

# **Plantation for Muga silkworm: A socio-economic study on sericulture under Bongaon Development Block of Kamrup District, Assam.**

**Lakhyajit Rabha**, Research Scholar  
Deptt. of Commerce, Gauhati University.

**Amal Rabha**, Asstt. Professor  
Deptt. of English, Bikali College, Dhupdhara.

**Amit Kumar Rabha**, Asstt. Professor  
Deptt. of Commerce, Bikali College, Dhupdhara.

## **Introduction:**

Sericulture is a commercially sustainable farm based economic enterprise favouring rural poor in the unorganised sector, because of its relatively low requirement of fixed capital and high returns. It involves various operations, such as plantation of host plants, rearing of silkworm for production of cocoon from which the filament is derived. Thereafter the processes of reeling, throwing, weaving etc. are skilled operation in order to obtain an appropriate marketable product.

In North East Region of India, sericulture occupies a unique position in the socio-economic life of the people. The precious glittering golden yellow silk muga is exclusive and endemic to the North Eastern Region of India since nowhere in the world muga silk can be produced. Though the salubrious climate of Assam is suitable for all the varieties of silk i.e., Muga, Mulberry, Eri and Tasar; Muga is the most famous and the best of all. Assam is the biggest producer of Muga silk since 95% of this silk is produced in Assam only. The state of Assam possesses excellent climate conditions and different varieties of food plants are abundantly available for all round development of sericulture. In spite of nature gift and tradition, the commercialisation of this culture has not taken place as yet. As a base for this Mugaculture, if given its due place, may prove to be a useful tool for upliftment of rural economy.

The Muga silkworm (*Antheraea assamensis*) has its natural habitat in the deep forests of the sub-mountainous areas of Assam and surrounding, including Nagaland and the north part of West-Bengal. The Muga silkworm feed on the leaves of a number of tree species belonging mostly to the family Lauraeae. The most important among the host species in Upper Assam is the Som tree (*Pertsea bombycina*) and Lower Assam the Sualu tree (*Litsea monopetala*). Mejankari (*Litsaea citrta*), Chapa (*Magnolia sphenocarpa*), Digloti (*Litsaea salicifolia*), etc are secondary host plants. Bhomlati (*Symplocos grandiflora*), Bogri or ber (*Zizphus jujube*), Bajramani (*Xanthoxylum alatum*) etc. are also used when leaves are scarce.

**Plantation of Muga silkworm host plants:**

The rearing operation depends on the availability of host tree. The primary host tree "som" and "Sualu" are mainly used for commercial brood and seed brood respectively. Although the primary host trees "Som" and "Sualu" are available naturally, rearers keep it a small number of trees around the homestead. Seeds usually propagated by fallen excreta of birds with undigested seeds scatters over a wide area. The viability of seed loses if preserved for a long period. Nursery can be prepared after monsoon from mature seed. Storage of seed in a dry place for a month is effective. Seed is necessary to prevent rain-water and strong sunshine.

Seedling is available in plenty in a plantation (somon) before monsoon. Transplantation is done in a nursery bed when the seedlings attain a height of half a metre. Healthy seedlings are again transplanted in a rows 8 to 10 metres apart after the monsoon is over. The north-south should be of lesser distance so that trees can touch one another when grown to a reasonable height. When branches are connected to one another, the worms can crawl conveniently without being handled. The trees should be pruned properly, so that more leaves can be obtained. Rearing becomes convenient in trees of medium height. Both host tree -Som and Sualu- can be planted and are suitable for rearing after four-five years of growth and can withstand regular pruning. The larvae reared on som leaves yield more silk and the resulting female moths lay more eggs than larvae reared on other tree species. In the systematic plantation the rearers maintained a spacing of 3m×3m and 4m×4m.

**Significance of the study:**

Growing plantation is the first and foremost pre-requisite for success in sericulture. The healthy leaves contribute for a good growth of the worm. Increased quality of leaf at economic cost has a direct bearing on cocoon production which ultimately enhances the income of rural people. The rearers of Muga silkworm in Assam largely are dependent upon leaves of Som and Sualu tree. However, during the scarcity of this primary host plant, the secondary host plants can meet the requirement of the food to some extent. It is natural that the growth influenced to great extent by the quality of food plants led to the silkworm during rearing. Therefore, use of appropriate plantation of host plants in order to maintain a steady rate of production, it is necessary to plant the host tree of Muga silkworm, which grows luxuriantly in Assam.

The eastern part of Goalpara and south west of Kamrup districts (such as Luki, Bongaon and Boko) constitute the most prolific muga growing area. These areas are very important as producers of best muga seed cocoons.

These growing problems and risks involved in farming of Muga have made to tend many farmers of this industry to change over to rubber plantation. This shifting cultivation is seen particularly in three lower Assam districts while the trend has been assuming a general character among the Muga farmers of Goalpara District. It is observed to be a growing inclination among farmers of Muga silk in some parts of Kamrup and Kokrajhar districts. It is, therefore, important to study the present position of plantation of muga silkworm host plants and problems related to it.

This paper attempts to study the present position and socio-economic viability on somoni (plantation of som plants) and sualu plantation.

**Objectives of the study:**

1. To analyse the present position of the Som and Sualu plantations and economic used of such plantations by the owners.
2. To identify the socio-economic characteristics of owners of somoni (plantation of Som) and sualu plantation.
3. To find out the problems related to Som and Sualu plantation.

**Methodology:**

Bongaon Development Block of South Kumrup District, Assam state, has purposely been selected for the study, based on availability of Muga silk worm host plantation and production of muga cocoon. Moreover, the State Sericulture Department, Assam has undertaken an ambitious project to develop Batakuchi village under Bongaon Development Block as a Model village.

Initially the list of sericulture villages and the names of owner of Muga-worm host plantation were obtained from local sericulture department of Bongaon Block. The primary data was collected from the sampled respondents following the personal interview method using structured interview scheduled standardized. There are 110 samples collected for primary data.

**Data analysis and interpretation:**

In this study data have been analysed and interpreted in three parts:

- 1) The present position of food plantations of Mugaworms and its economic use,
- 2) The socio-economic characteristics of owners of somoni (plantation of Som) and sualu plantation.
- 3) The problems related to Som and Sualu plantation.

**The present position of the Som and Sualu plantations and its economic use:**

The position of Som and Sualu plantations are analysed on the basis of the following points.

Sl. No.	Variables	Frequency	percentage
1	Muga food planted for rearing		
	Som	106	96.36
	Sualu	1	0.91
	Both	3	2.73
	Total	110	
2	Total area under Muga food plantation		
	below 0.5 acre	21	19.09
	0.5-1 acre	80	72.73
	1-2 acre	6	5.45
	2-4 acres	2	1.82
	above 4 acres	1	0.91
	Total	110	

3	Age of plants		
	0-5 years	6	5.45
	5-10 years	26	23.64
	10-15 years	48	43.64
	Above 15 years	30	27.27
	Total	110	
4	Total number of active food plants		
	less than 200	30	27.27
	200-400	46	41.82
	400-600	22	20.00
	above 600	12	10.91
	Total	110	
5	Type of plantation		
	Systematic	89	80.91
	Sparse	21	19.09
	Total	110	
6	Plantation used for rearing		
	Self	72	65.45
	Lease	27	24.55
	Both	11	10.00
	Total	110	
7	Rearing of crop per year		
	once	23	20.91
	Twice	68	61.82
	Thrice	17	15.45
	More than Thrice	2	1.82
Total	110		
8	Total production of cocoons per year		
	10000-15000	46	41.82
	15000-30000	52	47.27
	30000-60000	10	9.09
	more than 60000	2	1.82
Total	110		

The above table reveals that most of the farmers have Som plants to rear silkworm (96.39%) whereas 0.91% rear muga on Sualu plants and remaining 2.73% used Som and Sualu plants as food plants for muga rearing purpose. The study results indicated that 72.73 %

of the farmers have their own food plantation within 0.5-1 acres area, 5.45% of respondent have 1-2 acres areas, and only 0.91% farmers having above 4 acres of food plantation area. Out of the available plantation, 43.64% plantations are 10-15 years old, 27.27% plantation are above 15 years old and only 5.45% plantation are below 5 years old.

This indicates that most of the owners of somoni are under marginal and small farmer groups and 41.82 % of them have 200-400 active food plants, 27.27% have less than 200, only 10.91 % have more than 600 active food plans. As per the study 80.91% of existing plantations are systematic whereas 19.09 % plantations are scattered plantation without proper spacing and planting geometry. It is clear that 65.45 % farmers used their plantation by self for rearing muga worms and 24,55% farmers are given to rear their plantation on lease.

With regard to rearing of silkworm in plantation, 61, 82 % respondents rear twice in a year and 20.91% rear once in a year. About 47.27% farmers produced 15000-30000 cocoons, 41.82% farmers produced 10000-15000 cocoons and only 1.82% rearers produced cocoons per year.



**Photo:** Nursery of som plants and rearing of muga silkworm on Som plantation.

**The socio-economic characteristics of owners of somoni (plantation of Som) and sualu plantation:**

Sl. No.	Variables	Frequency	percentage
1	Age of the respondents		
	below 25 years	0	0.00
	25-40 years	27	24.55
	40-60 years	67	60.91
	above 60 years	16	14.55
	Total	110	
2	Caste		
	ST	98	89.09
	SC	0	0.00
	Others	12	10.91
	Total	110	
3	Education		
	Below HSLC	82	74.55
	HSLC Pass	26	23.64
	Graduate	2	1.82
	Total	110	
4	Occupation		
	Cultivators	95	86.36
	Business	11	10.00
	Service holder	4	3.64
	Total	110	
5	Sericulture income taken as source		
	Primary	12	10.91
	Secondary	98	89.09
	Total	110	

From the study it is revealed that majority of the farmers(60.91%) are in the age group of 40-60 years followed by 25-40 years (24.55%) and below 25 years (0.00%). From this data it is clear that most of the farmers are above 40 years and they have been practicing it for long time and the new generation (age group between 20 to 30 years) seems not to be interested to involve themselves in this practice, which might be due to the present day work culture and the patient they have. Among the respondents covered under the study, 89.09% of the respondents belong to ST and 10.91% belong to other caste. Most of the respondents (60.5%) are under 10th pass, 27.2% are 10th pass and very few farmers are graduate. From the study it is found that 89.09% respondents have taken this activity as a secondary source of income and only 10.91% farmers take it as primary source of income.

**The problems related to Som and Sualu plantation:**

	Types of Problems	No. of Respondents	Percentage
1	Plantation Problems :		(out of 39)
	a) Lack of large plantation area	90	82.05%
	b) Lack of bud host plant	85	76.92%
	c) Lack of finance	79	71.79%
	d) Non-availability of supporting facilities	85	76.92%
	e) Non-Trained for plantation:	76	69.23%
	(Total Respondents involved in plantation activity is 110		

With regard to plantation, the respondents face several problems such as lack of large plantation area, Non-availability of host plant, lack of finance, non-availability of subsidy facilities, lack of training programme for plantation etc. There are 82.05% respondents who suffer from the problem of lack of large plantation area due to small holding of land, lack of finance and non co-operation of forest department for plantation of silk host plant. 76.92 % respondents face the problems of host bud plant for silkworm due to lack of nursery facility of such host plant viz., som and sualu. There is lack of plantation maintenance through proper inputs. Existence of plantation is closer spacing (2×2mtr) which is not suitable for seed crop rearing.

**Conclusion:**

Muga culture has provided a subsidiary income generation opportunities mostly during leisure hours, when the family is free after agricultural operation. The muga rearers face many problems like paucity of seed during the commercial production seasons. The seed produced by the farmers are neither Disease-free laying (DFL) & nor adequate to meet the requirement of commercial seeds. Consequently, the muga rearers often cannot utilise their plantation to the fullest extent for rearing purpose. Actually, the seeds are not properly examined to eliminate the pebrine disease in case of Muga culture. In most cases hatching is not regular and therefore, the resultant growth of worm is not uniform. Incidents of mortality go on increasing and in the successive stages the survived ones are not able to form cocoon. Since muga is reared outdoor, it suffers from a large number of problems such as unfavourable weather, infection from various other creatures and outbreak of various diseases etc. In different seasons muga rearing culture suffers from different types of problems.

**Reference:**

Roy Chandan, Roy Mukherjee Sanchari and Ghosh Shantanu (September 2012): Sericulture as an Employment Generating Household Industry in West Bengal; MPRA Paper No. 43672, posted 9. January 2013 14:55 UTC

Banerjee D. (1990): Silk Production in West Bengal: A Case of Stunted Commercialization, Occasional Paper, No 124, CSSS, Calcutta;

Gangopadhyay (2008): Silk Industry in India- A Review, Indian Science & Technology; NISTDS, CSIR, New Delhi;

Hanumanappa H.G & Erappa S. (1985) : Economic Issues in Sericulture: Study of Karnataka, Economic & Political Weekly, Vol XX, No 31, Aug 31, 1985;

Usha Rani (2007) : Employment Generation to Women in Drought Prone Areas : A Study with Reference to the Development of Sericulture in Anantapur District of Andhra Pradesh; Journal of Social Science, 14(3), P-249-255;

Anitha. R. and Kanimozhi. V. (2013): Women entrepreneurs in sericulture: their participation & problems faced, Asia pacific journal of research, July 2013, Volume: 1 Issue: 7 114

S.K. Dewangan (2013): livelihood opportunities through sericulture a model of gharghoda tribal block, raigarh dist; American Journal of Environmental Science 9 (4): 343-347, 2013, ISSN: 1553-345X

Angellina Glorita Parimala (2009) "Role of women in sericulture" Kisan World pp. 33-34 Anitha (2011) "Status of silk industry in India" Kisan world pp. 31-34

Devasurappa (2004) in his study "Silk Industry in Karnataka" Tamilnadu Agriculture University, Coimbatore.

Harinath, Koulagi and Wadar (2006) "Development Of Grade Standards For Raw Silk In Karnataka" Southern Economist, pp.31 -37

Jayaram and indumati, (2008) "Sericulture - An enterprise with pride and promise" Southern Economist pp. 21-25

Kumaresan, Vijayaprakash And Dandin (2004) "Improved Sericulture Technologies In South India" Kisan World pp.34-37

Lakshamanan and Geethadevi (2004) "Growth of mulberry silk production in India", Productivity, pp. 300 - 306.

Mamatha Girish (2004) "Sericulture-based optimum farming system models for small farmers productivity" pp.307 -311



# **Horticulture for Sustainable Farm Income and Protection of Environment with Special Reference to Northeast Region.**

**Kishore Talukdar,**  
Journalist  
Mob-96784-10390  
Email-tdrkishore@gmail.com

Agriculture is the backbone of Indian economy. About 70 percent people of the world's second largest populated country source their livelihood from farming from 2.3 percent of world's land resource. In industrialized nation the figure is just 3 to 4 percent. The figure says there is no alternative but the Agriculture development which could shape the destiny of India as a developed nation. With the rising of population pressure on agricultural land is mounting and so Agriculture faces a huge challenge that is how to augment productivity by maintaining sustainability is a matter to be reckoned with. But Indian Agriculture being highly sensitive to climate variability and weather extremes like droughts, floods and severe storms the eco-agriculture concept has taken center stage to neutralize the adverse effect of global warming in this sector. Here it is pertinent to mention that 40 percent of earth's total area is used for farming but productivity is on the decline on many agricultural lands each year. About 5 to 10 million hectares of cropland is taken out of production due to soil erosion, nutrient depletion, salinization and water logging. To be laconic, farming with nature means maintain healthy environment and supports livelihood. What is imperative for healthy landscape is Eco-friendly farming practice whether it is horticulture crops, plantation crops or other crops. Here, the theme to be dealt with is on Horticulture with special reference to Northeast region.

While India is fast galloping ahead as horticulture force to be reckoned as global leader, NE has tremendous potentiality of horticultural crops following the favourable topographic coupled with agro-climatic condition. 10 Horticultural products of NE has already rose into fame with getting the coveted GI tag. Spicy ginger of Karbi Anglong is one of them. It is by no means a mean achievement for the region because GI tag which came into force in India in 2013 is a certification which is indicative of distinctiveness of a product origin at a particular geographical location and guarantees its quality. Employment generation and improvement of economic status of farmers and entrepreneurs could be a reality by tilling this crop. It could ensure nutritional security to the people besides improving the productivity of land. But all is not well with the bumper production of the crop should facilities such as post harvest management, marketing and processing of the crops are conspicuous by absence.

Like that of other crops horticultural crops are prone to disasters. So, growers may suffer complete failure and partial loss of their crops. But there is silver lining. With proper preparedness grower could minimize the loss though they could not make evasion from collateral damage in case of natural disaster. Northeastern region has the making of producing spice crop like ginger, turmeric, garlic.

Horticulture farming has taken the fancy of farmers of Assam. Being a journalist this journalist recently highlighted a success story of papaya cultivation in Boko area in Kamrup where a group of youth achieved the feat on a leased plot. Toeing their line, others farmers of the village have started switching over to papaya cultivation.

A group of Young farmers grow the fruit in an eight-acre plot at Bhogdabari near Boko in Assam's Kamrup district. They have so far earned Rs 10 lakh from the sales of papaya from two and half acres of their leased land. "We expect to get Rs 3 lakh more within three months from the same two and a half acre plot," says Krishna Boro. Their profit margin will be Rs 8 lakh after excluding the input costs of Rs 4 lakh. Their bank accounts will grow even more once they start growing papaya on the remaining four and a half acres of land in November-December this year. The farmers plant around 400 saplings in each half acre of land using scientific methods. The results that the three adventurous farmers got have inspired at least 100 more growers in the region. "We are happy with the yield and its returns. But we are much happier that we have motivated other farmers in Boko," says Boro. There's good reason farmers are turning to growing papaya. The high breed varieties of the papaya they cultivate are the Red Lady (Taiwanese) and Swapna. A single plant of these varieties produces 20 to 40 kg and they sell a kilo of ripe papaya for Rs 40. Upbeat over the produce, the farmers have decided to extend the area of papaya farming to more than 12 acres. They say that the demand for the fruit is so much that farmers are having a difficult time meeting the requirements. In quick turn, they are now preparing the seed beds and readying it to plant saplings.

So high the demand is that they don't even need to go to the market to sell their produce. They claim bulk buyers, including women from Guwahati, are coming in hordes to their farms. Buyers from various parts of Lower Assam, including from the Boko areas, are arriving to procure the fruit. "Our farming camp has virtually become a marketing hub. We are sorry many had to return empty handed," says Rabha. The rising demand for papaya is good for farmers. Despite being perishable in nature, they hardly suffer any post harvesting loss because of the timely arrival of the buyers. If there is one negative aspect, it is that buyers are unwilling to believe that the fruit for sale is naturally ripen. They are suspicious chemicals were used to ripen the papaya. They prefer selling the fruits at the ripening stage to raw fruits because of the price factor. One kg of raw fruits fetches them Rs 10 while the same amount of ripe fruits get them Rs 40.

A visit to the cultivation area shows that the farmers have learnt the technique to get the best results from papaya cultivation. Poly sheets are used to maintain the moisture content of the soil. They, however, urgently need drip irrigation facility for uniform distribution of water to every planted material during the lean season. Water is not a problem but between December and February, there is scarcity, they say. So they pumped out water to tide over the crisis. The State Government too is now helping out. Nawab Indad Ali, District Agriculture Officer of Kamrup, says a proposal for drip irrigation has already been submitted. The department is also

trying to establish marketing linkages. Farmers in Kamrup will soon be linked to the Farmers Producer Organization. Three Farmers Producers Organizations have already been set up -- for pineapple at Boko, orange at Sonapur and for flowers at Hazo. "Now, with the extension of area under papaya cultivation to three villages, the FPO for papaya will be set up at Boko," says Ali. The FPOs, an initiative of the Union Ministry of Agriculture to promote and strengthen member-based institution of farmers, help in supply of inputs like seed, fertilizer, machinery and training, networking, financial and technical advice. It's only going to get better for the farmers of Kamrup. For people like Dhananjay Rajkumar Rabha, who tried for six years to get a government job, papaya cultivation has come as a boon. There are many more like Rabha who have benefited. Christopher Columbus called papaya "the fruit of angles." It surely has become "the fruit of success" for the farmers of Kamrup.

Farming of horticulture crops has brought smile to a cluster of erosion-ravaged villages in Assam Bortari area. The worst sufferer villagers who were left destitute after losing the agricultural land to the wrath of the Brahmaputra have scripted success story by practicing banana and vegetables farming. The plot measuring 5000 bighas under cultivation of slew of crops is reclaimed land due to silt deposition. In 1980, we were rendered landless as Brahmapura-triggered erosion gobbled up our land resource but with the formation of char in the same site the latter gives us a new lease of life," said a group of farmers. Assam's first land spur of 721 meter length have done the wonders which is instrumental in reclaiming thousands bigha of land. Constructed in 1985-86 it is located 33 km downstream of Guwahati city and left bank of the Brahmaputra. Making best use of every inch of fertile reclaimed land, thousands of youth are practicing farming which proves highly profitable venture for them. The elated farmers told that a few years ago their area was locus of poverty but now they are making headway with horticulture farming in massive scale.

Sustainable agriculture is quintessential prerequisite for rural development. Sustainability means farming practice which is economically feasible, socially acceptable and environmentally sound. Organic farming is required for the protection of environment. Thus, pesticide application in farming practice requires to be halted. It helps enhance yield but undermine the quality of life through possible contamination of soil, water and air even the final product is not spared which retain residues. Excessive application of pesticide damages soil and environment. Pesticide residues are the second largest agent causing cancer next to cigarette. Also, the residues are inimical to soil microorganism and earthworms resulting soil degradation.

For the greater interest of humanity and nature-based rich biodiversity of this part of the country farmers must zero in on sustainable agriculture. Aldo Leopold an ecologist says "a good farm must be one where the wild flora and fauna has lost acreage without losing its existence." Northeastern region with the presence of 25 percent endemism falls under Indo Burma Global Biodiversity Hotspot. Presence of at least 0.5 percent endemism qualifies a region a biodiversity hotspot in the world. So imagine the richness and quality of biodiversity of our region. Endemism stands for faunal and floral species which are unique to region concerned. It looks strange but the fact is northeast is home to 51 types of forest which are categorized under six major forest type: 1. Tropical Moist Deciduous Forest, 2. Tropical semi evergreen forest. 3. Tropical wet evergreen forest. 4. Subtropical forest. 5. Temperate forest and 6. Alpine forest. The year 2000 was historic for this region as the latter was brought under Indo-

Burma hotspot which is second largest biodiversity hotspot after the Mediterranean basin. Will we allow the vaulting biodiversity to extinct by tilling agriculture antagonistic to forest ?

Most importantly, for sustainable farming skill upgradation, adoption of improved production system and high density planting, introduction of high yielding varieties including canopy management are required. Horticulture Commissioner, Government of India. Cultivation of fruits like pineapple, banana, Khasi mandarin, Kiwi and passion fruits in clusters have helped improving economic status of small and marginal growers of the NE. Centrally sponsored scheme Horticulture Mission for Northeast and Himalayan States earlier known as Technology Mission for Integrated Development of Horticulture in Northeast and Himalayan States was introduced in 2010-11. As far as area expansion of Horticulture crops in NE is concerned since the initiation of this scheme the latter is a boost with expansion of 566510 hectares under the Horticulture crops. The crops in the expanded areas are fruits, vegetables, plantation crops, medicinal crops and aromatic plants and so on .

Marketing is a multiplier of economic development. If there is no market to sell produce farming activities will come to an end. So, marketing is such an all-important engine for growth it could make or break an economic system. Sad to say, on many occasions marketing has suffered following the lack of infrastructure bottleneck. The case in point is Daranggiri Banana Market in Assam's Goalpara district. During rainy season both sellers and buyers have to face inconvenience beyond description in carrying out business activities. The market, spread over 5 bighas, has another major problem, that of deep potholes which cause difficulties to truckers while loading the crop. Truckers have to move about 50 metres from NH-37 to reach the loading area inside the market. S.K. Azizul, a truck driver from Burdwan district in Bengal, said, "Our vehicle gets struck in the pot holes, some of which are as deep as two feet." "We had to fill the potholes with earth and boulders by spending Rs 5 lakh from our own coffers last year. The government's response in this regard has been poor," Ranjit Rabha, the secretary of the Samiti, said. "For the past two years, the Samiti has been making all-out efforts to persuade authorities of Central Bank of India to set up a branch at Daranggiri. In the absence of a branch, traders have to go either Dudhnoi or Krishnai which is about 20km from Daranggiri," Rabha said .

The run of misfortune of Assam's Daranggiri banana market, the largest hub for bananas in the Northeast, seems unending as the Central Government sponsored Daranggiri Banana Processing Project has been scuttled all of a sudden. Work began at the sprawling market in Goalpara in 2008 under the Swarnajayanti Gram Swarozgar Yozana scheme after Assam Panchayat and Rural development Minister Chandan Brahma laid the foundation stone of the project building. But, what you see today is a neglected, empty building within the market premise. "The project remained half done as after the building was erected, no machinery was installed for packaging of the produce as by then, the Union Government closed the scheme," states Khanindra Choudhury, the project director of the District Rural Development Agency, Goalpara. The Central government replaced the scheme with the National Rural Livelihood Mission (NRLM). Choudhury says since the objective of both the schemes varies, the construction work had to be stopped. "Though the DRDA submitted a proposal to release the remaining funds of the project so that an important and long pending infrastructural need of the traders in the market could be met, the Government did not," he adds.

For this banana hub of notational repute, this is not the first case of governmental short sightedness and negligence. Around 1990, the Indian Council of Agriculture Research (ICAR) was keen to set up a national research center for banana in Assam. A team of ICAR visited the Daranggiri banana market to select a site for the centre. It was "highly impressed" by what it saw at the market and showed a lot of interest to set up the country's lone research center for banana there. But the State Government reportedly could not provide a suitable location as per the requirement of the visiting team. "We missed a huge opportunity of having such an important national research unit for banana in the State," rues Nalin Kumar Mohan, former chief scientist of Horticulture Research Station, Assam Agriculture University. Mohan had accompanied the ICAR team to the market in Goalpara. In 1993, this centre was finally set up by ICAR at Tiruchirapalli in Tamil Nadu .

Both medicinal and aromatic plants are included in Horticulture crops. Northeast is store house of this crop, medicinal plants in particular. Green medicine" has gaining ground both in the developed and developing countries in the world. According to WHO, over 35,000 plants are used by human cultures and 20,000 plants are marketed for medicine and cosmetics

As far as Processing Industries and Development of Horticulture are concerned NER is still a long way to go. Processed products have export demand. So requirement is processing industry in a big way. To expand the export market production of quality crops at affordable price is pre requisite. What is important is that organically produced crops have upper hand in export market. Sad to say, potential of vegetable farming in India is yet to be tapped to the hilt. Average productivity of vegetables crops in India is low 15.1 t/ ha which is a wide gap between the yields obtained and the potential yields. Improved technologies and improved varieties are essential to bridge this gap. It is improved quality of vegetables that enhances soil fertility and makes the soil ecosystem sustainable .

Northeast is the hub of medicinal plants. But anthropogenic pressure on the forest landscape is potential threat to the herbal herbs. Be it is a case of illegal timber felling, hill cutting, quarrying forest vegetation have to bear the brunt. To preserve these faunal wealth Assam Government has set up a Medicinal and Aromatic Plant Garden at Rani reserved forest area near Deepor Beel Ramsar Site. The garden spread across 2.5 hectares is not only home to 147 species of medicinal and aromatic plants but also a research site for horticulture students who visit the garden. Sad to say, lack of proper management has brought woes to the garden. Laxmon Teron, an environmentalist, said the garden require proper management as some planted species have already died. "Nearly 30 per cent plants have died owing to lack of proper care," he said. "The dead plants require replacement." There are a large number of plants in the garden, which fall under the Convention on International Trade in Endangered Species of Wild Fauna and Flora. "Weeding should be done five times from April to November to help the plants grow to a desired level. There are some creepers which could kill the growing plants." About 90 per cent of medicinal plants in the country have been found in the wild and according to World Health Organization, 80 per cent population in the developing countries are dependent on traditional medicine, which are mostly plant drugs .

So rich in medicinal plants that a herbal healer of Assam has made Assam proud by winning innovative award for his path breaking innovation in herbal medicine from the president

of India. Biren Kalita of Amtola village in Assam's Kamrup district is herbal healer of national repute as has catapulted into fame by winning laurel for his innovation in herbal formulation. Less known Kalita who is no more once says herbal does wonders for the people of this country. The 74-year-old, who was honoured for his innovation of herbal medicine to cure placental retention in animals (tested on cattle), The National Innovation Foundation (NIF) had conferred on the septuagenarian the state award to make India innovative and creative. The honour was given during the Sixth National Grassroots Technological Innovations and Traditional Knowledge Awards function in New Delhi. The foundation is under the department of science and technology .

Management of soil and pest is an all-important matter for keeping land resources healthy and maintaining its long term fertility. To feed the growing population need of augmenting food grain production has arisen. So, chemical fertilizers are being applied to enhance the produce. Consumption of average fertilizer in India has increased from 0.5 kilogram/ hectars to 117.07 kilogram/hectars during 1951-52 to 2007-8. Economic Survey 2008-9. But there are adverse effect of such chemicals on soil micro flora, water, food and fodder. Pesticides and nitrates are detected in ground water of many agricultural regions. Human health is affected by drinking water with high concentration of nitrate.

Though last but not the least post harvest management of the crops is an issue which cannot be blinked for gaining maximum return. On many occasions the pains involved in the tilling activities have gone in vain following the lack of proper post harvest management. India loses about 35 to 45 percent of the harvested fruits and vegetables during handling, storage, and transportation etc. in terms of money the loss is estimated at Rs 40,000 cores per year. This amount of loss is equivalent to the annual consumption of fruits and vegetables of United Kingdom .

### References:

- Editorial on Low External Input Sustainable Agriculture, Magazine.
- Fruits of success by Kishore Talukdar at Nezine.com
- YOJANA, December 2009
- YOJANA, December 2010.
- Annual Report 2010-11 Horticulture Mission for Northeast and Himalayan States.
- The Telegraph, September 22, 2015 by Kishore Talukdar
- A Ripe Case of Negligence at Nezine.com by Kishore Talukdar. October 25, 2015
- The Hindu Survey of Indian Agriculture, 2008
- The Hindu Survey of Indian Agriculture, 2008
- Medicinal garden hit by funds crunch by Kishore Talukdar. The Telegraph, May 20, 2014.
- Innovators struggle for funds by Kishore Talukdar, The Telegraph
- <http://postharvestindia.net>.