

CHAPTER 2

A PROFILE OF AGRICULTURAL DEVELOPMENT IN ASSAM

2.1 Introduction

The economy of Assam is mainly rural and agrarian. Agriculture occupies a vital position in the economy of Assam. As per population census of 2001 about 53 percent of the total working force are engaged in agricultural activities in the state. The contribution of this sector in the state domestic product (SDP) at constant (1993-94) prices was 31.84 percent and at current prices was 32.56 percent in 2001-2002.

Assam is producing both food and cash crops. Main food crops in Assam include rice, wheat, pulses, vegetables, maize etc. The principal cash crops are tea, jute, oilseeds, tobacco, sugar-cane, mesta etc. The area under these crops have increased considerably since 1951. The area under food crops in Assam increased marginally from 27 lakh hectares in 1975-76 to about 28 lakh hectares in 2000-2001. Total area under rice increased from 23.0 lakh hectares in 1976-77 to 26.46 lakh hectares in 2000-2001, which accounts for nearly 74 percent of the total cultivable area of the state. Area under non-food crops, except jute, registered an increasing trend.

Out of the total geographical area of 7852 thousand hectares, net sown area in Assam up to 1999-2000 was to the extent of 2734 thousand hectares and area sown more than once was 1352 thousand hectares making the total cropped area in Assam to 3503 thousand hectares. There are 80 thousand hectares of cultivable waste land and 110 thousand hectares of fallow land. In 1999-2000 total cropped area of the state stood at 4087 lakh hectares which constitute about 52 percent of the total geographical area of the state against the all India coverage of 51 percent.

According to the agricultural census of 1995-96 there were about 26.8 lakh operational holdings which covered an area of about 37.43 lakh hectare of land compared with the figures of the earlier census, 1990-91, the number of operational

holdings during 1995-96 were higher by 6.33 percent and operated area declined by 2.07 percent. The marginal holdings with less than 1 (one) hectare of land accounted for 62.22 percent of the total holdings and 19.80 percent of the total operated area of the state in 1995-96. In the case of small holdings with size class between 1-2 hectare, the share turned out to be 20.91 percent of the total holdings and 24.52 percent of the total operational area. On the other hand, the large holdings (20 hectares and above) constituted only 0.19 percent of the total number of operational holdings, with 10.47 percent of the total operated area in the state. An important feature revealed by the agricultural census is that the average size of operational holdings in the state recorded a declining trend over the successive censuses. The average size of operational holdings, which was 1.37 hectares in 1976-77, recorded marginal decline to 1.36 hectares in 1980-81. In 1985-86, the same declined to 1.31 hectares and in 1995-96, it further declined to 1.17 hectares. At all India level too, the average size of holdings was found to have gradually declined from 1.69 hectares to 1.57 hectares over the period 1985-86 to 1990-91. The following table shows the position of agricultural holdings and operated area from 1970-71 to 1995-96.

Table 2.1 Numbers, Area and Average Size of Operational Holdings in Assam

Item	1970-71	1976-77	1980-81	1985-86	1990-91	1995-96 (P)
No. of Holdings	1964376	2253654	2297588	2419156	2523379	2625390
Total operated area (in thousand ha)	2882	3079	3121	3161	3205	3253
Average size of holdings (in ha)	1.47	1.37	1.36	1.31	1.27	1.24

Source: Directorate of Economics & Statistics, Assam.

Economic Survey 2002-2003, Assam, Page – 19;

P= Provisional

The above table indicates some important features about land holding pattern and operational area in Assam. The table reveals that total no. of holdings in Assam

increased from 19,64,376 holdings for 1970-71 to 26,25,390 holdings for 1995-96. Another important feature revealed by the table is that the average size of operational holdings in Assam has been declining day by day. It was 1.47 hectares in 1970-71 and it declined to 1.24 hectares in 1995-96. At the all India level also the average size of holdings have also declined from 2.00 hectares in 1976-77 to 1.57 hectares in 1995-96. But still average size of operational holdings of Assam is lower than all India average holding size. Apart from small average size holdings the geographical land to man ratio in Assam is one of the lowest among the Northern East (N.E.) states.

Table- 2.2 Land to Man Ratio in North-East Region (Hectares/ Person) as on 1991.

State	Geographical Area (Ha)	Population	Ratio
Arunachal Pradesh	83,74,300	8,64,558	9.69
Assam	78,43,800	2,24,14,322	0.35
Manipur	22,32,700	18,37,149	1.22
Meghalaya	22,42,700	17,74,778	1.26
Mizoram	21,08,100	6,89,756	3.06
Nagaland	16,57,900	12,09,546	1.37
Tripura	10,48,600	27,57,205	0.38
All N.E.	2,55,08,300	3,15,47,314	0.81
All India	32,87,26,300	84,63,02,688	0.39

Source: CMIE Report on Agriculture, 1997-98

It appears from the table 2.2 that among the NE States the geographical land to man ratio is the highest in Arunachal Pradesh (9.69 hectares/ person) and the lowest in Assam (0.35 hectares/ person). The table also shows that the overall

geographical land to man for the NE region (0.81 hectares/ person) is much higher than the national average (0.39).

The main cause of decline in the average size of holdings as well as land to man ratio in Assam is excessive population pressure due to absence of alternative occupation particularly in the rural areas. A large majority of population i.e. to the extent of more than 70 percent has to depend on agriculture sector alone. Thus this excessive dependence on agriculture is exerting huge pressure on agricultural land holdings. According to 2001 census more than 53 percent of the total working population in Assam are engaged as cultivators and agricultural labours. The excessive dependence of the population on agricultural sector has been causing continuous subdivision and fragmentation of land holdings in Assam. All these have been resulting in a continuous decline in the average size of holdings and land to man ratio in Assam.

Again the distribution of holdings by size groups is worth mentioning. The proportion of holdings below 1.0 hectare of land is significantly high being about 62.64 percent. Similarly proportion of holdings between 1 and 2 hectares also account for a large number of holdings. As per 1995-96 agricultural census data, the proportion of operational holdings, percentage of area and average size of different farm categories are shown in the table 2.3 below:

Table 2.3 Percentage Distribution of Operational Holdings in Assam, 1995-96

Sl. No.	Category	Size of holdings/farms	%of holdings	% of land area	Average size (in ha)
1.	Marginal farm	Below 1 ha	62.64	21.16	0.37
2.	Small farm	Between 1 & 2 ha	20.85	26.18	1.39
3.	Semi medium	Between 2 & 4 ha	12.86	30.85	2.65
4.	Medium	Between 4 & 10 ha)	3.50	16.05	5.07
5.	Large	10 ha & above	0.13	5.74	47.50

Source: Statistical Handbook, Govt. of Assam, 2002, pp. 50-51

The table 2.3 shows that marginal and small farmers constitute more than 80 percent of holdings. But the average size of their holding is very small which is only 0.37 ha and 1.39 ha respectively which are uneconomic.

What is the size of economic holding is a question often asked. There are various factors which determine the of possibility raising an income, sufficient for an average family to maintain at a reasonable standard of efficiency. This possibility of earning income from a particular size of farm is determined by the nature of land, technical possibilities of raising crops, other important facilities such as HYV seeds, irrigation, availability of other agricultural inputs and expertise of the farmer himself. The agro-climatic conditions being varied within the state, it is not possible to arrive at a precise idea of an economic holding. The underdeveloped nature of agriculture makes it more difficult. However, 2.5 to 3.5 hectares may be considered an economic holding with paddy as the main crop under the existing cropping pattern and technology.

2.2 Cropping Pattern: By 'Cropping Pattern' is meant the proportions of cultivated land at a particular point of time that are devoted to production of different crops, as also changes in those proportions over a period of time.

For a long period of time most of the land (about 90 percent) of Assam was put under food crops and the remaining land was used for the production of non-food crops. But from the middle of this century and particularly from 1960's a changing trend in cropping pattern in Assam has been occurring and this trend is continuing till today. The following table 2.4 reveals the change in cropping pattern in Assam since 1960-61.

Table 2.4 Change in Area under Different Crops in Assam since 1960-61 (in thousand hectares)

Crops/Year	1960-61	1980-81	1990-91	2001-02
1. Total Food grains	4572 (84.9)	2521 (84.2)	2755 (83.5)	2752 (83.99)
Rice	4320 (80.2)	2275 (75.9)	2526 (76.5)	2537 (77.34)
Wheat	09 (0.16)	102 (3.4)	84 (2.5)	69 (2.10)
Other coarse cereals	58	23	32	28 (0.85)
Pulses	185 (3.4)	113 (3.8)	113 (3.8)	118
2. Total Non-food grains	813 (15.1)	474 (15.8)	545 (16.5)	525 (16.00)
Oilseeds	309 (5.7)	233 (7.8)	320 (9.7)	320 (9.7)
Jute	299 (5.5)	112 (3.7)	96 (2.9)	68 (0.03)
Cotton	32	4	2	2
Mesta	11	12	7	5
Sugarcane	62	48	36	27
Potatoes	76 (1.4)	38 (1.2)	56 (1.6)	80 (2.43)
Others	24	26	25	23

Source: Statistical Handbook, 2004 and earlier issues.

Note: Figures in bracket shows percentage figures to total area under different crops.

The above table 2.4 shows that the proportion of area under food crops was 84.9 percent in 1960-61 and it marginally declined to 83.99 percent in 2001-02. So it is evident that proportion of land used for food grain production is still higher. The table also shows that area under non-food grains including various cash crops was only 15 percent in 1960-61 and it increased marginally to 16.5 percent. As regards the production of jute which was at time popular as a cash crop among agriculturists is gradually becoming unpopular in Assam. The area under cultivation of jute in Assam as percentage of total cropped area which was 5.5 percent in 1960-61 gradually declined to 0.03 in 2001-02. Another notable change in the cropping pattern in Assam as seen in the table is that the area under the cultivation of oilseeds

as percentage of total cropped area increased gradually from 5.7 percent in 1960-61 to 9.75 percent in 2001-02.

A change in cropping pattern implies a change in the proportion of area under different crops. At one time many believed that cropping pattern in India and more particularly in Assam could not be changed. Sinha (1964) for instance, gave expression to such an opinion when he wrote: "In a tradition ridden country with a very low level of knowledge, the peasants are unwilling to make experiments. They accept every thing with a spirit of resignation and a sense of fatalism. For them, agriculture is a way of life rather than a commercial proposition. In an agricultural community where the members are illiterate and tradition ridden, there is hardly any possibility of crop shifts". This opinion is not correct any more as is clear from the change in cropping pattern in Punjab and Haryana. With the passage of time things have changed a lot in Assam also. Farmers have started to believe that the cropping pattern can be changed and must be changed for further agricultural production and to bring agricultural diversity. Improved agricultural practices like HYV seeds, irrigation, fertilizer and some modern agricultural implements along with remunerative price of produce and economic farm size can play an important role in changing the traditional cropping pattern into a modern one irrespective of physical characteristics of soil, climate, weather, rainfall etc.

2.3 Production and Productivity

Agricultural production in Assam, area, productivity per hectare and total output are influenced in a large measure by rainfall and weather conditions. Monsoon is the most important factor determining agricultural production and productivity in Assam. The rains are totally uncertain in Assam. Sometimes rains are insufficient and sometimes there is too much of rain resulting in heavy floods which cause widespread damage and destruction. It is difficult to isolate the weather factor and study only the effects of agricultural inputs and technology on agricultural growth. Agricultural production and productivity in Assam has been found to be low and varying year to year mainly due to weather and climatic factors.

Production of food grains and other principal crops in Assam are shown in the following table:

Table 2.5 Total Production of Food grains in Assam Since 1960-61 (in lakh tones)

Year	Production of Foodgrains
1960-61	16.79
1968-69	20.41
1969-70	18.26
1970-71	20.34
1974-75	16.67
1975-76	23.66
1980-81	27.05
1985-86	30.30
1989-90	29.51
1990-91	34.42
1991-92	34.80
1992-93	34.02
1993-94	34.16
1994-95	35.17
2000-01	41.73

Sources: Statistical Handbook, Assam, 2002 and earlier issues.

The table 2.5 given above reveals that total production of food grains in Assam has been increasing gradually since 1960-61 and it has become more than double during the last 35 years i.e. from 16.79 lakh tones in 1960-61 to 41.7 lakh tones in 2000-01. But this increase has not been uniform throughout the years under consideration. The main reason for the variation in the production of foodgrains in

Assam is natural factor like weather and climate and non-adoption of improved agricultural technology.

Production of other cereal crops in Assam viz. wheat, maize etc. has registered some increase in recent years. Production of most of the cash crops like sugarcane, potato, oilseeds etc. registered only marginal increase in recent years.

The following table 2.6 shows the trend in the production of principal crops in Assam since 1960-61.

Table 2.6 Production of Principal Crops in Assam (thousand tones)

Crops/Year	1960-61	1980-81	1990-91	1991-92	1992-93	1993-94	2000-01
Autumn rice	267	502	522	494	614	587	58
Winter rice	1367	1978	2565	2487	2442	2556	2760
Summer rice	7	43	183	216	243	219	681
Total rice	1641	2523	3270	3197	3299	3362	3999
Wheat	3	118	105	111	79	101	86
Other coarse cereals	9	17	18	18	18	18	17
Pulses	26	47	49	54	51	56	62
Total food grains	1679	2706	3442	3380	3402	3536	4105
Oilseeds	48	112	169	191	150	144	155
Jute (a)	813	912	866	867	1034	667	668
Sugarcane	869	174(b)	1522	1453	1548	1374	988
Potato	144	224	428	473	388	507	677

Source: Statistical Hand Book, Assam, 2002 and earlier issues.

Note: (a) 000 bales of 180 kg

(b) Production of Gur

The above table reveals that total production of rice which is the most important crop of Assam, has increased from 1641 thousand tones in 1960-61 to 3999 thousand tones in 2000-01. Total production of pulses in Assam which was very low at 26 thousand tones in 1960-61 gradually increased to 62 thousand tones in 2000-01. Similarly the table shows that production of most of the crops has increased but growth rate is very slow.

Thus we have seen that although the production of principal crops in Assam have been increasing but it has increased at a slower pace in comparison to that of all India production of principal crops. Following table 2.7 shows the production of important agricultural commodities in India since 1960-61.

Table 2.7 Production of Important Agricultural Commodities in India From 1960-61 to 2000-01 (in million tones)

Commodities\Year	1960-61	1970-71	1980-81	1990-91	1993-94	2000-01
Foodgrains	82.0	108.4	129.6	176.4	182.1	195.9
Rice	36.6	42.2	53.6	74.3	79.0	84.9
Wheat	11.0	23.8	36.3	55.1	59.1	68.7
Pulses	12.7	11.8	10.6	14.3	13.1	10.7
Oil seeds	7.0	9.6	9.4	18.6	21.5	18.4
Sugarcane	110.0	126.4	154.2	241.0	227.1	299.2
Tea	0.3	0.4	0.6	0.7	n.a	n.a
Coffee	Neg.	Neg.	0.1	0.2	0.2	0.25
Jute (bales)	4.1	4.9	6.5	7.9	7.4	10.5
Potato	2.7	4.8	9.7	15.2	17.6	n.a

Source: Govt. of India, Economic Survey 2001-02 and earlier issues.

Cotton Bale – 170 kilo; Jute Bale – 180 kilo

Neg. – Negligible n .a. – Not available

From the above table it appears that during 1960-61 to 2000-01 the production of food grains have been continually increasing year after year. Production of food grains increased from 82.0 million tones in 1960-61 to 195.9 million tones in 2000-01. During 1950 and 1960 import of cheap food grains from the United States under PL 480 (when wheat price was around Rs. 2.00 per kilo) hampered the growth of agriculture. It was only after 1970 when imports of food grains were stopped and minimum prices of different agricultural commodities were guaranteed that production of food grains and non-food grains started increasing. Also during 1970s due to increasing use of hybrid seeds, chemical fertilizers, pesticides and assured supply of water, there took place what has come to be known as the “Green Revolution” in respect of rice and wheat in some parts of India and that explains rising production of food grains especially during 1970-71 to 2000-01.

But so far as the question of increase in production in Assam is concerned it started increasing only after 1980. Production rate in Assam is lower (already mentioned) than all India level. Prices of agricultural commodities are not still guaranteed and sometimes prices of some commodities decline to the lowest level that discourages agricultural production in Assam. Moreover, use of hybrid seeds, fertilizers, irrigation is still at the preliminary stage that necessarily explains the cause of low productivity in Assam in comparison to all India level.

2.4 Agricultural Yield Rate

The yield rate of various crops in Assam is not at all satisfactory in comparison with the average yield rate of all India. In Assam cultivation is still carried on with traditional techniques and modern inputs like fertilizers, HYV seeds, irrigation and pesticides etc. are yet to be extensively used. Further yield per hectare of land differs from crop to crop and also from place to place. In Assam the yield rate of rice per hectare increased from 1022 kg in 1970-71 to 1220 kg in 1980-81. It had further increased to 1362 kg in 1993-94 and again to 1565 kg in 2000-01. The yield rate of wheat also increased from 583 kg in 1990-91 to 1219 kg in 2000-01. Similar rising trends have also been observed with respect for yield rates of crops

like jute, sugarcane, mustard, pulses and maize. The yield rate of most of the crops of Assam and India can be seen from the table 2.8 given below.

Table 2.8 Yield Rate of Crops in Assam and India (kg/ha)

Crops\Year	1970-71		1980-81		1990-91		2000-01	
	Assam	India	Assam	India	Assam	India	Assam	India
Rice	1022	1123	1220	1336	1291	1740	1565	1901
Wheat	583	1307	1158	1930	1248	2281	1219	2708
Jute	1305	1186	1455	1245	1632	1833	1730	2021
Sugarcane	37217	4800	39000	58000	42510	65000	36898	68500
Potato	4524	10000	5888	13000	7240	16000	8254	18000
Rap & Mustard	413	580	485	560	535	940	515	941

Source: (i) Assam Economic Survey, 2002-2003 and

(ii) Statistical Handbook, Directorate of Economics & Statistics, 1994 and earlier issues.

The table 2.8 reveals that the productivity of major crops in Assam is much below the national average. The productivity of rice in Assam in 1980-81 was 1220 kg/ha as against the national average of 1336 kg/ha and regional productivity of 1219 kg/ha. Among the NE states productivity in Assam is one of the lowest. In 1980-81 the productivity of rice was 1447 kg in Manipur, 1333 in Meghalaya and 1354 kg in Tripura. Even the productivity of wheat is comparatively low in Assam as against the regional productivity of 1463. It was 1158 kg in Assam in 1980-81. In fact wheat productivity in Assam has gone down further in recent years. This is not an encouraging sign.

It is evident from the table 2.8 that agricultural yield of various crops in Assam are poor and even declining gradually in the case of some crops.

Thus, the agricultural sector in Assam has been suffering from low productivity. It has not developed significantly for which per capita availability of food grains is still one of the lowest even among the North Eastern states. The table 2.9 shows the per capita availability of food grains in North East.

**Table 2.9 Per Capita Availability of Foodgrains (1991-92 & 1996-97)
Based on the 1991 Population Census (kg/ annum).**

State	Per capita Availability of food grains (kg/ annum)	
	1991-92	1996-97
Arunachal Pradesh	254.23	254.0
Assam	150.76	157.58
Manipur	190.57	212.67
Meghalaya	87.50	85.59
Mizoram	130.77	193.98
Nagaland	168.33	175.19
Tripura	176.52	201.69
All NE	154.84	164.71
All India	198.95	235.52

Source: CMIE Report on Agriculture, 1997 & 1998.

It appears from the table that the per capita availability of food grains in Arunachal Pradesh (254 kg/ annum) is the highest among NE states (164.71) and even higher than the national average (235.52 kg/ annum). The per capita availability of food grains in Assam is lower than not only Arunachal Pradesh but also Manipur (212.67), Mizoram (193.98), Nagaland (175.19) and Tripura (201.69). The table also shows that as per report of 1996-97 the per capita availability of food grains is lower than the national average in all the other NE States except Arunachal Pradesh. It is the lack of adoption of modern technology that explains the agricultural backwardness and food grains deficiency in Assam.

Agricultural productivity in Assam still remains considerably stagnant and poor. The main causes of low agricultural productivity in Assam are small size and uneconomic land holdings, orthodox method of cultivation, lack of assured irrigation facilities and socio-economic factors like farmers conservative outlook, ignorance, illiteracy etc. Present position in Assam is not conducive enough for adoption of improved agricultural technology for augmentation of agricultural production.

KEY MAP OF ASSAM SHOWING BARPETS DISTRICT

