

Prospects of Agriculture and Allied Entrepreneurship Development in North-East India

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ABSTRACT

The North East of India comprising of the 8 states of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim, is a reservoir of rich natural resources and a beautiful amalgamation of different people and cultures. Blessed with biodiversity, huge hydro-energy potential, oil and gas, coal, limestone, forest wealth, fruits and vegetables, flowers, herbs and aromatic plants, rare and rich flora and fauna, NE India has all the potential to transform into a commercial hub and tourist paradise. North East India has an added demographic advantage, in the sense that it occupies 7.8 per cent of the country's total land space but has a population of 3.8 crore, which makes it approximately 3.73 per cent of the country's population. This is also a huge untapped, emerging market, which should prove to be of interest to large domestic and international investors. The area is a vibrant source of energy rich in oil, natural gas, coal, limestone and India's largest perennial water system, the River Brahmaputra and its tributaries, which can be tapped for energy, irrigation and transportation. The fertile soil around the valley of the River Brahmaputra is a veritable storehouse of horticultural products/plantation crops/vegetables/spices and rare forest products, to create entrepreneurial awareness to the young generation and motivate them to establish small and medium enterprises, to trained up the prospective new and young entrepreneurs to maintain and run their enterprises successfully, to enabling the entrepreneurs about the global production and market strategy in context of market economy, to encourage the entrepreneurs to establish pollution free enterprises. Entrepreneurship promotes capital formation by mobilizing the idle saving of the public. It provides immediate large-scale employment. Thus it helps to reduce the unemployment problem in the country, i.e., the root of all socio-economic problems. Entrepreneurship promotes balanced regional development. Entrepreneurship helps reduce the concentration of economic power. It stimulates the equitable redistribution of wealth, income and even political power in the interest of the country. It encourages effective resource mobilization of capital and skill which might otherwise remain unutilized and idle. It also induces backward and forward linkages which stimulates the process of economic development in the country. Entrepreneurship also promotes the country's export trade, which is an important ingredient to economic development.

Key words: Hydro-energy potential; Lime stone; Forest wealth; Herbs and Aromatic plants; Flora; Fauna;

“Entrepreneur is one who always searches for change, responds to it, and exploits it as an opportunity”. Entrepreneurs innovate and innovation is a specific instrument of entrepreneurship. It creates resource because there is no such thing as a ‘resource’ until man finds a use for something and endows it with economic value. India is second among all nations in Total Entrepreneurship Activity as per the Global Entrepreneurship Monitor Report 2002. Over the years India has concentrated more on the development of the institutions that support private enterprise by building a

stronger infrastructure to support it. The Government has encouraged entrepreneurship by providing training and also the facilities to succeed, particularly in the rural areas. Moreover, in India, the post-liberalization and globalization era has brought with it a growing middle class - roughly estimated to be 250 million - and rising disposable incomes. This presents a huge potential, which if tapped can be a veritable gold mine. Entrepreneurs can make the best of this by catering to various demands of this segment

Good entrepreneur can create a strong economy.

Entrepreneurship is an important facet of industrial growth and development of a nation. It is the backbone of a nation that sets its eyes on maximizing its performance in every field. The spirit of entrepreneurship brings about enthusiasm, persistence and the ability to seek entrepreneurial opportunities that lead to success. A nation's ability to generate a steady stream of business opportunities can only come about when its people take to entrepreneurial activities. Entrepreneurs are essentially the engines of growth for a nation. There are several factors that go into making a successful entrepreneur, and he or she need not necessarily possess a strong business and financial background. On the contrary, well-conceived and well directed training can always produce an outstanding entrepreneur. In addition, today's world with its burgeoning population offers limited avenues of employment.

The North East of India comprising of the 8 states of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim, is a reservoir of rich natural resources and a beautiful amalgamation of different people and cultures. It surely is a region waiting to happen. Blessed with biodiversity, huge hydro-energy potential, oil and gas, coal, limestone, forest wealth, fruits and vegetables, flowers, herbs and aromatic plants, rare and rich flora and fauna, NE India has all the potential to transform into a commercial hub and tourist paradise.

The region shares borders with China in the north, Bangladesh in the South-West, Bhutan in the North-West and Myanmar in the East. This makes the North-East a prospective hub of international trade and commerce. Unlike the rest of India, North East India has an added demographic advantage, in the sense that it occupies 7.8 per cent of the country's total land space but has a population of 3.8 crore, which makes it approximately 3.73 per cent of the country's population. This is also a huge untapped, emerging market, which should prove to be of interest to large domestic and international investors.

The area is a vibrant source of energy rich in oil, natural gas, coal, limestone and India's largest perennial water system, the River Brahmaputra and its tributaries, which can be tapped for energy, irrigation and transportation. The fertile soil around the valley of the River Brahmaputra is a veritable storehouse of horticultural products/plantation crops/vegetables/spices

and rare forest products. Subsidies on transport, capital investment, interest on working capital, excise duty refund, income tax exemptions etc. are available for industries in the region, as declared in the new North East Industrial and Investment Promotion Policy 2007 (NEIIPP). Attractive incentive structures should attract new domestic and foreign investments into the region, which, despite having several advantages, has not witnessed the kind of fast-paced growth and development that it should have experienced in the past years.

North East India also offers huge opportunities in sectors of strategic importance like energy and infrastructure; oil, natural gas and hydrocarbons; agro, food processing and horticulture; floriculture; IT and IT S; cement; defenses, etc. Tourism is another potential high growth industry. Manipur has huge potential in sectors like power, agro-based industries, etc.; a greater private sector involvement in the state economy will ensure local job creation and entrepreneurship development. The State Government of Manipur lays a major thrust on Agro and Food Processing; an Agric Export Zone for Passion Fruit is being developed in the state.

The literacy rate in Mizoram is above 90%, which is the 2nd highest in India. A well-educated and hardworking young population is an advantage for Foreign and also domestic corporate; sectors like IT and ITeS, agro processing, floriculture and bamboo are some areas that offer huge opportunities to investors. The state also grows fine quality of grapes, which can be utilized for large-scale wine production. The State Government of Manipur is pro-active and industry-friendly, and investors can be assured of single-window clearances. Assam provides huge investment opportunities in sectors like hydrocarbons, oil and natural gas, bamboo, handicrafts and tea. Assam tea is well known for its distinctive quality, and exported to the developed markets of Europe. Sectors like IT, hospitality and tourism, power, agro and food processing are poised for impressive future growth - companies like Infosys and Reliance have already shown interest in investing in Assam, with Tata Consultancy Services even having a BPO unit in Guwahati. All the North-Eastern Indian States have distinct advantages, and provide immense economic and trade opportunities to domestic and international corporate.

Prospects of Agriculture and allied Entrepreneurship Development Opportunities in North-East India

Entrepreneurship Development of Pig Production NE

Assam and Nagaland were selected for the

appraisals because Nagaland has the highest pig density of the eight states (0.6 pigs/person; table 1) and Assam has by far the largest human population (about 70% of the region total; table 1) and is the largest market for pork.

Table 1. Human and pig population in the NES of India

	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura	NE India
Area(KM)	89743	78438	22327	22429	22081	16579	7096	10486	263179
Population (000)	1203	29564	2374	2540	973	2180	593	3505	42932
Pigs(000)	330	1543	415	419	218	644	38	209	3816

Source: North Eastern Development finance Corporation Databank (<http://www.db.nedfi.com>)

Table 2. Per capita consumption of pork (Kg. per annum) in urban and rural areas and for rural social groups in three northeastern states

State	Rural	Urban	Scheduled Tribes	Schedules Castes	Other Backward Caste	Others
Assam	0.02	0.61	2.26	0.44	0.49	0.21
Meghalaya	3.26	2.04	2.14	0.00	2.26	0.15
Nagaland	9.54	7.18	7.45	1.61	4.14	1.80

Source: National Sample Survey Organization (2003)

North East States of India has much higher pork consumption than the rest of the country. Table 2 shows that consumption for the three States, of these states; Nagaland has the highest per capita consumption. The tribal population in particular appears to consume more pork on average than other groups.

Entrepreneurship Development Mushroom Production in NE

In the hill states of North-eastern region, mushrooms are a highly coveted item of food. The different kinds of edible and non-poisonous mushroom that are consumed in the region grow wild. There have been regular systematic plans at present to promote domestic cultivation of mushrooms. The horticulture department of almost all states do have scheme for promotion of mushrooms. And yet, commercial production of mushroom to a significant extent has not taken place so far. The efforts in this direction continue, both by the Government agencies and by voluntary social service organizations. These efforts must continue.

The region is not easily accessible by normal surface or water transport, which is one of the reasons which inhibit the rapid economic development of this region. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura constitute the so-called NE, but for development programmes, Sikkim has also been added. As the industry is almost non-existent and

agriculture is of subsistence in kind in most parts, unemployment and underemployment prevail. Any program for economic development of this region might take into account the profitability of the venture, employment generation suitability of the climate and linking of the people.

A low volume-high value commodity venture like mushroom production is perhaps a highly suitable agro-industrial venture. It is not only highly profitable but is also labour-intensive, and above all not dependent on arable land. Mushrooms are grown indoors and rooms or huts can be raised on otherwise idle land such as slopes. The venture, being indoor highly suited to womenfolk. Being highly profitable and labour intensive, it can attract the youth.

Advantage NE :

- * Varied climate (5-35°C) suitable for all mushroom
- * Abundant agro wastes (raw materials)
- * Excellent domestic (local) market
- * Mushrooms as food very popular with the NE hill people
- * High humidity (always above 60 per cent)

Entrepreneurship Development of Poultry Production in NE : Around 70 percent of Indian population is depending on agriculture and animal husbandry of which 30 percent are landless. Poultry farming provides employment to five million people of

the country with a population of 30.1 million poultry. India rank 5th in egg production in the world producing about 38.5 billion eggs (2002). Its broiler production was 500 million tones and ranks 19th in broiler production in the world (FAO, 2004)

Backyard Poultry Production

It is an age old system is that or customary system of poultry farming in the rural condition of North-east region (NER). From the study it is observed that more than 80 percent of the poultry farming is done under this system in NER.

Advantage of such system is that there is less expenditure in chick feed and medicine, besides taste of local fowl is considered most protein us. Eggs are also highly tasty because of the deep yellow colour of the egg yolk. Plenty of beta-carotene is available from such egg.

Kitchen waste, broken rice, paddy, grain, leafy vegetables, etc. are used as ideal feed for the backyard poultry. In addition to this, bird itself can find out worms and insects by perching on the soil etc. Hence, it saves from heavy expenditure. Market price of poultry feed at Imphal (Rs/kg) is as follows:

* Pre-starter	28-30
* Starter (broiler)	28
* Grower mash	27-28
* Layer mash	26

Local cock and hen weigh on an average 1.44-2.2 kg and 1.3-1.8 kg, respectively. Average laying ability is 30-40 eggs per lying, and quickly brooded. Hatchability under natural condition is 80 percent, i.e. out of eggs, 11 chicks are able to hatch out. There is no expenditure for hatching.

Housing is very simple with some laying basket kept on top of the house/Bayer for night hostage. Disease resistance is another quality of local bird and can resist many diseases including Ranikhet, infectious bursal disease, fowl pox, etc.

Improvement suggested

Better breed like Giriraja, vanaraja, Dahlem red, naked neck gene line, dwarf chicken (coloured), Grama priya, etc should be introduced. In Manipur Giriraja is found suitable and Central Agricultural University, Imphal is presently keeping 3000 parent stocks, and has distributed at least 84,000 chicks to Manipur and Neighbouring states

Entrepreneurship Development of Fermented Bamboo Shoot in NE

Soibum (Fermented Bamboo Shoot)

Soibum is a whitish fermented product of succulent bamboo shoots having characteristic flavor and taste, produced through the main process of fermentation without the addition of salt and others. Because of high demand of the fermented bamboo shoots the succulent and soft shoots are converted into another acidic food through the process of fermentation. The spontaneous fermentation of succulent bamboo shoots helps in the preservation of the fermented products which is known as the Soibum by the local people of Manipur.

The traditional processing of Soibum is undertaken without salt treatment. The formation is found to be conducted in different ways, and has been adopted according to the skill of the practitioners. The traditional way of fermentation can be broadly divided into two types

- i. Semi- fermented
- ii. Fermented.

Fermentation of Soibum is found to be very common and popular. The fermentation in Nonay type is mostly conducted in chamber made of plank and bamboo and has no specific size, and the chamber is built up according to the convenience of the practitioners. The bottom of the chamber is perforated and the upper surface has one lid. The walls of the chamber on all sides except the upper one are first lined with the leaves of a specific plant. The leas enclosure is then followed by the lining of polythene sheet, and this polythene occupies the innermost lining.

The thin slices of the succulent bamboo shoots are then pressed compactly into the chamber. There after filling the chamber with the slices to the capacity the upper surface scaled first with the polythene sheet and then with the leaves. The weights are then put on the mash for proper pressing. It is reported that production of good quality soibum can be achieved with adequate pressing of the mash. It has been reported that with the introduction of polythene sheets, it is used as the innermost lining of the chamber. It may be said in the primitive method of manufacturing soibum, the polythene sheets was not used Andro type of fermentation has been undertaken in another design. The practitioners adopted roasted earthen pot as the chamber of fermentation. The pot has bulky body with narrow neck. The succulent shoots which are then prepared into slices.

Neither the leaf nor polythene enclosure is used for this purpose. As portion of the pots are filled with the slice. After the fermentation has been commenced as notices from the evolution of the characteristics smell of soibum, another mash of raw material are added. The procedure continues till the pot is filled either the bamboo slices.

Different curry items with Soibum:-

- * Bamboo shoot (Soibum) and potato along with fermented fish and dry chili (Erombo)
- * Fried bamboo shoot (Soibum) with potato (Sabji Style)

* Cooking of bamboo shoot with fish, pork, chicken and different items etc.

Now a day's tin fermented types of Soibum (Bamboo Shoot) is started for export in different part of NE India as a entrepreneur by different NNOs.

Moreover, there is no elaborate change in the colour of the succulent shoot. The Andro type is associated with production of brownie soibum.

Extensive biochemical analyses conducted in soibum indicate the contents of protein, free amino acid, reducing sugar, non-reducing sugar, total sugars, as carbic acid and thiamine.

Table 3. Periodic levels of pH, Lactic acid and Titrable acids during the course of Fermentation of Bamboo shoot (Soibum)

Species	Entities	Days						
		0	5	10	15	20	25	30
B.tulda	pH	5.0	4.5	3.50	3.65	3.75	3.56	3.80
	Titriable acids (%)	0.02	0.55	0.80	0.89	1.01	1.15	1.21
	Lactic acid (%)	0.02	0.25	0.52	0.59	0.81	0.85	0.80
	Acetic acid(mg/100g)	15.01	83.05	125.95	90.56	135.05	178.50	83.65
	Pyruvic acid(mg/100g)	0.61	0.72	0.67	0.92	1.20	1.11	1.88
	Alphe keto glutamic acid(mg/100g)	0.53	0.70	0.81	1.02	1.25	2.21	3.42

Table 4: Changes in the levels of soluble sugars during the course of fermentation of Bamboo shoot (Soibum)

Sugars	Days						
	0	5	10	15	20	25	30
Reducing sugar(mg/100gm)	1090.20	181.52	8.15	6.24	13.27	14.3	26.00
Non-reducing sugar(mg/100gm)	580.04	372.10	144.5	62.95	78.9	78.02	85.22
Total sugar(mg/100gm)	1669.32	190.95	154.21	69.02	91.59	90.96	112.01

Table 5. Changes in the levels of individual sugars during the course of fermentation of Bamboo Shoot (Soibum)

Sugars (individual)	Days			
	0	2	15	30
Raffinose	32.50	43.35	8.20	6.42
Sucrose	155.30	52.10	16.02	16.50
Galactose	143.21	55.32	5.93	8.20
Glucose	325.15	105.65	40.5	36.35
Mannose+ Arabinose	295.00	85.21	5.95	8.95
Ribose	419.05	67.20	11.55	5.02
Xylose	105.29	22.02	3.19	1.50

Entrepreneurship Development of Fermented Fish Production in NE

NGARI (FERMETED FISH) : Ngari or Utonga-fermented dry fish locally known as ngari or utonga is a fermented by 3-6 months fermentation of sundried small sized fish-*Puntius sophore*, *P. ticto* in air tight containers.

Ngari is usually taken in vegetable or meat curry preparations, chilly chutney with Ngari preparation with Ngari have the flavor. Through Ngari is consumed widely produced and sold in a large scale.

Preparation of 'Ngari': The main steps or the process is for the production of fermented fish, 'ngari' involve a brief washing of the sun-dried fishes, followed by drainage and then left dry for 24-48hrs. This makes the fish body rofter. The fishes were pressed hard using stone roller to breakdown head and bones before filling the fishes, a thin layered of mustard oil was applied to the inner wall of the pot (kharung) to cheek porosity. Then the pots were fixed half to the ground using sand to avoid from movement. Fishes were pressed hard mechanically inside the pots using wooden stick. After 3-6 months fermented dry fish is ready for consumption.

Preparation of 'Ngari' under laboratory condition: Sun dried *P. sophore* was also fermented under laboratory condition following the traditional method. In the

laboratory fish pots were prepared in glass bottles instead of earthen pots used in natural(traditional) method. The fish pots were then stored at different temperature (20c, 30c and 40c) using BOD incubator.

Nutritive value of Ngari

Total protein, total lipid, total cholesterol ash content, total soluble sugar and total amino acids are the nutritive contents found in Ngari as indicated by analyses.

Table 6. Comparative Fat, Protein, total Amino acid contents in Phabou and Ngari

Entities	Phabou (mg/g)	Ngari (mg/g)
Fat	295.0	397.0
Protein	146.04	109.86
Total amino acid	42.85	55.84

Entrepreneurship Development of Fruits Production in NE:

Commercialization of potential fruit crops: Manipur has vast potential for commercial plantation of fruits like pineapple, passion fruit, lemon, lime, orange, banana, amla, olive, etc. Both the two most-sought-after varieties of pineapple viz, Kew and Queen are produced in commercial scale and the availability for eight months make the State highly advantageous for processing and export. Passion fruit, both as fresh and in processed form like juice and concentrates has excellent market world-wide because of its unique taste and flavour. Besides, many other fruits like the famous Kachai Lemon, Khasi mandarin etc. are in high demand for its high quality. Manipur also has a great advantage of being linked with Myanmar and South-East Asian countries for exporting its produces.

Vast scope for area expansion under fruit crops: Manipur has plenty of scope and potential to grow various horticultural crops because of varied agro-climatic condition. However, so far only 14.5 per cent of the identified potential areas for horticultural crops have been covered. With 9/10 of the geographical area covered with hills, there is ample scope for bringing more land under fruit cultivation in the hill areas. Fruits can be grown on uneven and undulating lands and in this way it gives additional benefits as forest cover for such lands which are liable to run off and erosion. Fruit like Cashew nut can be grown successfully even in cultivable wasteland.

Scope for increasing productivity: There is enough scope for increasing farm returns and productivity through the adoption of improved package of practices

like INM, IPM, good irrigation system, use of quality seeds and planting materials, high density planting etc. Based on the experimental finding about suitable planting density of pineapple for the foot hills of Manipur, Meitei (1993) stated that the most common double rows planting with a spacing of 25 cm×50 cm×80 cm can produce 61,538 plants/ha.

Scope for organic farming of fruits: With increased awareness and health consciousness among the people, organic food products, especially the fruits and vegetables are slowly gaining momentum in the country and in foreign markets like USA, Europe and Japan and fetching premium prices. Trends indicate that the organic food market would grow substantially in most of the European countries USA and Japan. Currently, the demand out places the supply, Manipur has a big advantage of developing organic farming of fruits since more than 60 % of arable land is under traditional agriculture, where no synthetic inputs are being used. APEDA has set up one model organic farming project for passion fruit at Mao of Senapati District by transferring the existing farm in about 10 hectares through one NGO, namely “Good Samaritan Social Service”.

Exploration of natural resources: Manipur has vast natural resources which are unique and has the potential of becoming the cynosure at the world stage and thereby becoming the continuous income and employment generating source and of course the human resource of the State.

Increasing market for processed fruit products: With changing food habit, the demand for processed and value added fruit products is increasing rapidly. At present, many of such processed fruits are imported to Manipur from other States and neighbouring countries through Myanmar. But, it has opened a vast opportunity for developing food processing industries in Manipur with the establishment of various processing units like Exotic Juice Limited, Mao, Pineapple Processing and Cold Storage Unit, Matai, Heiron Food Processing Centre, Moirang to name a few.

Development of fruit processing industries: Food processing industry is a major thrust area in the State of Manipur as it plays a significant supportive role in the diversification and commercialization with value addition of agro-horticultural products. Blessed with suitable agro-climatic conditions, Manipur abounds in varieties of raw material resources for food processing industries.

The State has tremendous potential for further development of food processing industries based on locally available materials like pineapple, orange, Lemon, banana, passion fruit, papaya, guava etc.

Future strategies for development entrepreneurship in NE :

- Improved efficiency and profitability of production should be achieved by incremental changes to better utilize existing resources through innovative community-based programmes implemented by client-oriented staff.
- Participatory methods to identify and target priority problems and to develop and rest interventions for specific locations will be essentials to ensuring ownership and acceptability among the communities.
- A key element will be to identify and promote current best practices of the most successful community members.
- Entrepreneurship curriculum may be devised especially in the context of agri. Education and be introduced as part of the total curriculum.
- The institute may initiate establishing entrepreneurship development cell for providing modular training to the students and farmers.
- Technology Incubator especially focused on agriculture technology and R&D for value added agriculture products may be established for promoting agriculture based interprises.
- Attempt may be made to organize training on market entrepreneurship and promote such

entrepreneurship.

- Evaluation of high yielding varieties of fruit crops for North-eastern condition and identification of resistant rootstocks.
- Research and extension on different models of fruit based cropping system for the NE States.
- Research and demonstration on Integrated Nutrient Management, Integrated Pest and Disease Management in Horticulture Based Cropping System.
- Strengthening of effective linkage between State Government and ICAR along with CAU and other organizations like NGOs, NHB, NABARD and other funding agencies.
- Strategic advertising by using print, electronic and web media for marketing and export promotion of fruit crops with registered TRADEMARKS like “Manipur Orange” or “Kachai Lemon”.

CONCLUSION

The entrepreneurship miracle in other country is an engine for job creation, innovation and diversity. In the case of diversity it is observed that women – owned and minority owned business may be emerging growth companies of the next decade. The role of entrepreneurship in global business of developing countries like India is also significant. The wide range of significant contributions that entrepreneurship makes include promotion of capital formation, creation of immediate large-scale employment, promotion of balanced regional development, and effective mobilization of capital and skills

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