetables are pea 27.57, tomato 28.86, beans 49.1 land cabbage 19.22 and in channel II it was 3.43, 3.7, 4.95 and 2.2 for pea, tomato, beans and cabbage. Marketing efficiency in channel III were 1.9, 1.77, 2.26 and 1.19 for pea, tomato, beans and cabbage. Marketing efficiency was highest in channel I and lowest in channel III in settled cultivation.

6.1.10 Problems faced by farmers in production of vegetables under shifting cultivation and Settled cultivation:

Various problems of production and marketing of vegetables are identified by the farmers in the study area. In order of relative importance among different problems of production, non availability of seed in time was the most felt one. Lack of knowledge about plant protection measures was the next problem. Lack of knowledge about the recommended package of practices and non availability of credit facilities were the major problems faced by the farmers in production of vegetables in the study area.

In the marketing field, the major problems faced by the farmers were lack of proper domestic market and poor market facilities, lack of storage and lack of proper transportation facilities as revealed by the sample farmers.

6.2 Conclusion:

The following conclusions emerged from the study.

1. The rate of literacy was very high in the study area. P.U/ H. S level education was found to be most prevalent (43.51 percent) followed by primary level (25.34 percent) and graduate and above (23.42 percent) in the sample area.

2. Workers constituted about 37.35 percent of the sample population. Male workers constituted about 26.80 per cent while female worker constituted about 10.55 per cent of the sample population. The above finding shows that male workers out numbered female workers. The study also reveals that percentage of workers increased with the increased in size of holdings.

3. About 49.86 percent of the working population had agriculture as their main occupation. This was followed by service which includes Government servants and other private sector services and business accounting to 31.21 percent and 18.91 percent respectively.

4. The average size of operational holding was 3.46 ha, 6.48 ha and 12.20 ha respectively for small, medium and large farmers. In the aggregate level, average size of operational holding was 7.38 ha. The land holding showed an increasing trend with increase in size.

5. Rice was found to be dominant crop covering 44.36 percent of the total crop area. It was followed by vegetables, oilseeds, maize, sugarcane, potato, ginger and pulses respectively. The average cropping intensity was found to be 174.53 percent.

6. The average per hectare total cost of Vegetables production came to about Rs. 39,927 for pea, Rs. 53,577.71 for tomato, Rs. 44,568.95 for beans and Rs. 72,948.48 for cabbage respectively for shifting cultivation and in settled cultivation the average cost of cultivation was Rs. 67,407.25 for pea, Rs. 94,192 for tomato, Rs. 79,905.46 for beans and Rs. 72948.48 for cabbage respectively. The comparative economics shows that the cost of cultivation was higher in settled cultivation. It was mainly due to use of more inputs like plant protection measure, fertilizers seeds, etc. among the vegetable the cost of cultivation was highest in tomato followed by beans, cabbage and pea for both settled and shifting cultivation.

7. The average yield was 26.06 q per ha for pea, 247 q per ha for tomato, 55.64 q per ha for beans and 82.02 q per ha for cabbage respectively under shifting cultivation. The average yield for settled cultivation was 58.38 q per ha, 98.70 q per ha for tomato, 68.08 q per ha for beans and 115.5 q per ha for cabbage respectively.

8. There were three marketing channels involved in the marketing of Vegetables in Wokha and Dimapur districts viz., producer – consumer (channel I), producer – village trader – consumer (channel II), producer – Village traders – retailers – Consumers (channel III).

9. The marketing cost was lowest in channel I in all the vegetables and highest in channel III in all the vegetables in shifting Cultivation. In channel I marketing cost was low as the producers sold their produce directly to the consumer and was high in channel III due to involvement of more intermediaries.

10. In case of settled cultivation also marketing cost was highest in channel III and lowest in channel I.

11. In shifting cultivation the table shows that the producers share in consumer rupee was highest in channel I for all the vegetables i.e pea (96.96 per cent), tomato (93.31 per cent), beans (96.17 per cent) and cabbage (88.98 per cent) and lowest in Channel III, pea (82.52 per cent), tomato (68.38 per cent), beans ((79.20 per cent) and cabbage (65.42 per cent) respectively.

12. Under settled cultivation, the price spread analysis shows that the producer's share in consumer rupee was 97.96 per cent, 96.53 per cent, 97.96 per cent and 94.79 per cent for pea, tomato, beans and cabbage in channel I respectively and in channel II it was 86.81 per cent for pea, 87.95 per cent for tomato, beans 91.17 per cent and cabbage 79.95 per cent and in channel III it was observed that the producers' share in consumer price was 76.76 per cent for pea, tomato 79.27 per cent, beans 84.18 per cent and cabbage 69.08 per cent.

13. Marketing efficiency was highest in channel I and lowest in channel III in shifting cultivation and in settled cultivation also Marketing efficiency was highest in channel I and lowest in channel III.

14. non availability of seed in time was the most felt one. Lack of knowledge about plant protection measures was the next problem. Lack of knowledge about the recommended package of practices and non availability of credit facilities were the major problems faced by the farmers in production of vegetables in the study area.

15. In the marketing field, the major problems faced by the farmers were lack of proper domestic market and poor market facilities, lack of storage and lack of proper transportation facilities as revealed by the sample farmers.

Policy implications:

This study generated information on Comparative study on production and marketing of Vegetables under settled and shifting cultivation in Dimapur and Wokha District of Nagaland. From the findings of the study following policy implications are drawn and suggested.

1. Farmers should be encouraged to produce quality vegetable seed as scarcity of seed is a common problem in the area. Seed production programmed should be taken up on priority basis.

2. Training and demonstration should be given to the farmers before commencement of the crop season.

3. Agricultural Input marketing system should be established and strengthened so that farmer's needs could be meet on time.

4. Storage facilities should be made available by the government and farmers should be allowed to store their produce at minimal rate. It will reduce distress sale.

5. The farmers should sell their produce through the most efficient marketing channel.

6. Road infrastructure should be improved in the potato growing area to reduce transportation cost and to have proper marketing facilities.

7. Improvement in the marketing system should be done and regulation of markets should be initiated by the state government to reduce imperfection in the present marketing system in the study area in particular and in the state in general

8. Institutional credit facilities at a nominal rate should be made available to the farmers to take up cultivation of potato in a large scale and to take up improved package of practices.

9. Formation of co – operative marketing should be encouraged in the village level for selling their produce.

10. Marketing system should be improved through market intelligence, market research and development, and marketing extension in the area. This would be beneficial in efficient marketing system of vegetables in the area.

11. Processing unit, cold storage should be set up in order to help the farmers.

References

REFERENCES

Abbot, I. C. 1970. Marketing Fruits and Vegetables, FAO Marketing Guide. (2nd Edition).

Acharya, S. S. and Agarwal, N. L. 1992. *Agricultural Marketing in India.* (2nd Edition). Oxford Publication, New Delhi.

Agarwal, N. L. and Saini, T. C. 1995. Vegetables Marketing- A Case Study of Jaipur Market (Rajasthan), *Indian Journal of Agricultural Marketing*, 9(I): 36-43.

Ali, M.; Akbar, M. A. and Raheman, M. L. 2002. Marketing of vegetables by farmers in some selected areas of Bangladesh. *Bangladesh Journal Training Development.* 15 (1): 88-97

Anil Kumar and Arora. 1999. Post Harvest Management of Vegetables in Uttar Pradesh hills. *Indian Journal Agriculture Marketing*, 13 (2): 6-14.

Annonymous. 1976. National Commission on Agriculture. Government of India. (Part XII).

Annonymous. 1988. List of Regulated Markets in Assam. Monthly market News Bulletin. Guwahati.

Annonymous. 2012. Slatistical handbook of Nagaland, Directorate of Economics & Statistics, Government of Nagaland Kohima.

Annonymous. 2013. Vegetable Statistics, Indian institute of Vegetable Research, Indian Council of Agricultural Research. Varanasi, Uttar Pradesh.

Analogous. 1989. Price-spread in the Country. Agricultural Economics Research Centre, University of Delhi.

Anonlogous. 1987. Government of India. Marketing of Ginger in India. Directorate of Marketing and Inspection, Ministry of Rural Development, Faridabad, Haryana.

Anonlogous. Government of India. Report of the Committee set up to Study the Potential for Integrated Horticulture Development in Meghalaya. Ministry of Agriculture and Rural Development, New Delhi, Mimeograph.

Arneja, C. S.; Singh, R. and Kaur, G. 1995. Constraints in Potato Cultivation faced by the Potato growers. *Agriculture Science Digest*. **15** (2): 1-3

Arya, B. L. 1995. Pricing Efficiency in the Marketing of Potato crop in Gujrat. *The Bihar Journal of Agricultural Marketing*.

Bala, B.; Sharma Nikhil; Sharma, R. K. 2011. Cost and Return structure for the Promising Enterprise of Off- Season vegetables in Himachal Pradesh. *Agricultural Economics Research Review*. **24**: 141-148.

Babu, P. K. 2007. Economic analysis of production and marketing of tomato in Barpeta district of Assam. *Journal of the Agricultural Science Society of North East India*. **20** (2): 175-181.

Begum, M. J and Raha, K. P. 2002. Technical Efficiency of Major Food and Cash Crops in Karnataka. *IndianJournal of Agricultural Economics*. **57**: 176-189.

Bhide, S. A.; Choudhury, R. S.; Hady, E. O. and Murulidharan, M.A. 1981. Structural changes in an Agricultural Assembling Market - A case study of Arecanut (Betelnut) Market in Mangalore, Karnataka State. *Indian Journal of Agricultural Economics*. **36** (2): 25-34.

Bhople, R. S and Ambarkar, K. S. 1996. Production, Storage and Marketing Constraints of Vegetables Growers of P. K. V. *Research journal*. **20** (1):31-33.

Bhukta, A. and De, A. K. 1997. Hen-Egg relationship: A study of Growth Pattern of Potato Production and Storage Capacity. *Economic Affairs*. **42** (2): 86-95.

Bhuyan, S. H.; Demaine, R. and Weber, K. E. 1990. Market Regulation or Regulated Market, *The case of Assam, India*, HSD Monograph No. 19, Asian Institute of Technology, Bankok, Thailand.

Blyn, George 1973. Price Series Correlation as a Measure of Market Integration, *Indian Journal of Agricultural Economics*. **28** (2): 56-59.

Bonny, B. P. and Prasad, R. M. 1996. Constraints in Commercial Production of Vegetables. *Journal of tropical Agriculture*. **34** : 156-160.

Bose, T. K.; Som, M. G. and Kabir, J. K. 1993. Vegetable Crops. (Eds) Revised and Enlarged Edition. Naya Prakash, 206, Bidhan Sarani, Calcutta.

Chadha, K. L. 1994. Horticulture: Delayed Recognition of Potential, *The Hindu Survey of India Agriculture*. Published by S. Rangarajan on behalf of M/S-Kasturi & Sons Ltd. Madra:111-117.

Chauhan and Chakraborty, K.S. 2005(a & b). Marketing costs and margins of agricultural produce in Tripura. *Agricultural Marketing*. **48** (1): 4-8.

Chauhan, K. K. S. and Singh, R. V. 1973. Marketing of Wheat in Rajasthan.University of Udaipur, S. K. N. College of Agriculture, Jobner, Rajasthan.

Chinchmalatpure, V. M.; Talathi, J. M. and Naik, V. G. 2009. Price spread in marketing of brinjal in Maharashtra state. *Indian Journal of Agricultural Marketing*. **51** (2): 5-8.

CII, Mckinsey Report, 1997. "The fruit and Vegetable Opportunity in Food and Agricultural Integrated Development (FAID) action report, pp. 140-152.

Cornejo, H.; Solo, G. and Chowdhury, S. 1994. Co-operative marketing of fruits and vegetables in India. Need of 21st century. *Economic Affairs*. **39**(1): 56-58.

Croxton, E. Fredrick H. and Dudley J. Cowden. 1995. *Applied General Statistics*, Second, Prentice Hall, New York: 562-578.

Dantwala, M. L. 1952. Report of the Enquiry into the Regulated Market in the Bombay State. Government of Bombay, Bombay.

Das. K. and Banerjee, T. 2000. Input use efficiency in pomegranate orchards in Bijapur district, Karnataka. *Indian Journal of Agricultural Economics*. 55 (3): 529-530.

Das, S,; Khan, M. H. and Reddy, S. N. 1985. Production potentials and resource productivity in Assam. *Journal of Research*, ANGRAU. 17 (4): 118-121.

Dastagiri, M. Band Immanuelraj, T. K. 2012, Supermarket Supply chains in Horticulture in India. The Novel Marketing Models, effects and polices. Agro technology 1: 107, doi 10417/2168-9881.

Devaraja. 1998. Channels and Price Spread in Potato Marketing- A Case Study in Belgaum District. *Agriculture Marketing*, **41** (1): 19-21.

Dhillon, P. K. and Goel, Veena. 1993. An analysis of the of Seasonal Pattern of Market Arrivals and Prices of Onion in Ludhiana Market of Punjab. *Indian Journal of Agricultural Marketing*. 7 (1): 125-129.

Epperson, J. E and Lei, L. F. 1989. A regional analysis of vegetable production with changing demand for row crops using quadratic programming. *Southern Journal of Agricultural Economics*. July: 87-95.

Garg, J. S. and Prasad, V. 1974. Comparative Profitability of Vegetable Crop in the vicinity of Kanpur City. *Indian Journal of Agricultural Economics*. **29** (3): 168-170.

Garming, J.; Gajanana, T. Mand Suarhamanyam, K. V. 2013. Fruit marketing through co-operative: A case study of Jalgaon banana. *Agricultural Economics Research Review*. **26** (1): 36-48.

Gaya, Deen. 1977. Marketing of Potato in Farrukhabad District ofUttar Pradesh. Ph.D. Thesis. Indian Agricultural Research Institute, New Delhi.

Ghosh, S. P. (1985). *Horticulture in North-Eastern India.* Associated Publishing Company, New Delhi: 18-33.

Gogoi, M. 1996. A Study of Marketing and Processing of Arecanut in Assam. PhD. Thesis, Department of Agricultural Economics and Farm Management. Assam Agricultural University, Jorhat, Assam.

Gopalan, M. and T. M. Gopalan. 1991. "Marketing Efficiency of Co-operative in Potato Region in Tamil Nadu: An Empirical Study." Indian Co-op. Rev., **28** (3): 203-221.

Gunwant, K. V., Hussian, M., Purohit, C. R., Ali, F. S., Rana, D. 2012. "A Comparative study of production and marketing practices of Vegetables in Nainital and U.S Nagar Districts of state Uttarakhand", India. *International Journal of advances in computing and information technology.* **pp**. 569-578. Doi: 10, 6088/ijacit.12.16006.

Gupta, A. K. and Ram, G. S. 1981. Price Spread behavior of Vegetables in Delhi. *Agricultural Situation in India.* **36** (7): 549-557.

Halder, P.; Hatai, L. D and Baig, M.A. A, 2007. Economics of production and marketing strategies of potato in Orissa. *Indian Journal of Agricultural Marketing.* **21** (2): 46-57.

Haque, T. 2000. Contractual Arrangements in Land and Labour Markets in Rural India, *Indian Journal of Agricultural Economics*, 55(3): 233-252.

Jain, B. C. and Nichit, C. V. 2007. Marketing of major horticultural crops in Dharsiwa block of Raipur district ofChhatisgarh. *Agricultural Marketing.* **50** (2): 36-41.

Jairath, M. S. 1994. Econometric Methods 3rd Edition, Mc Graw Hill Book Company, New Delhi.

Jairath, M. S. 1994. Production and disposal pattern of sweet potato in India. *The Bihar Journal of Agriculture Marketing.* **2** (1): 65-72.

Kainth, Gur.; Singh, Sharan and Mehra, P. L. 1988. Seasonality Pattern of Market Arrival and Prices of Potatoes in Punjab. *Indian Journal of Agricultural Marketing.* 2 (1).

Kakaty, G. 2009. "Potentialities of Horticultural Crops and Market Accessibilities in Assam and Meghalaya with special reference to Technology Mission for Integrated Development of Horticulture" Agro-Economic Research Centre for North East India, Jorhat, Study No.13o: 109-110.

Kamdar, K. H. (1928). Some Observations on Marketing in North Gujarat and at Bombay *Indian Journal of Economics,* **9**(34).

Kasar, D.V., B. S, Ambre, R.C. Rauf and V. S Rasane 1994. Marketing of Bittergourd in Ahmednagar Distict of Maharashtra, *Indian Journal of Agricultural Marketing,* **8**(2):246-249.

Kerutagi, J.; Kaur, H. and Gupta, M. 2009. Problems and strategies in production and marketing of fruits and vegetables in India. *Agricultural Situation in India.* **65** (12): 621-623.

Khemar, S.H., D. S. Nawadkar and S. B. Dangat. 1994. Profitability of Tomato cultivation in Ahmednagar district of Maharashtra state. *Indian Journal of Agricultural Economics.* **8**(1): 96-100.

Krishna, M. 1994. Some Emerging Aspects of Production and Marketing of Vegetables in Bihar, *Indian Journal of Agricultural Marketing,* Conference Special number, pp 141-147.

Krishnaswamy, L. 1971. The degree of competitiveness in Agricultural markets, paper presented at the International Conference of Agricultural economics held at Brazil.

Kushwaha, R. K. S., O.P. Rana, G. N. Singh and O. P. Maurya. 1994. Marketing of Potato in District Muzaffarpur (Bihar) in the Context of Diversified Agricultural Groeth, *Indian Journal of Agricultural Marketing*, Conference Special number, pp 136- 140.

Malik, B. K.; Bhosale, S.S.; Shendge, P. N. and Kale, P. V. 1999. Economics of Production and Marketing of Banana in Jalagon district of Western Maharashtra. *Indian Journal of Agricultural Marketing*. **16** (1): 173-181.

M.B. Dastagiri, Ramesh Chand, T. K. Immanuelraj, C. V. hanumanthaiah, P. Paramsivam, R. S. Sidhu, M. Sudha, Subhasis Mandal, Basantha Singh, Khem Chand, B. Ganesh Kumar. 2013. Indian vegetables: Production Trends, Marketing Efficiency and export Competitiveness. *American Journal of agriculture and forestry*. **1** (1): 1-11.

More, S. S.; Dudhate, D. G. and Kalabandhi, B. M. 2008. Constraints faced by banana growers in production, marketing and finance of banana cultivation. *International Journal of Agricultural Sciences*. **4** (2): 562-564.

Narain, Dharam. 1961. Distribution of the Marketed Surplus of Agricultural Produce by Size-Level of Holdings in India (1950-51). Institute Economic Growth. Occasional Paper No. 3. Asia Publishing House, London.

Nawadkar, D. S.; D. K. Muhandule, D. L. Sale and S. B. Dang. 1991. Marketing of Vegetables in Western Maharashtra, *Indian Journal of Agricultural Marketing*. 5(2): 178 .

Nawadkar, D. S.; S. M Shete, S. K. Nawale and S. H. Khemar. 1995. Study on Tomato Marketing in unorganized sector, *The Bihar Journal of Agricultural Marketing*, 3(3): 280-283.

Negi, Y. S. and Bhalla, P. 2002. Collection and marketing of important medicinal and aromatic plants in tribal's areas of Himachal Pradesh. *Indian forester.* **128** (96): 641-649.

Niwas, S. and R. P. Singh. 1982. Economics Aspects of Cole crops in the Hinterland of Hissar City, *Agricultural marketing*, **25**(1): 11-14.

Parmar, G. D.; K. A. Khunt and D. B. Desai. 1994. Marketing of Vegetables in South Gujarat, *Indian Journal of Agricultural Marketing*, **8**(2): 258-263.

Pawar, B. R,; Landge, V.V.; Yeware, P. P. and Deshmukh, D. S. 2010. Marketed surplus and price spread in Marketing channels of banana. *International Journal of Commerce and Business management.* **3** (1): 100-104.

Pathak, M. 1996. Economic Analysis of Production and Marketing of Rabi Vegetable Crop in Barpeta District of Assam. M.Sc (Agricultural) Thesis, Assam Agricultural University, Jorhat.

Pokhreal, D. P. 2010. Comparision offarm Production and marketing Cost and Benefit among Selected vegetable pockets in Nepal. *The Journal of Agricultural and Environment.* 11: 10 -24.

Pramanik, S. C; Kumar Ganural, B., Nawaz, S and Balkrishnan, M. 2003. Economic of Production and Marketing of Vegetables in Andaman and Nicobar Islands. *Annual Agricultural Research. New Series.* **24** (2): 776-781.

Prasad, Arbind. 1993. Vegetables marketing: A case study of two Agricultural markets of Bihar, *The Bihar Journal of Agricultural Marketing*, **2**(2): 101- 112.

Prasad, J. 2001. Vegetables Production and Marketing in Bihar: A Farm Level Study. *The Bihar Journal of Agricultural Marketing.* **IX** (3) pp. 225-245.

Radha, M. and Chowdhary, A. K. 2004 (a & b). Towards a rainbow revolution. *The Hindu Survey of Indian Agricul*

Radha, Y. and Prasad , E. 2001. Economics of Production and Marketing of Vegetables in Karimnagar District, Andhra Pradesh. *Indian Journal of Agricultural Marketing*. **15** (1): 55-61.

Ramana, T. V. and Kuberudu, B. 2010. The prototype of vegetable cropping, marketing and its determinants: A case study in Godavari delta region, AP, India. *International Journal of Commerece and Business Management*. **3** (1): 134-138.

Ramesh, P. K. and Murughan, M. L. 2007. Marketing of banana in Guntur district of Andhra Pradesh. *Indian journal of Agricultural Marketing*. **21** (1): 38-41.

Rathore, M.S., J.P. Bhatia and R. Swarup. 1974. Economic Analysis of some Vegetable Crops of Temperate Region, Indian Journal of Agricultural Economics. **29(3)**: 78.

Rizvi, S. M.A. and Rajendra Singh. 1987. Pattern of production and Marketing of Potato in Saraon Development Block of Allahabad – A case study, *Indian Journal of Agricultural Marketing*. **1(2)**: 96 -100.

Rojamony, L., L. Bastine and A. Khadey. 1985. Economic Evaluation of Cucurbitaceous Vegetables cultivation in Summar Rice fallows, *South Indian Horticulture*. **33(4)**: 245 -250.

Sangolkar, S. C. 2012. Economics of banana marketing in Jalgaon district. An analysis across alternative channels. *African Journal of Marketing Management*. **3(5)**. August: 128-132.

Saikia, T.N and D.Borah. 1998. Marketing of Pineapple and Citrus(Orange) in Assam and Meghalaya. Agro-Economic Research Centre for North East India, Jorhat.

Sen, C and R. P. Maurya. 1998. Marketing of Vegetables in Sewapuri Block. *Agriculture marketing*, **41(2)**: 29-31.

Selvaraj, K. N. and S. Krishnamoorthy. 1990. Marketing Operations for Improving Marketing Efficiency of Vegetables- The Case of cabbage and Carrot, *Indian Journal of Agricultural Marketing*, **4**(2): 205-208.

Sharma, H., Dahiya, P.S. and Nayar, N. M. 1992. Price Analysis of Potato vis-à-vis Vegetables and Pulses in India. *Agricultural Marketing*. **34** (4): 8- 12.

Sharma, R. K., S.K, Sharma and R. K.Thakuf. 1995. Marketing of Vegetables in Himachal Pradesh, *Indian Journal of Agricultural marketing*, **9**(1): 44-50.

Shafma, H. C., Kaur, A. P. and Pandey, N. K. 1997. Potato Marketing in Bihar Viv - a- Vis Cold Storage inadequacies. *Journal of the Indian Potato Association*. **24** (3-4): 142-147.

Sarma, R. K . 1999. Structufe of Vegetables Markets in Lower Brahmaputra Valley Zone of Assam. *The Bihar Journal of Agricultural Marketing*. **VII** (2) pp. 206-214.

Shiyani, R. L., Kuchhadiya, D. B. and Patat, M. V. 1998. Marketing of Vegetables in South Saurashtra Zone of Gujrat. *Indian Journal of Agricultural Marketing*. **12** (1-2) : 156-160.

Singh, Sukhpal. 2007. Agribusiness in South Asia: A fact sheet.

Singh, G. C. 1993. An Empirical investigation into production and mafketing and Esxport potential of Vegetables in Bihar. *The Bihar Journal of Agricultural Marketing*. **1**(3): 339-349.

Srivastava, G. C. 1993. An Empirical investigation into Production, Marketing and Export potential of Vegetables in Bihar, *The Bihar Journal of Agricultural Marketing*, **1**(3): 339-349.

Susanta, K, Roy 2001. Integrated Post Production Management N Food Processing- The National objective." Indian Food Packers, 55 (2):76-84.

Swarup, V. 1994. Vegetables , export needs thrust, The Hindu Survey of Indian Agriculture, Published by S. Rangaranjan on behalf of M/S Kasturi & Sons Ltd, Madras: 125-127.

Talukdar, K.C. 1984. A Study of Efficiency and Equity in Major Agricultural Contmodities in Assam State, Ph.D. Thesis, Indian Agricultural Research Institute, New Delhi.

Tewari,S.C., S. P. Dhall and S. L. Sharma. 1974. Income and Investment Behavior of Vegetable growing and cereal growing Farms-A Comparative Study, *Indian Journal of Agricultural Economics*, **29**(3): 179-180.

Thakur,D.S. 1994, High stakes for Banks in off Season Vegetable Production and Marketing, *The Bihar Journal of Agricultural Marketing*, 2(1): 89 -95.

Thakur, D.S., Kapila and Satish Chander. 1985. Economics of Vegetable production Diversification of farming in Himachal Pradesh, *Himachal Journal of Agricultural Research*, **11**(2): 71-79.

Thakur, D. S., Thakur, D. R., Sharma, K. D. and Sanjoy. 1994. Vegetables Revolution and Economics in Himachal Pradesh. *The Bihar Journal of AgriculturalMarketing*. **11** (2). 145-146.

Thakur, D.S., Sanjay, D. R. Thakur and K. D. Sharma. 1994 a. Economics of off Season Vegetable production and Marketing in hills, *Indian Journal of Agriculture Marketing*. **8** (1): 72-82.

Thakur, D.S., D.R. Thakur, K. D. Sharma and Sanjay. 1994 b. Vegetables revolution and economics in Himachal Pradesh, *Himchal Journal of Agricultural Research*, **11** (2): 71-79.

Verma, A. S. and Singh, A. S. 2004. Study of socio – personal, economic and psychological attributes and constraints faced by brinjal growers, Agriculture Update. **1** (1/2): 204-206.

Appendix

. Distribution of sample vegetables farmers aecording to Size classes of holding

SN	District	Sample farmers / Growers in number	
		Operational holding in hectare	No of household / farmers
1.a.	Wokha	0.1 to 1	83
b.		1.1 to 2	44
c.		2.1 & above	23
Total			150
1.a.	Dimapur	0.1 to 1	82
b.		1.1 to 2	43
c.		2.1 & above	25
Tolal			150

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