

STUDY ON

ROLE OF HORTICULTURAL CROPS (MAJOR FRUITS AND
VEGETABLES) IN THE ECONOMY OF THE RURAL
PEOPLE OF THE DISTRICT OF BARPETA,
ASSAM.

(40)

A Report Submitted

TO

OMEOKUMAR DAS INSTITUTE OF SOCIAL CHANGE AND
DEVELOPMENT.

NOWZAN ROAD : UZANBAZAR : GUWAHATI-781001

BY

Miss Gitanjali Devi, M. Sc. (Agri)
P. C. GOSWAMI SCHOLAR.

1995

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UNDER THE SUPERVISION OF
Dr. NALIN KR. MOHAN
CHIEF SCIENTIST
HORTICULTURAL RESEARCH STATION
ASSAM AGRICULTURAL UNIVERSITY
KAHIKUCHI, ASSAM.

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FOREWORD

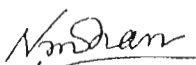
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Horticultural Research Station
Assam Agricultural University
Kahikuchi, Guwahati - 781017

It is well established that Assam is predominantly an agricultural state and agriculture is the mainstay of economy. The development and contribution of horticulture plays a dominant role in the rural economy. But it is difficult to judge the present status of horticulture in the state due to limitation in basic information and very poor data base. Non-availability of information on area under cultivation, production and productivity of the crops constrain in production etc. are the major bottleneck in the plan and programming of the horticultural development in the state.

The study undertaken by the scholar is able to throw some lights on the status of horticulture (fruits and vegetables) in the Barpeta District which is one of leading districts in the horticultural production.

It is my pleasure to state that, Miss Devi has collected the pertaining information and compiled the manuscript with all sincerity and devotion.

Date : 9th August '95
Place : Kahikuchi.


(N.K. Mohan)

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The author gratefully acknowledge the help rendered by Sri Pradip Kr. Choudhury, Subject Matter Specialist, Deptt. of Agriculture, Govt. of Assam, Pathsala Sub-Division for his valuable suggestion during the time of investigation.

Date : 1st August '1995

Place: Pathsala

Gitanjali Devi
(Gitanjali Devi)

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CHAPTER - I

INTRODUCTION

Horticulture is an important component of agriculture comprising production and management of fruits, vegetables, flowers and preservation of fruits and vegetables. ^{It} plays a major role in the development of agriculture and rural economy.

The soil of Assam is fertile and ^{as such it has} high potentiality for increasing ^{the} production of food stuff. The state enjoys hot and humid climate with high rainfall and humidity. The soils of the state are acidic to neutral in reaction with high organic matter content, ^{the soils are favourable for} favours the growth of various fruits, vegetables of tropical, sub-tropical and temperate origin.

Assam is well known for growing various fruits and vegetables from the time immemorial. Most of ^{the} fruits and vegetables are being grown in the gardens situated in and around the house, which is locally known as 'Bari' (Homestead garden). These 'baris' ^{are} ~~have significantly contributed to~~ significantly contributing in the production of fruits and vegetables in the state, (Singh, 1993). Number of fruits and vegetables crops are grown under multistoried cropping system in the gardens. But most of the crops in the gardens are unsystematic and unscientific. ^{In} Out of a study ~~undertaken~~ ^{it has been reported that} by Barman (1990) ~~stated~~ ^{has} that about 35 per cent of the horticulture produce in the state ~~have~~ ^{has} been contributed by the 'baris'.

According to a report of the State Agricultural Department, Assam has produced 9.25 lakh tonnes of fruits and 19.10 lakh tonnes of vegetables during the period of 1992-93.

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and covered an area of 0.693 Lakh ha and 1.259 Lakh ha, ^{hectares under fruit} ^{hectares under vegetables} respectively, (Anon, 1993). Growing of fruits, vegetables and flowers are gaining popularity among the farmers of Assam. It is ^{widely} unequivocally accepted that per unit production of the fruits and vegetables in terms of food value and economic return are significantly higher than other field crops. Most of the fruits and vegetables are also being considered as the cash crops. ^{In 1992-93} At present, the Barpeta district ⁱⁿ has produced 7.5 thousand tonnes of fruits covering an area of 7.1 thousand ha ^{In respect of} (1992-93). Regarding vegetable production Barpeta District ^{occupies the} rank first position ^{with} producing 19.93 thousand tonnes ^{of vegetables} and ^{grown over} covering an area of 15.72 thousand hectares during 1993-94. There are several large scale production ^{pockets of} pockets and ^{presently} farmers are adopting whole farm or integrated farming in the homestead gardens.

^{Such as} Most of the important vegetables like Bhendi, ridge gourd, bottle gourd, pointed-gourd, pumpkin, amaranthus etc. are grown in ^{Season} ^{White} kharif, and vegetables like tomato, cabbage, cauliflower, knolkhol, spinach, pea etc. are ~~being~~ grown in rabi season. Fruits crops like banana, Assam lemon, pineapple, turmeric, ginger, colocasia, black pepper etc. are grown as monocrop ^{intercrop} or intercropped with the arecanut or coconut.

^{According to 1991 census} ^{the population of Assam is 224 lakh} ^{of Assam} In Assam, the present population stands at 2.24 crores (1991), where ^{About 70 percent} about 82 per cent of the total population are living in the villages and more than ^{3/4th} of the population are dependent on Agriculture for their livelihood. It is also estimated that more than 50 per cent of the state's income ^{is} are derived from agriculture and 90 per cent of the food stuff are produced from land based farming. ^{in general and} Virtually agriculture and more particularly the horticulture ^{is particularly important} is playing a dominant role in the economy of the state.

However, it is ^{the} ~~the~~ common fact that the economic aspect of these crops have been ignored ^{by the} ~~at the~~ farmers level due to lack of ^{agro-economic data} ~~reliable and location specific statistical data.~~

The study makes an attempt to find out how best the farmers of the Barpeta District ^{could utilise} ~~utilising~~ their farms ^{for the raising} ~~for the~~ horticultural crops ^{for ensuring} ~~and ensure~~ regular flow of income. The main objectives of the project are —

1. ^{To} ~~The~~ determine the economic value (return) of major fruits ^{grown by different} ~~among different~~ categories of farmers.
2. To determine the economic value (return) of major vegetables ^{grown by different} ~~among different~~ categories of farmers.
3. ^{To compare} ~~Comparison~~ of the economic values between vegetables and fruits.

CHAPTER - II

METHODOLOGY

The study was conducted in Barpeta District of Assam. The district ^{has two subdivisions} ~~has been divided into two sub-divisions~~ namely, Barpeta sub-division and ^{Bisali} ~~Pathsala~~ sub-division. To look after different rural development works the ~~whole~~ district ~~covered by~~ ^{has been divided into} eight different Development Blocks namely, Rupsi, Mondia, Keotkuchi, Chenga, Gobardaha, Bhabanipur, Jalah and Bajali. (Distribution of the blocks in Appendix - I). For the present study twenty ~~number of~~ farmers were randomly selected from each of the blocks under different villages. ^{Thus} ~~Total~~ one hundred and sixty farmers were randomly selected for the whole study.

^{The sample farmers were divided into three categories.} Classification of farmer categories were made on the basis of operational homestead holdings with the help of cube-root F (3/F) method. Thus, all the gardens taken for the study were grouped into three ^{categories} considering the area covered under each of the gardens. The ~~area ranged for the small garden less than 0.302 ha :~~ ^{with an area of} ~~for medium garden, 0.302 ha to 0.75 ha ; for large garden more~~ ^{is considered as small garden, between} ~~than 0.75 ha.~~ ^{as medium garden} ~~A reliable structural schedule comprising different crop cultivation and economical aspect of the major horticultural crops (fruits and vegetables) were employed for the purpose of data collection by personal contact method (Proforma in Appendix -II) Simple statistical technique such as 'frequency and mean' are applied for the purpose of analysis of data.~~ ^{gardens with more} ^{area as large garden}

^{As per} Out of the information available at the office of the District Agricultural Officer, Barpeta, four leading rabi vegetables (cauliflower, cabbage, tomato and carrot) and four kharif

vegetables (Gourd, cucumber, bhendi and cowpea) were selected for the study. Among the fruit crops grown in the region two fruits and two nut crops such as Banana, Pineapple, Coconut and arecanut were considered to be most important and taken for the study. Production from each of the crops were calculated out on the basis of marketable and consumable yield and expressed in kilogram. The value of the produced were calculated out as per the prevailed local market price.

The cost of cultivation was calculated ^{on the basis of} ~~out considering~~ the cost of seeds, manures, chemicals, labour cost involved in interculture operation etc. (Details enclosed in Appendix - III).

To ascertain the economic return of the crops the cost + benefit ratio ^{on the basis of} was calculated out ~~considering~~ the net income and production cost.

CHAPTER - III

RESULTS

Information collected ^{regarding} on the area under horticultural crops (ha), production of fruit and vegetable, total value ^{of the produce} ~~produced~~, ^{quantity} ~~amount~~ produced and sold, cost of production, net income and cost; benefit ratio are presented in Table 1(a), 1(b) and 1(c) for small, medium and large garden, respectively. The results are described ^{under} in the following heads:

III(i) Area under Horticultural crops :

From the data it is revealed that out of the 8(eight) development Blocks under Barpeta district, Bajali and Bhabanipur, Development Blocks favourably grew more summer vegetable ^{as} compared to winter vegetables. Winter vegetables are grown more in ^{that of} Gobardhana, Jalah, Rupsi and Mondia development block. It was observed that farmers of all the three vegetables, viz., small, medium and large gardens occupied more area under rabi than kharif crops. All the categories of farmers utilized more area for cultivation of rabi vegetables in tomato followed by cabbage, cauliflower and carrot. Similarly out of the kharif vegetables bhendi covered more area followed by cucumber and gourd.

Among the fruit crops the ^{more} ~~higher~~ cropped areas were recorded under coconut ^{cultivation} followed by arecanut, banana and pineapple. ~~in all the categories of farmers.~~

III(ii) Production (kg) and Total Value of Production (Rs):

Production of vegetable crops ^{of} ~~either~~ rabi and kharif ^{seasons} were differed irrespective of garden sizes. Tomato recorded the highest production followed by cabbage in rabi vegetables, whereas

Table : 1(a) Cropped Area, production and income under small garden(less than 0.302 ha)

Area (ha)	Production (ha)	Production Total value of pro- duce (Rs)	Cost of produc- tion (Rs)	Produc- tion sold (Rs)	Producti- on cons- umed (Rs)	Net income (Rs)	Cost benefit: ratio
<u>Rabi vegetables</u>							
Cauliflower	0.066	838	3352/-	220/-	3032/-	3132	14.23
Cabbage	0.066	1205	3615/-	215/-	3315/-	3400	15.81
Tomato	0.090	1755	8715/-	250/-	8475/-	8525	34.1
Carrot	0.050	640	1920/-	120/-	1860/-	1800	15.0
<u>Khariif vegetables</u>							
Gourd	0.033	280	980/-	30/-	700/-	950	31.6
Cucumber	0.066	541	1623/-	100/-	1533/-	1523	15.23
Bhendi	0.133	1300	3250/-	170/-	2815/-	3080	18.11
Cowpea	0.033	115	633/-	38	495/-	595	15.65
<u>Fruit crop. No. of plants/Area.</u>							
Coconut	4/.022	248	1240/-	120/-	1000/-	1120	9.33
Arecanut	8/.006	1088	250/-	25/-	240/-	225	9
Banana	6/.002	50	400/-	20/-	240/-	380	19
Pineapple	8/.0002	8	40/-	4/-	-	36	9
<u>Price index for the calculation</u>							
Cauliflower	: Rs. 4/kg	Gourd(Ridge)	: Rs. 3.5/kg	Coconut	: Rs. 5/nut		
Cabbage	* Rs. 3/kg	Cucumber	: Rs. 3/kg	Arecanut	: Rs. 0.25/nut		
Tomato	: Rs. 5/kg	Bhendi	: Rs. 2.5/kg	Banana	: Rs. 8/kg		
Carrot	: Rs. 3/kg	Cowpea	: Rs. 5.5/kg	Pineapple:	: Rs. 5/kg		

Table : 1(b) Cropped area, production and income under medium garden (0.302 ha - 75 ha)

	Area(ha)	Production (kg)	Total value of produce (Rs)	Cost of production (Rs)	Production sold (Rs)	Production consumed (Rs)	Net income (Rs)	Cost : income benefit
<u>Rabi vegetables :</u>								
Cauliflower	.120	1522	6088	430/-	5768	320	5338	12.41
Cabbage	.133	2433	7299	420/-	6963	335	6543	15.57
Tomato	.140	2730	13650	412/-	13300	350	13238	32.13
Carrot	.057	729	2187	135/-	2127	60	2052	15.2
<u>Kharif vegetables :</u>								
Gourd	.112	952	3332	105/-	3034	297	3227	30.73
Cucumber	.133	1090	3270	200/-	3180	90	3070	15.35
Bhendi	.199	1950	4875	254/-	4450	425	4621	18.19
Cowpea	.006	21	115	7/-	88	27.5	108	15.42
<u>Fruit crops. No. of plants/ Area.</u>								
Coconut	6/.033	372	1860	150/-	1700	125	1710	11.4
Areca nut	25/.018	3400	748	72	725	31.25	676	9.3
Banana	20/.009	225	1800	70/-	1640	160	1730	24.71
Pineapple	36/.0009	40	200	20/-	180	20	78	9.

Table : 1(c) Cropped area, production and income under large garden (more than 0.75/ha)

	Area(ha)	production (kg)	Total value of produce (Rs)	Cost of production (Rs)	Production sold (Rs)	Production consumed (Rs)	Net income (Rs)	Cost : benefit
<u>Rabi vegetables :</u>								
Cauliflower	0.145	1840	7360	525	7020	340	6495	12.39
Cabbage	0.150	2745	8235	520	7890	345	7715	14.83
Tomato	0.175	3000	15000	540	14650	350	14460	26.77
Carrot	0.082	1049	3147	194	3081	66	2953	15.22
<u>Khariif vegetables :</u>								
Gourd	0.133	1130	3955	125	3657	297	3830	30.64
Cucumber	0.160	1312	3936	250	3840	96	3686	14.74
Bhendi	0.200	1960	4900	255	4475	425	4645	18.21
Cowpea	0.059	206	1133	72	995	137	1063	15.18
<u>Fruit crops : No. of plant/ Area.</u>								
Coconut	14/.07	868	4340	320	4000	150	4020	12.56
Arecanut	45/.033	6120	1345	125	1300	31.25	1220	9.76
Banana	45/.02	500	4000	140	3800	200	3860	27.57
Pineapple	62/.0023	80	400	35	370	30	365	10.42

the production of bhendi was highest in kharif followed by cucumber, gourd and cowpea, respectively. ?

The production of arecanut, banana, pineapple and coconut were directly associated with the size of the gardens, ~~larger the garden higher cropped area recorded.~~ Irrespective of size of gardens, coconut covered ^{large} ~~higher~~ area, followed by arecanut, banana and pineapple. Value of ^{the crops} produced are evaluated according to market price.

III(iii) Utilisation of the Farm Produce :

The produce ^{crops} were ^{partly} utilised by the growers either by ~~from~~ for ^{house hold} consumption. ~~the~~ ^{quantity were sold in} consuming a part of the produce and excess amount by selling in the market. It has been observed that among the vegetables, ^{crop} Tomato ^{is} ~~the~~ most remunerative, followed by Cabbage, cauliflower in rabi and bhendi followed by cucumber in the kharif season.

^{Big} Large farmers obtained ^{higher sale} ~~sold~~ value in coconut followed by banana, arecanut and pineapple. Consumption of fruits ^{are} ~~are~~ almost ~~showed~~ similar trend ^{by} in all the categories of farmers.

III(iv) Cost of Production :

From the table it has been observed that the cost of production varied according to the size of gardens. Among all the vegetable crops the highest cost of production was recorded in tomato followed by cabbage, cauliflower and carrot in rabi season. In kharif season, ^{the cost of production of bhendi is followed} ~~bhendi~~ followed by cucumber, gourd and cowpea. recorded cost of production in the sequential order. In an average it has been observed that cost of production per unit area was very low in small gardens ^{as compared} ~~in comparison~~ to medium and large gardens.

Out of the four fruit crops taken for the study it has been observed that the cost of production, irrespective of size of gardens was higher in coconut followed by arecanut, banana and pineapple.

III(v) Net Income :

It is seen that farmers of all categories ^{of farms} obtained highest income from tomato followed by cabbage, cauliflower and carrot during the rabi season ^{and} ~~and during the kharif season~~ bhendi followed by cucumber, gourd and cowpea ^{in the kharif season.}

III(vi) Cost:Benefit ratio :

The cost : benefit ratio was determined ^{for} in all the crops grown under different gardens considering the cost involved in production and net benefit received out of the produce. It is interesting to note that all the crops under the study had shown profit over cost of production. Among the different crops, irrespective of garden sizes, tomato recorded the highest cost-benefit ratio followed by carrot, cabbage and cauliflower in rabi crops and gourd followed by bhendi in kharif crops.

In respect of fruits, banana recorded the highest cost benefit ratio followed by coconut. Interestingly, the ratio increased with an increase in the garden size. The larger garden recorded higher ratio over the smaller one.

CHAPTER - IV

DISCUSSION

IV(i) Area under Horticultural Crops : It has been observed that selection of crops and their cultivation in different blocks were varied. However, rice was the predominant crop in all the blocks. All the horticultural crops are being grown in the upland ^{areas} situations, this may be ^{the} reason why summer vegetable cultivation ^{is} are dominant in Bajali, Salbari, Rupsi and Mondia block, where most of the area ^{are} under upland condition. In all the categories of farms, rabi season vegetable crops ^{grown in rabi season} covered ^{larger} the major areas in comparison to the kharif vegetable. Lower land coverage under vegetable crops in the kharif season may be due to (i) Non suitability of lands for vegetable cultivation, (ii) ^{larger} ^{are} Major areas utilised under rice cultivation (iii) Non-availability of labours (iv) Risk for the high rainfall or flood damage.

Irrespective of farm sizes, the major ^{are} areas covered under tomato ^{cultivation} followed by cabbage, in rabi season and Bhendi in kharif season. The preferences for these crops were given mostly because of higher yield, easy in adoptability, good market demand etc.

Among the fruit crops coconut covered a major area followed by arecanut, banana and pineapple. Cultivation of coconut is gaining popularity for the reasons ^{such as, ease of growing} like easy to grow, round the year production, ^{non requirement of continuous care} once started bearing does not require much care, ^{saleability} may be sold the nuts either as green (immatured) or matured nuts may be ^{longer storing period} stored for a long time and ready market.

IV(ii) Production and Market Value : Among the vegetables grown in kharif and rabi ^{seasons} Bhendi and tomato production was significantly higher as they were the leading vegetables in two different seasons.

Irrespective of the sizes of gardens, the production rate of both ^{the} crops ^{were} comparatively higher. Increase in production is directly associated with the size of ^{the} gardens. Both the crops were highly remunerative crops and their demand prevailed during the entire harvesting periods. Farmers are adopting very high technology by using hybrid seeds, Use of micro and major ^a fertilizer, chemicals, growth regulators and high rate of plant protection chemicals for which the production rate is quite high. The value of crops ascertained in different gardens was directly associated with the ^{quantity} ~~amount~~ of production of the crops in a particular garden.

Among the fruits the coconut was most remunerative than other crops, because of its high value and easy to market.

IV(ii) Utilization of the farm production : Production of fruits and vegetables are utilized by the growers in two different ways, a ^{part of the produce is} part used by family members of the farmer and ^{the surplus quantity} ~~rest of the amount~~ sold out in the market. In respect of the small growers, the farmer produces ^{vegetables and fruits} are not only ^{to meet} ~~meeting~~ the daily ^{requirement of} ~~nutritional and food~~ requirement of the family but also ^{to earn} ~~help by~~ earning a small amount. ^{many} However in the medium and large gardens the ^{farmers} ~~growers~~ are mainly growing their crops in ^{the form} ~~the light~~ of commercial cultivation. Obviously the farm incomes are higher in the large gardens ^{no compared to} ~~over~~ by medium and small gardens. The farm income, irrespective of the size of the gardens mainly depended on (1) area and size of the garden (2) size of the family, amount produced and utilised by the family members (3) rate of production and amount sold in the market (4) cost involve in production (5) selection of the crops etc.

The farmers of the Barpeta Districts are adopting high-tech to boost up their production. It has been observed that

in most of the crops the production rate is at par or higher than the average production ⁱⁿ of the country. Farmers are also increasing their farm income often growing off-season or early vegetables, and supplying the produce in the small scale processing centre and by ^{preserving} keeping the vegetables in Cold Storage for the off-season.

IV(iii) Cost of Production : Cost of production was higher in medium and large categories of gardens. Increase in higher cost of production in the large gardens may be due to use of improved agricultural implements, use of chemicals and fertiliser, irrigation, high use of agricultural labour etc. On the other hand the small farmers used FYM as the source of fertilizer and have involved ^{the themselves} themselves in different interculture operations. In small and also in some of the medium gardens, the family member were also regularly working in their respective garden and ^{use} very occasionally the hired agricultural labour. The small growers ^{have retained} are keeping the ^{habit} practice of growing their own seeds and other planting materials for the next season. As such cost of seeds and planting material had been reduced and thereby cost of production was lower in small gardens than medium and large categories of gardens.

IV(iv) Cost-benefit ratio : The results revealed that per unit profit was more in case of small farmer as they took intensive care to their crops than medium and large ^{big} farmer. Moreover, their cost of production was comparatively ^{lower} lowest than medium and large farms.

Cost-benefit ratio in gourd was next to tomato, but by ^{age} age it was lower than tomato. In spite of high cost-benefit ratio farmers were not interested to grow gourd, because the production of gourd was highly problematic, as the crop is highly ^{susceptible} susceptible to a number of diseases and pests, further it cannot

logged areas.
stand in water ~~logging~~ *condition*. Moreover, the demand of the crop is only for a certain period i.e. when other vegetables are not available in the market. These may be the probable reason why farmers are growing the crops in a limited area though high cost-benefit ratio observed.

Irrespective of garden sizes among a fruit crops, higher cost-benefit ratio recorded in banana. It may be due to higher yield per unit area and lower cost of cultivation, lower incidence of pest and disease etc.

V. Comparison of the farm income between Vegetables

and Fruits : The cost-benefit ratio, ^{when} compared between fruits and vegetables ^{it} shows a very interesting trend. ^{Increase of} ^{farming} ~~In vegetables, when~~ ^{with the increase in the size of the garden, there is a corresponding increase.} the size of the garden increased, the cost-benefit ratio ^{decrease in cost benefit ratio (CBA)} reduced ^{But in case of fruits farming the cost} whereas ~~in case of fruits the cost-benefit ratio increased with an~~ ^{Benefit ratio shows an increasing trend along with the increase} increase in the size of the garden. It had been observed that in the large fruit gardens the growers used to adopt most advanced technology for better growth and production. But in small gardens the fruit crops are mostly neglected and uncared. Among the fruits higher cost-benefit ratio was recorded in banana in large garden. This may be because of higher productivity rate. However, except banana, in general, cost-benefit ratio was very low in other fruit crops. This may be one of the reasons why farmers are interested ⁱⁿ ~~for~~ growing vegetable crops instead of fruit crops. Most of the farmers ^{they} consider vegetable, as ^{important} ~~the~~ cash crops and ^{with good consumers demand.} ~~they grow the~~ crop ~~considering the prevailing demand of the crop.~~ Further the farmers may grow 3-4 vegetable crops in a year ⁱⁿ ~~under~~ upland conditions. *area*

CHAPTER - V

SUMMARY

1. Kharif vegetables are favourably grown in Bajali, Salbari, Rupsi and Mondia development block. Rabi vegetables are grown in Gobardhana and Jalah development block.
2. All the three categories of farmers occupy more area under rabi than kharif vegetables.
3. Tomato and bhendi occupy more area during rabi and kharif season respectively.
4. Coconut is most popular nut crops in all the development blocks.
5. Production and total value of the produced ~~either~~ ^{either} rabi and kharif ~~are differed~~ ^{are} irrespective of sizes of the garden.
6. Tomato recorded highest production during rabi and bhendi recorded highest production during kharif season.
7. Among the vegetables the highest ~~sale~~ ^{sale} value ^{is} obtained from tomato during rabi, bhendi during kharif, and ~~coconut~~ ^{coconut} among the fruits. *Among the fruits highest sale value is obtained from coconut.*
8. Consumption of fruits, vegetables are according to the need of the family, seed and planting material kept for the next season.
9. Cost of production of vegetables varied according to the garden sizes. Highest cost of production was recorded in the cultivation of tomato followed by Bhendi, and in respect of fruit crops, ^{coconut} ~~coconut~~.
10. *In* All categories of farmers received highest net income from tomato during rabi and from bhendi during kharif season. ^{Bigger} ~~Larger~~ farmers obtained highest income from coconut.
11. Highest cost-benefit ratio ^{is} observed in tomato and gourd, in case of fruit crops the highest value ^{is} obtained from banana.

CONCLUSION

The Horticultural crops plays a very important role in the rural areas of Barpeta District. From the study it has ^{been} observed that irrespective of sizes of the gardens, the vegetables and fruits contributes a strong financial support to the growers.

~~According to the~~ Considering the size of gardens the farm income varied. Out of the gardens the per unit production and income were higher in small gardens than the medium and larger gardens. As per result a small farmer may earn up to Rupees eleven thousand by growing two vegetable crops in different seasons. Farmers have selected the vegetable and fruit crops to grow in their gardens considering the demand for their family and also in the market. ^{household requirement of} ^{the} ^{consumers demand in the} ^{more market}

Fruits and vegetable grown in the region are not only helping the economy of the farmers but also meeting the ^{nutritional} and food requirements of the rural people. ^{improvement of}

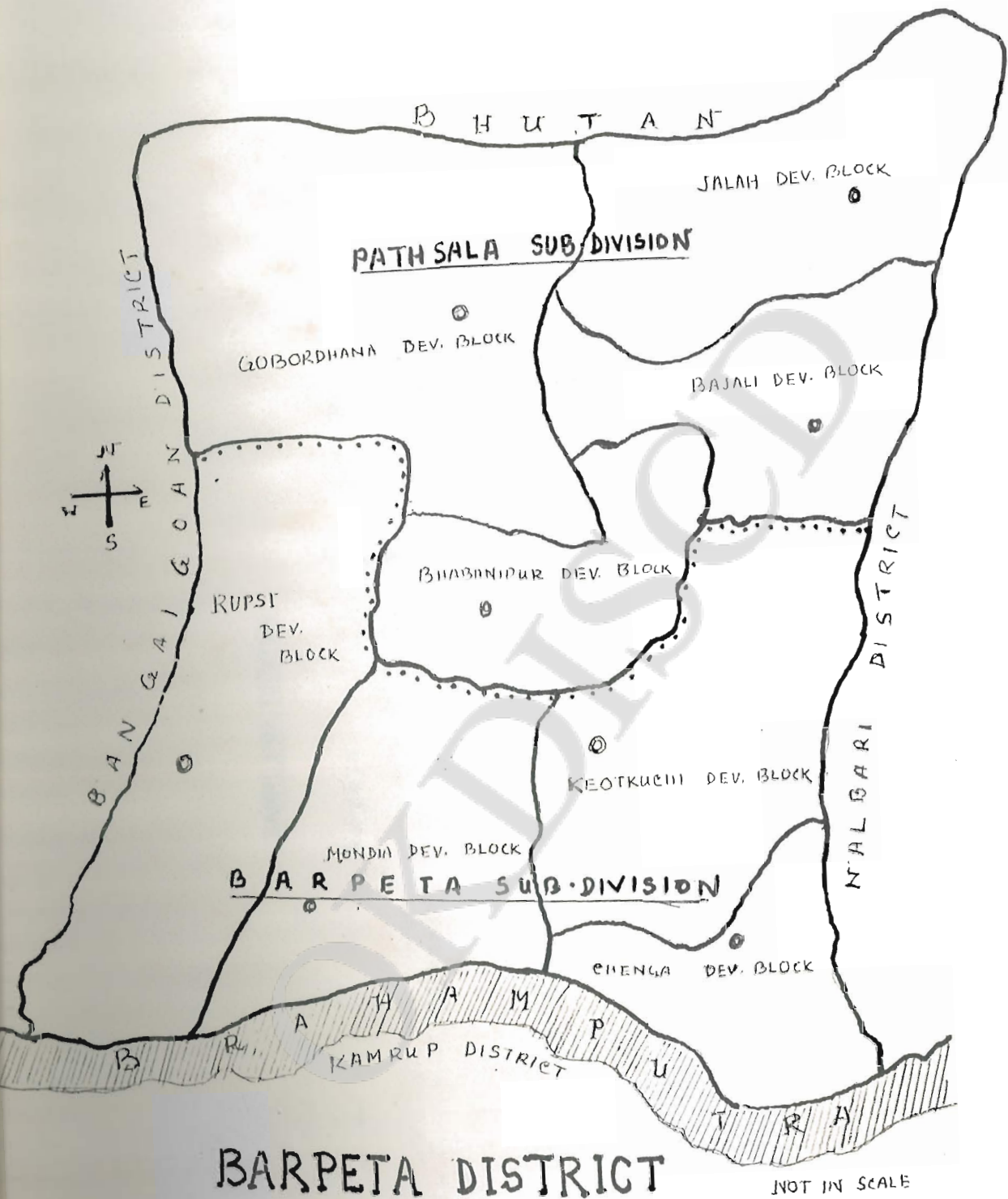
There are ample scope to ^{increase} develop the production of horticultural crop in the Barpeta District by utilising land and other ecological resources.

Suggestion :

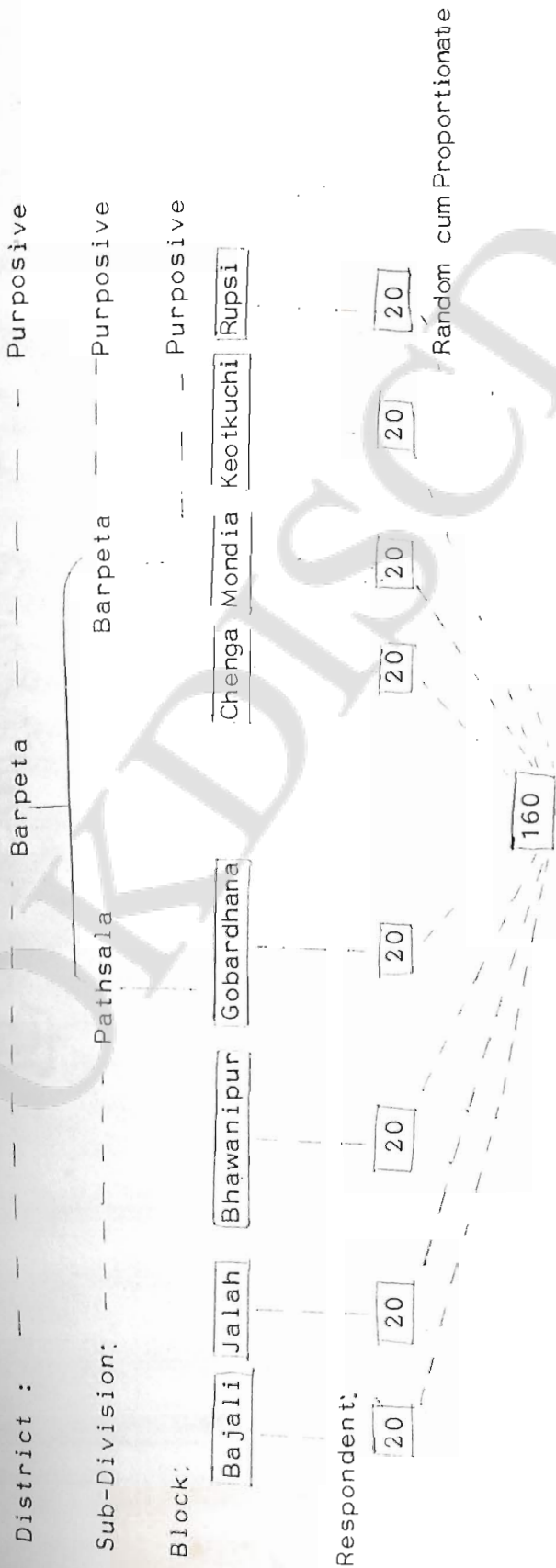
^{to the development of} Since ^{farming has} the fruit and vegetables have contributed significantly ^{contributed} in the rural economy of the district, emphasis should be given to ^{increase} expand the present area under horticultural crops and ^{it is also necessary} increase the yield per unit area by adopting improved agricultural technology like better seed selection, manuring, adoption of planting technology and crop protection measures etc. Facilities have to be created in this region to train-up the farmers to adopt ^{efficient} best crop management practices. ^{also} Facilities should be created for cold storage, processing unit and suitable marketing network.

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SAMPLING DESIGN



General information :

1. Name of the respondent :
2. Village
3. Block :
4. Size of the homestead holding (Ha) :

	Total area and area under Horticultural crops (Ha)	Production (kg)	Total value of produced (Rs)	Production sold (Rs)	Production Consumed. (kg)	Cost of production (Rs)	Net income (Rs)	Cost/ benefit ratio
Major Vegetables								
<u>Rabi :</u>								
Cauliflower								
Cabbage								
Tomato								
Carrot								
<u>Kharif :</u>								
Gourd								
Cucumber								
Bhendi								
Cowpea								
<u>Major Fruits</u>								
Coconut								
Arecanut								
Banana								
Pineapple								

COST OF CULTIVATION (Rs) OF DIFFERENT
HORTICULTURAL CROPS

APPENDIX: III

Input						Inter- cultu- ral opera- tion inclu- ding labour	Irriga- tion practice	Misce- lleneous (Rs)
Seeds	FYM	Fertilizer			Chemicals			
(kg)	(kg)	Urea (kg)	SSP (kg)	MOP (kg)	(kg)			

Major
Vegetables

Abi :
Cauliflower
Cabbage
Tomato
Carrot
Charif :
Courd
Cucumber
Chendi
Cowpea

Major
Fruits

Coconut
Arecanut
Banana
Pineapple

