



Changing agricultural scenario and its impact on food habit in north east states of India

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Abstract:

In spite of the population explosion, it is possible to substantially augment the carrying capacity of the land, doubled or even tripled the food grain production and achieved rapid industrialization to provide economic security and improve the quality of life of the people of North East States of India. Since the planning period starts, stress has always been laid on the production of food grains to meet the requirements of the increased population. In this respect, North Eastern Region of India can not be compared with all other states of Indian Federation as growth of population is most alarming in this region due to immigration from neighbouring border countries and the flow of population to this region from other states of Indian Union. This problem of food insecurity can be linked with the backwardness in agricultural development.

INTRODUCTION

The North Eastern Region (NER) comprises seven states of Indian Territory forming 7.8% of the total land area and about 4% of the total population of the country. More than 70 per cent of total geographical area of NER is covered by hills and about 3 million hectare is estimated to be under soil erosion hazard as a result of practice of jhum cultivation. In Assam alone, 83.2 per cent of area are suffered from erosion of slight (35.3 p.c.), moderate (37.7 p.c.), severe (10.0 p.c.) and very severe (0.3 p.c.) intensity. Improvement of soil conservation and soil fertility is a critical component of low income people. Traditionally, agriculture has been the mainstay of people of this region but the agro-based economy fails to flourish as it should have due to lack of proper involvement and utilization of technological aids. As a result, the stamp of 'backwardness' has been attached to this region suffering from food scarcity, while the country moves ahead from its target of production to food surplus in different phases of the post-Independence era. Increasing the yield of crop in a complex system and in an environmentally positive manner is a challenge that will not be easy to meet in a place like NER. It is dominated by the tribal population and the development of agriculture and production of food grains in the region is highly depending upon the custom, culture and the food habit of the tribal people. At the same time, due care

should be taken for the protection of the environment of the region and hence sustainable development in agriculture is highly welcomed in the north east.

Our study began as an attempt to evaluate the on going debate regarding the food prospects of India. This debate is usually depicted as hinging around the issue of future food demand elasticity and the extent to which rise in per capita income will be translated into increased demand for live stock products. As NER is a food deficit area, it cannot be compared with the other states of India, for its peculiar socio-economic and demographic features.

OBJECTIVE OF THE STUDY

The present study is an attempt to focus how the problems of agricultural development can be linked with the social system and the governmental policies of the region. Till now, there is no study regarding this especially in NER of India.

The primary objective of agricultural development is to satisfy the essential materials needs of the society, but the same can not be achieved at the cost of local environment and the culture of the people. Hence, care has been taken to study the tribal way of life and its impact on the agricultural development of the region.

To analyse the agricultural backwardness of the region, some of the social indicators have been chosen. As it is very much customary in this region to blame the rise of insurgency as the major factor which impedes the development of the region in general and the agricultural development, in particular, the study rejects the notion as some of the states of the region made rapid progress in agriculture during the period of insurgency and rise of terrorism.

Finally, the study, based on statistical data and other secondary sources, is concluded with some remedial

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measures and suggestions for the future planners of the country as well as people of the north-east to cope with the currents of new millennium so that a hunger free north-east can be achieved.

Agricultural Development and Allied Problems

Indian economy is pre-eminently agrarian and North-East India is no exception to it. Agriculture occupies a key position in the economy of NER because of its contribution to:

- Overall economic growth through supplies of food, raw materials and export,
- Source of livelihood for over 70 p.c. of population and
- Providing a large market for non-agricultural goods and services.

Also, it is a source of revenue for the state governments of NER. Agriculture in NER has considerable social and political influence. Agriculture has a vital role to play in the economic development of NER, which is a key factor in the economic growth in absence of mushrooming growth of industries as seen in other parts of India especially in western and southern states. NER produces a wide array of crops although the food crops preponderate over other crops accounting for maximum total cultivated area of the entire region. Among food crops, rice is the major crop followed by maize and pulses. But the slow growth in agricultural sector results the slow growth of north east economy. Again, the policy makers are keener on accelerating industrialization than the development of agriculture.

However, the agricultural backwardness of the region is clearly visible in the context of present day India. While other states of India like Punjab, Haryana, West Bengal are marked by food surplus in the production of rice, wheat, fish etc and they blamed the government of India for not having purchasing capacity and an adequate market facility to supply the surplus food grains, the people of NER are importing two million tones of food grains from other regions of the country at a higher prices.

It is very customary in this region to blame the rise of terrorism as one of the major factors which impedes development of the region in general and the agricultural development in particular. However, during the period of insurgency, the studies show that states of Nagaland, Manipur, Mizoram made rapid progress in the production of food grains². Hence, we can not generalize the problem of terrorism as the greatest hindrance in the development of agriculture and in the production of food grains of the region for which the security of life is always threatened.

Food originates from efficient, effective and environmentally benign production technique and conserve and enhance the natural resource base of crops and animal husbandry, forestry and fishery. In Assam rice production in this year is surplus to the tune of 41 thousand tones. The problem lies in the fact that there is high level of poverty and lack of purchasing power of the poor which reduce the ability to access to food and adequate nutrition. However, economic and ecological access will remain as the main challenge at present.

The impending food crisis over the world is due to increasing population, increasing purchasing power of effluents

leading to the consumption of more animal products, increasing damage to the ecological foundation of agriculture, depleting per capita availability of land and water and the absence of technologies that can further enhance the yield of potential of major food crops.

The most important problem which creates hindrance on the way of agricultural development is the problem of population explosion in the region. The total population of the region is about 38.5 million representing about 3.75 per cent of India's total population in 2001. The region's growth rate of population is much higher than the national average. It is striking to note that India's total population increased by 51.80 p.c. in the period 1951-71, 54.39 p.c. in 1971-91 and 21.35 p.c. in the period 1991-2001 whereas for the NER the respective growth rates are 90.86 p.c., 62.11 and 22.02 p.c. At the same time the share of population of NER, in comparison to India, increased from 2.84 p.c. in 1951 to 3.75 p.c. in 2001 (**Table 1**).

Increased population at an alarming rate in the region is due to immigration from outside the country as well as from within the country. The population explosion caused by immigration poses serious threat on the natural resources of the region and the availability of cultivable lands for the people of NER. As a result, the agricultural production could not cope with the growing population and socio economic changes of the region for which the food grain production is short by 2 million tones of demand in this region.

The absolute number of the migrants was more than 91 thousand in 1901. Since then it has been steadily increasing and reached at nearly 745 thousand in the census year 1991. The share of migrants from Bangladesh was between slightly more than 87 per cent in pre-independence era. In post independence era it reached at 94 per cent in 1951- the highest among the periods 1901-1991. From 1961 onwards the share started to decline and became around 89 per cent in the census year of 1991. It is also clear from the statistical information that Bangladesh was followed by Nepal in sending migrants to the NER of India. Again, the number of migrants who came from other states of India varied between 0.5 million to around 0.8 million during the pre independence era. But it declined to around 0.4 million in 1951 and reaching slightly more than 0.5 million in 1991³. In recent years the flow of immigration again shows an increasing trend.

Since north eastern society is dominated by the tribal population, the reference may be made to the tribal method of cultivation. Out of 23.78 lakh hectare of land in the country as a whole 19.91 lakh hectare (83.73 p.c.) of land in the northeast is under shifting cultivation or jhuming adopted in the ancient farming system, which was once considered as a farmer friendly practice has now become an ecological menace. Rapid deforestation over the years 1987-1997 due to the shifting cultivation in the region have reduced the total forest cover amounting to 1312 sq. km (**Table 2**). An inevitable consequence of deforestation is increased run off rain water, precipitation and extensive soil erosion resulting in unacceptable deterioration of top soil, degradation of land and sedimentation of water bases resulting in desertification and frequent flooding. The high rate of soil erosion in deforested areas in our country ranges from 10 tones per hectare in the plains to about 30 tones per hectare in the north eastern hilly region⁴, 10 to 50 times larger than in the forest areas.

The Union Government has sanctioned Rs. 68 crore to the eight North Eastern States during the past three years for modernizing the forest protection force, forest protection system and strengthening the forest management. Tripura and Assam got the maximum amount of Rs. 16 crore each while the other states of the region received 5-9 crore for this purpose. Among the eight NE States, including Sikkim, the forest cover had increased in Arunachal Pradesh and Tripura (N E News Letter, Vol. 5., No.4, April, 2003).

The environmental problems caused by increased sedimentation has extensively affected the capacity of the reservoirs as well as the aquatic eco-system in the inland waters just as soil erosion, in addition to loss of fertility, has drastically reduced the recharging capacity, resulting in severe depletion of under ground water. Extensive deforestation has resulted in increased carbon-di-oxide concentration in the atmosphere. The changes in climate and rain pattern gradually setting in because of deforestation. Water and soil erosion have affected the maximum lands used for agricultural purpose.

The Ministry had allocated an amount of Rs. 47.00 crores (10% of Gross Budgetary Support) under various non conventional energy programmes during 2002-2003 including Rs. 1.50 crore for setting up of State nodal agencies in all the NE States for exclusive implementation of various conventional energy programmes. During March, 2003 an expenditure of Rs. 34.23 crore has been incurred, making a cumulative expenditure of Rs. 46.69 crores during April 2002-March, 2003. A total of 323 Family Type biogas plants were installed in Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim, making a total 3841 plants up to February, 2003 during 2002-2003. Under Village Electrification Programme 178 villages were sanctioned for electrification in NE region during 2002-2003.

The climatic fluctuation and changes in the rain pattern have further compounded the problem of providing adequate food security to our increased population. The gross neglect of environment also resulted in polluting not only river water but also surface water, making them fertile breeding grounds of many communicable diseases due to indiscriminate discharge sewage, dumping of solid wastes etc. Further, the tragedy of the commons due to common ownership of the property right also adversely affects not only the loss of fuel and food but also fodder to a large extent.

In the entire north east, the valley districts of Manipur are among the most productive zones in the production of paddy. However, the same can not be said to be true about the districts of Assam. Moreover, the average yield of paddy in Assam is also lower than the regional yield. Lack of assured irrigation seems to be the major factor behind it. The productivity of paddy in Manipur – Tripura Valley and Mizoram is higher than the regional average and also above Assam which alone accounts for more than 70 per cent of area and output in the region. Mizoram has achieved remarkable growth in the yield rate of paddy since around the middle of 1980. It is due to increase in fertilizer consumption and the new land use policy in Mizoram. Also it is observed from the Table 9, that while the Government of Assam fixed the amount for expenditure in agricultural sector (Rs. 1557.82 lakhs) as on 01.04.1998 but disbursed only 23.60 per cent while only 15.95 per cent of the disbursed amount actually utilized. The same is true in the states

of Arunachal Pradesh and Meghalaya. On the other hand, the government of Tripura and Manipur are not only disbursed more but also actually utilized 70.25 p.c. and 47.09 p.c. respectively on agricultural sector. Perhaps corruption at the governmental level and red tapism of the bureaucrats are responsible for this problem in the states of NER. Although the paddy productivity is the lowest in the state of Arunachal Pradesh, the yield of oil seeds and pulses is the highest in the state along with Meghalaya, Mizoram and the hill districts of Manipur. As the region is classified into hill areas and plain areas, the cropping pattern in hill districts is more varied and not similar to the plain areas. The development of infrastructure facilities like roads, banking, health and communications are perhaps responsible for the above gaps.

The low productivity of food grains explains the shortage of food in the NER and is responsible for poverty of agricultural masses. Agricultural productivity is in inverse proportion in NER to the number of people engaged in it. There is excessive pressure on land resulting in small uneconomic and fragmented holdings. Such small and scattered holdings coupled with defective land tenure system are bound to keep the agricultural productivity very low⁵.

Animal husbandry and Dairy production is an important subsidiary activity of the people in the north east. Meat consumption is very high but the region draws upon supplies from outside to meet its growing demand. As against the all-India average of 29 cattle for 100 persons, NER has 36 cattle for 100 people. The average number of pigs per 100 people in the north east is 53 as against the all-India average as 1 pig. The same is true of poultry farming.

However, the production of milk and egg is less compared to the population of cows and buffaloes and poultry birds and ducks. The traditional food habit of the people of the region and the poor management practices of the government are perhaps responsible for this.

Fish is an important item of diet of the people of north east. According to an estimate, 203617 hectares of the cultivable water area is available for fish farming in the north east. This is apart from 1,61,713 hectare of water spread area in lakes and beels. However, scientific pisci culture has not yet developed in the region and the availability of fish is much less in comparison to its demand.

A sizable area in the region is in plantation of tea. Its share to the total production of tea in the country in the year 1980 was 53.44 per cent. Many parts of the region are showing good potential for the cultivation of rubber, coffee and a variety of horticultural crops. The region has a total cultivable area of 6.13 million hectare out of which net area sown is only 0.80 million hectare. However, the above production has not reached the target due to various socio-economic problems of the region.

Nutrition and Food Security

It is now a well-known fact that the nutrition plays an important role in physical efficiency of the people and act as a device to determine the food security in a country and in different parts of the country. India is a vast and varied country. There are large differences in per capita income, availability of the food stuffs, purchasing power, dietary habits, habitual consumption of food stuffs, health and

nutritional status between different states in the country and even in different areas of a state. In almost all the states, there are substantial urban-rural and inter district variations along with the marked variation between tribal and non-tribal population within the district, for which it is always a difficult task to measure the nutritional standard of the population living in a particular region and the case of NER is highly apparent. It is always a fashion in India to relate food problem with income or private household consumption expenditure. The nutritional value of food items is implicitly or explicitly assumed to be constant. The income elasticity of poor households is supposed to be always less than unity. The income elasticity is sometimes calculated for the sake of deriving relationship with food expenditures. The nutrient intake, household income and working capability of individuals in the household are interrelated. The expenditure incurred on food items is an indication of nutrition intake. Each food item has some calorie value and therefore total calories purchased and consumed as indicated through private consumption expenditure of a household. At the same time it should also possible to say that lower is the consumption expenditure of a household, lower is the calorie intake and that is why intake of calories determines the food poverty. Further, poverty on account of lower intake of calories that are needed to maintain health as the particular household was unable to earn adequate wages or income to purchase the nutrient required. Food provides energy and body spent energy. Once the food intake activity is stopped, the death is certain. Food items are comprised of carbohydrates, proteins, fats, vitamins and minerals. Besides, water is essential for digesting the intake of food ingredients. Although the climatic conditions, food habits, money in hand, age, height, weight and other factors influence the diet and calorie needed, still we can derive the consumption norm based on food items like rice, wheat, pulses, fish, egg, meat, milk and vegetables etc. Hence, the above description may serve as the indicators to determine the nutrition deficit in the population of the NER. The dietary standards differ from one country to another. The recommended intakes of nutrients of a nation differ from those of international norms set up by FAO and WHO. The term used to describe dietary standard is "Recommended Dietary Allowance (RDA)"⁶. The Table 8 shows the quality of items (Recommended Dietary Requirements) should be consumed by the persons of different sex and age groups. This is the level of intake of essential nutrients considered, in the judgment of the committee (national or international) on dietary allowances, to be adequate to meet the known nutritional needs of practically all healthy persons.

Education is the main instrument of social change. It is the index of social progress and economic development of a region. Normally it has been considered an agency helping economic production through the development of skills and efficiency highly necessary for the said production. Education is an organic entity, changes, grows with the time, responds to the needs of the society adapts to the environment. It was mostly an ornament in the agricultural civilizations, a tool in economic development in the industrial era and has become today all pervasive resources, a resource that can find substitutes for other resources, but has no substitute for it.

A look into the Table 3, it is observed that the female

literacy rate is highest in Mizoram (95 p.c.) followed by Nagaland (77 p.c.) and lowest in Arunachal Pradesh (48 p.c.) which is the only state in NER below the national level in this respect. There is a big gender gap in literacy which is one of the major obstacles in attaining total literacy. Enrolment in various stages of education is growing at a fast rate, but the proportion of girls is low and declines sharply at higher stages of education. The highest gender gap has been found in the states of Manipur (24.03 p.c.), Arunachal Pradesh (21.76), Tripura (20.93) and lowest in Mizoram (7.01) followed by Meghalaya (8.27). However, all the states of NER are below all-India level (24.84 p.c. points)⁸.

The development of an area is best reflected in the distribution of basic needs. Table 4 confirms the fact of region's backwardness as it is observed that the per capita consumption of electricity is much lower in the states of NER as compared to the country's consumption (338.5 kwh). Among the states of NER, the highest per capita consumption is observed in the state of Meghalaya (134.5kwh) and lowest in Tripura (80.4 kwh).

The North Eastern Council (NEC) has contributed to the North Eastern Region power supply through its power projects. The county's third hydel power project and the first in the North East, which is located in the heart of Shillong at Mawprem is all st to be revived after a gap of 81 years since its inception. The Ministry of Non-Conventional Energy Sources (MNCES) will finance the restoration of the Sonapani Hydel Power Plant, which is expected to light Mawprem and part of Mawlai area. The power plant, which will be "totally unmanned and remote control based" is expected to generate its full capacity of 1.5 Mega Watt for six to seven months especially during the Monsoon and 50% to 62% during other seasons. The unique feature of remote controlling is the first of its kind in the North East and will be managed by the Mawlai 132 KV sub-station.

Drinking water is the most precious commodity in our daily life. Supply of safe drinking water is essential to sustain life. It is remarkable to note that in the state of Mizoram, only 16.21 per cent of households can enjoy the facility of safe drinking water while water is the life blood of the environment (Table 4). With a view to ensure community participation in creation and maintenance of source and in the interest of long term sustainability of the sources, Government has introduced reforms in the rural water supply schemes which is called SECTOR REFORMS. West Tripura is one of the 63 districts in the country which have been chosen for implementation of the reforms programme. District Water & Sanitation Mission (DWSM) has been constituted for overall supervision of the project, while District Water & Sanitation Committee (DWSC) and Village Water & Sanitation Committee (VWSC) have been formed for implementation of the programme.

The Centre has constituted a separate cell for the North East in the Ministry of Rural Development to bring the region at par with the rest of the country. The cell, headed by Union Rural Development Ministry Joint Secretary would look after the development of infrastructure in the region besides, generation of employment. The cell has made it mandatory for all the Ministries of the Central Government to allocate 105 of their budget to the region. The Union Rural Development

Ministry had also allocated 10% of its budget for the North East since 2000-2001.

Despite of several governmental measures, the purchasing capacity of the people of NER has not increased up to that level what our planners and policy makers desired. The statistics of per capita income of the people of NER may be stated as, in 1992-93 the per capita income of Nagaland and Mizoram was just slightly above the national average (Rs. 5781 at current Prices) whereas in case of Arunachal Pradesh it was marginally below Rs. 5551 (Table 10). In case of Manipur, it was Rs. 1429, Meghalaya Rs. 1361, and Tripura Rs. 1323.. The per capita income in 1980-81 was not only so significantly below the national average over the periods (1980-81 to 1992-93).

Per Capita Net State Domestic Product (PCNSDP) gives a rough idea about the economic condition of NER with respect to all-India level. It is observed that all the states of NER except Arunachal Pradesh (Rs.2119 –Rs.3265) and Mizoram (Rs.2119 – Rs.7743) are below the all India level (Rs. 1857 – Rs. 2553) for the years 1985-86 to 1994-95. In this respect Assam's position is the lowest for ever during the period 1990-91 (Rs. 1544) to 1996-97 (Rs. 1628) and also in the period 1980-81 (Rs. 1254). The picture shows the economic backwardness of the region in general and Assam in particular (Table 5).

Monthly Per Capita Expenditure (MPCE) may be accepted as an indicator of standard of living for people, on the basis of minimum calorie intake, suggested by Indian Council of Medical Research (ICMR) which should be 2400 calorie for an Indian working persons in rural India and 2100 calorie in urban India. This exercise yielded the official or Planning Commission's poverty line (per capita expenditure for 30 days) of rural and urban India at 1973-74 prices as Rs. 49.02 and Rs. 56.64 respectively⁷. Thus an estimated people of 46.02 p.c. in urban India and 56 p.c. in rural India were below the poverty line in the year 1998. Considering the economic condition of NER, it is estimated that the percentage of population below the poverty line is higher in respect of all-India level in 1998 and which come out as 56.83 p.c. and 42.33 p.c. for the rural and urban people of NER respectively (Dutta, 2003). However, as per NSSO's round survey, the poverty ratio has declined in the north east. It has declined to 40.01% in 2000 as round survey, 2000 as compared to 45.01% in 1993-94.

It should be noted that, as for example, the state of Nagaland could not spend the Ninth Plan outlay fully. The Tenth Plan outlay had been projected for Rs. 2227.65 crore which was 11% higher than the Ninth Plan outlay. State Government was advised to have regular monitoring so that tenth plan outlay could be utilized fully. Concern was expressed on the large size bureaucracy eating into resources meant for developmental activities, high rate of population

growth, lower literacy in two districts, lower sex ratio, tardy implementation of developmental programmes and absence of banking facilities affecting credit supply in rural areas.

In the north eastern hill areas food production is subject to wide fluctuations due to shifting cultivation. Hence estimate of production may not give the true picture. However, during the last two decades per capita production has declining in the states of Assam, Manipur, Meghalaya and Mizoram and are lower than the national average except in the state of Arunachal Pradesh. While the population is rapidly increasing in the states of the region, it is observed that in case of Assam, the per capita food production decreased from 158 kg. In 1972-73 to 154 kg. in 1990-91 which further decreased to 139 kg. in 1997-98. The respective figures for Meghalaya are 120 kg., 87 kg. and 83 kg. only (Table 4).

It is interesting to note that on a global basis, only 8 p.c. increase in food grain production in the last 50 years, has been through expansion of cultivable area, the rest 92 p.c. coming from improved irrigation techniques and use of high yielding cultivates. About 46 p.c. of the global food grain production comes from irrigated area, which has increased from 80 million hectares in 1950 to 240 million hectares in 1993. It will not be possible to increase the total annual food grain productivity in the country beyond 250 million tones, with the present agricultural practices, which totally falls short of the requirement to produce a minimum of 400 million tones by the year 2050 to provide adequate food security to the projected 1.8 billion population⁹.

A look at the Table 6, it is observed that the performance of the northern states in comparison to all-India level, regarding availability of cereals, all the states of NER excluding Arunachal Pradesh and Tripura, are below the national average (522.7 gms per capita per day). In case of per capita per day availability of pulses, it is observed that all the states of NER are below the all-India average over the period 1983-1999.

Table 7 gives a picture of per capita per day availability of food grains production where same picture is observed as in case of pulses. It is observed that Arunachal Pradesh, the only state in NER tried to maintain its superiority till 1994 but declined thereafter.

Thus food insecurity is a matter of great concern not only to the people of NER but also to the policy makers and planners of NER. It is further observed that no proper care has been taken for the development of agriculture to increase production by which the living condition of the society of NER may be a better one.. Modern technologies, irrigation facilities, scientific and modern equipments are not being properly used for the real development of agriculture in the age of globalisation and liberalization and for which the region stepping back day by day.

Table 1. Population Trend in North East Region (in'000)

Year State	1951	1961	1971	1981	1991	2001
Arunachal Pradesh	---	337	468	632	865	1091
Assam	8029	10837	14625	18041	22414	26638
Manipur	578	780	1073	1421	1837	2389
Meghalaya	606	769	1012	1336	1775	2306
Mizoram	196	266	332	494	690	891
Nagaland	213	369	516	775	1210	1989
Tripura	639	1142	1556	2053	2757	3191
N E R	10260	14501	19582	24752	31547	38495
India	361088	439235	548160	683329	846303	1027015
Decadal growth Rate of NER	---	41.34	35.04	26.40	27.45	22.02
p.c. of NER with respect to India	2.84	3.30	3.57	3.62	3.70	3.75

Table 2. Forest Cover in NER of India (Sq. Km.) during the period 1987-1997

State	1987	1989	1991	1993	1995	1997	Total change over decade	Total geographical area of Land (in sq. km.)
Arunachal Pradesh	60500	68783*	68757	68661	68621	68621*	- 162	83578
Assam	26386*	26058	24751	24508	24061	23824*	- 2562	78523
Manipur	17679	17885*	17685	17621	17558	17318*	- 567	22356
Meghalaya	16511*	15690	15875	15769	15714	15657*	- 854	22489
Mizoram	19092*	18178	18858	18697	18576	18775*	- 317	21087
Nagaland	14351	14356*	14321	14348	14291	14221*	- 135	16527
Tripura	5743*	5325	5535	5538	5538	5346*	- 397	10477
NER	160262	166255*	165777	165142	164359	164943*	- 1312	255039
India								3280483

Table 3. Female Literacy Rate, Female Work Participation, Gender Gap in literacy and Density of Population (per sq. km.)

State	Female Literacy Rate (in p.c.)		Female Work Participation (in p.c.)	Density of Population (population per sq. km.)			Gender Gap in Literacy	
	1991	2001		1951	1991	2001	1991	2001
Arunachal Pradesh	29.69	44.24	37.5	--	10	13	21.76	19.83
Assam	43.03	56.03	21.6	102	184	340	18.84	15.90
Manipur	47.60	59.70	39.0	26	82	107	24.03	18.17
Meghalaya	44.85	60.41	34.9	27	79	103	8.27	
Mizoram	78.60	86.13	43.5	9	33	42	5.73	
Nagaland	54.75	61.92	38.0	13	73	120	7.01	-
Tripura	49.65	65.41	13.8	61	263	304	12.87	9.85
NER				40	124	151	20.93	16.06
India	39.29	54.16	22.3	117	273	324	24.84	21.69

Table 4. Per Capita Food Grain Production, Consumption of Electricity and Percentage of Households having Electricity, Safe drinking water in N.E.States

	1*	2*	Per capita food grain production (in kg.)				3*
	1996-97	1991	1972-73	1980-81	1990-91	1997-98	
Arunachal Pradesh	80.8	40.85	104	207	253	186	70.02
Assam	107.6	18.74	158	150	154	139	45.85
Manipur	127.9	50.92	159	205	155	152	38.72
Meghalaya	134.5	29.16	120	116	87	83	36.16
Mizoram	127.8	59.20	244	70	118	123	16.21
Nagaland	88.0	53.42	107	136	160	150	53.37
Tripura	80.4	36.93	116	196	187	152	37.18
India	338.5	42.37	172	190	208	198	62.30

1* per capita consumption of electricity (in kwh)

2* percentage of households having electricity

3* percentage of households having safe drinking water

Table 5. Per Capita Net State Domestic Product (At Current Prices 1980 - 81), in Rs.

State	1980-81	1985-86	1990-91	1994-95	1995-96	1996-97
Arunachal Pradesh	1571	2119	2710	3265	3304	3059
Assam	1284	1510	1544	1585	1606	1628
Manipur	1419	1598	1739	1986	1993	---
Meghalaya	1361	1412	1733	1673	1808	1837
Mizoram	1289	2658	4474	7743	---	---
Nagaland	1448	1653	1916	2270	---	---
Tripura	1307	1240	1646	1898	2113	2197
India	1625	1857	2267	2533	2664	2814

Table 6. Per Capita Availability of Cereals and Pulses (in Gms.) Per Day in NER

Year State	CEREALS				PULSES			
	1983	1988	1994	1999	1983	1988	1994	1999
Arunachal Pradesh	569.8	675.4	653.9	446.6	--	--	15.3	16.8
Assam	365.8	359.5	410.2	373.9	7.10	7.71	6.72	7.69
Manipur	418.5	461.0	492.4	476.4	2.93	--	--	--
Meghalaya	293.8	235.1	208.2	225.9	3.88	4.03	3.54	3.07
Mizoram	179.1	233.2	398.6	395.8	0.52	4.39	35.2	28.6
Nagaland	392.6	247.2	432.1	423.6	3.88	9.58	19.82	22.1
Tripura	535.6	475.8	457.1	391.9	3.02	4.13	5.91	3.9
India	448.4	443.6	520.5	522.7	45.2	37.6	40.5	41.1

Table 8. Recommended Dietary Requirement in Grams

Food Items	Adult Male			Adult Female			Children		Boys	Girls
	(1)	(2)	(3)	(1)	(2)	(3)	(4)	(5)	(6)	(6)
Cereals	460	520	670	410	440	575	175	270	420	380
Pulses	40	50	60	40	45	50	35	35	45	45
Leaf Vegetables	40	40	40	100	100	50	40	50	50	50
Other Vegetables	60	70	80	40	40	100	20	30	50	50
Roots & Tubers	50	60	80	50	50	60	10	20	30	30
Milk	150	200	250	100	150	200	300	250	250	250
Oil & Fat	40	45	60	20	25	40	15	25	40	35
Sugar & Jaggery	30	35	55	20	20	40	30	40	45	45

(1): Secondary Worker (2): Moderate Worker (3): Heavy Worker
(4): 1-3 years (5): 4-5 years (6): 10-12 Years.

Table 9. Agricultural development in ner (rupees in lakhs)

State	Unutilised amount of money	Amount fixed for Expenditure as on 1.4.98	Amount disbursed	Expenditure
Arunachal Pradesh	421.96	980.32	327.05	94.11
Assam	1440.65	1557.82	365.65	58.67
Manipur	919.52	1538.84	474.90	223.64
Meghalaya	334.20	878.91	523.06	74.01
Mizoram	204.72	1434.17	941.18	283.48
Nagaland	415.22	1799.22	1333.18	574.92
Tripura	537.38	1015.77	438.90	308.34

Table 10. Per capita output (at current prices, in rs.)

State	1980-81	1986-87	1992-93
Arunachal Pradesh	1561	3274	5551
Assam	1200	2313	4230
Manipur	1429	2362	4180
Meghalaya	1361	2250	4458
Mizoram	1289	2658	5910
Nagaland	1448	2591	5910
Tripura	1323	2108	3569
India		1625	2703
Coefficient Variation:			
India		31.04%	27.84%
NER	30.39%	7.69%	14.31%
	18.21%		

CONCLUSION AND SUGGESTION

The continuous neglect of soil health and fertility exhaustive methods of cultivation must be rectified through appropriate soil conservations methods and efficient use of organic and inorganic plant nutrients through improved soil management practices. Though reduced use of fertilizers is advocated for environmental effects, the use of inorganic fertilizers is a must in the present moment where soil fertility is low and loss of soil and nutrients are more and large section of population are poor and insecure in food supply.

Distribution of improved varieties of crops, arrangement for fertilizer and proper irrigation facilities, availability of these inputs of farmers level, demonstration and training for effective and efficient use of organic and inorganic fertilizers in various farming system through Integrated Nutrient Management System and plant protection through Integrated Pest Management by bio-pesticides etc can be effectively managed in these areas. Besides long term property rights to land, access to credit, marketing facilities of produce and investment in roads and rural transportation system are to be efficiently managed.

Educated youths of the villages must be attracted in farming through spreading science-based precision farming techniques which are both intellectually stimulating and economically rewarding. Increased investment in effective Agricultural research through private sector, NGO's and other agencies is most important NER in particular to achieve household food security and nutritional security.

In the Indian Council of Agricultural Research (ICAR) vision 2020 strategic plan to achieve food and nutrition security it propose to address the issues of bio diversity, natural resource management, farming system approach, rain-fed agriculture, post harvest management, farm mechanization, information networking and effective partnership with other public and private institutions.

It is necessary to improve all the factors employed in agricultural viz. land, labour, capital and enterprise. Poor quality of seeds, non-adoption of modern technologies, non-use of plant protection measures, out-of-date implements, lack of adequate or biased finance (agricultural credit), absence of productive investment in land due to defective land tenure system, poor communication between research and extension or development agencies and lack of irrigation facilities are the low agricultural productivity in the region.

REFERENCES

- [1] Bansil, P. C. (1999): Demand For Foodgrains By 2020 A.D., Observer Research Foundation, New Delhi.
- [2] Bhalla, G. S. and P. Hazell (1997): Food grains Demand in India to 2020, Economic And Political Weekly, December 27.
- [3] Bhalla, G. S. , P. Hazell and J. Kerr (1999): Prospects for India's Cereal Supply and Demand to 2020, Food, Agriculture and the Environment, Discussion Paper 29, International Food Policy Research Institute
- [4] Dutta, P. C. (2002): Development Social Forestry in Assam of North Eastern Region, IJRS, Vol.-34, No.2, pp52-62.
- [5] Dutta, P. C. (2003): Regional Disparity and its Consequences in North Eastern Region of India, In Economic Liberalization and Regional Disparities in India – Special Focus on the North Eastern Region (Eds.) A. C. Mahapatra and C. R. Pathak, Star Publishing House, Shillong. , 179-182.
- [6] Dyson, T and A. Hanchate (2000): India's Demographic and Food Prospects- State Level Analysis, Economic and Political Weekly, November 11.
- [7] Faruquee, R (1998): Bangladesh Agriculture in the 21st Century (Ed.), The University Press Ltd., Dhaka, Bangladesh
- [8] Kalirajan, K. P., G. Mythili and U. Sankar (2001): Accelerating Growth through Globalization of Indian Agriculture(Eds.), Macmillan India Ltd. , New Delhi.
- [9] Kapila, Uma (2002): Indian Economy Since Independence (Ed.), Academic Foundation , New Delhi.
- [10] Kumar, P. (1998): Food Demand and Supply Projections for India, Agricultural Economics Policy Paper 98-01, Indian Agricultural Research Institute , New Delhi.
- [11] Misra, V.V. and M. Govinda Rao (2003): .Trade Policy, Agricultural Growth and Rural Poor – Indian Experience, 1978-79 to 1999-2000, Economic and Political Weekly, 38(43), 4588-4603.
- [12] Narain, Prem, S. D. Sharma, S. C. Rai and V. K. Bhatia (2003) : Evaluation of Economic Development at Micro Level in Karnataka , Journal of the Indian Society of Agricultural Statistics, 56 (1), 52-63.
- [13] Samanta, R. K. (1994): Issues For Agricultural Development in Tribal Dominated North East India, in India's North East – The Process of Change and Development, B. R. Publishing Corporation, Delhi.
- [14] Swaminathan, M. (1999): Understanding the Cost of Food Corporation of India, Economic and Political Weekly, December 25.