MINOR RESEARCH PROJECT

ON

PROJECT TITLE:

THE PROBLEM AND PROSPECT OF HORTICULTURE WITH SPECIAL REFERENCE TO BHURAGAON REVENUE CIRCLE OF MORIGAON DISTRICT

SUBMITTED TO
THE REGISTRAR
KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY
HOUSEFED COMPLEX, LAST GATE
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(Enclose a set of Questionnaire with this project.)

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ACKNOWLEDGEMENT

I wish to express my deep gratitude to Dean (Academic) respected Dr. Arupjyoti Choudhury Sir, Deputy Registrar (Academic) Dr. Limpon Bora Sir and Registrar of Krishna Kanta Handique State Open University, Guwahati – 6 for their inspiring guidance and giving me the chance to carry on this project.

I am thankful to the staff of District Agriculture and Horticulture Office, Morigaon and Revenue Circle Office, Bhuragaon for providing support during the course of this study.

My special thanks go to my husband Mr. Pragati Prasad Bora for his constant inspiration, valuable suggestions and hospitality in the course of my entire research work.

The study receives immense support from the farmers who cultivate horticultural crops in the study area. I sincerely thank all of them for their active cooperation. I also like to thank Pallabjyoti Deka, Research Assistant who helps me in the primary data collection in the study area during the course of this study.

I also express my high sense of gratitude to Dr. Kamal Chandra Nath, Principal of Charaibahi College for his love and affection and good wishes that have been a great source of inspiration to complete this work.

I cannot forget to express my thank to Sabir and Atikul for their sincere co-operation in typing my research work.

Thanking you,

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PART ONE : INTRODUCTION

CHAPTER I : INTRODUCTION

1.1 INTRODUCTION

Horticulture, the branch of plant agriculture dealing with garden crops, generally fruits, vegetable and ornamental plants. Horticulture is also the science and art of producing, improving, marketing, and using fruits, vegetables, flowers and ornamental, plants. Production and consumption of high quality fruits and vegetables allows us to maintain a healthy, balanced daily diet. Flowers and ornamental plants enrich our homes and communities, and contribute to our sense of well-being. Horticulture is generally encompasses a smaller scale of cultivation, using small plots of mixed crops rather than large fields single crops. Horticultural cultivations generally include a wide variety of crops, even including fruit trees with ground crops. Horticulture can also be defined as the branch agriculture concerned with intensively cultivated plants directly used by man for food, for medicinal purposes or for aesthetic purposes.

The Morigaon District has vast potential for development of plantation and horticultural crops. At least 2600 ha of land can be brought under horticultural crops. There has been an impressive growth of horticultural crops in the District in recent years. Fruits crops, vegetable crops, potato crops, nuts, spices, medicinal and plantation crops are some important horticultural crops of the District.

1:2 SIGNIFICANCE OF THE STUDY

At present in India as compared to the yield of field crops per hectare, the yield of horticulture crops is very high. Horticulture crops form a vital part of the Indian agricultural production. India is the second largest producer of fruits and vegetables in the world. Cultivation and processing of these crops generate significant employment opportunities for the rural and Peri-urban population. In addition, marketing creates employment prospects for the urban poor which in turn ensure better livelihood security. Horticulture has also a significant place in rural area

like Bhuragaon Revenue Circle by providing economic uplifment in terms of employment generation and growth. In a poor and backward area of Morigaon District like Bhuragaon Revenue Circle the horticulture are normally associated with agriculture and provide subsidiary employment. The economy of this study area is generally agro-based soil erosion and adverse effects of chronic floods on fertile agricultural land have made even affluent farmers land less. Therefore, a large number of such cultivators shift to carry out horticultural practices. The horticulture sector plays a unique role in rural economy by improving the income of the rural people. With the development of this sector many poor families have been able to raise their income and improve their standard of living. On the other hand the horticulture crops are more profitable. Because, as compared to the other field crops, the horticulture crops can also be grown 3 to 4 times each year giving the products all the time they are grown. More number of crops can be grown from same piece of land. Hence horticulture crops have great significance from the economic point of view also.

Horticulture crops play an important role in human nutrition, preventing diseases and contributing to the nation's development and prosperity. The horticulture also affects our lives on a daily basis by providing nutritious fruits and vegetables. Fruits, vegetables are also rich source of vitamins, minerals, proteins, and carbohydrates etc. which are essential in human nutrition. Hence these are referred to as protective foods and assumed great importance as nutritional security of the people also.

Saroda and Rajani, Researcher from Sri Padmavathi Mahila University in India also conducted a research in 2012 on Horticultural Nutrition Interventions through women's participation reported that maternal and child under—nutrition contributes to more than 10% of the total global disease burden. This implies that horticultural products have crucial health benefits.

Among the different types of Horticulture crops, peanuts grow in a very fascinating manner in the study area. Already there is a big market for peanuts in Baralimari under the study area of the District. The District Agricultural Department is the nodal agency for development of horticulture and plantation crops. At present there is no autonomous body for development of this sector.

1:3 OBJECTIVES:

The main objectives of the study are:

1. To find out the problems of horticulture crops and to suggest policy measures in the study area.
2. To study the engagement of Male and Female in horticulture sector in Laharighat Revenue Circle.
3. To study the importance of horticulture in providing employment and in the sector of fruits and vegetables plant production.
4. To find out educational and training opportunities among the farmers in horticulture sector.

1:4 HYPOTHESIS:

In order to active the above objective the following hypothesis are adopted.

1. There has been an impressive growth of horticultural crops in the district and specially in the study area in recent years. But for development of this sector, financial support to the horticultural farmers is not sufficient as they require. There are also no food processing or preservation units in the study area. Therefore, setting up to marketing, cold storage, transportation system for raw and processed perishable horticultural products.

2. There is a great importance of horticulture in our lives on a daily basis by providing nutritious fruits and vegetables. Horticulture can generate substantial employment opportunities in the study area.

3. The absence of proper training facilities is one important cause for which production of this sector is not sufficient as their need.

1:5 LIMITATION OF THE STUDY:

Food security, nutritional security, sustainability and profitability are the main focuss of present and future agricultural development. During 2000 to 2010, the statistical evidences point out that share of cereals and pulses in the per capita food expenditure in India has reduced from 40 to 28 percent while that of high value products including fruits and vegetables rose from 36% to 42% during the same period. Therefore, future of agriculture and food sector will rest on crop diversification towards high value crops and higher value addition. Despite the overwhelming importance of horticultural sector and India being the leading producer of fruits and vegetables, available statistical evidence are not sufficient.

The present study is mainly confined to the Bhuragaon Revenue Circle of Morigaon District. The Horticultural Sector can play a pivotal role in diversifying agriculture in terms of increasing production, productivity, nutrition, income and employment. Though the study area do have huge potential for the development of horticulture cultivation, yet this sector facing various problems that curb the growth of this sector. Some of the problems faced by the sector are lack of credit facilities, poor cultivation practices and low yield, lack of desirable planting materials, lack of marketing facilities, scarcity of trained manpower and extension support, lack of cold storage facilities, soil erosion, and heavy infestation of weeds, insects, pests and diseases etc. There is a lot of scope for increasing the area under sweet potato, Assam lemon, guava, jackfruits and banana, papaya, peas, tomato, potato cabbage, ginger, chilly etc. are also having good potential in the study area. To solve these problems Government, Departmental and different agencies should take some remedial measures in order to make the horticulture more productive. The present study makes an attempt in this very direction with a focus on the problems and prospects of horticulture in rural areas of the District.

The Study intends to focus the problems and prospects of horticulture in the selected area and collection of such related data and information from the concerned horticulture farmers through primary survey. This will help to highlight the problems facing by this sector and also help the policy makers in centre and District to chalk out effective measures for further development of this sector.

1:6 METHODOLOGY:

The study is confined to the Bhuragaon Revenue Circle of Morigaon District. Both Primary and Secondary data will have been collected to achieve the objectives specified above. Filed surveyed with a set of questionnaire will be prepared to collect information related to the problems, production yield of horticulture crops from the officials of District/Circle/Village level. Information on area, production and yield of horticulture crops and problems faced by this sector will be also collected from the departmental office, concerned agencies and Horticulture farmer. In this context the interview method will also be adopted.

The Secondary data for the study area will be collected from the Revenue Circle Office of the study area and from the District horticulture department. Besides these, books from departments like Economics, Education, Geography, Statistics, and Environmental Economics are also collected for the present study. Relevant Books, Journals, Published and unpublished paper also have been reviewed for the purpose.

After collecting information from the secondary sources ten households in each village under the study area, growing highest area of large vegetables, fruits, peanut, spices respectively have been selected and complete enumeration has been carried out in the village for those households who are growing horticulture crops.

In our primary survey, all the households growing horticultural crops have been covered and for a particular households, area, production and yield have been collected for all horticultural crops grown by the household and also problem faced by them during the reference year.

A structured Questionnaire were administered in 10 villages of the Bhuragaon Revenue Circle. Information were seek from the horticulture farmers of the respective village. The survey were done purposively after pilot studies being carried out. 200 households were also interviewed as sample size, 20 households were picked up from the every 10 village. Therefore, the finding will reveal the actual status, problems and potentiality of the horticulture in the study area.

1:7 REVIEW LITERATURES

The pattern of horticulture crops cultivation differs considerably in different places owing to physical properties of land, climate, rainfall, temperature, hours of sunlight, cultural practices of the inhabitants etc. The technology and financial management along with the marketing management plays pivoted role in the production of any crops in a given context.

The farmers pay more attention and allocate available land resources for growing food crops. Even government agricultural policy is also generally related with food crops for food security of the people of the country. But gradually the importance of horticultural crops is realized by the people. It is also observed that the government of the developing countries too concentrates on horticultural product for both food security and health security.

For horticulture crops, some specialized systematic marketing system are developed in almost all of the developing counties while in developed counties for both food crops and fruits crop marketing system is well organized and highly developed. Proper handling, storage, gradation, packaging, transportation, quality maintenance etc. are important for perishable commodities like fruits and vegetables.

Though many scholars studied about the problem and prospect of horticulture, yet systematic study has been going on in recent times. The available literatures that have been studied relevant to the subjects are presented briefly.

Sargent (1973) highlighted that in primitive stages of agricultural development, agriculture remained the main occupation of the people. In the transitional stage of economic development, agriculture carried immense burden in the drive for economic growth. However, during maturing phase the main emphasis still remains on the maintenance of balance role for agriculture, but horticulture becomes more important. This is due to the commercialization of crops around the world. Fruits and vegetables have becomes greater importance in the past few year in the process of agricultural development. This is so because of the high increases in income derived by the cultivation of fruits and vegetables crop as compared to annual cereal crops. In addition; fruits and vegetables crop are being the sources of protection foods, brought awareness to the masses.

Baruah (1986) in his research paper on horticultural crop cultivation in Assam point out that in the North Eastern Region. There is vast scope for development of horticulture proper and scientific development of horticultural crops will greatly help in increasing the growth of the rural economy and in maintaining the nutritional security.

There are some very good varieties of fruits crops, which have got export potential to the neighboring countries. For this, it is needed to stress more on research and development to get quality product. He emphasis that a strong farmers co-operative is needed for getting inputs and planting materials as supported by proper market, proper storage, credit and transport facilities.

Dharendra Nath Borthakur (1992) elaborately pointed out and explores the overall potential and growth of horticulture in North East Region. He maintains that North East Region of India offers a favourable set of climate conditions for cultivation of various types of horticultural

crops such as fruits, vegetables, flowers, spices etc. The development of horticulture has not picked up as desired because of a number of constraint i.e. lack of proper marketing, problems of transport, processing adequate technology as well as the weak extension support in the field of horticulture.

Goswami, Sarma and Choudhury (1993) in their research paper opined that the potentialities for development of horticulture is very great in North-East. They however, emphasized for the qualitative improvement of variety of horticultural crops followed by adoption of post harvest technology, storage, transportation and marketing.

Government of Karnataka (1993) in the status paper of Agricultural Development Project analyzed that one hectare area horticultural crops can generate income to the tune of Rs. 20,000 annually while the corresponding figure for rice is less than Rs. 10,000 and a crop like ragi can hardly fetch Rs. 4000 per hectare. So due emphasis has been given on the development of horticultural crops in Karnataka.

Singha and Sharma (1994) in the article “Horticultural Information and Crop Clinical Cell a new concept in Agricultural Development” published in the journal “Agricultural Extension Review” Vol. 6 No. 4 opined for the necessities of a proper information transfer and technical guidance system taking into consideration the needs and problems of farmers. It is high time to bring about changes in the traditional behaviour of farmers and to adopt scientific cultivation methods.

G.L. Kaul (1997) analyzed the role of horticultural crops in crop diversification, human nutrition and industrial growth and in generating income and employment under Indian situation. His analysis is more valid today when Indian agriculture is getting more and more commercialized and competitive. These crops have been identified as most remunerative crops for replacing subsistence forming in the rain fed dry land, hills, wasteland. These crops are characterized by high,

productivity per unit area, much higher than field corps. Their role in improving environment is an added advantage.

Roy (1998) in his unpublished thesis of “A study on production, productivity and resource use efficiency in Mandarin Orange Cultivation in Tinsukia District of Assam” it is mentioned that there were various factors that affect the productivity of orange. Prominent among them were lack of capital finance, lack of skill labour, managerial constraint, technical constraints of knowledge about proper use of fertilizer and pesticides, marketing problem faced by the farmers, transportation, low price, storing etc.

Subrahmanyam (1998) in the summaries of group discussion on the subject “Horticulture in India, Organization of Production, Marketing and Processing” pointed out that there are two types of risks faced by the cultivators viz (i) the price risk i.e. the wide price fluctuations due to oversupply in peak season and (ii) the risk created by the middlemen in the market.

Indian agriculture is dominated by small and marginal farmers. Acc to the Agricultural census 2001, 81.9% of holdings were less than or equal to 2 ha and had an average size of 0.59 ha. Although, horticulture has potential to higher returns from land, it is often debated that farmers cultivating tiny pieces of land may not diversify toward these crops due to numerous constraints in production and marketing as well as higher production and price risks associated with these crops. Among the horticultural crops vegetables are more pronounced on small farms, while fruits and spices occupy a larger share on large farms. These differences are expected. Vegetables generate quick returns, require low capital and relatively higher labour input, which match resource endowments of the small farmers. Since fruits and spices require higher initial capital and have a long gestation period, these do not suit to small farmers who are capital constrained. Therefore, small farmers generally diversify towards vegetable because of surplus labour and liquidity constraints. (Birthal et al., 2008)

Dutta and Borah (2003) prepared a detailed report of a project on 'Marketing and Preservation of horticultural produce of Kahibama and Adjoining villages of Kamrup District.' In the report they mentioned that low yielding pattern of horticultural crops in the villages have been due to the combination of few factors like lack of proper market, lack of proper training facilities among the cultivators.

Sati (2004) in the book "Horticultural Development in Hills" pointed out that orchard help in maintaining ecological balance by checking soil erosion, maintaining soil moisture and better utilization of cultivable waste lands.

The book also explained the importance of fruits as a natural source of vitamins and minerals. He opined that horticulture industry has a unique role to play in the health and economy of people of the developing counties.

Paudyal et al, (2004) described that the state Government has taken a decision to formulate policy of potential Horticulture Development in the state considering the kind of terrain and agro-climates, the needs of rural populace, the possibility of bettering rural economy through horticulture and the availability of potential crops, it is imperative to have a resolute policy to develop Horticulture & cash crops in Sikkim. In order to prepare a road map towards the set goals of the Government, it has become necessary to identify potential horticulture crops and to draw requisite policy resolutions to effect their development in positive manner.

As of the genesis, Singh et al. (2004) devided the development of horticultural sector of India into four phases – pre independence was the first phase where horticulture sector was only a household activity. Though the second phase was initiated from 1948-1980, it did not constitute any planned effort, yet some specific problems were addressed. In the third phase, from 1980-1992, institutional support from central and state governments has been made. The fourth phase, from 1993-2003, focused the sector with an enhancement of planned allocation and knowledge based technology, which was marked as "Golden Revolution" of the sector.

In the opinion of Abau-Hadid (2005), horticulture sector is a unique activity which can directly address poverty and food security issues in both urban and rural areas of the developing world.

The National Horticulture Mission (NHM) with effect from 2005-2006 stress on the holistic growth of Horticulture by adopting an area based regionally differentiated cluster approach. The main objectives of the mission are to enhanced production and productivity of horticulture crops, to reduce post-harvest losses, to improve nutritional security, increase farmer income and generate employment opportunities for the unemployed youth.

A study in China by Wang, et al, (2006) found that the need for super market revolution in China has come up recently due to increase in demand for vegetables, fruits, nuts and other high valued products in the county.

In Indian context, Dr. Gautam Kalloo (2006) rightly pointed out that the horticulture sector has emerged as a potential player in the Indian economy, contributing 30% to GDP in agriculture from mere 8.5% area under horticulture crops as well as means of diversification in overall development of agriculture. Today, we are heralding toward Golden Revolution, as we have achieved tremendous increase in horticultural production as well as export potential, with increased returns to farmers and nutritional security to the masses.

P.S. Brithal, A.K. Jha, P.K. Joshi and D.K. Singh (2006), hold the opinion that agricultural diversification as pathways for agricultural development. They maintained that demand for high value products such as fruits, vegetables etc. has been increasing rapidly in the domestic as well as in the global markets which are moving towards integration. Diversification led to growth and generates enormous income and employment opportunities for the farmers, small holders and

rural laborers. Moreover, vegetables and fruits crops production are labor intensive, have low gestation period and generate quick and higher rate of yield per unit of land and labor. The republic Congo also recognized the role of urban and Peri-urban horticulture in ensuring food and nutritional securities and alleviating urban poverty.

According to Mittal (2007), growth of horticultural crops in the country is not only enthused by the domestic needs but also by a large quantity of expert requirements from other nations. The shift in cropping pattern in favour of horticulture in India in the past one-and-a-half decades has been leveraged by economic feasibility, especially the fruits and vegetables.

A study by Weinberger and Lumpkin (2007) revealed that the growth of physical infrastructures, appropriate credit mechanism and land use policies of urban and peri-urban areas encouraged the farmers to cultivate horticultural crops.

Regarding the marketing of the products, Sapkota (2010) said “It is true that the most of the farmers are facing difficulties in marketing and this problem won’t be solved until and unless we, the farmers of Sikkim will be able to produce sufficient and fulfill the demand of the market”.

Singha and Chakravarty (2013), pointed that with the growth of urbanization, modernization and rise in disposable income of the society, consumption pattern has also changed proportionately more towards non cereals food compared to cereals crops in the recent past in the country. As a result of which, cropping pattern has also changed greatly from conventional/traditional crops to high value cash crops in Indian Agriculture.

So far the study of problems and prospect of horticulture is concerned; no significant study has been done by any scholar in the study area. However at present different departmental works is done to solve the problems of this sector. The District horticultural development motivate farmer for diversification of area from traditional crops to commercial crops and undertaking measures to provide short term credit to poor horticultural farmer. But no systematic study about the problems and prospect at micro level is done by any scholar.

CHAPTER – II : THE STUDY REGION

2:1 Location of Bhuragaon Revenue Circle :

Bhuragaon Revenue Circle is 120 Km of State HQ and 30 kms from District HQ, Morigaon. The latitude 26.44353 and longitude 92.287898 are the geo coordinate at the Bhuragaon Revenue Circle. The Bhuragaon Revenue Circle has a population of 123469 (as per 2011 census) out of which percentage of male and female are 51 and 49 respectively. As per 2011 census, there are 947 females per 1000 male. A large number of population of Bhuragaon Revenue Circle i.e. 92% live in rural part.

Climate of the Study Area :

The climate in Bhuragaon is warm and temperate. In winter, there is much less rainfall than in summer. In Bhuragaon the average annual temperature is 24.5^0 C. The rainfall here average 1557 mm. The driest month is December, with 5 mm of rain. Most participation falls in June, with an average of 309 mm. August is the warmest month of the year. The temperature in August averages 29.0^0 C. In January, the average temperature is 17.4^0 C. It is the lowest average temperature of the whole year. There is a difference of 304 mm of precipitation between the driest and wattest months. The average temperatures vary during the year by 11.6^0 C.

The soil supports the cultivation of two principal crops – Agriculture and Horticultural crops.

PART TWO : ANALYSIS

CHAPTER – III

SOCIO ECONOMIC CONDITIONS OF HORTICULTURE CROPS GROWERS.

3:1 Backward of the Respondents :

This chapter is devoted to the socio-economic characteristics of respondent farmers, based on the result of field survey. Here we have included those characteristics that have a definite bearing on prospects of horticultural crops. The Socio-economic condition of the households gives rough understanding of the study area, sample farmers and their level of development status – Socially and economically. The collected 200 sample farmers/households from 10 villages have been classified into four different social categories, four different farm sizes. Similarly the sample farmers have been also further divided into different categories which are based on the education, land ownership pattern, earning members of the family, annual family income.

3:1:1 Table : Distribution of Respondents by level of Education.

Sl. No.	Village	Under Matric	HSLC	HS	BA	MA	Total
1	Niz Gerua	11 (55%)	5 (25%)	3 (15%)	1 (5%)	-	20
2	Baralimari	8 (40%)	6 (30%)	4 (20%)	2 (10%)	-	20
3	Hindu Japari	12 (60%)	4 (20%)	2 (10%)	2 (10%)	-	20
4	Bhuragaon	10 (50%)	3 (15%)	4 (20%)	3 (15%)	-	20
5	Balidunga	15 (75%)	4 (20%)	1 (5%)	-	-	20
6	Auguri Pam	14 (70%)	2 (10%)	3 (15%)	1 (5%)	-	20
7	Tengaguri	16 (80%)	3 (15%)	1 (5%)	-	-	20
8	Mohmara Pather	17 (85%)	3 (15%)	-	-	-	20
9	Borduba	13 (65%)	5 (25%)	1 (5%)	1 (5%)	-	20
10	Gerua Ati	12 (60%)	6 (30%)	1 (5%)	1 (5%)	-	20
	Total	128 (64%)	41 (20.5%)	20 (10%)	11 (5.5%)	-	200

Source : From the field survey.

From the above table we can see that the largest share of respondents (64%) are found to be at under metric followed by 20.5% percent at HSLC level. Very negligible share of the respondents i.e. 10%

at H.S and only 5.5% were found at Graduate holder, but no any respondents were found under M.A category in surveyed village. There were also found some respondent households were illiterate till today and they were also included in the under metric category. And major literate persons obtained education upto 4-7 standard. Thus literacy level of respondent farmers in the study area was very poor. The low level of literacy is one of the many reasons for slow and very low adoption of new technology in horticulture.

It is generally believed that, if a respondent is more educated, he is more enlightened about the existing options of demand and supply and is more aware to advanced techniques than an illiterate traditional farmer. Therefore, role of education is very important in taking up cultivation of horticultural crops.

3:1:2 Table : Distribution of respondents by land size classification.

Sl. No.	Village	Marginal	Small	Medium	Large	Total
1	Niz Gerua	10 (50%)	8 (40%)	2 (10%)	-	20
2	Baralimari	7 (35%)	11 (55%)	2 (10%)	-	20
3	Hindu Japari	5 (25%)	11 (55%)	3 (15%)	1 (5%)	20
4	Bhuragaon	4 (20%)	12 (60%)	3 (15%)	1 (5%)	20
5	Balidunga	11 (55%)	8 (40%)	1 (5%)	-	20
6	Auguri Pam	9 (45%)	10 (50%)	1 (5%)	-	20
7	Tengaguri	8 (40%)	9 (45%)	3 (15%)	-	20
8	Mohmara Pather	7 (35%)	11 (55%)	2 (10%)	-	20
9	Borduba	13 (65%)	6 (30%)	1 (5%)	-	20
10	Gerua Ati	10 (50%)	8 (40%)	2 (10%)	-	20
	Total	84 (42%)	94 (47%)	20 (10%)	2 (1%)	200

Source : From the field survey.

The land details of the respondents are important because they indicate the economic and social status of the households. The details of the land size of the respondents are presented in the table above (3:1:2). Generally, the size of land affects crop pattern, horticultural income and adoption of improved technology and other initiatives. From

the field survey it is found that the largest portion of sample farmers (i.e. 47%) are belongs to the small farmers followed by 42% of marginal farmers. The percentage of medium farmers are only 10 percent but very negligible percent of large farm, i.e. only 1 percent are found in the study area.

3:1:3 Table : Land owned by the respondents
(sample 20 households from each village)

Sl. No.	Village	Land in Bighas (Below 10 bighas)	Land in Bighas (Above 10 bighas)	Total No. of Family
1	Niz Gerua	13 (65%)	7 (35%)	20
2	Baralimari	8 (40%)	12 (60%)	20
3	Hindu Japari	5 (25%)	15 (75%)	20
4	Bhuragaon	3 (15%)	17 (85%)	20
5	Balidunga	11 (55%)	9 (45%)	20
6	Auguri Pam	10 (50%)	10 (50%)	20
7	Tengaguri	4 (20%)	16 (80%)	20
8	Mohmara Pather	6 (30%)	14 (70%)	20
9	Borduba	12 (60%)	8 (40%)	20
10	Gerua Ati	9 (45%)	11 (55%)	20
	Total	81 (40.5%)	119 (59.5%)	200

Source : From the field survey.
Figures in parentheses give percentage.

It has cleared from the above table that large number of sample farmers are owned above 10 bighas of land i.e. 59.5 percent and 40.5 percent of farmers are owned below 10 bighas of land. In the village Bhuragaon, large number of sample farmers (i.e. 85%) are owned above 10 bighas of land. And in village Niz Gerua very small percent of farmer (i.e. 35%) are owned above 10 bighas of lands.

3:1:4 Table : Distribution of respondent by caste.

Sl. No.	Village	SC	ST	OBC	General	Total
1	Niz Gerua	3 (15%)	7 (35%)	4 (20%)	6 (30%)	20
2	Baralimari	5 (25%)	-	3 (15%)	12 (60%)	20
3	Hindu Japari	6 (30%)	4 (20%)	4 (20%)	6 (30%0	20
4	Bhuragaon	-	-	2 (10%0	18 (70%)	20
5	Balidunga	-	-	1 (5%)	19 (95%)	20
6	Auguri Pam	6 (30%)	3 (15%)	4 (20%)	7 (35%)	20
7	Tengaguri	2 (10%)	-	-	18 (90%)	20
8	Mohmara Pather	-	-	-	20 (100%)	20
9	Borduba	4 (20%)	-	2 (10%)	14 (70%)	20
10	Gerua Ati	2 (10%)	9 (45%)	4 (20%)	5 (25%)	20
	Total	28 (14%)	23 (11.5%)	24 (12%)	125 (62.5%)	200

Source : From the field survey.

Caste factors can influence the farmer's decision to grow specific crops. Some caste may be specialized in undertaking specific activities while traditions in some caste may preclude farmers from undertaking a specific crop.

From the table 3:1:4 we have seen the sample farmers/households included in the present study was dominated by the general category i.e. 62.5 percent followed by 14 percent of SC, 12 percent of OBC and 11.5 percent of ST category. This is true despite variation in caste in the villages, horticultural crops are grown by them.

3:1:5 Table : Total number of family members of the sample households/ farmers engaged in horticulture in the study area.

Sl. No.	Village	Male	Female	Total
1	Niz Gerua	13 (65%)	7 (35%)	20
2	Baralimari	11 (55%)	9 (45%)	20
3	Hindu Japari	11 (55%)	9 (45%)	20
4	Bhuragaon	12 (60%)	8 (40%)	20
5	Balidunga	10 (50%)	10 (50%)	20
6	Auguri Pam	14 (70%)	6 (30%)	20
7	Tengaguri	10 (50%)	10 (50%)	20
8	Mohmara Pather	12 (60%)	8 (40%)	20
9	Borduba	13 (65%)	7 (35%)	20
10	Gerua Ati	14 (70%)	6 (30%)	20
	Total	120 (60%)	80 (40%)	200

Source : From the field survey.

Engagement of the family members is an important determinant of crop diversification and adoption of horticultural crops. And economic development is unthinkable without the participation of women. A good portion of women i.e. (40%) in the study area are employed in horticulture. Even in Balidunga and Tenagaguri the percentage of engagement of women were highest i.e. 50%. Effectively engaged in an activity improves the way they feel about themselves, increasing confidence and self esteem. Women develop valuable additional skills such as team building and problem solving, thereby improving their employment prospects. Horticulture as a sector has a positive impact on rural development and helps to improve the quality of life and economic well being of people. The economy of the study area is generally agro based. Soil erosion and adverse effects of chronic hoods on fertile agricultural land have made even affluent farmers land less. Therefore, a large number of such cultivators shift to carry out horticultural practices.

On the other hand cultivation of horticulture crops are labour intensive and as such they generate a number of employment opportunities for study area.

3:1:6 Average annual family income of the sample farmer

To understand the socio-economic status i.e. social position and economic condition of the sample families in the study area, an attempt has been undertaken to estimate the annual income of these families. It is well accepted that family income is the absolute scale to measure the economic viability of a family. Again, the source/sources of that income partially focused on the social status of that family. With this view the average annual family income of the sample horticulture farmers in the study area has been worked out.

3:1:6 Table : Average annual family income of the sample famer

Sl. No.	Village	Less than (One lakh)	More than (One lakh)	Total No. of Family
1	Niz Gerua	12 (60%)	8 (40%)	20
2	Baralimari	6 (30%)	14 (70%)	20
3	Hindu Japari	13 (65%)	7 (35%)	20
4	Bhuragaon	5 (25%)	15 (75%)	20
5	Balidunga	7 (35%)	13 (65%)	20
6	Auguri Pam	6 (30%)	14 (70%)	20
7	Tengaguri	4 (20%)	16 (80%)	20
8	Mohmara Pather	11 (55%)	9 (45%)	20
9	Borduba	12 (60%)	8 (40%)	20
10	Gerua Ati	13 (65%)	7 (35%)	20
	Total	89 (44.5%)	111 (55.5%)	200

Source : From the field survey.

From the above table, it has seen that a good percentage of family have annual income more than one lakh (i.e. it is 55.5%). Similarly, in the study area, horticulture is becoming a source of livelihood and export

revenue. In village Tengaguri the highest percentage (i.e. 80%) of horticulture farmer have annual income more than Rs. One lakh. The Bhuragaon Revenue Circle has a uniquely favourable agro climatic conditions, soil and moisture which make it ideal place to engage in horticulture. In the study area the horticulture crops are more profitable. Because, as compared to the other field crops, the horticulture crops can also be grown 3 to 4 times each year giving the products all the time they are grown. More number of crops can be grown from same piece of land. Hence it can help to raise the income of the horticultural farmer in the study area. Horticulture crops play a unique role in Bhuragaon Revenue Circle as well as in states economy by improving the income of the rural people.

3:1:7 Motivating factors for taking up Horticulture crops.

The farmers are usually motivated for growing certain crops by some of the important factors. Crops productivity, higher profits, easy to grow etc. attract the attention of farmers. They generally grow those crops which have high potential, higher productivity, higher market value etc.

In this study, here we have found some important motivational factors such as, its productivity, easy to grow, low cultivation cost etc. The suitability of the soil were also found to be very important factor for motivating horticulture crop cultivation in the study area. However, infrastructural facilities such as access to market, road and transportation, availability of communication facilities and the government support to the horticulture farmers in the study area were found to be very low.

3:1:7 (a) Table : Preferences wise motivating factors for taking up Horticulture crop of sample farmers.

Sl. No.	Village	Easy to Grow	Less cultivation cost	Soil Support	Good Price	Close to market	Climate condition	Cost support
1	Niz Gerua	4	3	7	2	-	3	-
2	Baralimari	5	2	4	1	-	4	-
3	Hindu Japari	2	3	3	-	-	2	-
4	Bhuragaon	4	2	5	2	1	5	-
5	Balidunga	3	2	5	2	2	3	1
6	Auguri Pam	5	2	6	2	1	2	1
7	Tengaguri	6	1	5	1	1	2	-
8	Mohmara Pather	2	1	4	2	1	5	1
9	Borduba	2	-	3	1	2	3	1
10	Gerua Ati	1	1	2	-	-	1	-
	Total	34	17	44	13	8	30	4

Source : From the field survey.

3:1:7 (b) Table : Motivating factors for taking up Horticultural crops of sample farmers (in percentage)

Sl. No.	Village	Easy to grow	Less cultivation cost	Soil support	Good price	Close to market	Climate conditions	Govt. Support	Total
1	Niz Gerua	21.05	15.79	36.84	10.53	-	15.79	-	100.00
2	Baralimari	31.25	12.50	25.00	6.25	-	25.00	-	100.00
3	Hindu Japari	20.00	30.00	30.00	-	-	20.00	-	100.00
4	Bhuragaon	21.05	10.53	26.31	10.53	5.26	26.31	-	100.00
5	Balidunga	16.67	11.11	27.78	11.11	11.11	16.67	5.55	100.00
6	Auguri Pam	26.31	10.53	31.58	10.53	5.23	10.53	5.23	100.00
7	Tengaguri	37.5	6.25	31.25	6.25	6.25	12.50	-	100.00
8	Mohmara Pather	12.50	6.25	25.00	12.50	6.25	31.25	6.25	100.00
9	Borduba	16.67	-	25.00	8.33	16.67	25.00	8.33	100.00
10	Gerua Ati	20.00	20.00	40.00	-	-	20.00	-	100.00
	Total	22.67	11.33	29.33	8.67	5.33	20.00	2.67	100.00

Source : From the field survey.

Though profitability through provision of better marketing facilities or market being close and good price of the produce is the basic factor for taking up the cultivation of any crop, but due to the soil support, easy to grow and favourable climatic condition as the key factors in motivating respondents to take up cultivation of horticultural crops in the selected villages. In order to capture this aspect, some questions were included as opinion survey in the questionnaire and related queries have been answered on this basis.

CHAPTER – IV

GROWTH AND DEVELOPMENT OF HORTICULTURE CROPS IN BHURAGAON REVENUE CIRCLE

4:1 Area, production and yield of horticulture crops (Composition of Horticulture crops in Bhuragaon Revenue Circle) :

At present in India as compared to the yield of field crops per hectare, the yield of horticulture crops is very high. Horticulture crops form a vital part of the Indian agricultural production. India is the second largest producer of fruits and vegetables in world. Cultivation and processing of these crops generate significant employment opportunities for the rural and peri-urban population. Horticulture has also a significant place in rural area like Bhuragaon Revenue Circle by providing economic upliftment in terms of employment generation and growth.

In the study area there were different types of horticulture crops were grown such as vegetable crops, fruits crops and spice crops. Among vegetable crops Sweet potato, Potato, Tomato, Brinjal, Cabbage, Cauliflower, Pumpkin etc. fruits crops like Banana, Water melon, Papaya, guava, Assam lemon and spice crops like Garlic, King chilly, Turmeric, Onion were grown in Bhuragaon Revenue Circle.

In this section, we are putting the secondary data of area, production, productivity and yield of different horticultural crops of ten villages under Bhuragaon Revenue Circle.

4:1 (a) Table : Village wise total Area, production and yield of Horticulture crops in Bhuragaon Revenue Circle during 2013-14.

Sl. No.	Village	Crops Category	Name of Crops	Area (in Ha)	Production (in HT)	Yield (MT/ Ha)	Total horticultural Crop Area in %	Net Crop Area (Ha)
1	Niz Gerua	Fruits	Papaya, Banana	8	40	5	4.69	1704
		Vegetable	Potato, Pumpkin, Tomato	70	60	86		
		Spice	Turmeric	2	3	1.5		
2	Baralimari	Fruits	Banana, Guava, Peanut	25	25	1	6.23	1605
		Vegetables	Potato, Sweet Potato, Tomato, Cabbage, Brinjal, Cauliflower	65	73	1.12		
		Spices	King Chillies, Garlic, Turmeric	10	47	4.7		
3	Hindu Japari	Fruits	Water melon, Banana, Peanut	27	29	1.07	5.10	2039
		Vegetables	Potato, Sweet potato, Tomato, Brinjal, Cabbage, Cauliflower	69	87	1.26		
		Spices	Garlic, Onion, Turmeric	8	5	0.62		
4	Bhuragaon	Fruits	Banana, Water melon, Assam lemon, Guava	10	12	1.2	59.17	409
		Vegetables	Potato, Sweet Potato, Tomato, Pumpkin, Brinjal, Cabbage, Cauliflower	197	307	1.55		
		Spices	King chillies, Garlic, Onion, Turmeric	35	39	1.11		
5	Balidunga	Fruits	Assam lemon, Banana, Papaya	212	412	1.94	54.08	797
		Vegetables	Cabbage, Pumpkin, Brinjal, Tomato	187	280	1.49		
		Spices	Garlic, Turmeric	32	30	0.93		
6	Auguri Pam	Fruits	Banana, Water melon, Guava	52	660	12.69	34.60	1286
		Vegetables	Cabbage, Brinjla, pumpkin, Cucumber, Cauliflower	325	719	2.21		
		Spices	Garlic, Turmeric, King chillies	68	510	7.5		

7	Tengaguri	Fruits	Banana, Water melon, Guava	267	2100	7.86	66.41	1063
		Vegetables	Sweet potato, Potato, Tomato, Brinjal, Cabbage	375	690	1.84		
		Spices	Garlic, Turmeric, Chillies	64	53	0.82		
8	Mahmara Pather	Fruits	Banana, Assam lemon	407	920	2.26	57.28	1971
		Vegetables	Potato, Pumpkin, Tomato, Brinjal	667	1530	2.29		
		Spices	Turmeric, Chillies, Onion	55	45	0.81		
9	Borduba	Fruits	Banana, Guava, Lemon	176	1720	9.77	56.40	1296
		Vegetables	Tomato, Brinjal, Cabbage, Pumpkin	471	730	1.54		
		Spices	King Chillies, Garlic	84	143	1.97		
10	Gerua Ati	Fruits	Papaya	6	17	2.83	2.36	1907
		Vegetables	Potato, Pumpkin	36	126	3.5		
		Spices	Turmeric	3	1	0.33		
	Total			4013	11413			

Source : District Agriculture and Horticulture Office, Morigaon.

The horticulture sector can play a pivotal role in diversifying agriculture in terms of increasing production, productivity, nutrition, income and employment. The important horticultural crops were grown in the study area were fruits crops, vegetable crops and spice crops. The largest horticultural crops area was found in the village Tengaguri i.e. 66.41% and lowest horticultural crop area was found in the village Gerua Ati i.e. 2.36%. The 2nd and 3rd rank horticultural crop area villages were Bhuragaon and Mahmara Pather which has 59.17% and 57.28% respectively.

4:1 (b) Table : Village wise total % of Area and production of fruits crops, vegetable crops and spice crops during 2013-14

Sl. No.	Village	Area in %			Production in %		
		Fruits	Vegetables	Spices	Fruits	Vegetables	Spices
1	Niz Gerua	10.00	87.50	2.50	38.83	58.25	2.91
2	Baralimari	25.00	65.00	10.00	17.24	50.34	32.41
3	Hindu Japari	26.73	68.32	7.92	23.07	71.90	4.13
4	Bhuragaon	4.13	81.40	14.46	3.35	85.75	11.89
5	Balidunga	49.19	43.39	7.42	57.06	38.78	4.15
6	Auguri Pam	11.68	73.03	5.28	34.94	38.06	27.00
7	Tengaguri	37.82	53.12	9.06	73.86	24.27	1.36
8	Mohmara Pather	36.05	59.08	4.87	36.87	61.32	1.80
9	Borduba	24.08	64.43	11.49	66.33	28.15	5.51
10	Gerua Ati	13.33	80.00	6.67	11.80	87.50	0.69

Source : Calculated from table 4:1 (a).

From table No. 4:1 (b), it has seen that the largest area under fruit crops were found in village Balidunga which was 49.19% of total horticultural area. Largest area under vegetable crops were found in village Niz-Gerua (i.e 87.50%) and largest area under spice crops were found in Bhuragaon which were 14.46%. Production of fruits, vegetables and spices were highest in village Tengaguri (73.86%), Gerua Ati (87.50%) and Baralimari (32.41%) respectively. The table also have Reflected that the production of all three crops have very low according to the area allocated. And this was mainly due to so many problems which were discussed in the next chapter.

Composition of Horticulture crops in Bhuragaon Revenue Circle:

Horticultural crops comprise a large variety of crops including fruits, vegetables, spices, flowers, medicinal plant and aromatic plants. In view of the large genetic base available, crops adapt to diverse conditions of soil and climate. In the study area mainly three horticultural crops were grown viz fruit crops, vegetable crops and spice crops.

Table No. 4:1 (c): % Share of fruits, vegetables and spices in total area and production and their yield in Bhuragaon Revenue Circle during 2013-14.

Sl. No.	Item	Area (ha)	% share	Production (MT)	% share	Yield (MT/ha)
1	Fruits	1190	29.65	5935	45.49	4.99
2	Vegetables	2462	61.35	6235	47.79	2.53
3	Spices	361	8.99	876	6.71	2.43
	Total	4013	100.00	13046	100.00	3.25

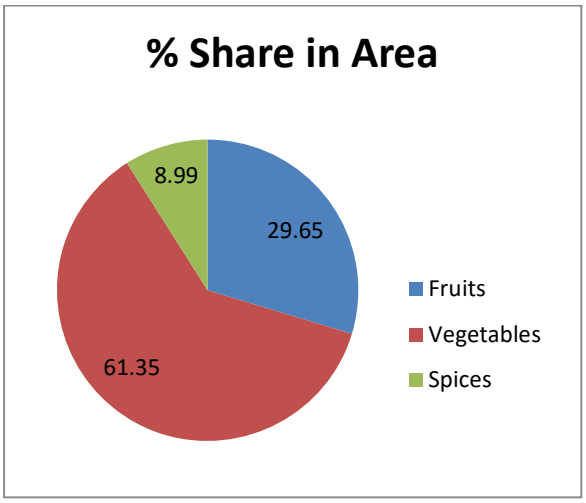
Source : District Agriculture and Horticulture Office, Morigaon.

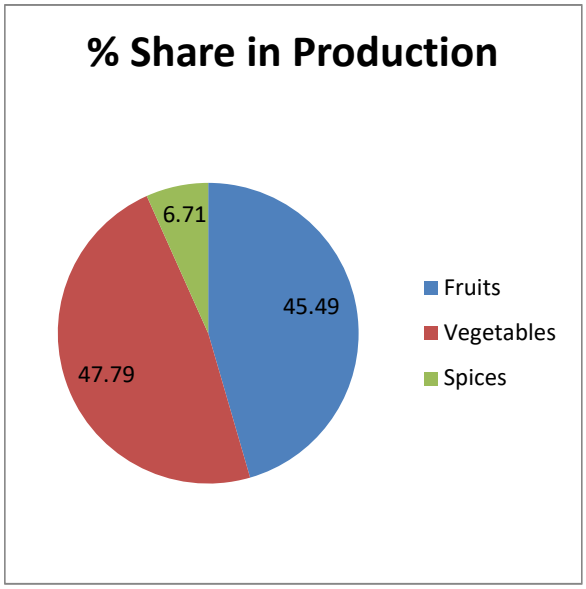
The above table it has seen that the % share of vegetables in area and in productions was the highest i.e. 61.35% and 47.79% respectively during 2013-14. A gap was observed in the share in area and production in case of fruits and vegetables. Therefore there is an urgent need to augment productivity of fruits and vegetables crops in the study area. Increased productivity has to come from improvement in technology and better infrastructural facilities.

As we well known some of the special spices possess anti-oxidant properties and others are used as preservatives. India is the largest

producer as well as consumer of spices in the world. In the study area spices have formed around 8.99% of area under horticultural crops and contribute 6.71% to total production. Here also special attention should be given to increase its production. Since in the study area there is good prospect of spices production.

Figure No. 4:1 (c) : Share of fruits, vegetables and spices in total area. Production and yield of Horticultural crops in Bhuragaon Revenue Circle during 2013-14.





4:1:1 Fruits Crop:

The important fruits grown in the study were Banana, Papaya, Guava, Assam lemon, Water melon and Pea nuts. The popularity of these fruits were ever growing because these fruits gave very quick returns in the study area.

Table No. 4:1:1 Village wise share in % of fruit crops in Area and production during 2013-14.

Sl. No.	Village	Area (ha)	% share	Production (MT)	% share
1	Niz Gerua	8	0.67	40	0.67
2	Baralimari	25	2.10	25	0.42
3	Hindu Japari	27	2.27	29	0.49
4	Bhuragaon	10	0.84	12	0.20
5	Balidunga	212	17.81	412	6.94
6	Auguri Pam	52	4.37	660	11.12
7	Tengaguri	267	22.44	2100	35.38
8	Mohmara Pather	407	34.20	920	15.50
9	Borduba	176	14.79	1720	28.98
10	Gerua Ati	6	0.50	17	0.29
	Total	1190	100	5935	100

Source : From field study and secondary data.

From the above table it has seen that the highest % share of fruits in area among ten villages was Mohmara Pather i.e. 34.20% followed by village Tengaguri and Balidunga i.e. 22.44% and 17.81% respectively. But share in production among ten villages was highest in village Tengaguri which was 35.38% followed by Borduba and Mohmara Pather i.e. 28.98% and 15.50% respectively. Though in often villages, the

productions of fruits were low, but there are also good prospect and potentialities to increase fruits production.

4:1:2 Vegetables Crop:

The important vegetables were grown in the study area were Potato, Sweet Potato, Pumpkin, Cabbage, Brinjal, Cauliflower, Tomato etc. Vegetables formed an important segment of horticulture in Bhuragaon Revenue Circle. Among these vegetables, the off season vegetables such as Tomato, Cabbage and Cauliflower etc. which have comparative advantage over pricing. Therefore focus was also given to promotion of theses off season vegetables in the study area.

Table No. 4:1:2 Village wise percentage share of vegetable crops in Area and Production during 2013-14.

Sl. No.	Village	Area (ha)	% share	Production (MT)	% share
1	Niz Gerua	70	2.83	60	1.30
2	Baralimari	65	2.64	73	1.59
3	Hindu Japari	69	2.80	87	1.82
4	Bhuragaon	197	8.00	307	6.67
5	Balidunga	187	7.59	280	6.08
6	Auguri Pam	325	13.20	719	15.62
7	Tengaguri	375	15.23	690	14.99
8	Mohmara Pather	667	27.09	1530	33.27
9	Borduba	471	19.13	730	15.80
10	Gerua Ati	36	1.46	126	2.74
	Total	2462	100	4602	100

Source : From field survey and secondary data.

From the above table it has seen that the highest % share of vegetables in area among ten villages was in the village Mohmara Pather (27.09%) followed by the village Borduba, Tengaguri and Auguri Pam i.e. 19.13%, 15.23% and 13.20% respectively. The share in production was highest in the village Mohmara Pather (33.25%),

followed by the village Borduba, Auguri Pam, and Tengaguri i.e. 15.86%, 15.62% and 14.99% respectively. In our field survey period it has seen that though the production of vegetables were low in the study area due to some problems but there were good prospect to increase the production of such vegetables.

4:1:3 Spices crop:

Spices crop such as Garlic, Turmeric, King chilly, Onion were grown in the study area. Production of spices in the study area were not so bad though the area allocation under spice crops were very low. As a high value crop, the spices crops were grown organically in the study area without use of any synthetic fertilizers or pesticides resulting in premium sales. As we all know, Turmeric as a spice has great importance, Cultivation of this crop is all the more significant for the simple reason that it has far greater tolerance to diseases and pests as compared to others. However, cultivation practice needs to be improved and standardized under local conditions.

Table No. 4:1:3 : Village wise percentage share of spice crops in Area and production during 2013-14.

Sl. No.	Village	Area (ha)	% share	Production (MT)	% share
1	Niz Gerua	2	0.55	3	0.34
2	Baralimari	10	2.77	47	5.36
3	Hindu Japari	8	2.22	5	0.57
4	Bhuragaon	35	9.69	39	4.45
5	Balidunga	32	8.86	30	3.42
6	Auguri Pam	68	18.84	510	58.22
7	Tengaguri	64	17.73	53	6.05
8	Mohmara Pather	55	15.23	45	5.14
9	Borduba	84	23.27	143	16.32
10	Gerua Ati	3	0.83	1	0.11
	Total	361	100	876	100

Source : Field survey and Secondary data.

From the above table it has seen that the highest % share in area of spice crops among ten villages was in the village Borduba which was 23.27% followed by Auguri Pam, Tengaguri and Mohmara Pather which were 18.84%, 17.73% and 15.23% respectively. Though the area under spice crops cultivation was highest in village Borduba but unfortunately its production was not satisfactory. And this was due to some problems such as poor quality of seeds, lack of proper knowledge of production etc. But in the surveyed village Auguri Pam, its % share in total spice production was found encouraging which was 58.22%. Over all from filed survey it has seen that there were good prospects and potentialities to increase spice crops production in the study area. Therefore special attention should be given to increase its production.

4:2 : Irrigation facility for Horticulture crops in the study Area.

Proper and sufficient irrigation is quite necessary for healthy production of Horticultural crops. Most horticultural crops require irrigation to minimize plant stress. Proper timing of water applications during appropriate periods can increase the yield and quality of most horticultural crops.

Table No. 4:2 : Distribution of Irrigated land area in Bhuragaon Revenue Circle.

Crops Category	Total Area (ha)	Canal	Tube Well	Canal + Tube Well	Drip Irrigation	Tank
1. Fruits	1190	-	70 (5.88)	-	130 (10.92)	40 (3.36)
2. Vegetables	2462	-	40 (1.62)	60 (2.44)	210 (8.53)	50 (2.03)
3. Spices	361	-	-	10 (2.77)	-	-

Source : District Agriculture and Horticulture Office, Morigaon.
Note : Figures in parentheses give percentage.

From the above table it has seen that the irrigation facilities were not sufficient for horticulture crops as they require. On the study area highest percentage of irrigation was provided by drip irrigation. For fruits it was 10.92% and for vegetables it was only 8.53%. For spice crops, only canal + tube well sources of irrigation was used but in very negligible portion i.e. only 2.77%. For this reason also production of horticultural produce was low in the study area though there have good potentialities of them to produce more. Therefore Government and Department should provide better irrigation facilities through assistance to the farmers. Specially drip irrigation facility should have provided to the horticulture farmers. Because drip irrigation is a method of constantly watering the plant drop by drop, close to the root. This method reduces the amount of water lost through leakage and evaporation. Instead of applying fertilizers to the ground near the plants they are mixed into the water and delivered drop by drop to the root, achieving greater effectiveness and improved quality of harvests. It also suitable for marginal lands and those with lower water quality maintain also soil quality and improved land productivity. For those positive points, sources of drip irrigation is most effective and appropriate method of irrigation for horticulture in the study area where most of the farmers are also marginal and small farmers.

Table No. 4:3 : Percentage change in Area, Production and Yield of horticulture crops in the study area (from 2009-10 to 2013-14)

Year	Fruits			Vegetables			Spices			Total		
	Area (ha)	Production (MT)	Yield	Area (ha)	Production (MT)	Yield	Area (ha)	Production (MT)	Yield	Area (ha)	Production (MT)	Yield
2009-10	440 (25.14)	1575 (41.82)	3.58	1200 (68.57)	2016 (53.53)	1.68	110 (6.28)	175 (4.65)	1.59	1750	3766	2.15
2010-11	679 (27.87)	3046 (46.71)	4.37	1635 (63.37)	3200 (49.07)	1.96	169 (6.76)	275 (4.23)	1.63	2501	6521	2.61
2011-12	815 29.16	4165 (51.31)	3.11	1800 (64.40)	3665 (45.15)	2.04	180 (6.44)	287 (3.53)	1.59	2795	8117	2.90
2012-13	930 (29.72)	42.97 (47.18)	3.54	1949 (62.28)	4250 (46.66)	2.18	250 (7.99)	561 (6.16)	2.24	3129	9108	2.91
2013-14	1190 (29.65	5935 (45.49)	4.98	2462 (61.35)	6235 (47.79)	2.53	361 (8.99)	876 (6.71)	2.43	4013	13046	3.25

Source : District Agriculture and Horticulture Office, Morigaon.

Figures in Parentheses depicts year to year percentage change.

After presenting an overview of horticultural crops in sample villages of Bhuragaon Revenue Circle at one point of time, we looked into year to year percentage change in area, production and yield of Horticultural crops during 2009-10 to 2013-14. Table No. 4:2 illustrated year to year change in area, production and yield of fruits, vegetables and spices from 2009-10 to 2013-14.

The acreage under and spices showed an increase in percentage change from year to year in the study area during this period. Year to year percentage change in production of fruits in the study area also satisfactory. But during 2011-12, the percentage was the highest (i.e. 51.31%) among the other periods. The year to year percentage change in yield fruits crops in the study area during 2009-10 to 2013-14 was found positive. Like fruits, year to year percentage change in these parameters in case of spices was also significant. Year to year significant increase in production of spices was due to acreage expansion and its yielding capacity.

The acreage under vegetables showed a decrease in percentage from year to year in the study area during 2009-10 to 2013-14. Year to year percentage in production of vegetables during 2009-10 to2013-14 was found fixed and this was mainly due to decrease percentage of acreage. But yield was increased during this period. In view of agro-climatic suitability of vegetable crops cultivation in the study area, urgent steps were needed to increase productivity to potential levels through development in area specific varieties of vegetable crops. In the study area there is also a lot of potential for growing off season vegetables. Vegetables form an important segment of horticulture in the study area, since around 61% of total horticultural area was under vegetable crops during 2013-14.

The overall scenario of horticultural crops in the study area was found encouraging since acreage and productivity of these crops increased significantly and there is good prospect for such horticultural crops. For its further improvement and better production, proper training facilities should have also provided to the horticulture farmers.

4:3 : Training programmes for the development of horticulture and benefits received by the horticulture farmer in the study area:

Training programme for development of horticulture in the study area was not found adequately as they require. During the last five years only three training programmes were found at the District level. But no any training programme for horticulture development was found at the grass root level.

The schemes for development of horticulture section in the study area comprise district section scheme. The purpose of fund allocation for horticulture related components was to increase production and productivity. Seed was a vital input in production. It has therefore been considered necessary to provide special attention to the production and distribution of seeds of fruits and vegetables. The achievement of set targets was found poor in terms of production and distribution of seeds. The most important unit i.e. fruits and vegetable preservation unit was not found in the study area.

Benefits through agricultural subsidies or the government sources played an important role in the growth of horticultural section in the study area. Moreover, subsidies have been an integral part of government programmes launched from time to time increase productivity of the crops and for the development of emerging agricultural sections such as horticulture.

Table No. : 4:4 : Benefits Received by the horticulture farmer during 2013-14 (In the sample village)

Year of Benefit	Village	Name of Scheme	No. of farmer benefited	Nature of Assistance	Value of Assistance (Rs.)	Details of Assistance
2009	Balidunga	District Agriculture Office	15	Seed, plant protection subsidy		Diseases free HYV of seed, impart knowledge of plant protection etc.
	Tengaguri	Do	9	Banana Drip irrigation, Water tank		
	Borduba	Do	3	Vegetable seed		
2010	Mohmara Pather	District Agriculture Office	18	Banana Earth worm unit		Farmers training Scientific crop cultivation
	Auguri Pam	Do	21	Fruits seed		
2011	Bhuragaon	District Agriculture Office	9	Hybrid Vegetable seed		Diseases free Hyv Seed Scientific crops cultivation.
	Sunduba	do	3	Garlic seed		
2012	Balidnga	District Agriculture Office	12	Banana Water harvesting tank		Impart knowledge of plant protection and production
	Tengaguri	Do	15	Papaya fruit seed		
2013	Mohmara Pather	District Agriculture Office	21	Banana earth worm unit seed		Diseases free HYV seed scientific crop cultivation
	Auguri Pam	Do	18	King Chillies, Assam lemon seed		
	Balidunga	Do	21	Fruits seed		

Source: From District Agriculture and Horticulture Office, Morigaon

The table has revealed that growers of horticultural crops in the study area received assistance for seed, water harvesting and plant protection from the District Agriculture and Horticulture Office, Morigaon during 2009 to 2013. During the study period we have noticed that performance of different respondents in the area varied in terms of yield rates of horticultural crops. Although, several factors determine yield rates training of horticulture farmer played an important role. In the year

2009, 2010 and 2012 one day training programme was imparted to respondent in District Agriculture Office, Morigaon. Moreover subsidies have an integral part of government programme launched time to time to increase the productivity of the crops and for the development of horticulture. In the study area the assistance were met by providing financial support to the farmers along with training and supplying diseases free HYV seed but in piteous amount.

4:4 : Adoption of Technologies by the Horticulture farmers in the study area.

Technology will drive future growth of horticulture by pushing the levels of productivity of various crops grown by the farmers. Since the potentialities of horticulture in the study area is high, increase in production will have to be achieved by raising productivity. The productivity largely depends on adoption of high yielding varieties, availability of irrigation and use o pesticides and fertilizers.

During the survey, it was observed that most of the respondents used improved varieties of seeds. Some of them also used fertilizers. In the questionnaire canvassed to farmers during the survey period, we had enquired about adoption of better technology, use of pesticides by the respondents of horticultural crops. But in the study area there were no any green house, cold storage facilities, protected cultivation like shade net etc. The main reason of the absence of these facilities are mainly due to lack of adequate support from the Department and Government in terms of finance and extension services.

CHAPTER – V

PROBLEMS AND PROSPECTS OF HORTICULTURE CROPS IN BHURAGAON REVENUE CIRCLE

Though the study area has high potential for the development of horticultural crops, efforts have not been made to develop it as a commercial venture. For proceeding to prospects of horticulture sectors development, problem faced by the horticulture farmers have to be assessed first. To understand problems faced by the farmers, opinion of the farmerss were asked with the help of questionnaire with respect to production, infrastructure, marketing, credit facilities etc. of the sector. Also the problems like seeds. Storage, market centres have been considered as different types of problem. The intensity of these problems were measured by the number of respondent farmers to these problems and the information is presented in the percentage form. The retarding factors for the development of horticultural crops in the study area were stated as follows.

5:1 Problems of infrastructure:

The study area showed a good performance in horticulture cultivation due to their favorable climatic conditions and soil support. Most of the crops under the category of horticulture crops are short termed and are either perishable or non-durable commodities. For the same reason infrastructure with respect to storage, various communication networks and sound marketing system is very much necessary. But in the study area, no specific facilities for the sector were worked out. Still infrastructure development in the study area in terms of connectivity of roads, telecom, electricity, irrigation facilities etc. were inadequate. This has influenced availability of technology related marketing and storage facilities for horticultural crops, which are mostly perishable in nature. These factors together have affected productivity

negatively and have reduced returns from cultivation of these crops which in turn influence farmers decision in area allocation. Also, dispersed production and poor infrastructure have also made it expensive to market these crops.

5:1:1 Poor cultivation practices and low yield:

Non adoption of scientific cultivation practices were the major constraints for poor return of horticultural crop in the study area. Despite favourable environment, the rate of production and growth of all horticultural crops were low in the state average.

5:1:2 Lack of Marketing Facilities:

Due to lack of organized marketing structure in the study area, the horticulture farmers were getting low return, whereas the middleman got the profit at their expenses. And also due to poor primary markets the farmers sold their produce at a throw away prices to the middleman without even getting the opportunity to display them. Transportation of perishable produces was perhaps the most serious constraints in the horticultural development of the study area.

5:1:3 Problem of Processing:

The success of fruits and vegetable growing is closely linked with the success of fruits processing units, because of poor marketing and transport facilities. The processing industry can help in sorting out the problem of proper disposal of perishable commodities. Till today there were no any cold storage facilities in the study area. Few processing units exist but were not functioning up to the desired capacity.

5:1:4 Lack of desirable planting materials:

In our field survey period it has seen that there was lack of genuine planting materials in the study area. The disease free, true to type

genuine planting materials is imperative to produce disease free propagules. Screening of planting materials before its distribution is of utmost importance.

5:1:5 Lack of transportation facilities:

In the study area it has seen that road from field to market centre was not good for transportation. Since the study area ws flood affected and so, conditions of roads were very bad. Many roads were found kacha. Due to poor transportation facilities, the horticulture farmer sold their produce at a very low price in their own villages. The provision of good road connectivity facilitate a better post harvest management of the produce and help the farmers in receiving a better price for their produce.

5:1:6 Lack of proper irrigation facilities:

We have observed that in the study area the irrigation facilities were not adequate. The District Agriculture Office provide the assistance for tube wells, drip irrigation to the farmers. But these were very poor as they required.

5:1:7 Scarcity of trained manpower and extension support:

For development of horticulture trained manpower and extension support is most essential. But in the study area it has seen that during last five years the District Agriculture Office had been facilitated only three training programme with the departmental extension services on horticulture crop cultivation. In our field survey it was found that majority of the sample farmers could not apply improved technology due to lack of proper knowledge, lack of proper guidance and training and ignorance of the farmers.

5:1:8 Financial Constraints:

Since the study area was economically poor area, the farmers were unable to use new technology. Most of farmers were use traditional method of production till today in the study area. So, their production was also seen low as there were high potential to produce more. Therefore with their weak financial capacity, efforts of the horticulture farmers to adopt improved technology for growing horticultural crops were not adequate since the subsidy provided by Government and District Horticulture Office was low in comparison to cost.

5:2 Prospects of Horticulture crops in the study area:

The study area has huge potential for horticulture and suited for the same due to its unique agro climatic conditions. Being a flood prone area, production of horticulture can minimize the shock of crop failure and provide monetary benefits to the farmers. Untapped potential can be met with the help of adoption of scientific technologies. There is a lot of scope for increasing the area under Sweet potato, Assam lemon, Banana and Guava. Papaya is also having good potential in the area. The study area has also huge potential for vegetables. Hence improving infrastructure and removing bottlenecks hindering growth of productivity of horticultural crops hold prime importance for achieving the desired level of horticulture development in the study area. Employment generation and nutritional security are some other area of interest. The horticulture sector plays a unique role in rural economy by improving the income of the rural people in the study area. On the other hand horticulture crops are more profitable because as compared to the other field crops, the horticulture crops can also be grown 3 to 4 times each year giving the product all the time they are grown. More number of crops can be grown from same piece of land. Therefore due to adverse effect of chronic floods and soil erosion a large number of farmers shift

to carry out horticultural practices in the study area. With the development of this sector many poor families have been able to raise their income and improve their standard of living in the study area.

At present the horticulture is recognized as an important for potential diversification and value addition in agriculture. The horticulture crops in the study area has been mainly managed by local farmers, often women. In the study area, horticulture as a early showing short duration crops it could help the flood fury. The spice crops production had been also increasing during last five years. In the study area the common spice crops were Garlic, Onion, Turmeric and King chillies. Horticultural crops, particularly fruits and vegetables are now receiving increasing attention in views of its increasing commercial importance in the study area.

PART THREE: SYNTHESIS

CHAPTER – VI

Summary and Conclusion

6:1 Summary:

The entire project work of the "Problem and prospect of horticulture with special reference to Bhuragaon Revenue Circle" has been made in the forgoing analysis. The analysis is organized into Six chapters. It is started from brief introduction to the research problem including the study area, objectives hypothesis, methodology and review of the related study.

The Bhuragaon Revenue Circle is 120 kms of State HQ and 30 kms from District HQ, Morigaon. The Latitude 26, 44,353 and longitude 92,287898 are the geo-coordinate of the Bhuragaon Revenue Circle. The climate in Bhuragaon Revenue Circle is worm and temperate. In winter, there is much less rainfall than in summer, the average annual temperature is 24.5^0 C. The rainfall average 1567 mm. The driest month is December, with 5 mm of rain. Most participation falls in June, with an average of 309 mm. August is the warmest month of the year. The temperature in August averages 29.0^0 C. In January the average temperature is 17.4^0 C. It is the lowest average temperature of the whole year. The average temperatures vary during the year by 11.6^0 C.

The Bhuragaon Revenue Circle has a population of 123469 (as per 2011 census) out of which percentage of male and female are 51 and 49 respectively. As per 2011 census there are 947 females per 1000 male. In Bhuragaon Revenue Circle there has 75% General Caste, 14% are scheduled caste and 11% are scheduled Tribe people. A large number of population of Bhuragaon Revenue Circle i.e. 92% live in rural part.

In a flood prone area like Bhuragaon Revenue Circle where productivity of major crops like rice is not stable, increase in production of horticultural crops can minimize the impact of crop failure and provide

monetary security to the farmer. Diversification of agriculture is considered as an important strategy for agricultural development in India and importance of horticulture crops as a means of diversification and creation of employment opportunities in rural areas is recognized. Besides it also leads to agro-industries development and value addition. In Bhuragaon Revenue Circle, horticulture is becoming a major source of livelihood and export revenue. The study area has a uniquely favourable agro climatic conditions, soil and moisture which make it ideal place to engage in horticulture. The horticulture sector helps to increase rural employment and income generation, not to mention its positive impact on the overall economy. Horticulture can be used to build the economic status of women. Many women in Bhuragaon Revenue Circle are employed in horticulture. Since the percentage of women in the study area is almost half i.e. 49% therefore it is horticulture sector in which poor women can escape poverty through engaging themselves. Economic development is unthinkable without the participation of women. Horticulture as a sector has a positive impact on rural development and helps to improve the quality of life and economic well being of people. Horticulture crops play an important role in human nutrition preventing diseases and contributing to the nations development and prosperity. The horticulture also affects our lives on a daily basis by providing nutritious fruits and vegetables.

In Bhuragaon Revenue Circle horticulture sector comprise three types of crops viz. vegetable crops, fruits crops and spice crops. Among vegetable crops sweet potato, tomato, potato, pumpkin, brinjal, cabbage, cauliflower etc, fruits crops like banana, water melon, papaya, guava, Assam lemon etc. and spice crops like turmeric, garlic, onion, king chilli are mainly grown in the study area. The study area has huge potential for horticulture and best suited for the same due to its unique agro-climatic conditions. In a poor and backward area of Morigaon District like Bhuragaon Revenue Circle, the horticulture are normally associated with agriculture and provide subsidiary employment to the rural people. The economy of the study area is generally agro-based. Soil erosion and

adverse effects of chronic floods on fertile agricultural land have made even affluent farmers land less. Therefore, a large number of such cultivators shift to carry out horticultural practices.

For looking into issues related to horticulture, we have looked into main indicators related to population, educational status of male and female of sample farmers, land ownership, sources of irrigation and motivational factors for taking up cultivation of horticultural crops by respondents. The efficiency and success of farming is influenced to a significant degree by the socio-economic background of the households. In addition these characteristics influence adoption of improved technology and diversification towards high value crops. The literacy rate of the surveyed families was not found to be impressive. At the average level the largest share of respondents (64%) are found to be at under the under metric followed by 20.5% at HSLC level. Very negligible share of the respondents i.e. 10% at H.S and only 5% were found to be B.A holder. But no any respondents were found under M.A. category of the surveyed village. There were also found illiterate people in the surveyed village which are included in the under metric category. And most of literate people also obtained education upto 4-7 standard. Thus the literacy rate in the study area was piteous.

The scenario of land ownership was dominated by small (47%) and marginal (42%) farmers in the study area. The medium and large farmers constituted 10% and 1% of total respondents.

The nature of land ownership influences crop pattern, adoption of technology etc. At the aggregate 59.5% sample farmers were owned above 10 Bighas of land and 40.5% sample found below 10 Bighas of land. The main sources of irrigation were tube wells and Drip irrigation.

Around 62% of respondents were general category followed by 14% of Scheduled Caste, 12% of OBC and 11% of Schedules Tribe.

Engagement of the family members is an important determinant of crop diversification and adoption of horticultural crops. And economic development is unthinkable without the participation of women. A good portion of women (i.e. 40%) in the study area were employed in horticulture. Already mentioned since the study area is a flood prone area, to cope with the flood havoc, the flood escaping crop varieties should be introduced. Early showing short duration crops could help the flood fury. In horticulture about 60% of total respondent's farmers were engaged in the study area. Aggregate income of total sample farmers (i.e. 55.5%) were more than one lakh and 44.5% of total sample farmers were less than one lakh in the study area. The main motivational factor for taking up cultivation of Horticultural crops by respondents was soil support in addition to proximity to the climate condition, easy to grow, less cultivation cost but due to lack of adequate market facilities the farmers were not got good price for their produce in the study area. The Government support and other financial support to the horticulture farmers were also very negligible in the study area.

The horticulture sector can play a pivotal role in diversifying agriculture in terms of increasing production, productivity, nutrition income and employment. The important horticultural crops are grown in the study were fruit crops, vegetable crops and spice crops. Fruit crops like banana, papaya, water melon, guava, assam lemon, peanut, vegetable crops like sweet potato, potato, cabbage, brinjal, cauliflower, pumpkin etc. and spice crops like turmeric, garlic, onion, king chillies were grown in the study area. During 2013-14 the largest horticultural crops area village was Tengaguri i.e. 66.41% followed by Bhuragaon and Mahmara Pather which were 59.16% and 57.28% respectively. The share of vegetable in area and in production was the right i.e. 61.35% and 47.79%. In the 2nd rank the share of fruits in area and in production were 29.65% and 45.49% respectively. The share of spice was very

piteous i.e. in area (8.99%) and in production (6.7%) only. In sample village Tengaguri during the year 2015-14 the highest fruits were grown i.e. 35.38% followed by Borduba and Mahmara Pather i.e. 28.48% and 15.50% respectively. The estimated yield of fruits in Tengaguri 7.86 MT/ha. The production of vegetable was highest in the sample village Mahmara Pather i.e. 33.25% (yield was 2.29 MT/ha) followed by Borduba, Auguri Pam and Tengaguri i.e. 15.86% (yield 1.54 MT/ha) 15.62% (2.21 MT/ha) and 14.99% (1.84 MT/ha) respectively. It was encouraging to notice that the production of spice crops in the total production of 10 sample villages was highest in village Auguri Pam i.e. 58.22% and estimated yield of spice was 7.5 MT/ha during 2013-14. There was good potentialities of spice crops production in Auguri Pam. From 2009-10 to 2013-14, the year to year percentage change in production of fruits and spices were satisfactory due to acreage expansion and its yielding capacity. But year to year percentage in production of vegetables during 2009-10 to 2013-14 was found mixed and this was mainly due to decrease percentage of acreage. But yield was increased during this period. In view of agro-climatic suitability of vegetable crops cultivation there was a lot of potentialities to increase the vegetable crops production in the study area.

The training programme and extension support for the development of horticulture was not adequate as they required. The horticulture farmer were received assistance for seed, water, harvesting and plant protection from the District Horticulture Office, Morigaon in the study area though they were not sufficient. In the study area there were also absence of new technology such as green house, cold storage facilities, protected cultivation like shade net etc. due to lack of adequate support from the Department and Government in terms of finance and extension services.

Though the study area has high potential for the development of horticultural crops, efforts have not been made to develop it as a commercial venture. The retarding factors for the development of

horticulture crops in the study area were problem of infrastructure like poor cultivation practices and low yield, lack of marketing facilities, problem of processing, lack of desirable planting materials, lack of transportation facilities, lack of proper irrigation facilities, scarcity of trained manpower and extension support, financial constraints etc. Hence improving infrastructure and removing bottlenecks hindering growth productivity of horticultural crops hold prime importance for achieving the desired level of horticulture development in the study area.

6:2 Conclusion:

The entire study, "The problem and prospect of horticulture with special reference to Bhuragaon Revenue Circle of Morigaon District" is inevitable to thrive lives of horticulture farmer in current as well as in future. This study examines the problem and prospects of horticultural crops in the study area. The following aspects are examined **:** area and productivity of horticultural crops, market infrastructure etc. The discussion reveals that the study area has ample scope for increasing the horticultural sector. However the main problems in the study area are lack of adequate market infrastructure such as transportation, storage and processing facilities, financial facilities etc.

6:2:1 Major Findings:

An in depth study on "The problem and prospect of Horticulture with special reference to Bhuragaon Circle of Morigaon District" has been made in the forgoing analysis. After the detailed analysis, the whole work is concluded with the following major findings –

(1) The Bhuragaon Revenue Circle is one poor and backward area of Morigaon District. The economy of the area is primarily agrarian. Occurrence of flood and soil erosion are the regular feature and consequential losses vary from year to year resulting the poor economic condition and poverty in this rural area. In this situation, to cope with the flood havoc, the flood escaping crop varieties such as horticultural crops

should be introduced. Early showing, short duration crops could help the flood fury. The horticulture sector plays a unique role in rural economy by improving the income of the rural people.

(2) As an economic sub sector, horticulture a vital role in poverty reduction efforts in the study area. Similarly in the study area horticulture is becoming a major source of livelihood and export revenue. The study area has a uniquely favourable agro-climatic conditions, soil and moisture which it ideal place to engage in horticulture. Horticultural crops cover an area of 4013 hectares, out of the net crop area of 14077 hectares. In the percentage term, it is around 28.51% of the net crop area of the study area.

(3) In the study area, largest share of respondents (64%) were found at under matric followed by 20.5% at HSLC level. Very negligible share of respondent i.e. 10% at H.S and 5.5% at B.A level were found. No any respondent were found Under M.A level in the surveyed villages. And major literate persons obtained education upto 4-7 standards were found in the study area. In the study area around 62.5% respondents were general category followed by 14% of scheduled caste, 12% of OBC and 11.5% of scheduled Tribe. 92% of total population of Bhuragaon Revenue Circle lived in rural

(4) From the field survey it has found that the largest position of sample farmers i.e 50.5% were belong to the small farmers followed by 38.5% of marginal farmers. The percentage of medium farmers were only 10% but very negligible percent of large farmer i.e. only 1% were found in the study area. 59.5% of sample farmers owned land above 10 bighas and 40.5% of sample farmers owned land below 10 bighas.

(5) Since engagement of the family members is an important determinant of crop diversification and adoption of horticultural crops and economic development is unthinkable without the participation of women. In the study area it was found a good portion of women (i.e. 40%) of the horticulture household family were engaged in horticulture.

(6) The percentage of average annual family income of the respondents in the study area more than Rs. 1 lakh was 55.5%. In the study area it was also found that there were some motivational factors for which the farmers took up horticultural crops. Such motivational factors were easy to grow, agro-climatic conditions, soil and moisture.

(7) Three main horticultural crops i.e. fruit crops, vegetable crops and spice crops were grown in the study area. The share of three crops in total horticultural crops area were 29.65%, 61.35% and 8.99% respectively. And the share of fruit crops, vegetable crops and spice crops in the in the total horticultural crops production were 45.49%, 47.79% and 6.71% respectively during the year 2013-14. The yield of these three crops were 4.99% MT/ha, 2.53MT/ha and 2.43 MT/ha respectively.

(8) The largest horticultural crop area out of net crops area is found in the sample village Tengaguri which was 66.41% followed by Bhuragaon and Mahmara Pather i.e. 59.16% and 57.28% respectively. The lowest horticultural crop area village is Gerua Ati which was only 2.36% during the year 2013-14. Production of fruits was highest in sample village Tengaguri i.e. 2100 MT whose share among sample 10 villages was 35.38%. Highest productions of vegetables were found in village Mahmara Pather i.e. 1530 Mt and its share was 33.27%. More spice production was found in village Auguri Pam whose share among sample 10 villages was 58.22%. And it is found very encouraging to produce more spice crops in the study area.

(9) In the study area during the period 2009-10 to 2013-14, the acreage under fruit and spice crops were shown an increase in percentage from year to year. Due to acreage expansion and its yielding capacity there were found significant in production of fruit and spice crops. In 2009-10 the area under fruit crops were 440 ha which was further increased by 1190 ha in 2013-14. In percentage term it was 25.14 percent in 2009-10 and 29.65 percent in 2013-14. Production of fruit also rose from 41.82 percent (MT) to 45.49 percent (MT) during

2009-10 to 2013-14. Spice crops area rose from 6.28 percent to 8.99 percent and its production was also found increased from 4.65 percent (MT) to 6.71 percent (MT) during 2009-10 to 2013-14. On the other hand production of vegetable crops was found fixed due to percentage decrease in its acreage. In 2009-10, the acreage under vegetable crop was 68.57 percentages (ha) which was further 61.35 percentage (ha) in 2013-14. But yield was increased during this period which was good sign to increase its production in the study area.

(10) Training programme for development of horticulture was found very negligible in the study area. During last five years only three training programmes were found at the District level. But no training and extension services were found at the grass root level. In the study area the assistance were met by providing financial support from the District Agriculture Office, Morigaon to the farmer along with training and supplying diseased free HYV seeds but which was found in piteous amount. In the study area there were not found any green house, cold storage facilities, processing units, protection cultivation like shade net. And the main reason of the absence of these facilities were found mainly due to lack of adequate support from the Department and Government in terms of finance and extension services.

(11) Though the study area has high potential for the development of horticulture yet the horticulture farmers faced so many problems. Such problems were like seeds, storage, marketing, credit and infrastructure in terms of connectivity of roads, electricity, irrigation etc. Due to poor primary markets and perishable nature of the products the horticulture farmers sell their produce at a throw away prices to the middleman without even getting the opportunity to display them. Transportation of perishable produces was perhaps the most serious constraints in the horticultural development of the study area. These factors together have affected productivity negatively and have reduces returns from horticulture cultivation. In the study area it was also found that since the horticulture farmers have weak financial capacity, they could not

adopted improved technology for growing horticultural crops because the subsidy provided by the Government and District Horticulture Office was too low in comparison to cost.

6:2:2 Suggestions and Remedial Measures:

(1) In the study area, it is found that almost all the sample households grow horticultural crops as a means of their livelihood. There is a lot of scope for increasing the area under vegetable crops like sweet potato, Tomato, Assam lemon, Cabbage etc. fruit crops like banana, papaya, guava and spice crops like turmeric, garlic, king chillies. As far as yield of the crops is concerned, yield of fruits, vegetables and spices has increased significantly. It is also understood that the horticulture sector in the study area has reached to the small and marginal lands and as a result of which, a negative impact on productivity and profitability of the same was realized in the recent past. Therefore, it is advocated that policy should increasingly cater to productivity enhancement rather than an increasing area.

(2) Being a poor backward area, the study area suffer from the basic infrastructures like poor road communication, weak marketing facility and lack of awareness among farmers of horticulture crops. Therefore suggestion has been made to improve these basic infrastructures for further development of horticulture sector.

(3) Food security, nutritional security, sustainability and profitability are the main focus of present and future agricultural development. The high value agriculture, particularly horticultural crops are the catalysts for the next wave of growth in the farm sector. Horticulture is one of the important sector in the economy of the study area. It provides much needed opportunity for diversification and increased employment in the study area where the scope of high rate of growth in agriculture is rather limited due to flood havoc and soil erosion etc. Therefore, serious

Government and Departmental policy efforts are needed to alive the potentialities of horticulture sector.

(4) To make the people educated in rural areas like Bhuragaon Revenue Circle, Government intervention is urgently sought through the provisioning of better education infrastructure, adult literacy programmes and educational scholarship etc. In implementing these, the religious minority and scheduled castes and scheduled Tribes population should be given top most priority.

(5) Government efforts should be made to impart training and extension services to the horticultural farmers. The Government should provide incentives in the form of free boarding and lodging etc. which will encourage the farmers to participate in the training programmes so that they may produces qualitative products. Without proper training the horticulture farmer will not be able to use proper scientific method of producing and the proper application of pesticides. Because improper application of pesticides is increasing the diseases in human beings.

(6) In order to promote horticultural sector in the study area, the Government and the Department should provide the sufficient credit facilities to the horticulture farmers which enable them to adopt the new technology for better production. They should be also provided the loans at concessional rates for the infrastructure of the horticulture sector. On the other hand most of the horticultural crops are perishable in nature. But there were no any cold storage and food processing units in the study area. And the major reasons cited were lack of adequate support from the Government in terms of finance and extension services. In this case, Government and Department should provide adequate finance to the horticulture farmers in the study area.

(7) Proper and formal marketing arrangement should be developed in the study area. This arrangement will save the producers from the clutches of middlemen, sales depot may be also opened in the study

area. Exhibitions of horticultural produces may be organized from time to time. This is also the way to ensure about the nutritional value, medicinal value of horticultural crops among the people.

(8) Government and District Horticulture Office should also provide quality seeds, regulated market facility and information, irrigation facility in the form of Government tube wells, assistance for drip irrigation, chemical fertilizers to the horticulture farmers so that they may produce more and quality horticulture crops. Since productivity largely depends on adoption of high yielding varieties, availability of irrigation and use of fertilizers/pesticides.

(9) Benefits through agricultural subsidies or other government sources played an important role in the growth of horticultural sector in the study area. Therefore subsidies should be an integral part of government programmes launched from time to time to increase productivity of the horticultural crops.

(10) Being a flood affected rural area the road conditions in the study area was very bad. And since most of the horticultural crops are perishable in nature, the sample farmers were deprived of getting better price for their output because they cannot transport their produce to the outside market easily and sell their produce at a very low price in their local markets. Therefore it is felt that road communication should be improved in the study area.

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Appendix – 1

Area, Production and Productivity of Horticultural crops in Morigaon District (2009-10 to 2013-14)

Year	Area (million ha)	Production (million MT)	Productivity (MT/ha)
2009-10	19.1	191.8	10.04
2010-11	19.2	211.3	11.00
2011-12	19.5	214.8	11.01
2012-13	20.2	219.7	10.88
2013-14	20.8	230.1	11.06

Source: District Agriculture and Horticulture Office, Morigaon.

Appendix – 2

Share of important fruits, vegetables and spices in the District Area and Production during 2013-14.

Crop	Area (ha)	% share	Production (MT)	% share	Yield (MT/ha)
I. Fruits					
Banana	2603	49.26	33839	68.17	13.00
Papaya	55	1.04	660	1.33	12.00
Assam lemon	875	16.56	4375	8.81	5.00
Guava	480	9.08	2400	4.83	5.00
Orange	25	0.47	25	0.05	1.00
Pineapple	45	0.85	675	1.36	15.00
Litchi	250	4.73	750	1.51	3.00
Jack fruits	270	5.11	2700	5.44	10.00
Mango	475	8.99	3800	7.65	8.00
Other fruits	206	3.90	412	0.83	2.00
Total	**5284**	**100**	**49636**	**100**	**9.39**

Crop	Area (ha)	% share	Production (MT)	% share	Yield (MT/ha)
II. Vegetables					
Potato	2165	20.75	21000	16.76	9.70
Sweet Potato	450	4.32	1530	1.22	3.40
Brinjal	1068	10.26	12045	9.61	11.28
Cabbage	1449	13.91	20452	16.32	14.11
Cauliflower	1309	12.57	15112	12.06	11.54
Tomato	1096	10.52	18457	14.73	16.84
Lady' finger	300	2.88	2303	1.84	7.68
Pumpkin	965	9.27	16042	12.80	16.62
Cucumber	675	6.48	3584	2.86	5.31
Radish	727	6.98	10847	8.66	14.92
Tapioca	7	0.07	32	0.02	4.57
Others	202	1.94	3887	3.10	19.24
Total	**10413**	**100**	**125291**	**100**	

Crop	Area (ha)	% share	Production (MT)	% share	Yield (MT/ha)
II. Spices					
Chillies	511	21.88	307	9.90	0.60
Turmeric	431	18.46	280	9.03	0.65
Onion	316	13.53	719	23.18	2.27
Ginger	338	14.47	254	8.19	0.75
Coriander	410	17.56	820	26.43	2.00
Garlic	207	8.86	600	19.34	2.90
Black paper	122	5.22	122	3.93	1.00
Total	**2335**	**100**	**3102**	**100**	1.33

Source: District Agriculture and Horticulture Office, Morigaon.

Some images of Horticulture crops produced in the Study Area are also enclosed.