

# Poverty in Natural Prosperity: Can Agriculture bring the Renaissance in North-East India?

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**Abstract:** Swami Vivekananda, the Holy Man of India once said “India has bushel full of doctrines and to spare. What we want is less doctrine and more bread”. Since then, India has risen through ranks but the dark side of the moon couldn’t hide. She is the home of 17.31% (1.21billion; March 2011) of the world’s population but ranks the third poorest. Global Hunger Index ranks India 67<sup>th</sup> out of the 122 developing countries. Reports indicated that “serious hunger” exists in all the States and 12 States having an “alarming rate of hunger”. Coming to the “Rainbow Land” of the country, the eight sisters of the North East add a splash of colour to the cultural map of India. Richly endowed with natural resources, the region is identified as one of the bio-diversity hotspot. Wide range of flora and fauna, the region with highest rainfall in the world, fertile virgin lands, wide climatic conditions from sub tropical regions of Assam and Tripura to the temperate zones of Sikkim – Mother Nature has blessed her with everything. The native population is hard working and tries their best to utilize the resources available. But the problem of food insecurity and poverty is prevalent. Intensive natural resource mining, degradation of natural resources (soil, water, vegetation), and mono-cropping under less organised agricultural practices are reasons for low productivity. Floods, river bank erosion cause unmitigated damage to people and property. Limited infrastructure, unemployment, diseases and epidemics is causing moral decay in the youths and pushing them towards an extreme lifestyle. This result in insurgency problems, rise in drug addiction, AIDS and hepatitis which are further crippling the economy and the society. The North-East Council report indicated that one-fifth of population in the region are living below the poverty line. Finding a single solution to all these problems might not be possible but a common solution can surely diminish them to some extent. As stated by the UN document, “Of the eight MDG, eradicating hunger and poverty depends on agriculture the most” and hence, the priority sector in North-East must be agriculture. Agricultural research and development should be given utmost emphasis in the north eastern States. There are few NGOs, CBOs and SHGs have been working through social mobilizing, training and capacity building of the rural people. Developing the infrastructure, encouraging the establishment of agricultural credit institutions, regulating market prices for agricultural and allied products can boost the rural economy.

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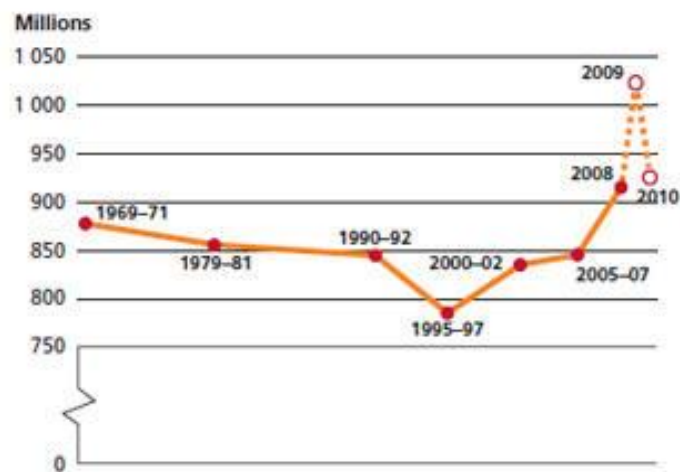
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## Introduction

The progress of the human race have been amazing till date-it has only been half a million years that we came to exist and our achievements are even surprising us today. We have landed on the moon, left our footsteps on many of the planets of our solar system and have gone a long way to look for the existence of any extra-terrestrial neighbour. Back home, the science fictions of yesterday are the realities of today. The sky is not the limit anymore, even most of the space has been conquered but when we look down, hunger, poverty and underdevelopment stares back at us.

## Poverty and Hunger: The Global Scenario

According to Food and Agriculture Organization (FAO) of the United Nations (2011), hunger is the consumption of less than 1800 calories per day. Food Insecurity has been defined as “a situation that exists when people lack secure access to sufficient amount of safe and nutritious food for normal growth and development and an active and healthy life”. In the estimates released by FAO (2010), the hunger situation curve went for a steep rise from 1995-'97 to 2009 (1023 millions). Though the FAO estimates of 2010 (925 millions) have raised some hopes but the situation is still far from satisfactory. Efforts to reach the Millennium Development Goals set by the UN of reducing the number of hungry people to half by 2015 are being carried out worldwide. But the report released by 2010 Global Hunger Index of IFPRI, indicated that, “we are nowhere near reaching that target”. The Global Hunger Index (GHI) 2010 shows some improvement over the 1990 GHI, falling from 19.8 points to 15.1 or by almost one-quarter. The index for hunger in the world, however, remains serious, it noted. On October 31, 2011 was celebrated as the “Day of 7 Billion” as baby Nargis was born in India while the number of hungry people has already reached 1 billion (FAO, 2011), thus every 1 person in 7 are living in chronic hunger around the world. The worst hit of the situation are the under-developed and the developing countries. Out of the 925 million people suffering from chronic hunger around the world, Sub-Saharan Africa had 239 million and Asia and the Pacific had 578 million while the developed countries had only 19 million.



(Source: Hunger notes, 2011)

**Fig. 1: Number of Hungry People from 1969 to 2010**

According to World Food Programme, 98 per cent of the world’s hungry live in the developing countries. Asia-Pacific Region is inhabited by around half of the world’s population and two-third of the world’s hungry people. Sixty five per cent of the world’s hungry live in only seven countries – India, China, Democratic Republic of Congo, Bangladesh, Indonesia, Pakistan and Ethiopia (<http://www.cocoponics.co>).

This setback has been attributed to not one reason – inflation in food prices in the global market, decrease in purchasing power of the people, inefficient distribution of income, discrepancy in Govt. distribution systems, *etc.* The FAO Hunger Portal states, “world currently produces enough food for everybody but many people do not have access to it”.

Production is not yet a problem but the gradual depletion of resources are. The hike in population is accompanied with a decline in the per capita availability of land (US – 30.155sq. km whereas, India – 2.59sq. km per 1000 as in [CIA World Factbooks](#) 18 December 2003 to 28 March 2011), genetic erosion, land degradation and severe water scarcity. As poverty increases, the investing power of the people decreases which affects agriculture. According to Nobel laureate and eminent economist Dr. Amartya Sen, hunger usually arose from problems in food distribution networks or from governmental policies in the developing world (Hunger-Wikipedia, 2011). Hunger eradication depends sequentially on the following facts: political will, anti-hunger policies, programmes, hunger outcomes (Masset, 2010).

### **Poverty and Hunger: The Indian Context**

World's largest democracy has many feathers on her crown – the country with space programmes to be proud of, one of the world's fastest growing automobile industries - but it is also world's second most populous country with a figure of 1.21 billion during 2011; home of the largest number (47%) of poor people in the world; the third poorest country in the world – and none to be proud of. According to the data released by the International Food Policy Research Institute (IFPRI) during 2011, the 2010 Global Hunger Index ranks India 67<sup>th</sup> out of 84 countries whereas, China ranks 9<sup>th</sup>, Pakistan 52<sup>nd</sup> and Bangladesh 68<sup>th</sup>. India is home for highest number (42%) of the world's underweight children (The Times of India, 2011). The UN Human Development Index has ranked India in the 119<sup>th</sup> position. These facts and figures are never encouraging for a country aspiring to gain the status of a developed country.

In official statements, the Indian Government expresses confidence in achieving the MDG of halving the rate of poverty by 2015 but the real scenario speaks otherwise (OneWorld Guides, 2011). The BPL population of the country is 40.74 crore (Deccan Chronicle, 2011). A preliminary assessment of a National Sample Survey conducted in 2009-'10 shows the rate has fallen to 32% from the baseline of 45.3% in 1993. The India Chronic Poverty Report observes that “about 65% of the poor in India live in eight (out of twenty-eight) States: Uttar Pradesh, Bihar, Maharashtra Madhya Pradesh, Orissa, Jharkhand, Chhattisgarh and Uttarakhand”. These poorest States also have to contend with the largest and fastest growing populations (One World Guides-India Briefings, 2011). The Arjun Sengupta committee concluded that some 77 per cent of Indians live on less than Rs. 20 per day; an evidence that this huge section of the society are still living below the MDG target. Inflation in food prices soared to 11.43% on October 15<sup>th</sup>, 2011 which resulted in a 10% decrease in the consumption (Economic Times, 2011).

Around 75% of the country's population lives in the rural areas. 43% of the total geographical area is under agriculture which provides 65% of the livelihood. Agriculture sector accounts for around 18.5% of the country's GDP according to 2010 estimates (<http://en.wikipedia.org> Economy of India). India has the 7<sup>th</sup> largest area used for agriculture with the highest irrigated area. She ranks first in pulse, milk and livestock production. The scenario presents with rays of hope. But the wide discrepancies should be justified. Of the total geographical area (329 million hectare), 265 mh has the potential for biological production but 50% of the total geographical area is threatened by land degradation. The Green revolution had increased the production manifolds but the indiscriminate use of chemicals has caused long lasting effects which is now resulting in degradation of its natural flora and fauna. According to the government's State of Environment Report 2009, about 15% of agricultural land has been degraded through excessive application of subsidized chemicals. Many groundwater aquifers have been depleted to critical levels. The consequence is that the amount of daily food grain available per capita is lower than in the 1950s (OneWorld Guides, 2011).

Indian agriculture is mainly dependent on monsoons. But still most of the states lack a proper water management system. There are great variations in the average amount of rainfall received by the various regions- from too much for most crops in the eastern Himalayas to never enough in Rajasthan. Season-to-season variations in rainfall are also great. The

consequence is bumper harvests in some seasons, crop-searing drought in others (Data1995 – Agricultural system in India from [www.indiachild.com](http://www.indiachild.com)). Depletion of ground water level is another big problem. Irrigating one area from another without proper drainage has led to increased salinity of water, flooding of fields and ultimately crop failure. Furthermore, charges of corruption and mismanagement in government operated facilities are also hindering the progress (Data1995 – Agricultural system in India from [www.indiachild.com](http://www.indiachild.com)). Extensive industrialization is constantly eating up the agricultural lands leaving many small and marginal farmers landless. Per capita land availability decreases but more importantly, access to food and income reduces giving a rise in poverty and hunger.

The adverse effect of climate change in agriculture of the world's 4<sup>th</sup> largest green house gas emitter does not come as a surprise. The sea level has been rising at 1.33mm per annum. The rate is likely to increase and exceed predictions of UN scientists. Studies suggest that a one metre rise in sea level would displace over 7 million people, threaten freshwater supplies and the concentration of industry and infrastructure (OneWorld Guides, 2011). Problems are not over even when the harvest is good. Absence of regulated market, non-existent minimum support price and absence of proper storage structure results in loss of tons and tons of agricultural products. The farmers, to pay off their debt, ultimately take refuge in suicide. The role of the government is also being questioned incessantly. Every year huge amount of food grains are reported to be rotten in the FCI go-downs when people are dying of hunger everywhere. The justification of foreign aid for a country which boasts a space programme and is the world's most prolific arms importer is increasingly being challenged by these facts and figures.

### **India's North East -The Big Picture of a Smaller Frame**

India's North-East, the true frontier region of India, has over 2000 km of international border with Bhutan, China, Tibet, Myanmar and Bangladesh. It is connected to mainland India by a 20 km narrow strip of land. Ethnically and linguistically one of the most diverse region of Asia, its uniqueness is its most prized possession. The eight states Assam, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Sikkim were added to the map of India at various points of time after independence to what existed earlier as the Assam Province. The North Eastern region spreads around 22,439 square kilometres, about 8% of the country's total area. Swift rivers, streams and small brooks cutting through the undulating plains, hilly terrains and picturesque valleys forms the topography of this region. Climate is moderate ranging from the humid sub-tropical conditions of Assam and Tripura to the temperate zones of Meghalaya, Sikkim and parts of Arunachal Pradesh. Rainfall is abundant amounting to an annual average of 2600mm. Arunachal Pradesh has the highest area under forest whereas; Manipur has highest barren and uncultivable lands. Sikkim has been declared as the "organic state". Most of the states have a literacy ratio higher than the national average except Assam, Meghalaya and Arunachal Pradesh.

### **Rich Biodiversity**

This region is a biodiversity hotspot. When there is a hue and cry around the world, the north eastern region boasts of 8,000 out of 15,000 species of flowering plants occurring in India, 700 species of orchids out of the 1,300 reported in the country - many of which are rare and endangered. Bamboo, which provides livelihood to a large number of people in this region, has 63 out of the 136 species belonging here. This region is home to Eri and Muga silkworm. Yak and Mithun are the unique animals reared by the people (Swaminathan, 2009).

### **North-East India: Generic Problems**

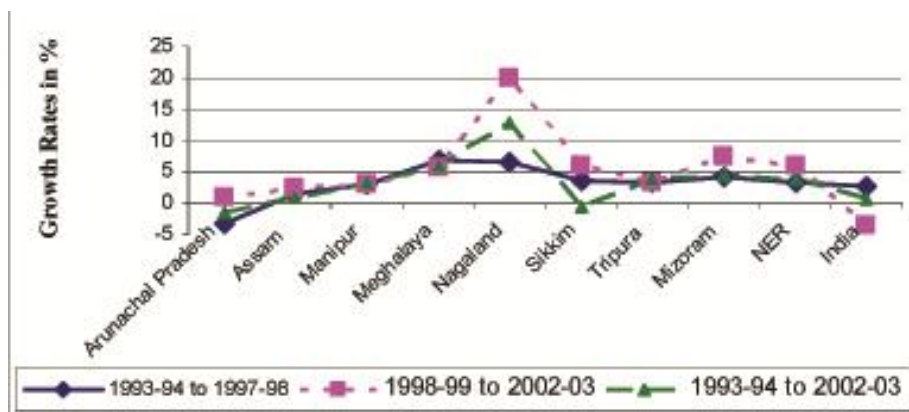
Though India is one of the fastest growing economies in the world, the regional inequity is becoming more and more prominent with the north east topping the list. Unemployment is a serious problem among the educated youth. Infrastructures encouraging self employment have dire need but are practically non-existent. Reaching the people is a big problem accounting to the hilly terrains hindering communication. Insurgency only adds up to the situation. Constant economic blockades, bandhs and strikes to showcase people's grievances about the existing conditions are ultimately aggregating it. Consequences are

moral degradation of the youth. The numbers of drug addicts are increasing at an alarming rate and so are the cases of HIV and hepatitis. India is home to nearly two lakh Intra-venous Drug Users. Of these over 50,800 people are from Nagaland, Manipur, Mizoram and Meghalaya. Over 20% of them are HIV+ solely due to sharing of contaminated needles (Azad India Foundation, 2011). Another highly discussed problem of north east accounting for many of the regions other problems is terrorism and insurgency. Development works in the rural areas in almost all the states and even in the cities in states like Manipur have come to a standstill. The Govt. is trying to rehabilitate the people involved in insurgency but they seem to be not affective enough. Unless the social and economic structures are changed altogether, getting a desired outcome cannot be expected.

**With these Generic Problems, Can Agriculture bring the Renaissance in North-East India?**

To cater the economic development, the agriculture sector must be strengthened to play much more active and indispensable role in any overall strategy of economic progress (Torado and Smith, 2004). The UN statement echoes the same thought - “Of the eight MDGs, eradicating extreme hunger and poverty depends on agriculture the most” (Food Security-Wikipedia, 2011). Agriculture is the dominant economic activity of the people of north east but the gap between potentiality and actual achievement is huge. Though resources are not a constraint here, appropriately utilising them is a difficult task due lack of information and knowledge.

Agriculture is the main occupation of the people but agricultural land is very less. Most of the area is forest covered or hill slopes where agricultural practices are real constraint. At present, of about 40 lakh hectares under cultivation, 39 lakh or over 97% is under food grain production. At about 1,520kg/ha, land productivity is very low in this region. Despite a vast potential, only 20% of the net sown area is under irrigation. Almost 95% of the region’s soil is acidic with pH value below 5.6 (DoNER-NEC, 2011). The percentage of cultivated area to total geographic area ranges from 2.2% in hilly states of Arunachal Pradesh to 35.4% in Assam as compared to the national 43.3%. Increase in agricultural land or increasing the productivity of the existing land are the biggest issues to be concentrated on. But as increase in population increases the demand of land for shelter, industries and other allied uses, sustainable increase in productivity is the more feasible option to be emphasised. The growth rates of the agriculture and production of the food grains were not showing expected positive trends over the years (Fig.2 & Table 1)



**Fig. 2: Growth Rates of Agriculture in the North-East from 1993-94 to 2002-03**

Source: Central Statistical Organisation- Various years & DoNER- NEC- North East Vision 2020 Document

Due to the hilly, rugged terrains of the north east, shifting cultivation or ‘jhum’ cultivation is the most predominant agronomic practice for crop production. In this slash and burn method, genetic erosion is becoming more and more prominent. A large number of flora and fauna are added to the list of extinct every year. Moreover, the productivity of the land is lost. The cycle which used to be of 7-10 years previously has come down to 2-3 years only.

Degradation of natural resources is a big concern and location specific measures should be called for without further delay. Jhumming should be replaced by 'contour bunding', terrace cultivation and conservation tillage and along with food grains the farmers should be persuaded to grow legume crops like pulses which can hopefully mitigate the situation to some extent.

**Table 1: State-wise Production of Total Food Grains in NER, (2001-2002 to 2009-2010)**

(Production: '000 Tonne)

States	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10*
Arunachal Pradesh	217.4	242.3	244.5	226.9	240.9	245.7	248.5	255.8	-
Assam	4023	3894	4035	3618.2	3677.8	3060	3470	4143.0	3939.6
Manipur	400.5	343.7	391.9	447.8	398.5	398.5	421.8	415.0	-
Meghalaya	224.7	227.1	233.8	225.2	183.1	231.5	231.8	236.3	-
Mizoram	126.3	129.1	139.4	124.6	129.8	56.3	19.1	58.9	-
Nagaland	355.4	388	409.8	403.5	424.8	436.2	473.2	514.2	-
Sikkim	98.7	96.6	99.9	103.9	100.3	100.3	111.6	107.5	-
Tripura	597.5	611.8	529.1	556.4	563.6	630	633.3	634.7	-
<b>India</b>	<b>212851.2</b>	<b>174771.4</b>	<b>213189.4</b>	<b>198362.8</b>	<b>208601.6</b>	<b>217282.1</b>	<b>230775</b>	<b>234466.4</b>	<b>218205.8</b>

NA: NotApplicable.

Note: \*4th Advance Estimates.

Source: Ministry of Agriculture, Govt. of India &

Rajya Sabha Unstarred Question No 844; dated on 24.02.2009 &

Lok Sabha Starred Question No. 51; dated 07.07.2009 &

Lok Sabha Starred Question No. 76; dated 23.02.2010 &

Lok Sabha Starred Question No. 360; dated 20.04.2010 &

Lok Sabha Unstarred Question No. 2611; dated on 10.08.2010.

(Adopted from the <http://www.db.nedfi.com>).

### **Cropping Pattern & Need for Diversification**

The cropping pattern of the region is another factor responsible for low productivity. Mono-cropping is widely followed and other than the cropping season, the land is kept fallow. Diversification of crops should be encouraged along with crop rotation that will ensure income round the year conserving the environment alongside.

### **Abundant Rainfall & Water Scarcity**

The region receives abundant rainfall but every year a large amount of crop loss is reported either due to flood or drought. Water scarcity in the winters is a common scenario. A large amount of water is lost in seepage while the people continue to deplete the ground water reserve. This is due to the lack of proper storage of rain water. Government intervention is needed for construction of water harvesting tanks and overhead tanks for storing rain water. Meghalaya Government has taken some notable steps in this sector but still the scope of work is huge.

### **Indigenous Technical Knowledge and Lack of Scientific Validation**

The indigenous farmers of the region from years of experience and their very own culture, tradition, language, belief, folklore, rites and rituals have developed their own practices, many of which have strong scientific foundation. In Meghalaya, crops are grown with tree species like Alder, Arecanut, Bamboo, khasi mandarin, pineapple, etc. (Jeva *et al.*, 2006). They have developed bamboo drip irrigation in the undulating topography and hilly terrains. Farmers of Assam have their own traditional pest management practices. The crab trap for controlling gundgi bug in paddy is widely adopted for its efficiency. But

unfortunately, research work on these ITKs is very few. Approval of the scientific community and encouraging their adoption in feasible conditions can make agriculture in the north east more remunerative and eco-friendly.

### **Farm Mechanisation and Traditional Farm Implements**

In this age of technology, farm mechanization is an important aspect for an economically sound agricultural system. But in the north eastern region, it is a big drawback. The farmers use their traditional implements which, in some cases, are time consuming and tedious. Again, the farmers are not financially sound enough for complete mechanization of their farm operations. In such conditions, the research institutes are expected to step forward to work on the existing implements to make them more efficient and cost effective.

### **Climate Change and Natural Disasters of North-East**

The climate change around the world has its impact on the north eastern region also. Global warming is taking its toll. Monsoon is late and prolonged. Floods due to heavy rainfall are common causing unmitigated damage to life and property every year. River bank erosion takes an ugly face each monsoon destroying large areas of agricultural lands in its course. Silting of river beds is a major reason for this.

### **Rural Youth, Migration and Agriculture**

Another major reason for the hindrance in agricultural development in recent years is the migration from the villages to the cities. The educated youth after completion of their studies prefer to stay in the cities and strive for jobs and services rather than going back to the villages and creating job opportunities for themselves and also others. The number of agricultural labour has also increased in the recent years. But due to the single cropping pattern in the villages, there is no work for them in the non-crop period when they come to the cities for jobs. Moreover, the basic facilities of city life allure them towards it in large numbers. The uneconomic and fragmented land holding is another reason for it. The government has to step forward to provide entrepreneurial training to the rural youth, give all the basic amenities like electricity, water supply, roads *etc.* to the villages and develop a reasonable land distribution system to keep the rural people content in their village life and ensure their year round income.

### **Market Infrastructure and Limited Access**

Underdeveloped market infrastructure is another problem in the village areas. Regulated markets are non-existent and the prices of products are decided by the local people themselves. Moreover, the more the supply, the less is the demand. These people when take their products to the cities, the transportation costs, taxes eat up all their profits. When they sell it to the wholesalers in the villages, they never get the actual price of the produce. Strong govt. intervention in setting up regulated markets in the villages, arranging transportation for the rural farmers and reducing the interference of middle men can only help the situation.

### **Low Volume and High Value Export Potential Crops**

The north eastern region has a wide range of climate favouring the growth of a wide variety of agricultural and horticultural plants. Their commercial production can create a huge demand in both Indian and international market. Exemplary works are being done in Anthurium and strawberry cultivation in Mizoram and Meghalaya respectively which are exported to international markets. Tripura has a huge potential for pineapple and orange, kiwi has been introduced in Sikkim, passion fruit is grown in Manipur in a large quantity. The 2000 km international border can be utilized fruitfully by exporting the agricultural, horticultural and allied products to the neighbouring countries. All these potentials are to be used to their optimum level to take north east to the export map of India.

### **Agricultural Research and Development**

The research and development initiative in the north east has been taken by the central government. Indian Council of Agricultural Research has set up its centres in all the states with the research centre for NEH region at Barapani, Meghalaya where the research and development efforts are directed towards evolving technologies for location specific situations. The National Bureau of Plant Genetic Resource for NEH region is also located

here. The Central Agricultural University (CAU) established at Imphal in 1993 was the first of its kind. The seven colleges and three Krishi Vigyan Kendras (KVKs) under it are training the youth in agriculture and allied activities. The developmental aspect is taken up by North East Council (estd. 1971), Ministry of Development of North Eastern Region (DoNER) started in September, 2001, North Eastern Development Finance Corporation Limited (estd. August 9, 1995) and others. They are working for maximizing self governance, capacity building and strengthening infrastructure in the region to reach the desired target of fulfilling the MDGs at least in this part of the country. The National Policy on Agriculture was adopted in 2000 and since has nurtured programmes. Establishment of agricultural credit institutions should also be encouraged.

### **Agricultural Extension**

Extension work needs a rise in the region to create awareness and develop knowledge of the rural people regarding the technicalities of agriculture. As long as the technical know-how is confined to the extension workers, it does not serve its purpose. Only a proper guidance by the extension personnel can change the farming system from non-remunerative to profitable agriculture. Few non-government organizations like NGOs, CBOs and SHGs have been working in the region through social mobilizing, training and capacity building of the rural people. But training farmers only will not suffice. Extension is a two way learning method and the extension personnel should have empathy and proper training to learn from the indigenous population.

A major reason for drawback of extension programme in the North Eastern region is that the extension personnel are mostly from outside the region. They neither have a clear understanding of the region nor the socio-economic mindset of the people. They work for a few years in the region without contributing much. The Govt. has a strong role to play in this situation. Agricultural graduates should be selected from the region, provided fellowships to do M.Sc and Ph.D degrees in agricultural and animal sciences universities and then inducted into the region's Agricultural Research Service. Scientist-centred system in personnel policies should be encouraged and promoted in place of a post-centred system (Swaminathan, 2009).

### **Information Communication Technologies (ICTs) and Its Opportunities**

Taking the research findings to the people in the north east is another big problem. The localities are scattered in the remote parts which have very less access. Because of the hilly terrains, construction of roads connecting those places is very difficult. But fortunately, this has not been a hindrance for the technology. Mobile phones, TV, radio has already reached those places and gained their popularity. Information and Communication Technologies can only save the day in such conditions and should be utilized to their best potential. Popularising Kisan Call Centre, broadcasting programmes on location specific issues of agriculture can increase the credibility of the information provided, make them reach faster and more effective. Two hundred and twenty five tribes and their sub-tribes give great language diversity to the region which also makes extension of research findings difficult. Employing local educated rural youth as facilitators to do the work after training them properly can make the task easier. Resorting to ICTs to do the same in local languages in local conditions can give a faster and easier solution in the remote villages of North East.

### **Group Extension Approaches**

The tribal society in the North East has a very strong bonding and lives in close association with each other. Agriculture knowledge dissemination efforts will be easier if the extension personnel can utilise this situation to their advantage. Persuading one tribe about a particular innovation can take them many steps ahead in persuading about the same to others.

### **Policy Recommendations and Action Plan**

In a nut shell, some of the policy recommendations and action plan that can be taken to develop the tribal community as a whole and agriculture specifically in the North East are indicated below:

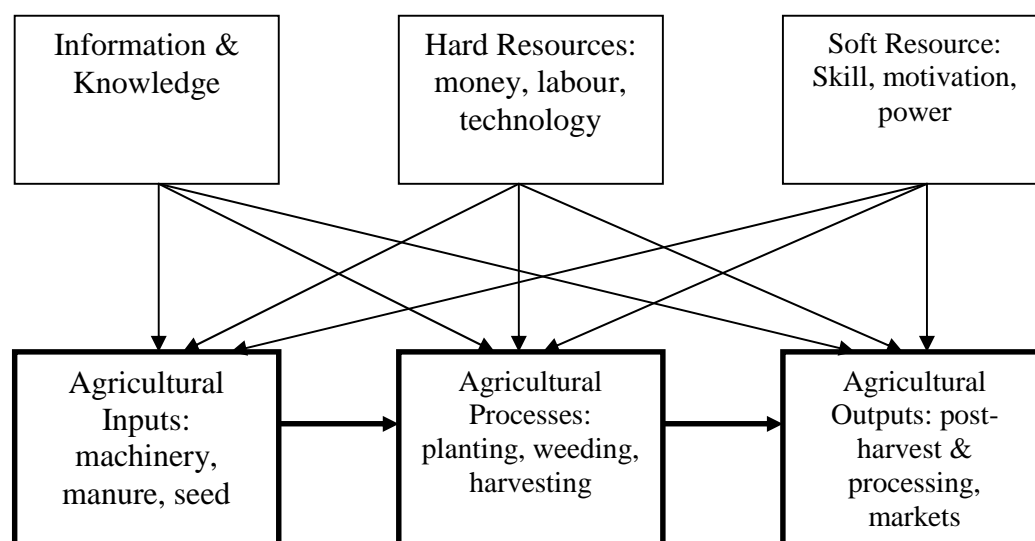


1. **Shifting Cultivation to Permanent (Settled) Cultivation:** Put an end to shifting cultivation for preventing genetic erosion and land degradation.
2. **Change of Cropping Pattern, Diversification & Intensive Cultivation:** Encouraging intensive cultivation keeping in view decreasing land availability and increasing number of mouths to feed. Imparting knowledge to farmers about proper cropping pattern and crop diversification to ensure year round income and sustainable development.
3. **Water Harvesting:** Conserving the water potential of the region through water harvesting for a secured future.
4. **Validation and Popularisation of the ITKs:** Identifying, validating and utilizing the potentialities of ITKs and recognizing their scientific validity.
5. **Small Scale Farm Mechanisation and Improving Local Farm Implements:** Mechanization and improving traditional farm implements for a more remunerative return and reducing the labour.
6. **Encouraging Adoption of Climate-Smart Farm Practices:** Adapting to climate change, but a better option is to prevent the climate change through adopting climate smart farm practices and a resilient agricultural system.
7. **Creating Vocational Skills and Rural Agro-Entrepreneurship:** Discouraging the rural people from migrating to cities by making agriculture a profitable occupation by developing vocational skills among farm youth and also creating Agro-based entrepreneurship opportunities in rural North-East will foster the rural prosperity.
8. **Establishing Local Market Infrastructure:** As the agricultural produce is to be sold by the farmer to get a remunerative return for the cost incurred, a good market infrastructure is very important in the villages which can bring a whole new lot of revolution in the agricultural scenario of North East.
9. **Strengthening Local People's Institutions:** Empowering the rural people through farmers' co-operative banks, self help groups and NGOs will be of real help in taking them forward.
10. **Encouraging Farm Exports:** Getting a remunerative return from the resources and also utilize the international border for their benefit, the people should be encouraged to make maximum use of the potential and go for international trade which will increase the flow of foreign currency in the region.
11. **Agriculture Research and Development:** It is high time to take research and development in agriculture seriously to promote the region in global map of development.
12. **Effective Agricultural Extension:** More efforts from the Ministry of Agriculture, ICAR and State Departments of Agriculture and allied sectors for diffusion of the research findings and developing awareness in the people are expected. Considering socio-economic aspects, North-East specific central sector schemes on agricultural extension need to be designed and implemented.
13. **Human Resource Development in Agriculture:** Agricultural education in the youth should be encouraged as career option by providing fellowships to the selected students for M.Sc and Ph.D and recruit them in the region for an overall development.
14. **Exploring ICTs Potential:** The sources of mass media and ICTs should be utilized to their optimum potential as they can be the harbinger of change in the region.
15. **Relying on Local Strength:** The main asset of the region, the tribal people should be made to realize their own potential and make them their own change agent. Developmental programmes should be rooted through Village tribal councils which will give the feeling of ownership on developmental programmes to the tribal population and they can contribute for better planning, implementation, monitoring and evaluation.
16. **Harvesting Organic Potential:** Most of the tribal farmers of North-east follow organic farming practices as a tradition over the generations. Hence, farm produce in

north-east by default it is “Organic” in nature. Huge potential for organic products in the outside region need to be explored and promoted.

### 17. Holistic Provision of Farm Support Services:

First, the agricultural development programmes/ projects must find a way to deliver all the resources necessary to turn farm information and knowledge into agricultural action. This means the provision of money, labour, technology, motivation, and support. Even if not directly delivered by the project, these resources must be available to the tribal farmers or the information or knowledge will remain unused. Second, the project must work across the supply chain: not just focused on agricultural processes but on backward linkages to inputs (farm machinery, organic manure, seeds) and on forward linkages to outputs (post-harvest technologies, and agricultural markets) (Saravanan, 2011).



**Fig. 3: Holistic Provision of Support Services for the Farmers of North-East India**

(Adopted from Saravanan, 2011)

### Conclusion

The World Development Report-2007 of World Bank had clearly emphasised on attention on agriculture as “...agriculture has effectively served as a basis for growth and reduced poverty in many countries, but many more countries could benefit, if governments and donors were to reverse years of policy neglect and remedy their underinvestment and mis-investment in agriculture...”. Data shows that with the development and transition of a country to an economic stronghold, the share of agriculture in its GDP decreases but in the developing and underdeveloped countries it has an immense role to play in fighting poverty and feeding the hungry mouths. The importance of agriculture lies not only in the fact that it produces food grains but also the immense opportunity of employment, income generation and supporting rural population in its mainstream and allied sectors. Technologies make our life easier, take the human race to a new level intellectually but as long as even one person die from hunger and poverty in this world, the fruitfulness of it will be questioned. It was agriculture that started civilizations around the world in the Neolithic Age (approx. 12,000BC) and has brought men where they are. It is again on agriculture to save humanity today and retain its existence on the face of earth

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