

Horticulture for Improving the Socio-Economic Status of the Farmers of Goalpara district, Assam and related Challenges

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ABSTRACT

The large financial potential of horticulture makes it a recognized essential component of rural development. Horticulture-based agricultural diversification can increase the value of this sector and provide rural residents with stable employment. A dependable source of human nutrition is also horticulture. In Assam 85.90% population belong to rural areas and more than 70% people depend on agriculture for their livelihood (2011 census). Goalpara is one of the districts of Assam that the NITI Ayog has designated as a model district for integrated development, including the horticultural industry. The area is home to a number of different horticulture crops. Farmers in these countries mostly produce vegetables like cabbage, tomato, pumpkin, and potato as well as fruits like banana, pine apple, etc. The Goalpara district has also one of the Asia's largest banana markets (Daranggiri) with leading production of banana in the state of Assam. The present study aims to studying how the horticulture practices grow the farmer's livelihood and economy of the rural parts. The paper further analyzes the problem faced by the horticulture farmers in developing the farming activities.

Key words: Diversification, Horticulture, Livelihood, Nutrition.

Introduction

Horticulture is the art of cultivating plants, especially garden features or having an enclosure. Horticulture is the science of production, utilization, and improvement of horticulture crops like fruits and vegetables, ornamental plants, flowers, etc. Even various plantations, aromatic, medicinal, and beverage plants such as tea and coffee, are also included in horticulture (Janick, 1972; Malik, 2000). In India from the middle of the 1980s, Government concentrated on horticulture investment, which gave the country legitimacy in improving income through improved output, creating jobs, and increasing export. Since then, the horticulture sector has

transitioned from supporting domestic consumption to supporting commercial travel. Currently, 33 percent of India's entire agricultural output comes from horticulture. Over the last decade the area used for horticulture increased by 2.6% annually and annual production expanded by 4.8%. During 2019–20, total horticulture production in India is estimated to be 3.12% higher than in 2018–19, i.e., 320.77 million tons of horticulture productions are covering an area of 26.46 million hectares (Ministry of Agriculture and Farmers welfare, 2021). Of the total production, the fruit production is estimated to be 102.03 million tons and the production of vegetables is estimated to be 188.91 million tons.

Since the independence, the central government

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of India has implemented a number of different developmental policies. However, Assam is a long way from having these goals and policies implemented. Despite being an agriculture-dependent economy, Assam's production and productivity are low compared to other states in the nation, which results in a small contribution to the national GDP (Deka, 2017; Bhuyan and Bhattacharjee, 2022). However, it has been noticed during the last few decades that the state's cropping pattern is steadily changing, leading to greater productivity and GDP contribution than before. Numerous studies have noted that growing horticulture crops has several benefits. In a rain-fed, dry land, hilly, arid, and coastal agroecosystems, these crops are highly lucrative for substituting subsistence farming and yield more biomass per unit area than field crops, resulting in efficient use of natural resources. Horticulture crops are vital for nutritional security, have the ability to develop wastelands through planned techniques, require far less water than food crops, and are environmentally friendly (Sharma, 2015; Roy *et al.*, 2014). Horticulture has a proven track record of boosting agricultural productivity, generating employment, boosting the financial well-being of farmers and entrepreneurs, boosting exports, and, most importantly, ensuring food security for the populace. However, the gross return from per hectare of horticulture land is much higher compared to other food grains (Bati and Sing, 1994). That productivity is 12.49 tons per hectare of horticulture crops to 2.23 tons per hectare of food grains in India (Department of Agriculture and Farmer Welfare, 2021). The fertile soil and agro-climatic variation of the region are pre-eminently suited for a variety of horticulture crops and also have vast opportunities to grow regarding the commercialization in demand of nutritional security and for more profit (Das *et al.*, 2007).

In Assam, vegetables and fruits are the two crops that are produced the most out of all horticulture crops. Although Assam produces a lot of high-value commercial horticulture crops, post-harvest losses are more common during product storage and transit. These tropical fruit crops like citrus, pineapple, banana, and many other fruits are grown commonly in the region, but lack of storage, marketing, and transit facilities found to be the problems in commercialization. Moreover, land tenure system, Jhum cultivation etc are also common problem in developing horticulture activity. Although Assam has a sizable area under production and cultivation, it is still

far behind in terms of horticulture production and productivity. To ensure the growth of the state economy, a thorough examination of horticulture production and productivity is needed.

Focusing on horticulture can provide desirable benefits in a number of ways in economically underdeveloped areas where rural underemployment is a major issue. Adoption of horticulture also leads to more effective use of limited land resources, preservation of ecological balance by reducing soil erosion, maintains of soil moisture, and improved usage of cultivable wastelands (Sati, 2004). In the flood-prone state of Assam, where the viability of major crops like rice is uncertain, the production of horticulture crops can be trusted to mitigate the effects of crop failure and to pay farmers a living wage. The Assam government has also initiated large number of plan to enhance the production and productivity of horticulture crops. In the 12th five year plan, the state government of Assam has focused to enhance the area and production of variety horticulture crops in the various districts of the state. Among the district Goalpara occupies a prominent role in the horticulture map of Assam and thus have prominent role in the upliftment of rural socio-economy of the district. The major aim of the present study was to examine the socio-economic status of the farmers associated with horticulture and the challenges at Matia block of the Goalpara district of Assam, India.

Objectives

The main objectives of the paper are:

1. To evaluate production and productivity of the major horticulture crops of the area;
2. To know the socio-economic status of the farmer involved in the sector, and
3. To identify the problem of horticulture development in the study area.

Materials and Method

Forming a part of Assam's agro-based economy, and among its districts, Goalpara a southern most district, is able to attain a momentum in horticulture- economical interest. It extend from 25°33' to 26°12' N latitude and 90°7' to 91°5' E longitude. Out of the total area of 1831 sq km, 45.76% is net cropped area. The present study selected 100 farmers from the Matia block (50 farmers from Dolgoma and Dahikata village respectively). A stratified random

sampling technique is used to select the villages and the farmers based on highest area under horticulture use. An interview schedule method is applied with a well structured questionnaire. To access the socio-economic condition and productivity of the farmers, the data like demography, land holding, land ownership, income and production are obtained from field survey by using purposively designed questionnaire. Secondary data are gathered from Krishi Vigyan Kendra, Dudhnoi, District Agriculture Office, Goalpara etc.

Results and Discussion

Horticulture and socio-economy

The socioeconomic approach is primarily interested in understanding the social, economic, and political facets of certain people or social groups in society. The socioeconomic method typically concentrates on assessing the adaptability of people or groups based on their internal features such as age, education, size of landholding, production, agricultural power, and so forth. Variations of these factors are responsible for the variation of the farmer's socio-

economic status.

Age structure

The study indicates that in Dolgoma village most of the respondent farmers (48%) were in Young age group (Table 1) followed by 34 % middle age and 18% old age farmers. While in Dahikata village more than 52% respondents are middle age farmer. In both the cases participation of young age farmers are found to be comparatively minimal in total, which may indicate the declining interest of young group of people towards agriculture.

Educational status

With regards to education 46% of farmers from the village Dolgoma, are under high school level education category followed by graduate (14%), HSLC passed (10%), Higher secondary (08%) and illiterate (4%). However, in Dahikata village higher percentage (38%) of respondents belongs to under HSLC level, followed by graduate (32%), HSLC (16%), higher secondary (12%) and post graduate (2%). It seems that level of educational status among farmers in Dolgoma is comparatively lower than

LOCATION MAP OF THE STUDY AREA

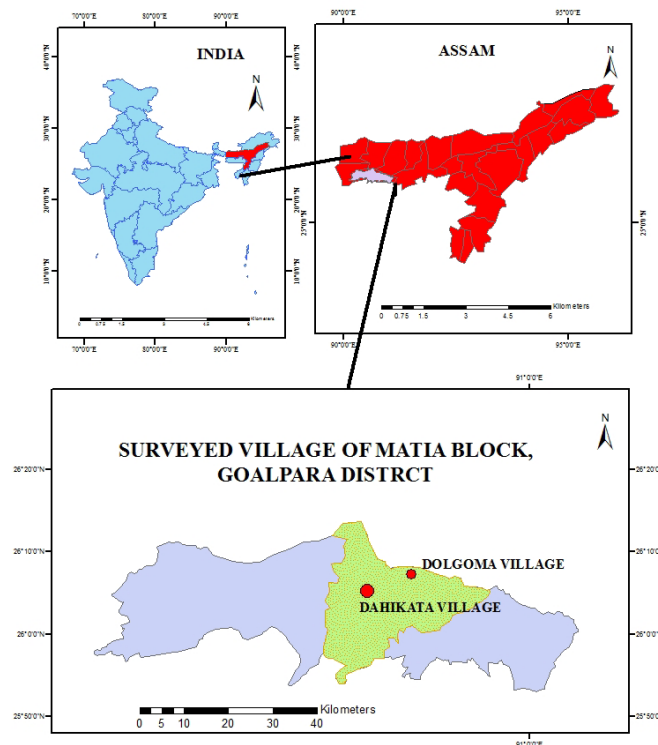


Fig 1: Location map of surveyed village

Dahikata village (Table 2). However, a comparative academically aware farmer in both the villages especially Dahikata village may provide a good background for spreading new agricultural innovation in the agricultural sector of the area.

Land holding

The study reveals that 34% of respondents were having less than 1 ha of land holding size, thus belonged to marginal farmer category at Dolgoma. The farmers who belonged to small and medium categories were 42% and 20% respectively. It also shows that only 4% respondents were having large land holding size. On the other hand in Dahikata village, 26% of respondents were having less than 1 ha of land followed by 46% and 28% farmers were

having small and medium size of land holding.

Thus it may be concluded that majority of respondents were small farmers having 1.01 to 2 hectare of agriculture land. This is because of the low per capita agriculture land and mainly fragmentation of land holding due to nuclear family system of Assam (Table 3).

Land ownership

Study on land ownership reveals that 61.53% respondents surveyed have ownership of their farm land at Dolgoma village. Again 27.69% of land owned under FPO or farmers' association. Only 7.69% practice farming on leased land, while 3.07% practice farming on relative's farm land. While, in Dahikata village 66% respondents practice farming

Table 1. Age structure of the respondent farmers, 2022

Age group	Dolgoma village		Dahikata village	
	No. of Respondent'	% of respondent'	No. of respondent	% of respondent
Young age 18-35	24	48	14	28
Middle age 36-55	17	34	26	52
Old age above 55	09	18	10	20
Total	50	100	50	100

Source primary survey, 2022

Table 2. Level of education of the respondents in the study area, 2022

Dolgoma village Education status	Dahikata village			
	No. of Respondents'	% of Respondents'	No. of Respondents'	% of Respondents'
Post Graduate	00	00	01	02
Graduate	07	14	16	32
HS	04	08	06	12
HSLC	05	10	08	16
Under HSLC	23	46	19	38
Literate	09	18	00	00
Illiterate	02	04	00	00
Total	50	100	50	100

Source: Primary survey, 2022

Table 3. Size of land holding pattern of horticulture farmers, 2022

Size of land holding	Dolgoma village		Dahikata village	
	No. of farmer	% of farmer	No. of farmer	% of farmer
Marginal (up to 1 ha)	17	34	13	26
Small (1.01 to 2 ha)	21	42	23	46
Medium (2.01 to 5 ha)	10	20	14	28
Large (above 5 ha)	02	04	00	00
Total	50	100	50	100

Source: Primary survey, 2022

on their own farm land, followed by 26% have leased farm land and 8% practice farming on relative's farm land (Table 4).

The results reveal that in both the village Dolgoma and Dahikata majority of farmers have own farming land. But in Dolgoma village the noticeable thing is that some respondents also belongs to FPO (Farmer Producer Organization) or other associations. The primary study found out that there are more than 3 FPO namely Nasriba, Uttaran, Rongmon in Dolgoma village. While, in Simmlitola, leased farm land of the respondent are also high in contrast to Dolgoma village.

Horticulture Practice

An attempt has been made to find out the trend of growth of horticulture practice in the study area. In Dolgoma village 34% respondents have been practicing horticulture from 5 to 10 years. Moreover 26% farmers have been growing horticulture just from less than 5 years, followed by 18% respondent belongs 10 to 15 years of farming experience. In Dahikata village 50% respondents have been practicing horticulture since 5 to 10 years, followed by 26% and 14% has just less than 5 years and 10 to 15 years of horticulture farming experience (Table 5).

It may be noted that the practice of vegetables has long history than fruits farming in both the villages.

Table 4. Land ownership of the respondent, 2022

Land ownership	Dolgoma		Dahikata	
	No of respondent Farmers'	% of respondent	No. of respondent farmers'	% of respondent
Owned by self	40	61.53	33	66
Leased in	5	7.69	13	26
From relatives	2	3.07	04	8
Under FPO/Association	18	27.69	00	00
Provide by Government	0	00	00	00
Total	70	100	50	100

Source: primary survey, 2022

Table 5. History of horticulture farming of the respondent in Dolgoma village, 2022

Year of horticulture farming	Dolgoma village		Dahikata village	
	No. of Fruits farmers'	No. of vegetables farmers'	No. of fruits farmers	No. of vegetables farmers
Less than 5 years	03(6%)	10(20%)	14(28%)	11 (22%)
5-10 years	05(10%)	12(24%)	03(6%)	10(20%)
10-15 years	01(2%)	08(16%)	02(4%)	05(10%)
15-20 years	00	06(12%)	00	03(6%)
More than 20 years	00	05(10%)	00	02(4%)

Source: primary survey, 2022

Table 6. Distribution of production potential of selected horticulture at Dolgoma village, 2022

Fruits & vegetables	Area in bigha	Average fruits or vegetables production (Bunches or quintal/bigha)	Total production (In quintal)	Duration of days
Banana	32	220(bunches)	7040	270-360
Papaya	04	180	720	180-360
Potato	109	18	1962	110-120
Cabbage	117	45	5265	60-100
Tomato	51	33	1683	60-120
Brinjal	54	30	1620	100-120
Pumpkin	73	50	3650	90-120

Source: primary survey, 2022

Especially in Dolgoma village, most of farmers are vegetables grower as a traditional practice of farming near the fertile flood plain of Brahmaputra river bank. In case of fruits farming, Dahikata village has increasing rate of farmers (6% to 28%). They practices fruits like sweet Malta, orange, variety of Jujubi, banana etc.

Horticulture Production Potential

An evaluation of the nature of income of the farmers through fruits and vegetables production in Dolgoma (Table 6) and Dahikata village (Table 7) are also studied. The study found that in Dolgoma village has highest area under Cabbage and Cauliflower followed by potato, pumpkin, brinjal, tomato, banana and Papaya fruits. On the other hand, in Dahikata village both fruits and vegetable are practiced. Among the fruits Sweet Malta, Guava and Oranges are newly grown in Dahikata village in the last four years. The produced vegetables are exported to local market as well as to city market

Guwahati.

Horticultural profitability

The financial analysis of the farmers has been done on the basis of the farmer's production and expenditure involved in the farming. It has been seen that a respondent having an area of 1 bigha (0.25 hectare) can earn net ret of Rs. 65,000 from papaya, Rs. 41,800 from banana, Rs. 59,600 from tomato, Rs. 53,000 from pumpkin, Rs. 34,200 from Brinjal, Rs. 21,000 from cabbage, and Rs. 19,200 from potato (Table 8 and Table 9). In Dolgoma village (Table 8) as most of the respondent have vegetables grower and they earn net return of Rs. 3,657,000 from pumpkin, Rs. 3,531,000 from cabbage and 3,039,600 from tomato. Whereas, in Dahikata village (Table 9) though most of the cultivated areas of the respondents are under vegetables farming but net return from fruits has the highest with Rs. 35,70,000 from Jujubi and Rs. 14,20,000 from sweet malta as well.

Table 7. Distribution of production potential of selected horticulture at Dahikata village, 2022

Fruits & vegetables	Area in bigha	Average fruits or vegetables production (Bunches or quintal/bigha)	Total production (In quintal)	Duration of days
Banana	49	220(bunches)	10780	270 -360
Papaya	11	180	1980	180-360
Sweet Malta	10	17	170	240-360
Guava	13	15	195	140-196
Jujube	17	55	935	240-360
Orange	08	15	120	240-360
Potato	43	18	774	110-120
Cabbage	52	5	2340	60-100
Tomato	29	33	957	60-120
Brinjal	37	30	1110	100-120
Pumpkin	39	50	1950	90-120

Source: primary survey, 2022

Table 8. Generated Income from production of fruits and vegetables in Dolgoma village, 2022

Fruits Vegetables	Area (bigha)	Expenditure on Per bigha	Total expenditure (Rs.)	Gross return (Rs)	Total Return (Rs)	Net returns cultivation (Rs)
Banana	32	24200	774,400	66000	2,112,000	1,337,600
Papaya	04	25000	100,000	90,000	360,000	260,000
Cabbage	107	21000	2,247,000	54,000	5,778,000	3,531,000
Tomato	51	13000	663,000	72,600	3,702,600	3,039,600
Brinjal	53	10,800	572,400	45,000	2,385,000	1,812,600
Potato	93	16800	1,562,400	36,000	3,348,000	1,785,600
Pumpkin	69	7000	483,000	60,000	4,140,000	3,657,000

Source: primary survey, 2022

Respondent's occupation

Study of the respondent's occupation that is other than farming reveals that 52% of the respondents of Dolgoma village are directly dependent on farming and rest percentage having other than farming also (Table 9). While in Dahikata village 46% of the respondents only practices farming and besides rest percentage have also other source of occupation like business, private job, government employ, daily wage worker etc.

Major problems and constraints

Marketing problem

Majority of farmers are (more than 62%) ignorant of the market to sell their product (Primary survey, 2022). They mostly rely on middleman for sell and distribution of their production. Especially in case of fruits like Sweet Malta, the farmers sell their product at a rate of Rs. 100 at their local market, but which original market price is about near Rs.250 to Rs.300.

In case of banana, tomato etc, due to its perishable nature need cold storage facility and well connected transport system. Sometimes, lacks of these facilities push behind them to sell their produce at lower price causing depreciation of profit. Moreover, during the initial stage covid19 pandemic lots of farmers face loss due to improper online system of horticulture marketing.

Improper irrigation system

Improper irrigation system is also hindering the productivity of horticulture crops. Various fruits crops like banana, sweet Malta are high water consuming crops. Most of the farmers are using lift irrigation system from the river or wetland for irrigation in the district. Recently drip irrigation system is also used in banana plantations by medium to large-scale farmers. But per unit of cost is very high. That is Rs. 12000 to 14,000 per bigha of farming land in the drip irrigation system and Rs. 5000 to 6500 per bigha in lift irrigation (Private survey, 2021).

Table 8. Generated Income from production of fruits and vegetables in Dahikata village, 2022

Fruits Vegetables	Area (bigha)	Expenditure on cultivation	Total expenditure Per bigha	Gross return (Rs.)	Total Return (Rs)	Net return (Rs) (Rs)
Banana	49	24200	943,800	66000	2,574,000	1,630,200
Papaya	11	25000	275,000	90,000	990,000	715,000
Sweet Malta	10	18000	180,000	160,000	1600,000	14,20,000
Guava	13	20000	260,000	60,000	780,000	520,000
Jujubi	17	10,000	170,000	220,000	3740000	35,70,000
Orange	08	20,000	160000	64,000	512,000	352,000
Cabbage	52	21000	1092,000	54,000	2,808,000	1,716,000
Tomato	29	13000	377,000	72,600	2,105,400	1,728,400
Brinjal	37	10,800	399,600	45,000	1,665,000	1,265,400
Potato	43	16800	722,400	36,000	1,548,000	825,600
Pumpkin	39	7000	273,000	60,000	2,340,000	2,067,000

Source: Primary survey, 2022

Table 9. Occupation other than farming of the respondent (farmer), 2022

Occupation	Dolgoma village		Dahikata village	
	No. of Respondent	% of the respondent	No. of respondent	% of respondent
Only faring	26	52	23	46
Own business	05	10	09	18
Government services	04	08	06	12
Daily wage worker	05	10	02	04
Private Job	07	14	08	16
Others	03	06	02	04

Source: Primary survey, 2022

Lack of capital and finance

Most of the farmers stated that they face financial problems investing in their farming. Be it tools, seeds, fertilizer, insecticide, or other types of equipments, they need a relatively high amount of capital. Again rural farmers also lack the interest to get a loan due to its tedious process. In terms of the financial support system like banking, less than 43% of respondent farmers are aware of this process. Again in the case of government incentives, more than 48% of farmers are unaware of this process, except for Farmers Producer Organization or Self Help Group members (Private survey, 2021).

Post harvest management

Proper post-harvest management is a serious issue faced by the horticulture farmers. Absence of post-harvest technology results in post-harvest losses such as crop diseases, loss of sale and reduced market price for produce. Facilities such as cold storage, drying, transportation, processing, packaging and marketing is required to increase the income of the farmers. Fruits crops like banana, jujube, Malta need lots of post-harvest management as the farmers are unaware of the scientific method of crop management.

Damage from Wild elephant and monkey

Raiding of horticulture plants by elephants in these plantations is common in Goalpara district. Many monoculture Plants like banana, pineapple, rubber, tea, oil palm etc have sprung up in Goalpara district in recent times and that in turn aggravates the human-elephant conflict and damages the crops by elephants. Over the past 20 years, an average of 800–1000 bighas (100–125 hectares) of agricultural land used for paddy cultivation has been destroyed annually (Talukdar and Kalita, 2014). Because of their footsteps, which may reach a depth of one foot, open agricultural land that has not been farmed becomes uncultivable. Similar to this, more than 40 villages under Matia block have been suffering seriously from the recurring seasonal attacks of wild elephants (Krishnai Range Forest Office, Goalpara, 2020). In both villages, estimated plantation crop damage is over 50 bighas of land for 43% of respondent farmers (Private survey, 2021).

Conclusion

Evaluation of the socio-economic status of the farmers is important for better policy options to overall

rural development process. The study find out that more than 46% of farmers are small-scale farmers as well as middle age group of having 36 to 55 ages in both villages. The net return of fruits and vegetables of the farmers are also more remunerative. Though lots of challenges are there but the socio-economic status of the farmers can be improved by imparting their problems and technical support, increasing their education level. Post harvest management and research in perishable fruits are also utmost important. The active involvement and participation in the rural field of the policymakers and authorized departments are required to achieve the healthy growth of horticulture.

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