

Agriculture Development in the North-Eastern Region Since Independence

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The agriculture potentialities in the North-Eastern Region is very vast, all the States and Union Territories in the region are weak in respect to agriculture economy. Though some of the units are marginally surplus in rice production, but the region as a whole imports large quantities of food from the central pool. Before Independence agriculture sector suffered from deep rooted institutional, structural, economical and social constrains leading to low productivity. After Independence in 1947, India's progress in Agriculture development is inspring, particularly after 1968, when the Country achieved 100 million mark in food production. With the spectacular increase in food grain production in India and several developing countries of Asia, Africa and Latin America the term 'Green Revolution' was coined to designate this spectacular increase in food production. The North-Eastern Region has been largely by-passed by the Green Revolution. Progress of agriculture development did not keep pace with increase in the population. More than half the tribal population in the hilly areas subsists on jhuming, living perpetually on the brink of starvation. The production oriented programmes of the Government have hardly touched the North-Eastern Region. Large scale immigration from the neighbouring countries who took up agriculture added to the problem.

In terms of natural resources, the North-Eastern Region is one of the richest region in the Country. Economically, it is one of the most backward regions. Its backwardness also reflects on its dependence on primitive type of agriculture practice of shifting cultivation, which besides being primitive method of cultivation is also considered uneconomical.

The region stretches from 21.57'N to 29.28'N Latitude and from 89.40'E to 97.25'E Longitude. As per the 1981 census the total population of the region has been estimated at 2,66,19,592 which is about 4 percent of the total population of the Country. Table 1 summarises some selective and basic statistic about the North-Eastern Region.

Periods of Agricultural Development

The periods of agriculture development in the North-Eastern Region may be divided into two parts. The dividing line being early seventies. In the year 1971 an act was promulgated for the North-Eastern States. This act was known as "North-East area reorganisation Act 1971". This act came into existence on August 1, 1972. This act gave the entire region a new shape. Assam was divided into several States and Union Territories. These were the States of Meghalaya and Nagaland and Union Territories of Mizoram and Arunachal Pradesh. Thus the entire North - East comprised of seven units, namely, the States of Assam, Manipur, Meghalaya, Nagaland and Tripura and Union Territories of Arunachal Pradesh and Mizoram. Prior to re-organisation of States there were only three States in the region ; Assam, Manipur and Tripura. The State of Assam comprised of :

1. Assam Plain Division
2. Assam Hill Division

Under the hill division there were five autonomous hill districts.

1. United Khasi and Jaintia Hills.
2. Garo Hills.
3. Lushai (Mizo) Hills
4. United Mikir Hills.
5. North Cachar Hills.

Before Independence, Tripura and Manipur were princely States, they were taken over as a territory of the Indian Union in 1949. Prior to 1954, Arunachal Pradesh was known as North East Frontier Tracts. In 1954 it was redesignated as North-East Frontier Agency and in 1972, it was given the status of Union Territory.

Cropping Pattern

The soil and climate of the North-Eastern States are extremely suitable for growing various food, vegetable, flowers and horticulture, Tea and Plantation crops. There are two distinct seasons Kharif (June/July to October/November, and Rabi (November to March/April). Crops are also grown between March/April to June. Thus the cropping pattern in the North-Eastern Region is more or less similar to that in other parts of India. Foodgrain occupy about 77 percent of the total cropped area (Table 2). In most parts agriculture is largely monoculture, with rice as the main crop. More than 60 percent cultivated area is under rice. Tea and Jute are the principal cash crops. Cultivation of sugarcane and

Tobacco is limited to small areas. About 1.95 lakh hectares of land is under tea cultivation and more than 50 percent of the countries tea is produced in Assam. Other cash crops grown are chillies, ginger, turmeric and arecanuts. The region is rich for cultivation of horticulture crops (Vegetable, flower, fruits and Tree culture) About 70 percent of the land is hilly and majority of soils are acidic and irrigation facilities are poor. These limitations provide suitable agro-climate condition for cultivation of different fruits like Jackfruit, Pineapples, Pear, Plum, Peaches, Oranges, Lemon, Apples, Banana, Papaya and several economically important trees,

Land Holdings

In most of the North-Eastern States maintenance of land records are either vague or records are not available. Except Assam the agricultural census agency has classified the other six units as non-land records states or Union Territories. For the present paper data on land records have been collected from Agriculture census 1970-71, 1976-77 and 1980-81 (Table 3 and 4). In Tripura majority of the farmers are sharecroppers. In Assam 76 percent of the total holdings are owned by individuals, about 15 percent is rented about 9 percent is partly owned and partly rented. In the hilly areas of Manipur, Meghalaya, Nagaland, Arunachal Pradesh and Mizoram majority of the farmers cultivate their own land. In these areas land is owned by individuals, village communities, district councils and/or religious bodies. Except Nagaland and Arunachal Pradesh in other units more than 65 percent of the household with less than 2 hectares of cultivable land cultivate about 35 of the total area under cultivation. In Nagaland about 30 percent of the household with more than 10 hectares of cultivable land cultivate 68 percent of the total area under cultivation. In Arunachal Pradesh about 6 percent of the household have more than 10 hectares of cultivable land cultivate about 30 percent of the total cultivable area. The per-capita availability of land varies from 0.51 hectares in Tripura to 8.98 hectares in Arunachal Pradesh, with a mean value of 2.23 hectares. In comparison with all India the per-capita availability of land in the North-Eastern Region is very high when only 13.36 percent of the total area in the North-Eastern region is under cultivation against an all India average of 47.0 percent. The average size of operational holding under marginal, small, semi-medium, medium and large as per the census record of 1970-71, 1976-77 and 1980-81 is presented in Table 3. It is interesting

to note that except Nagaland and Meghalaya average size of large holding is increasing in Assam, Tripura, Arunachal Pradesh and Mizoram, while marginal holding is decreasing in all the Units except Tripura and Arunachal Pradesh. The average area of operational holding ranges from 1.08 in Tripura to 4.3 in Arunachal Pradesh to 7.41 in Nagaland (Table 4). Average size of the family ranges between 5 persons in Nagaland and 8 persons in Mizoram.

The proportion of net cultivated area to total area is very low. In 1951-52 the percentage of net cultivated area to total area in the North-East region was 9.8 percent compared to the all India average of 37 percent, since then cultivated area in the North-East region increased very slowly. In 1981-82 net area sown was 3538 thousand hectares constituting only 13.86 percent of the total area, as compared to all India average of 47.0 percent. These figures indicate that extension of cultivated area is very limited. As per the 1980-81 land utilisation statistic area under cultivable waste in the seven units is only 746 thousand hectares. In 1981-82 the area sown more than once was about 4 percent of the net sown area as compared to all India average of 11.5 percent. The only way to increase production is to increase the area under double cropping with proper use of new technology associated with biologically improved varieties of seed, and other modern inputs.

Agricultural Labour

The census report of 1951 puts more than 60 percent of the population in the North-East Region depends on agriculture as their livelihood. This number increased to 73.35 percent in 1961, it was 69.35 percent in 1971, it was increased to 74.73 in 1981 (does not include Assam). Except Tripura there has been relatively small increase in the agriculture labour. Agriculture workers constitute 74.73 percent of the total working force in the North-Eastern region. This percentage varies from 67 percent in Manipur to 75 percent in Mizoram (Table 5).

Agriculture labourers and cultivators in the North-Eastern Region can be classified into two categories :

- (i) Region with low ratio of agricultural labours to cultivators.
- (ii) Region showing phenomenal growth in the agricultural labour to cultivators.

Nagaland, Mizoram and Arunachal Pradesh have low ratio of agricultural labours to cultivators, Assam, Manipur, Meghalaya and Tripura have shown phenomenal growth of the agricultural labours to cultivators. Prior to 1971, except Tripura the per-

centage of agricultural labours to cultivators was low in all the Units in the region. The low percentage of agriculture labour in most of the tribal dominated states is due to the customary land tenure system.

Fertilizer

The soils in the North-East are rich in organic carbon they are low in available phosphorus and potash, they are deficient in some of the micro nutrients. About 9 percent of the soil are acidic in reaction. The present consumption of fertiliser in the North-Eastern region is quite below the all India average of 46.3 Kg/ha (Table-6), a scientific type of manuring based on the needs of the crop(s) and the type of soil which will increase the crop yield has been investigated by ICAR Scientist (Table-7) for the entire North-Eastern Region. In the North-Eastern Region the use of chemical fertilizer was low in the 60s, its use remained stationary in the 70s. In the 80s use of chemical fertilizer gradually increased in Manipur, Meghalaya, and Tripura, however, there is a year to year variation in its consumption. Some observations which follow from our investigation revealed that at present most of the fertilizer is used on cash crops which give immediate return like vegetables, Potatoes, Tea etc. Very little is used on food crops.

Production wise only the state of Assam produces chemical fertilizer, of the total production of about 90 thousand tonnes of chemical nutrient (Nitrogen -N and Phosphorus- 2O5) only 40-45 percent is utilised in the region. (Table -8).

Irrigation

The history of development of irrigation in the North-Eastern region before and after Independence presents a very dismal picture. The principal source of irrigation in the region are natural drains and canals scattered all over the valley. Prior to Independence, development of irrigation in India was taken up in areas where famine was a periodic phenomenon. The North-East though prone to floods was not in the famine belt. It has been taken for granted that North-Eastern region is better provided by nature with abundant rainfall and soil moisture than other parts of the Country. The agriculture commission in its 1976 report has classified the percentage of gross sown area that can be ultimately irrigated into 4 groups, as follows :

Group I : Less than 3 percent.

Meghalaya.

Group II : Between 35-50 percent.

Tripura and Nagaland.

Group III : Between 50-6 percent.

Manipur.

Group IV : Between 65 - and above Assam.

Mizoram and Arunachal Pradesh have not been mentioned in the report. Observations made through our investigation reveal that Mizoram and Arunachal Pradesh could be grouped under **Group I** (Less than 35 percent). Since 1951 irrigation potential have not increased significantly. The percentage of area under irrigation appears high as the initial base figure were extremely low (Table - 9). The main source of water supply for agriculture in the region is rainfall. In most parts of the hilly region rainfall is spread over a period of eight months in a year from March to October while in the plains about 70% of the total rainfall are confined to the month of June, July and August, early showers arrive in May and late showers last till about last part of September. In most parts December, January and February are dry as a result there is very little agricultural activity during rainless months. In the hills agriculture activity during the dry months is confined to vegetable and potatoe cultivation.

The area under irrigation between 1950-51 to 1961-62 in the North-Eastern region increased by 1,61,000 hectares, however, these figures may be misleading as 1951-52 figures for Manipur and Tripura are not available. If 1971-72 figures are taken as base figures then the growth of irrigation has not increased substantially. The problem of irrigation is quite visible in the plain areas, and during the drier periods throughout the region. In comparision with the 1981-82 census figure to 1971-72, only the State of Meghalaya, Nagaland, Tripura and Union Territory of Mizoram have shown increase in irrigated land. The entire Brahmaputra valley can be considered a vast reservoir of ground water, but development of irrigation in several areas in the North-East region either neglected or its progress has been at a very slow rate.

Table - 10 shows statewise distribution of irrigated area in different states and union territories in the North-Eastern region. Percentage wise Manipur has the higher percent of area under irrigation while Assam has highest area under irrigation. In both these States area under irrigation has remained static since 1961-62.

Food Production

The area under food grains which was 81.10 percent during

1951-52 declined to 75.4 percent during 1954-55. There was an increase in the area of foodgrain production during 1960-61 to 82.0 percent. Since 1964-65 area under food grain production is under decline, however, during the last 15 years the percentage of total cropped area under cereal and pulses have remained static. Among the cereals area under rice the main food crop of the region have declined in their base level share over the years. Potato is the only crop to have shown a considerable gain in area, while in some areas wheat cultivation has been started, and its area is under increase in Arunachal Pradesh, Meghalaya and Tripura. Area under wheat cultivation in Assam has remained static since mid 70s. (Table 2) Food grain production has increased from 1.89 million tonnes in 1952-53 to 3.82 million tonnes during 1983-84, an increase of 101 percent. Taking 1970-71 as the base figures, percentage increase in food grain production between 1970-71 to 1980-81 is about 40 percent which is almost equal to all India level.

The average yield of foodgrains in the North-Eastern region is very low compared with those in other states in India (Table 11) During the last 30 years the overall yield of foodgrains have increased, though at a very slow pace. It is seen that during the last 30 years the use of chemical fertilizer was almost negligible. It may be pointed out here that, rapid increase in crop yields would be difficult without the application of fertilizer. On the contrary the yields of foodcrops in the North-Eastern region with very low rate of fertilization (Table 6) appears to be satisfactory. If the per hectare consumption of fertilizer in the North-East region is increased to all India level there will be a substantial increase in foodgrain production. As already indicated that extension of cultivated area is very limited, increase in yields will have to come from increase in output.

TABLE - I
Selective Basic Statistic of North-Eastern Region

State/U.T.	Geographical Area (000 ha)	Latitude & Longitude.	Population (in lakhs)	Density (Per Km)	Tribal Population (%)	Literacy (%)	Average Farm size (ha)	Cropped Area (%)	Population Practive agriculture (%)	Average fertilizer consumption (km/ha)
Assam	17852	24.8N - 27.56N 89.4E - 96.0E	199	253	..	28.15	2.3	28.1	66*	4.0
Manipur	2236	23.83N - 25.68N 93.03E - 94.78E	14.21	63	32.79	41.35	1.9	27.4	67	15.6
Meghalaya	2249	25.2N - 26.70N 89.50E - 92.47E	13.35	59	86.13	34.08	3.2	9.0	73	14.3
Nagaland	1653	25.6N - 27.4N 93.20E - 95.15E	7.75	47	89.70	42.57	3.5	11.0	72	1.7
Tripura	1048	20.56N - 24.32N 91.10E - 92.21E	20.53	195	31.53	42.12	1.1	36.1	68	8.2
Arunachal Pd.	8358	26.28N - 28.38N 91.30E - 97.25E	6.32	7	73.02	20.79	4.2	1.5	73	0.70
Mizoram	2110	22N - 24.24N 92.21E - 93.20E	4.94	23	15.02	59.88	2.3	4.9	75	0.70
North East Region	25505	21.57N - 29.28N 80.40E - 97.25E	266.7	104	..	..	2.6	19.3	71	6.5
India	328778	8.4N - 37.6N 68.7E - 97.25E	6838.0	208	9.54	36.23	0.3	52.4	65	46.3

Source : 1981 Census, * Assam 1971 Census.

TABLE - 2

Percentage Area Under Foodgrain, Rice and Oil in North-East Region

	1951-52	1954-55	1960-61	1964-65	1970-71	1977-78	1980-81	1982-83
Foodgrain	81.10	75.4	82.0	75.7	77.3	74.5	76.1	77.2
Oil	5.3	4.9	4.7	4.2	4.9	4.8	5.7	5.9
Rice	77.4	70.5	78.6	70.86	67.3	67.7	63.1	68.5
Others	13.6	19.7	13.3	20.1	17.8	20.7	18.2	16.9

Source : Statistical Abstract 1955-56, 1962, Bulletin of Rice Statistics, 1974

TABLE - 3

Average size of Operational Holding 1970-71 (A) 1976-77 (B) and 1980-81(B)

	Marginal			Small			Semi-Medium			Medium			Large		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Assam	0.54	0.44	0.43	1.48	1.41	1.43	2.74	2.73	2.74	5.54	5.48	5.29	57.88	55.28	77.60
Manipur	0.53	0.54	0.55	1.67	1.23	1.36	2.45	2.44	2.59	5.11	4.71	5.36	16.6	..	..
Meghalaya	0.68	0.53	0.53	1.51	1.31	1.32	3.76	2.54	2.55	5.46	4.99	4.97	12.5	13.90	13.30
Nagaland	0.72	0.63	0.45	1.23	1.54	1.31	2.67	3.01	2.64	5.96	6.77	6.14	18.5	18.52	15.76
Tripura	0.40	0.46	0.49	1.40	1.43	1.52	2.69	2.68	2.79	5.47	5.37	5.58	32.47	41.81	52.75
Arunachal Pradesh	0.56	0.61	0.61	1.43	1.42	1.4	2.78	2.77	2.70	5.97	6.17	6.0	17.15	18.39	22.2
Mizoram	..	0.7	0.7	..	1.3	1.4	..	2.4	2.4	..	5.0	4.8	..	15.2	..
Total	0.51	0.55	0.53	1.43	1.42	1.43	2.79	5.67	2.77	5.67	6.04	5.98	7.15	17.58	17.24
All India	..	0.39	0.39	..	..	..	..	2.78	2.77	..	..	..	..	..	..

Source : Agricultural Situation in India, March 1985, August 1986

TABLE 4

Average area of Operation Holdings of North-Eastern States

	1953-54	1959-60	1970-71	1976-77	1980-81
Assam	2.14	1.67	1.46	1.37	1.36
Manipur	1.13	1.13	1.15	1.12	1.24
Meghalaya	a	a	1.68	1.74	1.74
Nagaland	a	a	5.40	7.61	7.41
Tripura	1.53	1.50	1.01	1.25	1.08
Arunachal Pradesh	a	6.9	6.19	5.95	4.3
Mizoram	a	a	N	1.5	1.5
North East	1.6	2.8	2.8	2.9	2.7
All India				2.0	1.82

'a' included with Assam; 'N' - not available

Source : *Basic Statistic NEC : Indian Agriculture in Brief, Agriculture situation in India March 1985, and August 1985*

TABLE - 5

Percentage of Cultivators and Agricultural Labourers to Total Workers

	Cultivators	Labourers	Cultivators	Labourers	Cultivators	Labourers	Cultivators	Labourers	Cultivators	Labourers
Assam	61.35	3.29	64.69	3.65	55.85	9.92	59	9.92	59	8
Manipur	62.12	0.26	65.43	0.61	67.00	3.65	63	3.65	63	10
Meghalaya	a	a	a	a	69.15	9.88	70	9.88	70	2
Nagaland	a	a	88.22	1.14	78.34	1.45	44	1.45	44	24
Tripura	62.95	8.94	64.24	7.53	54.41	19.96	72	19.96	72	2.5
Arunachal Pradesh	a	a	a	a	78.34	1.96	72	1.96	72	3
Mizoram	a	a	a	a	83.53	0.36	72	0.36	72	3
All India	50.02	19.72	52.82	16.17	43.34	26.33	42	26.33	42	25

a=Included in Assam

Source : Census of India ; Basic Statistics, North Eastern Region, 1982 (NEC)

TABLE - 6

Consumption of Plan Nutrient per unit of Gross Cropped Area (kg/ha NPK)

	1974-75	1975-76	1976-77	1978-79	1980-81	1981-82	1982-83	1983-84	1984-85
Assam	2.30	1.90	1.80	2.33	2.8	3.3	3.8	5.6	4.0
Manipur	10.80	7.40	11.90	14.50	14.5	15.5	17.5	16.2	15.6
Meghalaya	8.50	9.90	9.90	9.30	8.30	9.5	12.8	13.8	14.3
Nagaland	0.90	1.10	1.80	1.40	0.50	2.0	0.8	1.9	1.7
Tripura	2.70	1.30	1.07	3.10	5.50	7.0	6.9	9.0	8.2
Arunachal Pradesh	..	..	..	0.46	8.70	..	..	..	..
Mizoram	..	..	..	1.70	0.70	..	..	..	..
All India	15.90	17.10	25.0	29.70	30.50	34.6	36.2	43.5	46.3

Source : Fertilizer Statistic 1977-78 ; 1979-80 ; 1981-82 ; 1984-85, Fertilizer association of India

TABLE 7**Recommended Dose of Fertilizer for North-Eastern Region**

	Nitrogen (N)	Phosphorus (P 205)	Potassium (K)
Rice			
(a) Upland	40-60	60	40
(b) Low-land	50-60	40	60
Maize	80	60	40
Soyabean	20	60	40
Wheat	75	60	40
Arhar	30	80	30
Raddesh	90 Cu, Mn, B, and Zn 5 kg/ha.		
French Bean	0	75	0
Sweet Potato	120	90	90
Cassava	90	0	90
Colocasia	0	0	60
Turmeric	100	150	100
Plum	100 : 200 : 100 gm/Tree		

Source : *ICAR Technology Bulletin, Vol. I, Crop Science* 1985

TABLE 8**Total Production of Fertilizer in the North Eastern Region * (000 Tonnes)**

	Ammonium Sulphate (20.6%)	Urea (46% N)	Single Super phosphate (16% P205)	T O T A L		
				Nitrogen	Phosphorus	N P
1975-76	94.0	54.3	8.7	44.0	1.0	40.0
1976-77	90.4	161.0	13.6	93.0	2.0	95.0
1981-82	27.2	179.6	12.0	88.2	1.9	90.1
1982-83	39.3	198.8	11.1	90.5	1.0	101.3
1984-85	27.2	179.6	12.0	82.2	1.9	84.1

* Only Assam Produces Fertilizer ; Source : Fertilizer statistic FAO

TABLE 9

Net Area Irrigated in North-Eastern Region 1951-52 to 1981-82.

(000 hectares)

	Canals		Tanks	Wells	Other Sources	Total
	Govt.	Private				
1951-52						
Assam	60	259	..	..	263	582(24.3)
Manipur	..	..	..	..
Tripura	..	..	..	..
1959-60						
Assam	72	292	..	..	257	31(28.1)
Manipur	..	68	..	..	..	68(75.5)
Tripura	..	..	a	..		8(0.5)
Total	72	360	a	..	265	697(27.8)
1967-68						
Assam	72	292	..	..	248	612(25.5)
Manipur	..	68	..	..		68(75.5)
Tripura	..	..	a	..	8	8(0.5)
Total	72	360	a	..	265	697(27.8)
1967-68						
Assam	72	292	..	..	248	612(25.5)
Manipur	..	..	..	..	65	65(36.3)
Nagaland	..	..	2	..	12	12(25.5)
Tripura	..	..	..	..	15	17(7.2)
Total	72	392	2	..	340	706(24.7)

1971-72						
Assam	71	291	--	--	210	572(25.5)
Manipur	--	--	--	--	65	65(46.4)
Meghalaya	...	...	...	...	37	37(22.8)
Nagaland	...	...	...	...	12	12(19.3)
Tripura	...	...	...	...	22	22(9.2)
Arunachal Pradesh						
Pradesh	6	...	...	...	17	23(20.0)
Mizoram	..	1	..	..	1	2(4.2)
Total	77	292	..	--	364	733(24.4)
1978-79						
Assam	71	291	..	--	210	572(21.3)
Manipur	..	..	..	..	65	65(46.4)
Meghalaya	..	..	...	...	48	48(24.8)
Nagaland	..	..	..	...	54	54(36.0)
Tripura	..	..	...	...	29	296(11.7)
Arunachal Pradesh						
Pradesh	..	...	...	...	24	24(21.4)
Mizoram	..	..	...	...	8	8(10.3)
Total	71	291	..	...	448	810(22.5)

Figures in parenthesis indicate percentage.

Source : *Fertilizer Statistic* 1981-82, 1984-85.

TABLE - 10

Net - Irrigated Area

	1950-51		1961-62		1971-72		1975-76		1977-78		1981-82	
	A	B	A	B	A	B	A	B	A	B	A	B
Assam	541	24.3	612	25.6	572	25.6	572	22.0	577	21.4	72	21.1
Manipur	..	..	68	40.5	65	46.4	65	46.4	65	46.4	65	46.4
Meghalaya	..	..	a	..	37	19.0	43	34.7	43	24.7	51	25.9
Nagaland	..	..	12	25.5	12	19.4	37	32.7	38	33.3	68	40.5
Tripura	..	..	13	5.7	22	6.1	30	12.5	30	12.5	38	11.8
Arunachal Pradesh	..	..	a	..	23	17.6	23	17.6	23	17.6	24	21.4
Mizoram	..	..	a	..	2	4.1	8	10.4	8	10.6	8	10.4
Total	541	..	702	..	733	..	778	..	784	..	830	..

A Area in 000 hectares

B Percentage of Net area sown

a included in Assam

Source Basic statistic 1882 NEC, Fertilizer Statistic 1981-82, 1984-85

TABLE 11

Yield in Kilogram per Hectare of Important Crops in North-East Region

	1952-53	1960-61	1972-73	1975-76	1980-81	1982-83
Rice	930	935	997	1970	1150	1156
Cereal	950	927	1007	1064	1144	1142
Pulses	1000	..	487	401	423	425
Potatoes	5214	4151	4624	5377	4150	4095
Oil	390	349	424	403	496	470
Foodgrain	950	910	989	1043	1116	1113
Jute	1448	..	1280	1367	1365	1400
Sugarcane	3285	..	37339	36771	35514	40954

- Source :
1. *Fertilizer Statistic FCI* 1981-82, 1984-85.
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Summary

As per the 1984-85 estimates 3696 thousand tonnes of food-grain was produced in the North-Eastern Region, with 475 grams of foodgrain per person per day there is a yearly shortage of about one million tonnes. This trend in the food grain production has been observed since the early 80s. India's food stock level is around 29 million tonnes. Foodgrain supplies from the central pool to the North Eastern Region does not appear to pose any problem. Nevertheless with all possible resources and favourable conditions for agriculture development the region could attain self-sufficiency in food grain production.

extensive cultivation, let us examine the factors responsible for increasing yields of fodgrian. The scope of physical expansion of arable land is limited, increase in food production will have to come from the existing cultivated land. In order to increase productivity of land, irrigation facilities needs to be increased, occurence of perenial food need to be controled, fertilizer consumption will have to be increased. Thus the assets that are easily availbale in the region needs to be fully utilised.

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