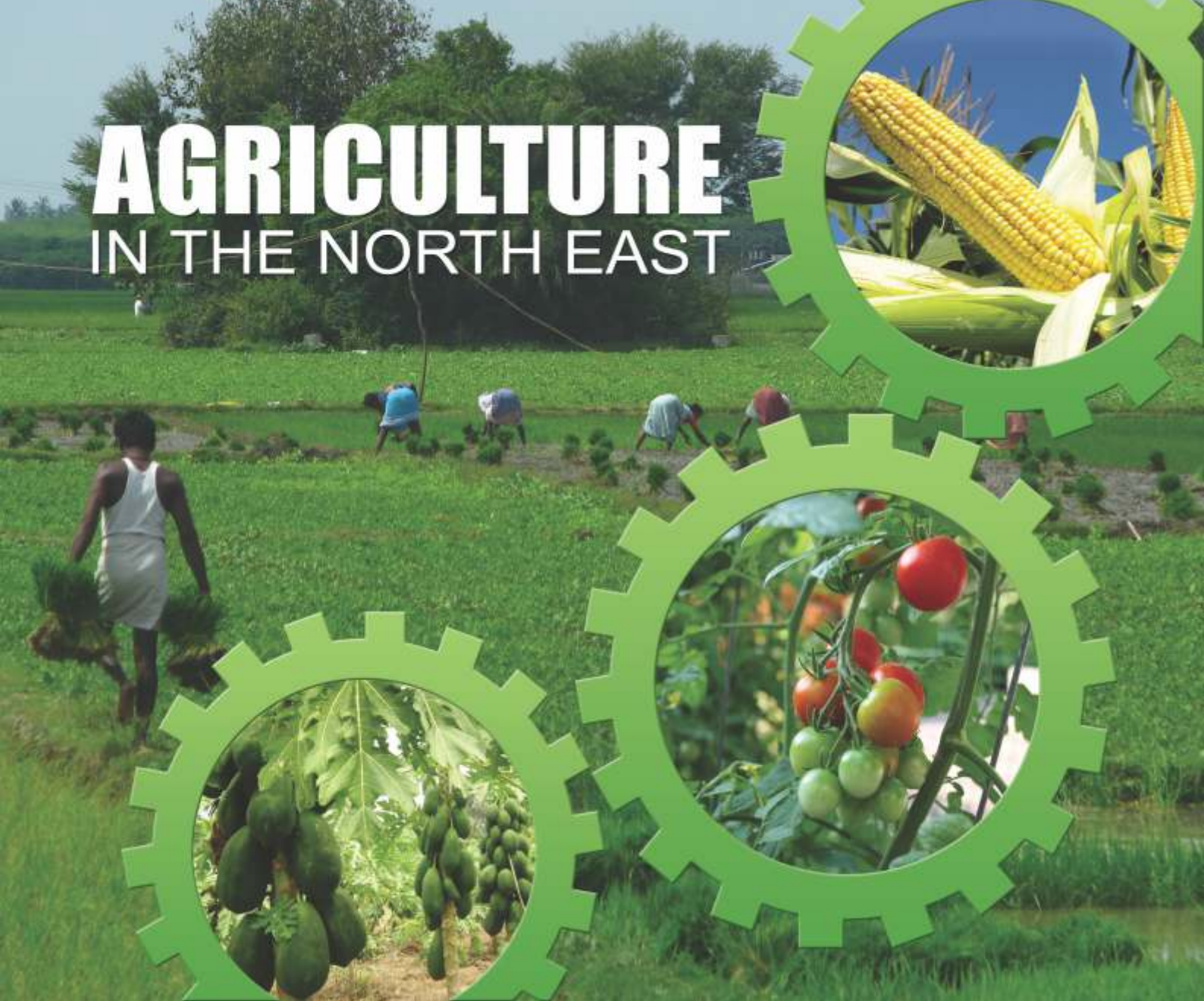




# FINER

News & Views

# AGRICULTURE IN THE NORTH EAST



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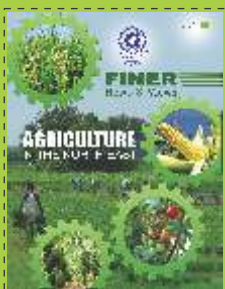
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Assisted by :  
FINER Secretariat

Published by :  
FEDERATION OF INDUSTRY AND COMMERCE OF  
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Animal Husbandry & Veterinary, UDD and  
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***MESSAGE***

It is indeed a great pleasure for me to know that the Federation of Industry & Commerce of North Eastern Region (FINER) is going to publish its Monthly Bulletin "FINER News & Views". The initiatives taken by the Industry Association towards devotion of Agriculture potentials of the North East Region are really praiseworthy.

I take this opportunity to compliment FINER for their endeavour in promoting agriculture and allied activities amongst farmers in Assam.

On this auspicious occasion, I convey my best wishes to FINER on the eve of publication of "FINER News & Views".

( ATUL BORA )

Date : 20<sup>th</sup> September, 2016.



## *President Desk*

Agriculture is the largest economic activity providing employment to 64.28 per cent of total workers in the North Eastern India. The region has 3.73 per cent of the total population of the country and contributes 2.60 per cent to the Net Domestic Product.

Agricultural systems are wet rice cultivation which is practiced in valley land and Aji system where rice and millet are cultivated with fish in deep water. In valley land, mono cropping as well as mixed cropping is practiced by farmers. An attempt is made here to focus on agricultural practices, their productive capability and viable sustainable land use strategies for people of the region. The northeastern area is rich in diversity of wild relatives of cultivated crops and out of 355 reported from all over India, 132 are found in this region. This area is also considered as the native origin of more than 20 major agricultural and horticultural crops and native home of about 160 domesticated species of cultivated crops. The yield and energy efficiency of different agricultural systems depends on the type of crops cultivated. The more efficient were found where rice is cultivated with maize or millet or any other crop. The efficiency of different agricultural practices varied between 1.70 and 75.20 and 0.70 and 8.80 respectively from ecological and economical view point. Popularization of agroforestry and horticultural practices, improved fallow management by introduction of native nitrogen fixing plants, recycling of agricultural waste in the form of composting are important among them.

The North Eastern regions hold enormous potential for development of agriculture, horticulture, animal husbandry and fisheries. The region produces only 1.50% of country's food grain production and continues to be a net importer of food grains even for its own consumption. The gaps between actual and potential yields are such that huge production increases can be achieved in the region, and for the country as a whole, simply by using available and accessible technologies.

Strategic planning and implementation is necessary to develop agriculture and make region marginally, if not significantly, surplus in food production by integrating research, extension and education duly supported by a time bound reforms in land tenure system in each State. Agricultural development strategy has to be evolved depending on resources, conditions and people's needs and priorities. As the land use pattern in the plains and hills is different, significant resources need to be allocated for research and designing separate strategies to improve farm productivity to match requirements of hills and plains.

The rich resource base in the region such as mega bio-diversity, fertile soil, varied agro-ecological situations of plains as well as valleys, hills, tilla land, immense water resources, human resources of ethnic diversity and cultural groups, could be potential sources of agricultural as well as economic development of the N.E. India.

### **Pobitra Buragohain**

President

FINER



## Interactive meet with Dr K.K Dwivedi, IAS, Commissioner, Industries & Commerce, Government of Assam, Guwahati

Federation of Industry and Commerce of North Eastern Region (FINER) conducted an interactive meet with Dr K.K Dwivedi, IAS, Commissioner, Industries & Commerce, Government of Assam, on 5th Sept, 2016 at Guwahati.

The programme started with the welcoming & Felicitation of the Dignitaries by Ms. Indrani Chaudhury, Dy. Director General FINER, followed by the presentation on FINER.

Mr. R.S Joshi, Chairman, FINER addressed the august gathering and lauded Dr K.K Dwivedi, for making the department more approachable and responsive for the Industries of the State. Shri Joshi, on behalf of FINER, also submitted a Memorandum to the Commissioner, on the different issues prevalent in the Industry and Commerce of the State and requested to take measures to address at the right earnest

Dr K.K Dwivedi, appreciated FINER for playing a vital role for the upliftment of Trade and Commerce in the State and the support rendered to the Department of Industries & Commerce all through in the matter. In addition to the issues regarding the suspension of the most focused policy of the Region - NEIIP 2007, the issues related to the Land, Power, Ease of doing Business,

National Mission of Food Processing, Taxation was also discussed during the meeting. He welcomed inputs, suggestions and concern raised by the members present and mentioned that the department will try its level best to address all issues of the public including the ones mentioned in the Memorandum submitted and solve the concern faced by the Industries and that proper procedure would be executed so as to avoid confusion.

Dr Dwivedi, also assured that the Department would take measures to implement proper mechanism to minimize the hurdle faced by the industries. He also mentioned that regular monthly meeting between Department of Industries & Commerce and FINER to be held to address the issues related to Trade & Commerce.

The senior official present from the Department, Smt Manjula Saikia, Additional Director and Shri Bipul Das, Additional Director, Industries & Commerce, Government of Assam, also mentioned that their doors were always open to the public and assured to extend full support to address the related issues.

An interactive session was also conducted between the distinguished guest and members of trade and commerce which turned out to be successful in the overall session.

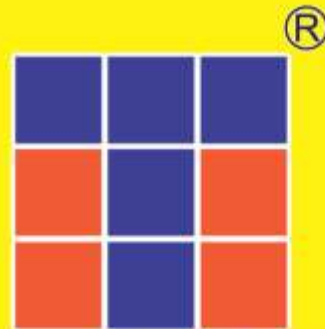


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**Mazbooti ka bharosa...hamesha**



FINER president had a meeting with the Dr. K. K. Jalan, IAS, Secretary, MSME, and Shri Hasmukh Adhia, IAS, Revenue Secretary Government of India on the impact of GST on MSME at New Delhi.

A memorandum on GST for the MSMEs was also submitted to the Secretary, MSME, and Revenue Secretary Government of India during a meeting .

# NORTHEASTERN INDIA STRATEGIES FOR AGRICULTURAL DEVELOPMENT An overview



B C Barah  
Assam Agricultural University

**T**he Northeastern India is a chicken-necked region, connected to the mainland with a narrow corridor and surrounded by international boundaries of Bangladesh and Bhutan. This unique characteristic adversely affects the economy and other regional factors, such as a sense of isolation, remoteness etc. Northeastern India consists of Assam, Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim covering 255.08 million hectares, which is about 8 per cent of country's land mass. More than 64 per cent of the total geographical area is covered by thick and deciduous forest (164.101 million hectares under forest).

Except a small valley plain of about 30 per cent, the rest of about 70 per cent of the total area is hilly and mountainous track of very steep to moderate slope. Thirty per cent of valley plain consists of upland, lowland, deep water and very deep water ecological situation. The region is highly diverse in terms of agro-ecosystem, socio-cultural mixture of the people, a blend of multiplicity of ethnicity and geo-topographical variability. Average rainfall in the region is the highest in the country. The renowned agricultural scientist Dr M S Swaminathan describes the region as a cultural and genetic paradise and granary of mega biodiversity in terms of flora and fauna as well as micro-flora and micro-fauna. Despite richness in natural endowment, the NEI is the most backward areas of the country, home for a very high proportion of the poor, agriculture is highly risky and productivity is low.

The crucial message is that the abundant and rich natural resources are neglected in the past but must put to efficient use now to catalyse the developmental process. In the absence of concerted efforts, the state is unable to provide necessary support system to manage these resources for the benefit of the people. Rather than conserving biodiversity, the stock of the biological

resources are fast dwindling and making the social life devoid of harmony and lack of coexistence. Large stock of natural resources, abundant water resources, number of perennial river systems and the precious human capital are actually wasted. As a result, the region suffers from drought situation even during monsoon season on one hand and frequent floods inundating vast plain areas on the other hand. Under the circumstances, if resources are not properly developed and managed, the food security in the predominantly agrarian economy will be endangered. Flood causes loss of crops, lives and properties regularly and its occurrences are increasing. Therefore, the missing policy link between effective supporting infrastructure, coordination and implementation of the developmental schemes is a major cause of concern requiring urgent attention. Total population in the Northeastern India is 31.547 million with density of population varying from as low as 10 persons per sq. kilometre in Arunachal Pradesh to 286 persons in Assam.

Assam is the most densely populated area. Relatively favourable land-man ratio indicates that there exists vast scope for efficient utilization of the land resource. The quality of land and water resource is extremely favourable to agriculture-forestry-livestock system. The rate of growth of population in the region is generally higher than at the national level but uneven across the states. It ranges from a low of 2.17 per cent in Assam to the high of 4.45 per cent in Nagaland during the period 1981-1991. The Census 2001 also shows identical trend. The per cent decadal change of population continues to be low at 19 per cent in Assam and the highest of 64 per cent in Nagaland. The tribal population is very high ranging from 20 per cent in Assam to 90 per cent in Manipur. Thus, under the peculiar composition of the population, rather than ignoring, the socio-economic, political and cultural diversity should form the basis of regional planning. Poverty is extremely rampant in the Northeast. The proportion of population below poverty line (BPL) in the year 2000 was reported at 33.47 per cent in Arunachal Pradesh, 36.09 per cent in Assam, 28.54 per cent in Manipur, 33.87 per cent in Meghalaya, 19.47 per cent in Mizoram and 34.44 per cent in Tripura. Except Mizoram, the BPL ratios in all other states exceed the All-India level of 26.10 per cent



(NSSO 2000). The most intriguing fact is that the BPL statistics shows that the region is lagging behind the national level by over a decade. The contribution of agriculture to the state domestic product is not substantial and its growth also low. The State Domestic Product at current price in 1995-96 is Rs 15,553 crore in Assam, Rs 1,557 crore in Tripura, Rs 1,442 crore in Nagaland, Rs 1,590 crore in Meghalaya, Rs 1,412 crore in Manipur, Rs 1,093 crore in Arunachal Pradesh and Rs 761 crore in Mizoram. The quality of land in the region is favourable for a wider range of crops/livestock-forestry-fishery activities. The proportion of area under forest is also favourable with a high per cent of 89.1 in Mizoram to 30.4 per cent in Assam. It indicates that there is need for an effective forestry development strategy for creating synergy between agriculture and forestry sector. Net cropped area of 3.722 million hectares is cultivated by 54.83 lakh cultivators. It gives the population:cultivator ratio of 5.75:1, whereas the number of people dependent on agriculture is over 86 per cent. The total number of operational holdings is 34.92 lakhs but majority of them are small in size. By and large production condition in agriculture is traditional. The agricultural productivity is the lowest, irrigation facility almost non-existent in many of the areas and consumption of fertilizer is extremely low in the region.

The lowest consumption of NPK is observed in Arunachal Pradesh at 2.2 kg/ha and the highest of 48.3 kg/ha in Manipur during 1997-98. The adoption of high-yielding varieties is also sluggish. The area under HYV paddy was 1,422 thousand hectares in Assam, 223 thousand in Tripura, 72 thousand in Manipur, 42 thousand in Meghalaya, 35 thousand in Arunachal

Pradesh and only 2.0 thousand hectares in Nagaland in the year 1996-97. In case of other crops, the adoption rate is much lower. These statistics show a pessimistic scenario of the current status of agricultural development in the region. However, it also sets the basis of strategies for future planning perspectives. Rice is the major crop in the region. The compound growth rate of rice area is 1.68% and of production is 2.95 per cent. Total area under rice is 33.97 lakh hectares varying from 43.09 per cent of gross sown area in Meghalaya to 84.97 per cent in Manipur. The total production of rice is 48.48 lakh tonnes and the average yield is 1,427 kg/ha. The decadal analysis shows that the low growth rate of rice area, production and productivity during the 1970s was improved in the next decade. But unfortunately, the improved performance could not be sustained. After reaching the highest peak in 1980s, the performance in the sector declined during 1990s not only for rice, but for all the crops. This is apparently an alarming signal for the longterm sustainability of the crucial agricultural activity in the region. Significantly, the growth of area and production in the post green revolution period (1981-1998) has already declined to below those of the green revolution period.

However, the silver line is that growth of productivity shows encouraging sign in the recent period. But a most relevant question in the changing scenario is that why the average performance of agriculture is far behind the national average level, not to speak of the best performing state. The demand and supply equation shows that demand for food outstrips the production and the gap is increasing over time. It is

estimated that the current deficit of 9.08 lakh tonnes of rice in Assam (for example), would increase to 14.73 lakh tonnes in 2010. The deficit of wheat would be 0.74 lakh tonnes, Maize 0.47 lakh tonnes and of pulses 1.82 lakh tonnes. There will be 1.70 lakh tonnes of deficit in oilseeds in Assam in the next decade. The story is similar or worst in other states. The current situation in the most populous and largest state, namely Assam is grim and deteriorating, which has wider implication in the entire region.

The per capita agricultural income in Assam is Rs 1,741 (at current price), net area under cultivation is 35.54 per cent of total area, only 15 per cent of net cropped area and less than 10 per cent of rice area is irrigated, area under HYV of all crops is 39.09 per cent and that of rice is 43 per cent. The fertilizer consumption is as low as 10.50 kg/ha and the cropping intensity is 140 per cent. It thus, implies the need for policy imperatives for enhancing production by inducting appropriate technology and necessary institutional change along with good governance. Most disturbing fact is that if the present scenario of adoption of agricultural technology continue, it will be difficult to catch up with required rate of productivity to meet the demand of food arising from the growing population. The existing yield gap between potential yield and average yield is 72 per cent in autumn rice, 62 per cent in winter rice and 68 per cent in summer rice and about 43 per cent in case of oilseeds. In order to achieve selfsufficiency in foodgrains in 2010, the required yield rates in Assam are estimated as 2.6, 2.5, 5.0, 1.8 and 1.3 tonnes/ha for paddy, wheat, maize, pulses and oilseeds respectively. These targets are easily achievable if necessary policy support systems gear up to bridge the gaps. The general production condition in the region is favourable for plantation crops. Among the plantation crops, the cultivation of tea, rubber and coffee are of the most commercial/corporate significance.

Total area under tea is the highest in the country at 2.36 lakh hectares, producing over 55 per cent of total production 4.33 lakh tonnes. At present, the area under rubber of 44.72 thousand hectares produces about 9,780 tonnes. The total area under coffee is 10.1 thousand hectares. The soils are also suitable for cultivation of a number of fruit crops such as jackfruit, arecanut, mango, orange etc, which are commonly grown but mostly for home consumption and sustenance purposes. Livestock is an integral part of the regional economy. A variety of livestock are available in the entire region. The land-man-livestock ratio in the region is higher than the same in the national level. However, most livestock are of non-descript type and the yield rate is low. Thus not only the milk and milk products but also the meat and meat products are in short supply in the region. The shifting cultivation is one of the common practices followed particularly in the hill areas. Shifting cultivation locally known as Jhum system has several unique features of the cultivation in hilly areas of northeast India. At present, it covers as much as 14,660 square kilometres providing

livelihood to 4.44 lakh jhumia families. The virtues of the system include, a long evolution process over the ages, employs the local knowledge and judgement for efficient management of natural resources. It is a slash and burn method of cultivating an admixture of crops continuously for a couple of years. Use of external inputs is minimal in Jhum and hence is a model of 5 pure organic farming system. It also uses minimum tillage and less or no inputs besides being an eco-friendly system.

The system provides not only the cereals but also enough of livelihood opportunities to satisfy the overall household food security. Most importantly, it provides a continuum stream of income generation. The management of the system is also highly participatory symbolizing a model of collective action. On the judgement of the community, if the system is not yielding enough to meet their requirement, then the field is abandoned and the cultivators move to newer areas, but return to the same area after a reasonable jhum cycle of about 5-10 years. Of course, the jhum cycle at present has reduced to less than 2-3 years primarily on account of population pressure.

Major Constraints Sluggish growth pattern and low-yielding agriculture in the region depict extremely grim future, making food insecurity most grievous in the face of sharply growing population. Hit by frequent natural disasters such as floods, high-low rainfall, increasing food deficits, low and unstable productivity in agriculture and livestock, the region poses a serious development question to the policy makers. Access to institutional and infrastructure support (including effective delivery system and credit institutions), lack of people's participation in the development process and management have been the inhibiting factors for development. The emergence of self-help groups, in this context, could potentially ease the credit problems to a great extent if properly promoted. Given the rich human capital and socio-cultural milieu, more concerted efforts are necessary to improve the future growth prospects and efficient utilization of untapped natural resources. It thus throws critical challenge to the policy makers to convert the weaknesses to strength for attaining long-term sustainability in the region. Analysis suggests that the major explanatory factors beneath the dismal agricultural scenario are its total dependence on erratic rainfall, unpredictable and variable monsoon, low level of irrigation facilities and inadequate crucial infrastructure support system including efficient R&D back up services. The management of land and water resources assumes enormous importance in improving the agricultural economy in the region. As the economic gains due to efficient land and water management in agriculture is quite substantial, systematic in-depth study on the status and future strategies is of prime importance in the region. The gains due to irrigation cannot be ignored, particularly in the context of the emergence



economy, particularly the agricultural sector (agriculture, horticulture, plantation crops, livestock and fisheries), identify and prioritization of the constraints, second section takes a stock of technology and future prospects for agricultural economy, the third section discusses the emerging institutional reforms and future needs and finally a conscientious recommendations are formulated.

These are suggested to be pursued vigorously, particularly should receive highest attention in the X Five-Year Plan for the NE. Specific Researchable Issues 1) Rabi fallow and waste land utilization 2) Boro rice 3) Breeding

of water needy Boro paddy. Floods have been creating great havoc regularly. Since an immediate solution to complex flood problems is hard to come by, effort should be made to convert the problem to a prospect. To cope with the floods havoc, the flood-escaping crop varieties should be introduced. Early sowing short-duration paddy photosensitive varieties, if available, could help escape the flood fury.

The impact of flood should be evaluated in terms of social opportunity cost and benefits. The overlay of the flood map, irrigation map, rainfall pattern and the cropping pattern maps provide a focused policy strategy in the geographical dimension. It is also argued that as an insurance against the uncertainty of weather and flood havoc, the promotion of short-duration rabi crops and supplementary irrigation facility would help escaping the flood fury. Among the measures for efficient resource utilization include a mix of short run measures to get rid of flood damages and long-term measures to optimally utilize the resource through efficient infrastructure support system. For example, the productivity performance of deep water crops like bao paddy in flood-prone and low-lying areas should be improved through effective R&D initiative. The bao paddy has excellent flood resistance property and naturally elongated stem to keep the foliage above water. It is no denying that the efficient infrastructure is the base of future growth prospects, which is presently highly inadequate. The magnitude of capital requirement for building the infrastructures particularly in the diverse topographical situation, is unparallel and extremely high. Thus the process requires careful and long-term strategies. Keeping in view the numerous constraints (elaborated inside), the critical priorities for accelerated agricultural development of the NE states are identified after a detailed deliberation at the National Workshop. The proceeding of the workshop is divided into four sections. The first section presents a report of the status of

cold-tolerant rice varieties and rice varieties for high altitude 4) Rainfed upland rice/direct seed/transplanted "ahu" rice 5) Wheat in rabi with emphasis on developing short duration HYV 6) Short- and long-term impact of the shallow tubewell (STW) programme on soil health, crop productivity, environment etc. 7) Crop diversification for economic utilization of irrigation water through STW 8) Rain water (Watershed) management 9) Improvement in 'Jhum' cultivation 10) Animal disease forecasting 11) Feed from conventional sources 12) Post-harvest management of horticultural/animal/fishery products Extension/Developmental Issues 1) Boro rice 2) Watershed development 3) Micro-irrigation/Sprinkler 4) Value-addition to 'Ahu' rice for making beaten rice and ricebran oil 5) Commercialization of processed maize product (Popcorn) and rice through post-harvest management/value-addition 6) Strengthening Research-extension-farmer (REF) linkage 7) Use of plastic in special reference to off-season crops Development (Supplies And Services) Issues 1) Supply of seeds/planting materials/feeds/animals/vaccine/soil testing/agricultural extension/credit/market facilities/market information 2) Promotion of allied enterprises/activities (Beekeeping, rural crafts, sericulture, mushroom production, floriculture etc.) 3) Development of appropriate rural infrastructures Policy Research Issues 1) Land reforms 2) Market reforms 3) Backward and forward linkages with corporate/plantation agriculture 4) Peoples Institutions: Traditional knowledge, self-help groups, farm management committee (FMC), shifting cultivation (impact analysis of Jhum control scheme), medicinal and aromatic plants 5) Micro-irrigation: Problems and prospects 6) Economic evaluation of watersheds 7) WTO and agriculture of the NE states 8) Land use restrictions.

# AGRICULTURAL DEVELOPMENT IN ASSAM

## - myth or a reality



Assam is one of the first and foremost states of the North Eastern Region in terms of her origin, organization, administration and development. Since time immemorial, Assam has been an agrarian state with a glorious past for her extensive trade, commerce and business based cultural, economic and social development. Being the home for most of the sister states of the region, Assam contributed tremendously in the socio-economic and political transformation of different states, communities, class and cultures in this part of the country.

Today, Assam has a geographical area of 78,440 Sq. Km. which is

much lower than the ancient Assam known as Pragjyotsa- Kamarupa centuries ago. Like any other states of the

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country, Assam introduced programmes of planned economic development during the post independence period and even after sectoral allocation of thousands of crores of rupees in the last so many decades, agriculture has not made much headway in comparison to other developed states of the country. Today, while most other states are marching ahead from their traditional agriculture based economy towards industry or service oriented economy, Assam is still miserably dependent on the agricultural sector and thus remained as a less developed state depicting a very gloomy picture. No doubt, there has been a noticeable stride in the form of programme implementation and infrastructural development in the state agricultural front during this period which should have a significant impact on the macroeconomic indicators, but to utter dismay this has not happened yet. The state is heavily dependent on other states for all essential commodities of daily need such as rice, *dal*, *atta*, milk fish, eggs, edible oil, potato, onions, sugar, salt, spices etc not to speak of hundreds of other each and every item of consumer and capital goods right from fabric to foot wear and mortar to motor car. This raises the frequently asked question as what ails our agricultural development programmes?





Under the above circumstances, probably this would be quite logical to verify the situation in which the development strategies are based either on future perspectives or on historical realities. It is a bare fact that mere application of physical and financial means would have very limited effect unless an in-depth analysis of the background issues are carefully monitored and resultant socio-cultural and economic shortfalls are suitably remedied. History indicates that Assam had a great heritage of agriculture, trade, commerce and industrial development in the very old past. This is evident from the records made in the ancient epics such as Yogini Tantra, Kalika Purana, Harsacarita, Arthasastra etc. Number of inscriptions also indicate that the extent of agriculture, commerce, trade and business were so much flourishing during the time of Bhaskara, the ruler of Kamarupa, that its glory got spread to rest of the country and abroad through friendship, fraternity and trade linkages. Such a consequence thus, has led us to conclude that there is ample scope to rethink and review the programme of agriculture and rural development for the people and polity of the state instead of its random implementation and application following a blanket method and practice of technology intervention.

The concept of agriculture and agricultural development got significant changes in the present situation. It has both micro and macro- economic goals to be achieved in the society and the economy and its

policy action affects people who are directly and indirectly involve with it. But ultimate success of all such development programmes has to be ensured by the farmer users who are to act as change agents with utmost dedication, sincerity and hard work. Farm human resource management, monitoring and accounting is yet to be developed as a paying and prospective proposition in our country. It is a fact that every farmer acts as an individual and he or she is the master of all decision making process in the farm business. Therefore their attitude, motive, expectation etc have immense role in converting all programmes/plans into reality within a definite time frame. Farmers' behavioural responses also vary differently in different socio-cultural environments and therefore, this aspect needs to be well understood before designing a development programme for them. It cannot be taken guaranteed that everything what is given to farmers will be accepted and adopted.

There was a time when so much of constraints even could not prevent our forefathers to achieve economic pursuits, the present success is inevitable beyond doubt, provided the ground realities of the past are analysed and follow up measures are taken giving due consideration to farmers' needs and aspirations. While designing such programmes, we should firmly believe that there will be no historical accidents, rather history would repeat itself.



# UNDERUTILIZED HORTICULTURAL CROPS IN NORTH EASTERN REGION

Division of Horticulture,  
ICAR Research Complex for NE Hill Region,  
Meghalaya



**T**he crops, which are neither grown commercially on large scale nor traded widely, may be termed as underutilized horticultural crops (UUHC). These crops are cultivated, traded and consumed locally. The popularity of these horticultural crops varies from crop to crop and locality to locality, which however, can be enhanced to a greater extent through publicity. The underutilized horticultural crops (UUHC) have many merits. These are easier to grow and hardy in nature, producing a crop even under adverse soil and climatic conditions. Most of them are very rich sources of vitamins, minerals, and other nutrients such as carbohydrates, proteins and fats. Since, the underutilized horticultural crops have a long history of consumption, the local people are aware about their nutritional and medicinal properties. Moreover, these are cheap and readily available. The horticultural crops are contributing 3.14% of the total geographical area of the region. The region is one of the richest reservoirs of genetic variability and diversity of different horticultural crops, which exist in plant types, morphological and physiological variations, reactions to diseases and pests, adaptability and distribution.

## SCOPE OF UNDERUTILIZED HORTICULTURAL CROPS

In North Eastern region, there are wastelands of different kinds viz. sand dunes, ravines, acidic soils, marshy and marginal lands, which are unfit for supporting cultivation of high input demanding crops. Such lands can easily be put to use for growing low input crops in order to diversify the present day agriculture, which is so inevitable in view of the increasing population

pressure and fast depletion of natural resources as well as the growing and changing human needs in the region.

The average productivity of the horticultural crops is just half of the national productivity. As grain farming is proving un-remunerative in the undulating topography of hilly tracts, which is deprived of irrigation facilities, despite government of India's has been putting forth endeavours to uplift the region, vast potential remains unexploited. It becomes possible to exploit the untapped potential of the region through location specific horticulture and subsequently expanding the area under horticultural crops. Production of UUHC can also be increased through adoption of scientific technologies.

Apart from nutritive value, underutilized horticultural crops are particularly more important for medicinal properties and famous for the retentive value in Ayurvedic medicine. Mostly people are familiar with the medicinal properties of locally grown horticultural crops.

**DIVERSIFICATION OF UNDERUTILIZED HORTICULTURAL CROPS:** North eastern region, being rich in plant diversity, has a very large number of non traditional or underutilized horticultural crops. Different agro-ecological/phyto-geographical regions hold rich diversity in both the cultivated and the wild horticultural crops. In view of its importance from the context of diversity conservation the region is one of the 18 hot-spots of the world. Diversity among UUHC in the region is discussed below:

**Fruit Crops:** The North-East India is rich in fruit diversity and contains more than one-third of the country's total diversity. Based on the areas and crops and their distribution, under utilized fruit crops of the region are given in Table 1.

Table 1. Diversities of underutilized fruit crops

- ❖ *Pyrus pashia* Khasi & Jaintia hills (Meghalaya)
- ❖ *Prunus nepaulensis* Khasi hill (Meghalaya)

- ❖ *Myrica fraquhariana* Sibsagar (Dikho valley Assam), Naga hills, Khasi & Jaintia hill (Meghalaya)
- ❖ *Passiflora edulis* Meghalaya, Mizoram, Manipur, Nagaland and Sikkim
- ❖ *Averrhoa carambola* Assam, Meghalaya and Tripura *Dillenia indica* Meghalaya and Assam
- ❖ *Garcinia cowa* Mizoram
- ❖ *Phyllanthus acidus* Assam, Meghalaya, Manipur, Mizoram and Nagaland
- ❖ *Elaeagnus* spp. North east frontier tracts, lower Assam and Meghalaya
- ❖ *Docynia indica* Khasi hill (Meghalaya) and Sikkim

Vegetable Crops: A wide range of vegetable crops are grown in this region, which includes solanaceous vegetables, cucurbitaceous, okra, various kinds of beans, tubers & roots crops, spices, cole crops as well as some species of leafy vegetables. Occurrence of their wild relatives is also a subject of potential exploitation towards the crop improvement. Diversities in underutilized vegetable crops are given in Table 2.

Table 2. Diversities of underutilized vegetable crops Species Distribution

- ❖ *Cyphomandra betacca* Meghalaya and Sikkim
- ❖ *C. minimum* Syn. *C. fastigiatum* Whole North eastern region
- ❖ *Sechium edule* High hills of Meghalaya, Manipur, Mizoram, Nagaland, Sikkim and Darjeeling hills of West Bengal
- ❖ *Momordica cochinchinensis* Assam, Meghalaya and Manipur
- ❖ *Momordica dioca* Garo Hills of Meghalaya and Tripura
- ❖ *Canavalia ensiformis* Meghalaya, Manipur and Nagaland
- ❖ *Vicia faba* Manipur and Nagaland
- ❖ *Psophocarpus tetragonolobus* Tripura and Manipur
- ❖ *Parkia roxburghii* Meghalaya, Manipur and Nagaland
- ❖ *Trichosanthus dioca* Tropical areas of Assam and Tripura
- ❖ *Coccinia grandis* Assam *Allium sativum* Meghalaya and Tripura
- ❖ *Flemingia vestita* syn *Maughania vestita* Meghalaya
- ❖ *Amorphophallus* spp. Meghalaya and Tripura

#### CONSTRAINTS FOR THE DEVELOPMENT OF UNDERUTILIZED HORTICULTURAL CROPS:

The constraints are:

- ❖ Lack of awareness among the farming community about the nutritional and medicinal value of underutilized horticultural crops.
- ❖ Lack of researches.
- ❖ Lack of desirable seeds and planting material.
- ❖ Limited application of advance on-farm agrotechniques.
- ❖ Lack of application of innovative and novel technologies such as biotechnology, plasticulture for enhancement of productivity.
- ❖ Lack of about post harvest management practices.
- ❖ Limited and inadequate marketing supports & infrastructure facilities for transportation, storage and processing.
- ❖ Poor recognition of these crops in horticulture promotion programmes.
- ❖ Improper institutional arrangements and limited role played by financial institutions in setting up of agro industrial and horticulture based industrial units.

#### CONCLUSION

The north eastern region is bestowed with the most congenial climatic conditions for the production of under-exploited horticultural crops. Besides this, quality seeds, varieties and hybrids of these horticultural crops could be produced and exported. The increase in area and production of these horticultural crops will not only provide nutritional security and save money on import but also export of fresh horticultural crops and seed in further expected to boost region economy. These horticultural crops also provide many fold employment opportunities in agro-based industries, packaging, storage, preservation, canning and transportation.

# PERFORMANCE OF AGRICULTURAL ECONOMY

## OF THE NORTH EASTERN INDIA

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The seven states of Northeastern India, comprising Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Nagaland and Tripura cover 255.09 lakh hectares, which is 7.76 per cent of total land area of the country. The region has unique distinction of having diverse hill ecosystems covering more than two-third of total geographical area. The hill areas have wide range of altitude upto 5,000 metres. The riverine plains, swamps, tilla land and char areas are the other agro-ecological situations. The region receives abundant rainfall with the world's highest rainfall of 12,000 mm at Mawsynram in Meghalaya, in one hand and the rain shadow belt in Nagaon district of Assam with  $\pm 1,200$  mm rainfall, on the other hand.

The N.E. hills cover Karbi Anglong and N.C. Hills of Assam, entire territories of Arunachal Pradesh, Nagaland and Meghalaya with per humid to humid climate receiving 3,528 mm rainfall annually. Nearly 94 per cent of land in Arunachal Pradesh and about half in Nagaland and Meghalaya are under forests. The hill regions of Manipur, Tripura and Mizoram receive 2,052 mm rains and the climate is to humid. The soil is acidic. Most of the land in Manipur is barren and considered unculturable. The plains of Brahmaputra and Barak Valleys of Assam receive 2,800 mm average rainfall with uneven distribution. The climate is per humid to humid.

Agriculture is the dominant economic activity providing employment to 64.28 per cent of total workers. The region has 3.73 per cent of the total population of the country and contributes 2.6 per cent to the Net Domestic Product.

### Land Holding Pattern

Total operational land in the N.E. India is 53.4 lakh ha. The highest operated area is 31.6 lakh ha in Assam and the lowest (0.8 lakh ha) is in Mizoram. Nagaland has the unique characteristic of highest size of operational holdings at 6.8 ha, which is higher than the Northeast regional average (1.59 ha) and also of the all-India level (1.6 ha).

### Land Utilization Pattern

Out of total geographical area of 255.09 lakh ha in the NE India, area under forest is 164.3 lakh ha (64 per cent). Arunachal Pradesh has the highest area (93.79 per cent) under forests followed by Mizoram (61.98 per cent). In Manipur forest area is sharply declining. Net sown area (NSA) in the region has increased from 31.61 lakh ha in 1977 to 38.05 lakh ha in 1995-96. The proportion of net sown area to total area is as low as 15 per cent as against 46.6 per cent for all-India average. Although the monocropped area dominates the region, the gross cropped area has increased from 39.41 lakh ha to 54.3 lakh ha due to newer area under cultivation and introduction of newer crops. There are a few exceptions like Arunachal Pradesh and Mizoram, where only 2.68 per cent and 3.09 per cent of the total reporting area are respectively cultivated, primarily on account of adverse conditions, difficult terrains and barren land. The cropped area in Manipur, Meghalaya and Nagaland is 8.32, 9.02 and 12.40 per cent respectively.



## Shifting Cultivation

In the Northeastern India more than two-third of total geographical area is covered by hills. Shifting cultivation (Jhum cultivation) is the common practice in the hills. About 4.43 lakh families solely depend on shifting cultivation. The practice of jhum has been undergoing rapid changes particularly in the recent times. Jhum cycle declined from 3 to 10 years to 2-3 years. Since the jhum system has a number of merits, declining jhum cycle would have serious adverse implication to the poor. The strategy for Jhum improvisation in tune with socio-cultural milieu would benefit the society. Among the alternative methods of improvement include adoption of improved cultural practice, planting perennial crops, control of soil erosion, encouraging allied agricultural activities. Few on-going programmes for promoting and improvisation of jhum are listed below.

1. Permanent settlement of Jhumia cultivators through development of plantation crops in Karbi Anglong and N.C.Hills of Assam,
2. Providing 2.0 ha of terrace land to Jhumia family along with inputs and financial help for permanent cultivation in Meghalaya
3. Pilot project on land reclamation, minor irrigation, land improvement, provision of seeds, fertilizers and development of horticulture and cash crops in Mizoram
4. Pilot projects in Nagaland induced farmers to give up Jhum cultivation and adopt terrace cultivation.

These schemes however, require economic impact evaluation and improvisation where necessary.

### Changes in Cropping Pattern

Rice is the main crop in the N.E. states covering around 61 per cent of gross cropped area. Manipur has the highest proportionate rice area (76.38 per cent) while Meghalaya (43.09 per cent) and Arunachal Pradesh (45.73 per cent) have comparatively lower area under rice. Jute is grown mainly in Assam, Meghalaya and Tripura. The cultivation of maize is concentrated in the hill states. The total area under oilseeds covers around 8 per cent of gross cropped area. Wheat is relatively a new crop in Assam and Meghalaya. Sugarcane is another cash crop grown in all the N.E. states except Arunachal Pradesh.

The salient features of cropping pattern are as follows:

1. The area under rice has declined from 73.97 per cent in 1977 to 62.63 per cent in 1991 in Assam, 74.44 per cent to 53.91 per cent in Tripura, remained stagnant at around 80 per cent in Manipur but increased from 6.41 per cent to 60.71 per cent in Mizoram and 17.08 per cent to 43.09 per cent in Meghalaya.
2. Oilseeds covers 6-8 per cent of gross cropped area except in Manipur (2.42 per cent), Meghalaya



(3.76 per cent) and Tripura (3.26 per cent).

3. Area under wheat increased tremendously since later part of the seventies in Assam, on account of spillover benefit of green revolution but started declining after 1985-86

4. Pulse area is stagnant in Assam around 1.10 lakh ha and subjected to constraints of soil moisture stress in the sowing season, poor management, problems of disease and pests and lower yield. However, the cultivation of pulses is spreading in Arunachal Pradesh, Mizoram, Nagaland, and Tripura since the eighties.

5. Jute and sugarcane are mainly grown in Assam and in minor proportion in Meghalaya and Tripura. Jute area is declining in all these states due to problems of retting, processing and marketing. Cotton is another crop grown in the region particularly in Meghalaya. Potato is gaining popularity in the cropping patterns of all the N.E. states except Mizoram.

6. Horticultural crops, particularly banana, arecanut, coconut, papaya, tapioca, sweet potato, orange, mango, guava, litchi, jack fruit and a number of vegetables are grown in all states while apple is grown in Arunachal Pradesh and Nagaland. Spices of various types like onion, chillies, ginger, and turmeric are found throughout the region.

### Growth of Production and Productivity

During 1970-1995, the annual average growth of production and productivity were 2.95 per cent and 1.68 per cent respectively in the N.E. states against the corresponding all-India rate of 3.6 per cent and 2.68 per cent. Total food grain production increased from 27.19 lakh tonnes to 47.24 lakh tonnes while yield increased from 1,002 kg/ha to 1,424 kg/ha during the period. Yield of rice is the highest in Manipur (2,552 kg/ha) followed by Tripura (1840 kg/ha). Adoption of improved cultivation practices like use of HYV and plant nutrients have contributed to yield improvement in these states.

But in other states like Arunachal Pradesh, Mizoram and Nagaland, the yield of paddy is 1,062 kg/ha, 958 kg/ha and 868 kg/ha respectively. In Assam, oilseeds have shown positive growth with improvement in yield from 417 kg/ha to 549 kg/ha. Wheat showed tremendous growth particularly in Assam during 1970-71 to 1980-81 primarily due to the influence of the national strategies of wheat development under green revolution. But its momentum got dampened after mid-eighties and showed negative growth since 1990-91. Maize showed positive growth in the hill districts of Arunachal Pradesh, Meghalaya, Nagaland and Tripura. Small millets are showing rising trend in yield in Arunachal Pradesh and Assam, while it is declining in Meghalaya and Nagaland. The scenario for the pulses is not encouraging and its area remains stagnant. Poor crop management mainly in rainfed situation is one of the reasons for slow growth. Severe scarcity of agricultural labour affected jute and sugarcane thus showing negative growth despite satisfactory yield performance (say 1,721 kg/ha in Assam, 1,629 kg/ha in Tripura). Poor marketing infrastructure and dominance of middlemen, problems of processing of sugarcane, closure of sugar mills in Assam, affected farm income. Potato is an important cash crop in the hill districts. Potato shows positive growth throughout the period and the yield has improved from 4,653 kg/ha in 1970-71 to 7,948 kg/ha in 1995-96.

#### Horticultural Crops

The plain and valley land of Assam, Tripura, Manipur are suitable for most of the tropical and subtropical fruit crops like banana, pineapple, citrus, coconut, mango, jackfruit, papaya, litchi, guava etc. However, banana, pineapple, citrus, papaya, peas, plum, peach apple, etc are also widely grown in hills of Meghalaya, Mizoram, Manipur, Nagaland and Arunachal Pradesh. Arecanut, betelvine and several spice crops are grown throughout the region. Enormous variations of crops as well as practice of growing vegetables both in kharif and rabi are seen in the region. As per estimates of North Eastern Council, the region produces 23.44 lakh tonnes of fruits in 4.87 lakh ha area and 1.22 lakh tonnes of spices like turmeric, ginger, onion and chillies. In addition, about 25.36 lakh tonnes of vegetables are grown in about 2.0 lakh ha area. Among the fruit crops, banana is the most popular crop and grown in all N.E. states producing 714.3 thousand tonnes in 60.24 thousand ha area. In Arunachal Pradesh, wild and seedy banana are found in forest areas. The cultivation of pineapple is concentrated in Assam, Meghalaya and Manipur covering 37.87 thousand ha producing a total of 307.68 thousand tonnes.

Among the citrus crops, mandarin orange and lemon are of commercial types grown in all N.E. states, which cover an area of 71.88 thousand ha. But the area under mandarin orange is declining due to the problem of dieback and poor management. Regular and commercial cultivation of temperate fruits like plum,

peach and peas are found in the higher elevation of Arunachal Pradesh, Mizoram, Manipur, Nagaland and Assam (N.C. Hills). Arunachal Pradesh has 5.1 thousand ha under apple cultivation mainly in the Kameng District where rainfall is around 900 mm. Other promising temperate fruits like walnut, almond, cashewnut is grown in Arunachal Pradesh and Tripura. Coconut and arecanut are the crops with high commercial value and these are grown mainly in Assam, Meghalaya and Tripura in an area of 1.10 lakh ha. There is enough scope for increasing farm returns through value-addition by use of efficient post-harvest management practices. The horticultural crops generate substantial marketable surplus for which adequate processing facility is necessary for value-addition and commercial trading. There is also need for storage, processing and marketing facilities, which are largely absent in the whole region.

#### Constraints to Agricultural Development

**Uneconomic and fragmented holdings:** The marginalisation of farmers is a dominant factor adversely affecting household income. Over 60.27 per cent of the operational holdings are below 1.0 ha and 22.18 per cent of the holdings are in the farm size group 1-2 ha. Except Nagaland, in other N.E. states, the size of operational holding is very small. Such small holdings are uneconomic and results in under-investment in agriculture leading to low input use and low production.

**Low adoption of improved technology:** The adoption of high-yielding varieties of rice varies between 42 to 50 per cent in Meghalaya, Manipur and Assam and 23 to 34 per cent in Arunachal Pradesh, Nagaland and Mizoram. Highest adoption of HYV is observed in Tripura at 96.77 per cent. Although more than 85 per cent area of wheat is under HYV but covers only around 2 per cent of gross cropped area. The main causes of slow growth of HYV area are the non-availability of suitable seeds, predominance of traditional seeds in hill areas under Jhum cultivation, short supply of recommended seeds and defective distribution system.

Fertilizer consumption is extremely low and variable. Fertilizer use is the lowest at 2.29 kg/ha in Arunachal Pradesh and the highest in Manipur at 72.46 kg/ha. In Meghalaya, the fertilizer use is declining from 15.55 kg per ha in 1986-87 to 13.39 kg in 1997-98, the same is stagnant at around 3 kg in Nagaland. There are number of factors limiting the expansion of fertilizer use such as defective distribution system, poor transport and communication system and inadequate institutional credit.

Irrigation is another crucial constraint to agricultural production, which, at present covers less than 10 per cent of the gross cropped area. Ineffective O&M system is responsible for poor performance. It is ironical that the region with annual average rainfall as high as 3,400 mm, also faces water problems. It

implies that development of water resource is extremely poor and the state support is weak. For example, on account of inefficient management system, about 109 state-owned watershed projects in Assam are currently unused, making the investment infructuous. Under the circumstance, people's initiative is required in proper rainwater harvesting and redistribution in the dry season crops. The introduction of state sponsored scheme of installing 1.0 lakh shallow tubewells is a wellcome deviation, which has received encouraging response from farmers in the cultivation of early Ahu and Boro rice. This also indicates the need for assured water supply.

**Flood problem :** Flood is a major natural disaster regularly causing inundation and damage of standing crops, delay transplanting of main rice crop (Sali), which results in low yield. About 3.0 lakh ha of cropped area are annually affected by flood in Assam. The large-scale soil erosion also takes place. About 0.49 lakh ha were eroded in 1997. The worst soil erosion affected districts are North Lakhimpur (to the extent of 0.31 lakh ha of soil erosion) and Darrang (9,877 ha).

#### Technological Constraints

1. Lack of suitable high-yielding rice varieties for diverse upland situations, flood affected areas, moisture stress conditions, and hill areas
2. Alternative crops for escaping pre-monsoon showers to avoid the problem of pre-harvest sprouting of crop in flood, free period
3. Develop improved crop management practices for shifting cultivation
4. Improvement and standardization of production techniques of fruits and vegetable crops
5. Use of improved post harvest management including pest and disease management and processing techniques for the major cash crops and horticultural crops
6. Land and water management technique specifically for acid soils
7. Economic packages for integrated farming systems combining crop cultivation with livestock, fishery, etc.
8. Integrated livestock management system for increased livestock products as well as draught power. The facilities of storage, processing and marketing are particularly deficient for perishable commodities. The access to institutional credit facility to the farmers must be improved substantially.

#### Rural Transport and Communication Network

The transport and communication facilities also need marked improvement in the difficult terrains of hills, dense forest, rivers, etc. At present, availability of road per 100 sq. km is low at 45 km against 62.8 km at

all-India average. Baring Assam, the Railway network is practically non-existent in the region. Most of the rural areas remain inaccessible during rainy season for non-availability of all-weather roads.

#### Attitude Towards Agriculture

Agriculture is the most preferred activity of a large section of the population in the region, yet the method of cultivation is indigenous. In view of the rapid technology turn over, appropriate strategy for HRD is required to maximize farm income through adoption of cutting-edge modern technology. The farmers usually stick to old practices and the younger generation distracts, which makes agriculture an occupation of elderly people living in rural areas. To attract enterprising youths to take up farming as profitable occupation and to reverse the out-migration, innovative strategy such as commercialization of agriculture and adoption of improved methods must be promoted.

#### Socio-economic Constraints

The N.E. India has diverse ethnic groups and social systems bound with customs and traditions. These factors clearly differentiate the type of economic activities and the economic status of the population, which inhibit the adoption of modern methods. Carefully prioritized strategies for agricultural development of the region may become instrumental to break the deadlock.

#### Prioritization and Policy Perspectives

1. Development of irrigation facilities and promotion of water-harvesting methods for assured water supply particularly in the rabi season.

#### Conclusion

The rich resource base in the region such as mega bio-diversity, fertile soil, varied agro-ecological situations of plains as well as valleys, hills, tilla land, immense water resources, human resources of ethnic diversity and cultural groups, could be potential sources of agricultural as well as economic development of the N.E. India. However, due to lack of appropriate strategies for development of natural resources, absence of coordination in programme implementation, weak geographical links and poor infrastructure facilities, the region is handicapped in catching up with the agricultural developmental pathways in tune with the national ethos. Slow agricultural development widens the disparities across the states. In this circumstance, agricultural sector needs prioritization of development perspectives for enhancing the adoption of recommended technologies through extension programmes, input supply, support of financial institutions and marketing functionaries. More crucially, the research and development programmes must address the problem of generation of need-based location-specific technologies for the specific agro-ecological situations

## Development of Food Processing , Marketing & Packaging Infrastructure to improve Farmer's income in the North East.

S Bhattacharjee  
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Chairman of Food Processing, Agro, Forest, Rural Industry, FINER



**N**E Region is blessed with vast natural resources & it has immense opportunities for trade & commerce both in fresh & processed form. It being home to diverse exotic variety of fruits, vegetables, medicinal plants could immerge as major centre of food processing industry. In the north east, large losses from farm to plate are attributed to poor handling, distribution, storage, and purchase/ consumption behavior. Huge resources that could otherwise be spent on more productive activities go into producing & transporting goods that mostly go to waste. Losses at almost every stage of the food chain can be reduced by using appropriate marketing & processing infrastructure including packaging. Packaging being an essential part of a long-term incremental development process to reduce losses will have to employ a blend of both technologies and processors to yield maximum result in the region.

In a difficult terrain like north east, marketing of processed products is more remunerative than raw produces where logistics, seasonal crops and infrastructure matters most. Farmer & processor linkages are needed to add value as per the requirements and demands of consumer. Storage and handling technologies and infrastructure requirements needs to be assessed and designed in a manner that losses are minimized and

the produce retains its original quality. Very often value addition & product diversification are easier said than done because of numerous constraints in the existing micro scale rural enterprises in the region. Lack of technological know-how, high cost of machinery, insufficient capital, & absence of hassle-free credit, taxation rules & food safety concerns create a fear psychosis.

The New Generation Cooperatives (NGC) model & Farmers Producers Organization (FPOs) are ideally suited since it binds both farmers and processors to honor commitments & agreements. Collective farming in clusters involving small farmers needs to be promoted including small cooperative processing. Self Help Group units in rural areas to undertake primary processing, grading and cleaning of produce for value addition and they need to be encouraged so as to allow small & marginal farmers to be part-time farmers & work in rural enterprises for enhanced income & returns on their produce.

Infrastructural development is the most crucial factor for tapping the potential for industrialization. Governments has to supplement effort by development of infrastructure and offer its participation in the form of Government share or partner in the PPP models of projects which are of prime importance considering the

location. In terms of FDI intention, the region has been given low priority by the foreign investors and there is a need to encourage foreign participation through simplification of its business environment. Region holds enormous potential to emerge not only as the main production and distribution hub but can also develop into a centre of cross-border trade. Broadly, the region needs to create dynamic institutional capacities for leveraging on its resource endowments and location advantage. Economy of North Eastern Region being largely rural & agrarian, Agriculture sector continues to support more than 75 percent population directly or indirectly providing employment to about 50 percent of the total workforce.

NE Region is traditionally rich in horticultural production. To make the horticulture sector more viable & sustainable, due emphasis have been given in raising productivity of various commercially potential crops through use of better technology & management. Similarly due importance has also been given on various aspects of facility like pre-harvest treatment, proper harvest, setting up of collection centers with grading facilities and transport facilities, marketing and processing etc. Despite significant growth registered through different scheme of Govt. of India region is faced with numerous problems such as good governance, unemployment, inadequate basic infrastructure and above all lack of agricultural and industrial infrastructure, sickness in the SME sector, environmental degradation issues etc.

Marketing of Agro-horticulture produces is a serious problem for the farming community in the region. Lack of organized marketing facility, lack of storage infrastructure near the field, poverty and need of money after harvest for repayment of agricultural debt forced the farmers to dispose off their hard earned produces at the earliest and that too at low prices. Keeping in view of the interest of farmers there is a need to play proactive role to develop adequate facility for

farmers by initiating the following on priority:

- ❖ Setting up of high quality infrastructure in PPP mode for horticulture promotion. Undertake widespread promotion of horticulture and floriculture, as well as medicinal and aromatic plants and herbs including organic farming, to capture highly remunerative niche markets abroad.
- ❖ Creations of new agri-markets, certification/standardization centres and other post harvest operations including food processing in PPP basis near the production centres may be given priority.
- ❖ Establishing a network of cold storage facilities & information centres and organizing marketing and financial support through SHG will have to be initiated on a large scale.
- ❖ Proper infrastructure for handling the post harvest operations with limited wastage should be attached to production centres in PPP mode.
- ❖ Government should invest in developing regulated markets and trading centers
- ❖ State should provide adequate storage facilities such as space where farmers, traders, and in a limited way even retail buyers can interact in the price discovery process
- ❖ Set up an Agricultural & Horticultural Marketing Board as a nodal agency for marketing, value addition and processing for north east

NE Region has been witnessing a strong demand for employment as large portion of population coming into the working age group of population. An ASSOCHAM study estimate made for Assam, the gate way state of north east, it is seen that 30.8 percent of population fall in the age group of 15 to 30 years. Assuming the current level of workforce participation rate, the demand for employment would account for 3.7 million. To meet the





potential demand of employment, it needs to grow at a double digit rate. At the investment front, Assam has recorded 11.1 compound annual growth rates during 2006-07 to 2015-16. Almost similar is the case with other states in the region, which needs to be looked on priority basis so as to accelerate investment activities in the region as well as encourage private sector to invest in the state. NERAMAC & FINER are taking up such Investors Meet & campaign in NER.

Govt. of India is making efforts to promote startup companies & develop entrepreneurship particularly in the north east to make a favorable change in the scenario. Assam government has recently introduced a single window system to clear all required permissions for an industrialist/entrepreneur within 30 days to set up a unit in the state. Entire process on this has been made online. Now an entrepreneur, sitting anywhere in the country, can log on to the website [www.easeofdoingbusinessinassam.in](http://www.easeofdoingbusinessinassam.in) and fill up a simple form providing details about him, the unit, its location, contact address to apply for permission of starting business/industrial units. In order to spur industrial growth and make Assam an investor-friendly state, this initiative of the Govt. of Assam will be a boon for the economical development in the state. Assam being the gateway of north east, it will allow other north eastern states also take the cue for a series of possibilities.

Government's efforts to reform indirect taxation under GST to establish a single Tax, uniformly adopted, throughout the country in a manner to create a seamless national market, to facilitate ease-of-doing business & free movement of Goods & Services across the country is welcome. 'Food' is a 'Unified Chain' bearing strategic relevance to agri-economy, saving wastages, rural development, employment generation, make-in-India, stand-up-India, a higher multiplier effect, GDP, consumer fulfillment, life sustenance and exports. Food industry is a high risk sector saving perishable agri-produce, grappling with uncertainties & vulnerabilities of weather & crop under severe financial pressures and difficult timelines, catalyzing employment even in the remotest regions of north east where other means of livelihood do not exist. Hence food industry should not be

clubbed with other sectors for the purpose of GST. Food constitutes 40% to 60% of household expenditure across the region both in rural & urban India, is highly price sensitive & inflationary, rising food prices cause social unrest, substantial negative socio-economic impact & serious political repercussions. Taxes on food are regressive in nature and fall more disproportionately on lower income households. Hence food needs to be given a special status under GST.

In the north east, Mission on Integrated Development of Horticulture (MIDH) is in practice in different form for long resulting to increase in production & productivity manifold. But it's estimated that more than 40% of produces are wasted due to lack of post harvest facility & that a very negligible amount of it is processed in the region. Loss of nutritional value & monetary loss on that count is huge. In order to boost farmers income, Govt. of India must review the provisions of National Mission on Food Processing (NMFP) for the development of food processing sector in the north east, which in turn would help in increase in farm productivity thereby increase in farmers' income as it will curbing the post-harvest loss of fruits & agricultural produce to a great extent. Patanjali Herbal & Mega Food Park has now decided to set up facility near Tezpur in Assam & its foundation is being laid shortly.

For an overall development, setting up of an Agricultural & Horticultural Marketing Board for processing, value addition and marketing will be of advantage. It can focus on creating infrastructure for post harvest & market linkages between producers and markets by establishing forward and backward linkages with farmers to provide assured market to their produce by generating rural employment and prosperity in the region through enhancement of farmers' income. Region would also be able to carve a niche in the organic food market once the naturally grown organic production, certification & marketing can be done in an institutionalized manner with better post harvest technology, supply chain, branding & certification of produce with appropriate aggregation model for marketing in the north east.



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