



Food Security Status of Assam: A Districts Level Analysis

SANJOY BORTHAKUR*, MRIDUSMITA BORTHAKUR AND MANOJ KUMAR SINGH¹

KVK, East Kameng, Pampoli, Arunachal Pradesh, India

ABSTRACT

Food security is the foremost important issue of a state or a country. The development of a country or a state is highly dependent on it. Food unsecured population cannot think for other issues of their life. In the state of Assam, just after independence the state had enough food for the population, which gradually decreased until 1981-83. But, after 1981-83, the per capita availability of food grains had increased gradually due to use of modern practices of cultivation *viz.*, high yielding varieties, fertilizers, etc. which led to increase in production. Nevertheless, this increase could not surpass the normative requirement of total food grains. Thus, although per capita availability of total cereals was marginally higher than the normative requirement, the state remains food deficit state since 1961-63 to 2000-02. Almost similar trend of change in per capita availability of food grains was observed in all the districts of the state with a few exceptions. Per capita availability of pulses as well as oilseeds was found to be very low, which was far below the normative requirement and in most of the cases revealed a declining trend.

Keywords: Food security, Per capita availability, Consumable product, Time series data

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INTRODUCTION

Food security is one of the vital issues of a state or a country since, development of a country or a state is highly dependent on it (Bharati *et al.*, 2014; Shedlin *et al.*, 2016). Assam is one of the important states of North Eastern region of India, where agriculture is the mainstay of economy that accounts for 40 percent of state domestic product (Anonymous, 2002 and Saxena, 2011). Food sufficiency helps in attaining economic development. Among the food-grains, rice is the principal crop, which alone occupies nearly 70 percent of gross cropped area and cover around 80 percent of total food production in the state (Bhowmick and Borthakur, 2002). Usually, food deficit states have the additional task enhancing productivity to bridge the gap. Although, the production of rice had increased over the years especially during the last decades, but, the per capita availability had not improved substantially (Das, 2016). More importantly, the higher population growth on the one side due to natural growth and influx of people from neighbouring countries and other states of India has resulted in the share of incremental growth of population in the state. According to the Census of India, 2001 the population of Assam stands at 2,66,55,528. Growth of population in the state after Independence (1951-2001) is 232 per cent against national growth rate of 184 per cent during the period. Most of the studies conducted in the past have excluded this important point in estimating food availability in the state. Considering the facts mentioned, the present study is an attempt to analyse the status of food availability in the state during the post independence period.

MATERIALS AND METHODS

District level time series data were collected from various publications of Directorate of Economics and Statistics, Govt. of Assam and Department of Agriculture, Govt. of Assam. District level data of all the 27 districts were not available for the early period of the study as most of the districts came into existence only during 80's. Hence, in the present study instead of 27 districts, 10 erstwhile districts were taken into consideration.

For analyzing food availability, the total population is converted to adult equivalent. To arrive at the actual production, 13 percent of the total output in case of cereals and pulses were deducted for seed, feed and wastage. To represent edible portion of the total crop, 70 percent in respect of oilseeds were deducted. In order to minimize the time effect decadal triennium averages of area, production and productivity of the crops were considered for calculation of food availability. Per capita availability of food grains were compared with the normative requirement (NIN, Hyderabad). In analyzing the food availability (the import, central pool and export of products are not considered) only the home production of state was considered under present study. The data from the respondents with the help of interview schedule Data were analyzed according to the procedure described by Bharati *et al.* 2014 and Suman, 2014.

RESULTS AND DISCUSSION

Availability of food grains over production

Per capita availability of different food grains are presented in Table 1. As per the recommendation of National Institute of Nutrition, Hyderabad, the per capita requirement of cereals is 420 g/day/person while for pulses and oilseeds the requirements are 82.66 g/day/person and 32.67 g/day/person

¹KVK, Golaghat, Assam, India

*Corresponding Author Email: borthakursanjoy@gmail.com

respectively. The Table reveals that the per capita availability of cereals remained more than normative requirement during all the periods. However, per capita availability of total food grains was more than the normative requirement only during 1951-53. Per capita availability of cereals, though remained more than normative requirement, it was in a declining trend up to 1981-83 and increased during 1991-93 but again

decreased during 2000-02. While the per capita availability of total food grains was never more than normative requirement except during 1951-53. From the Table it is observed that the per capita availability of pulse and oilseeds produced in the state was far below the normative requirement, although its area, production as well as productivity increased over the years (Table 2 and Table 3).

Table 1: Per capita availability of food grains in Assam (Quantity in g/day)

Item	Normative requirement	1951-53	1961-63	1971-73	1981-83	1991-93	2000-02
Rice		563.84	447.57	414.76	399.79	436.79	432.12
Wheat		0.68	0.85	16.22	19.66	12.88	9.28
Maize		0.64	1.00	1.39	1.97	1.59	1.59
Other cereals		0.62	0.62	1.47	1.00	0.67	0.53
Total cereals	420.00	565.79	450.04	433.83	422.41	451.94	443.53
Pulses	82.66	10.16	9.06	8.76	8.64	7.13	7.04
Total food grains	502.66	575.96	459.1	442.59	431.05	459.07	450.57
Oilseeds	32.67	6.34	4.92	5.35	7.50	7.40	6.17

Table 2: Trinomial averages of area of different crops in Assam (in ha)

Crop	1951-53	1961-63	1971-73	1981-83	1991-93	2000-02
Rice	1564596	1765412	2031235	2294302	2564833	2574430
Wheat	2248	3790	62479	101354	76415	70536
Maize	2750.33	7049.77	12503	22568	18375	19884
Other cereals	3256	4490	14752.7	12178	9571	9127
Total cereals	1572850	1780742	2120970	2430402	2669195	2673977
Pulses	71229.5	79006.5	95551.7	124321	111495	111415
Total food grains	1644080	1859749	2216521	2554723	2780690	2785392
Oilseeds	122185	134516	162365	279907	315896	310331

Table 3: Productivity of different crops in Assam

Items	1951-53	1961-63	1971-73	1981-83	1991-93	2000-02
Rice	964	922	1002	1068	1281	1501
Wheat	815	816	1274	1188	1268	1176
Maize	625	518	546	535	652	717
Other cereals	512	500	488	501	530	516
Total cereals	962	919	1004	1065	1274	1483
Pulses	382	417	450	426	481	565
Total food grains	937	898	980	1034	1242	1446
Oilseeds	402	385	469	476	511	515

The change of per capita availability of food grains over the years revealed that just after independence the state had enough food for the population, which gradually decreased until 1981-83. This was because of the high population growth (Table 4) during the period owing age to natural growth as well as influx from the neighbouring states of India and countries. But, after 1981-83, the per capita availability of food grains had increased gradually due to use of modern

packages of cultivation *viz.*, high yielding varieties, fertilizers, etc. which lead to increase in production. Nevertheless, this increase could not surpass the normative requirement of total food grains. Thus, although per capita availability of total cereals was marginally higher than the normative requirement, the state remains food deficit state since 1961-63 to 2000-2002.

Table 4: Population of Assam

Year	Population	Adult equivalent population
1951	7970998	6376798
1961	10837329	8669863
1971	14625152	11700122
1981	18253100	14602480
1991	22414322	17931458
2001	28960611	23168488

District level analysis

Almost similar trend of change in per capita availability of food grains was observed in all the ten erstwhile districts of the state with a few exceptions (Table 5). Amongst all the districts, only Karbi Anglong and Nagaon districts were found to be the food surplus districts. However, in both the districts per capita availability of pulse was far below the normative requirement. Karbi Anglong district was although found to be food surplus district; the per capita availability had declined continuously over the decades. In the Cachar district also per capita availability of cereal was recorded to be more than normative requirement over the decades barring

1981-83. However, per capita availability of food grains remained less than normative requirement during all the periods. In Lakhimpur district per capita availability of cereals remained more than the normative requirement but the availability had been declining over the decades; while per capita availability of total food grains remained more than the normative requirement till 1991-93 but became less in the recent years i.e. during 2000-02. Per capita availability of cereals and total food grains became more than normative requirement in the recent decades from 1981-83, but it was declined over the period.

Table 5: Per capita availability of food grains in erstwhile districts of Assam

Districts	Crop	Normative requirement	(Quantity in g/day)					
			1951-53	1961-63	1971-73	1981-83	1991-93	2000-02
Cachar	Rice		420.34	456.68	422.08	339.47	420.42	469.88
	Wheat		0	0	0.3	2.92	3.8	0.1
	Maize		0.07	0.07	0.14	8.77	8.35	0.05
	Other cereals		0	0.01	0.07	0.07	0.08	0.01
	Total cereals	420	420.4	456.77	422.59	351.23	432.65	470.04
	Pulses	82.66	1.69	2.08	1.7	1.63	1.96	2.14
	Total food grains	502.66	422.1	458.85	424.29	352.87	434.61	472.18
	Oilseeds	32.67	0.92	0.64	0.48	3.35	5.28	0.57
Darang	Rice		739.48	527.36	442.56	348.29	417.59	416.28
	Wheat		0.3	0.17	17.56	39.27	20.22	9.79
	Maize		1.27	1.51	1.57	0.93	0.37	1.05
	Other cereals		0.22	0.32	1.98	3.32	1.93	0.18
	Total cereals	420	741.27	529.36	463.67	391.8	440.11	427.3
	Pulses	82.66	12.38	11.4	14.61	18.2	17.88	10.37
	Total food grains	502.66	753.65	540.77	478.28	409.99	457.99	437.66
	Oilseeds	32.67	10.03	10.03	9.24	8.64	11.98	9.22
Dibrugarh	Rice		432.9	295.75	257.77	332.13	354.38	302.1
	Wheat		0.11	0.01	3.05	17.15	1.73	2.43
	Maize		1.23	0.66	1.87	3.93	1.03	1.08
	Other cereals		0.31	0.43	0.05	0.44	0.24	0.07
	Total cereals	420	434.55	296.85	262.74	353.65	357.37	305.68
	Pulses	82.66	2.21	2.21	1.42	7.33	2.54	3.02
	Total food grains	502.66	436.75	299.05	264.15	360.98	359.91	308.7
	Oilseeds	32.67	1.03	0.95	2.65	9.8	3.86	4.09

Karbi Anglong	Rice	506.7	450.21	757.52	754.12	713.56	669.44	
	Wheat	0	0.17	9.94	0.14	0.33	7.47	
	Maize	9.48	15.31	11.89	2.89	4.61	30.36	
	Other cereals	0	0.3	0.32	0.37	0.06	0.24	
	Total cereals	420	516.19	465.99	779.66	757.53	718.56	707.51
	Pulses	82.66	11.91	10.76	7.79	1.9	1.6	5.5
	Total food grains	502.66	528.09	476.75	787.45	759.43	720.16	716.73
	Oilseeds	32.67	6.27	9.28	11.45	1.56	1.73	13.86
Nagaon	Rice	606.37	454.8	407.94	386.41	569.93	574.42	
	Wheat	0.23	0.11	13.64	35.55	11.04	8.57	
	Maize	1	0.2	0.36	1.29	0.87	0.77	
	Other cereals	0.27	0.01	0.45	0.85	0.34	0.19	
	Total ce reals	420	607.87	455.12	422.38	424.1	582.19	583.95
	Pulses	82.66	18.75	15.3	12.27	12.14	7.35	6.48
	Total food grains	502.66	626.63	470.42	434.65	436.24	589.54	590.44
	Oilseeds	32.67	10.02	7.14	6.01	10.2	8.82	5.86
N.C. Hills	Rice	302.8	366.93	693.96	392.17	409.57	376.77	
	Wheat	0	0.34	1.89	114.18	54.39	1.09	
	Maize	8.74	20.48	20.71	3.67	3.68	18.56	
	Other cereals	0	0.48	0.8	0.58	0.57	0.06	
	Total cereals	420	311.55	388.23	717.36	510.61	468.21	396.48
	Pulses	82.66	7.85	7.9	4.35	93.1	58.54	6.93
	Total food grains	502.66	319.4	396.13	721.71	603.7	526.75	403.41
	Oilseeds	32.67	2.14	4.6	6.53	207.41	102.07	5.27
North Lakhimpur	Rice	721.88	592.54	539.83	521.62	551.47	429.5	
	Wheat	0.18	0	9.48	9.76	3.17	4.09	
	Maize	2.57	3.06	2.08	1.53	0.91	1.3	
	Other cereals	1.38	2.29	1.11	0.85	0.08	0.11	
	Total cereals	420	726.01	597.91	552.5	533.76	555.64	435
	Pulses	82.66	8.65	5.66	6.07	13.33	3.98	4.36
	Total food grains	502.66	734.67	603.57	558.56	547.09	559.61	439.36
	Oilseeds	32.67	5.83	4.43	12.66	18.7	12.06	9.44
Sibsagar	Rice	539.45	531.25	484.47	602.39	564.84	512.15	
	Wheat	0.02	0	4.39	27.37	18.22	3.15	
	Maize	0.12	0.07	0.38	0.68	0.27	0.24	
	Other cereals	0	0.03	0.2	0.43	0.2	0.03	
	Total cereals	420	539.59	531.35	489.44	630.87	583.53	515.57
	Pulses	82.66	5.77	3.73	4.45	11.02	8.18	4.38
	Total food grains	502.66	545.36	535.08	493.89	641.9	591.7	519.95
	Oilseeds	32.67	4.21	4.46	4.39	5.67	7.64	3.44

Policy implications

In the state of Assam more than 90% of total food grain availability was contributed by rice alone, which was 97.43% of total cereals and 95.95% of total food grains in the year of 2001. Likewise, area under rice was 96% of total cereals and 92% of total food grains. While, production of rice was found to be 97% of total cereals and 95% of total food grains in 2001.

Assam is endowed with various physical and climatic advantages for rice cultivation almost throughout the year.

Hence, in order to bridge the gap between normative requirement and availability of food grains and to fulfill the requirement of pulses increase in production of rice is a must so that state can produce surplus rice. In spite of importance of rice in the state, the yield level remains the lowest among the Eastern region of India (Borthakur *et al.*, 2003). The Government has to do a lot to improve the situation. In order to increase the productivity of rice in turn food availability for the population, steps should be taken to popularize the modern practices like use of high yielding varieties, hybrid

seeds, flood escaping crop, use of proper plant protection measures etc. Assam's agriculture is overwhelmingly rainfed. In fact, the rice improvement programmes in the 60's and 70's were primarily aimed at maximizing production through exploitation of the favourable crop environments (Kattumuri, 2011). Thus in the absence of high yielding modern varieties with specific adaptation to certain stress prone environments, even today, the farmers of Assam rely for such environments largely on the low yielding traditional varieties that give stable yield (Bharati *et al.*, 2014). For instance, hardly any modern rice variety could be traced in the upland (*ahu*) situation of Assam. Such experiences highlighted the need to evolve need based and situation specific varieties and technologies suitably fitted to the diverse environments. Nutrient application techniques for such situations have already been recommended with emphasis on integration of organics with the in-organics.

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CONCLUSION

It is clear that the availability of food grains depended mainly on production of rice because there is practically no possibility of change in cropping pattern in the state in near future, unless some miracle occurs. Suitable high yielding variety of rice along with package of management practices tailored specifically for such situation may go a long way in increasing rice production in the state. Similarly, research on management aspects should also be oriented for evolving integrated pest management; integrated nutrient management situation specific rice based cropping system in order to address the issues food, nutritional and environmental security.

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