

**Staff Paper P96-2**

**January 1996**

# **STAFF PAPER SERIES**

## **Land and Food Supply Problems in Bangladesh**

**by**

**Fahima Aziz**

---

**DEPARTMENT OF APPLIED ECONOMICS**

**COLLEGE OF AGRICULTURAL, FOOD, AND ENVIRONMENTAL SCIENCES**

**UNIVERSITY OF MINNESOTA**

---

# LAND AND FOOD SUPPLY PROBLEMS IN BANGLADESH

Fahima Aziz\*

Department of Applied Economics  
University of Minnesota

Fahima Aziz is an Assistant Professor, Management and Economics, Hamline University. I would like to thank Dr. Phillip Raup for his comments and Dr. James P. Houck for making this staff paper possible.

Copyright (c) 1996 by Aziz. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

The analyses and views reported in this paper are those of the author. They are not necessarily endorsed by the Department of Applied Economics or by the University of Minnesota.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

Information on other titles in this series may be obtained from: Waite Library, University of Minnesota, Department of Applied Economics, 232 Classroom Office Building, 1994 Buford Avenue, St. Paul, MN 55108, U.S.A.

## TABLE OF CONTENTS

INTRODUCTION .....	1
FOOD SUPPLY PROBLEMS .....	2
FOOD GRAIN PRODUCTION AND AVAILABILITY .....	2
THE FUNDAMENTAL CAUSES OF FOOD SHORTAGES .....	6
SLOW GROWTH AND HIGH VARIABILITY IN THE FOOD PRODUCTION .....	6
PHYSICAL AND CLIMATIC CONDITION .....	6
THE USE OF AGRICULTURAL INPUTS .....	7
AGRICULTURAL SUPPORT SERVICES .....	8
FRAGMENTATION OF LAND .....	9
LAND REFORM AND EXISTING LAND PROBLEMS .....	9
SOCIOECONOMIC CHARACTERISTICS .....	11
CONTROL OF CREDIT .....	13
THE PUBLIC FOOD DISTRIBUTION SYSTEM .....	14
POPULATION PRESSURE ON THE FOOD AVAILABILITY .....	16
DEPENDENCY RATIO .....	17
CONCLUSION .....	18

## LIST OF TABLES

1.	Foodgrain Production and Availability . . . . .	22
2.	Total Production of Rice . . . . .	23
3.	National Nutrition Surveys . . . . .	24
4.	Estimates from Anthropometric Studies of Nutritional Status . . . . .	25
5.	Distribution of Deficit Households According to Landownership . . . . .	26
6.	Wages and Food Prices . . . . .	27
7.	Population Size and Population Density . . . . .	28
8.	Dependency Ratios . . . . .	29

## INTRODUCTION

Bangladesh is faced with acute land and food supply problems. If we accept the idea that an economy must ensure its food supply, then the critical role of agriculture can hardly be emphasized here since Bangladesh is predominantly a rural economy. It is the eighth largest country in the world with a population of over 100 million. About 80% of the population lives in the rural areas. It is the fourth largest producer of rice and also one of the biggest recipient of food aid. About 58% of the economy's employment comes from agriculture. The share of agriculture in the rural labor force was about 66 percent in 1984/85 (Osmani, 1990). Scarcity of land and relative abundance of labor force has resulted in a high ratio of labor force to land, with a rising rate of landlessness among the predominantly rural (World Bank Report, 1980). The development of Bangladesh is fundamentally related to foodgrain production and its price. The primary foodgrains are rice and wheat accounting about two-thirds of agricultural production, and 60% of average household expenditure and 85% of total caloric intake. The vast majority live on a subsistence level and foodgrain production is a major determinant of the nutritional level.

This paper will study the problems of food supply and analyze the reasons for the slow growth in the production of foodgrains. The foodgrain distribution system will also be addressed and its role in the food shortage problem of Bangladesh. Past evidence shows that landlordism has obstructed the incentives of the peasants and has depressed the maximum productivity of owner-operated farms. This paper will briefly discuss the history of land reform and the measures undertaken to bring about tenancy reforms in Bangladesh.

## **I. FOOD SUPPLY PROBLEM**

### **FOODGRAIN PRODUCTION AND AVAILABILITY**

Mainly due to technological progress, the rate of growth of foodgrain production increased from 2.6% per year for the years 1950-71 to 3.4% for the years 1971-1985 (Hossain, 1988). The rate of foodgrain production was reported to have declined to 2.2% in the 1980s (Government of Bangladesh Planning Commission, 1990). The annual growth of total rice production between 1972-73 and 1989-90 was 2.62%, increasing to 3.08% in the 1970s and 2.57% in the 1980s (Goletti, Ahmed and Chowdhury, 1991). See Table 1 and Table 2 in the Appendix.

The poverty line defines a minimum per capita daily intake of 2,122 calories and hard core poverty line as 1,805 calories (Bangladesh Bureau of Statistics, 1988). Bangladesh Institute of Development Studies by Rahman and Haque (1988) defines per capita minimum caloric daily requirement as 2,112 calories, with a minimum of 437 grams of rice and wheat, equivalent to 1,525 calories (Thamarajakshi and Ravallion, 1991). The minimum income level required to purchase the above amount of foodgrain puts about 80% of agricultural labor households in poverty. Eighty-five percent of the households with caloric deficiency own less than 0.50 acres (Hossain and Quasem, 1990). See Table 5 in the Appendix.

Bangladesh's chronic shortage of foodgrains started in the 1950s. Food imports averaging 1.8 million tons have been needed in the recent years to maintain the average availability of grains to meet the minimum nutritional requirement of 15.5 ounces a day per person. In spite of the enormous volume of food aid, malnutrition has been a critical problem and has been getting worse over the last decade. This is extremely true for rural Bangladesh, which has benefitted much less from the public food distribution than the urban areas. Several major nutritional surveys of Bangladesh indicate severe malnutrition problems in the country. The studies were Nutrition Survey of East Pakistan of 1962-64, the

National Nutritional Surveys of 1975-76 and 1981-82, the Helen Keller International Survey of 1982-83, and the Nutrition Module of the Household Expenditure Survey of 1985-86. Table 3 summarizes the findings of the recent four studies. As can be seen in the Table in the Appendix, the surveys came up with very different estimates of malnutrition but the estimates are very high in all four surveys (Alwang, 1991).

The most important fact to this discussion is that many of those suffering from malnutrition in rural Bangladesh are small and marginal farmers or landless laborers. An effective measure would be to increase food production and thereby reduce malnutrition in rural Bangladesh, particularly to pay attention to the fact that the production increases should also extend to these landless farmers and also be accompanied by increased employment opportunities for landless laborers in food production process. Increased employment for landless labors may come if improved methods of agricultural practices require additional workers and if agricultural mechanization is one that requires more workers rather than displacing labor hours.

Growth in food production is a necessary condition for the well-being of the rural Bangladesh but is certainly not sufficient to remove poverty and malnutrition. Agricultural labors are a major part of the rural work force. The



most recent agricultural census for the year 1984-85 states that 31% of farm households and 63% of non-farm households depend on income from agricultural labor as the chief source of income (Thamarajakshi and Ravallion, 1991). Studies have estimated the number of landless be very high. One study estimates the number of landless households to be 4.8 million in 1982 and functionally landless (owns less than one half acre of land) to be 6.1 million, together constituting about 70% of all households.

Recent studies of Abdallah and Murshid (1986) and Osmani (1987) state that there is a rising in landlessness in rural Bangladesh. A major group of the population is subjected to food insecurity and to the fluctuating food prices. Employment measures of agricultural labor are extremely tenuous where agriculture is mainly characterized by seasonality and family labor participation. A large number of households are seasonally unemployed or underemployed during a part of the year. Employment may grow with increased production in agriculture but an extremely high rate of food production and related activities may not be able to absorb all the unemployed and underemployed (World Bank Report, 1989).

Rural labor force is expected to increase by 5 million but foodgrain production will absorb only about 30% of that increase in the agricultural labor force (Thamarajakshi and Ravallion, 1991).

## **II. THE FUNDAMENTAL CAUSES OF FOOD SHORTAGES**

### **A. SLOW GROWTH AND HIGH VARIABILITY IN THE FOOD PRODUCTION**

One of the fundamental causes has been the sluggish growth and high variability in foodgrain production. In the 1960s foodgrain production increased rate of only 1.7%, much below the annual population growth rate of 2.7%. Even though food imports grew to 1.8 million tons between 1978 and 1980 there was a 9% decline in capita food availability, from 17 ounces per capita per day in 1961 to 15.4 ounces in 1978 (World Bank, 1979). In the mid-seventies the rate of growth of food production went up to 3%. Recent reports state that the rate of growth has decelerated to 2.2% in the 1980s (Government of Bangladesh Planning Commission). Domestic production on the average has been lower such that per capita availability has been less than 16 ounces/day. (Tables 1 and 2, Thamarajakshi and Ravallion, 1991).

#### **Reasons for Slow Growth of Food Production**

##### **i. Physical and Climatic Condition**

Bangladesh is constrained by scarcity of cultivable land. There are only 22 million acres of cultivable land with very limited potential on these acres of land.

There is a definite need for irrigation during the dry season and a tremendous need for drainage and flood control during the monsoon and flooding seasons. There has been large investment in the last two decades in major water control programs and the irrigated area from these works is about 200,000 acres. The groundwater development and installed irrigation remains under-utilized. Minor irrigation system could play a very important part during the ripening season of aus, boro and aman crop when monsoon rain end early, or in short drought condition. Minor irrigation system remains unutilized to its fullest potential. Natural disasters such as cyclones, floods, droughts are frequent in Bangladesh and continue to be major constraints in the productivity of agriculture.

ii. **The Use of Agricultural Inputs**

During the mid sixties the use of improved grain varieties and fertilizers along with proper complementary farming methods were introduced. Technological improvement and adoption of new technological methods to increase both land and labor productivity were widely recognized in Bangladesh. However, diffusion of new technology has been slow in Bangladesh. Profitability of the adoption of the new technologies depends on the economic and physical infrastructure. These factors of adoption still remain under-developed in

Bangladesh. The spread of new technology has been slow; the HYV for aus and boro crops cultivation covers less than 20% of the potential areas (World Bank Report, 1989).

The slowdown in foodgrain production has been related to development of the irrigation system, deficiency of sulphur and zinc in the soil, poor seed quality are diminishing productivity with HYV in certain areas (Thamarajakshi, 1991).

iii. **Agricultural Support Services**

Agricultural support services are extremely critical for the adoption of HYV technology. Timely supply of farm inputs, proper technical expertise and advice, efficient marketing, credit availability, adequate storage facilities are some of the elements that help with the adoption of a new technology or a technological innovations. The government of Bangladesh have in the recent past taken effort to improve the workings and performance of the different agencies and departments that are responsible for the above services. Government agencies have been overloaded with work along with limited administrative capabilities. Support services have been overstretched with workload and difficult administrative procedure and lack of trained staff at various levels.

iv. **Fragmentation of Land**

Currently there are about 22 million acres that are being cultivated, half of which is suitable for double cropping and in a few cases, triple cropping. The other half consists of low lying areas which are deeply flooded by the rivers or inundated by salt water much of the year. The population increase has put tremendous pressure on the availability of land to a certain degree. Eighty three percent of the farms under 2.5 acres are fragmented, while ninety percent of the large and medium farms are in similar situation (Januzzi and Peach, 1979).

v. **Land Reform and Existing Land Problems**

The government of Bangladesh in 1971 the abolition of the Zamindari system (landlord system) a high order on the list of social reforms. Government's first order exempted holdings of 8.3 acres and less from land tax. A second order directed that the ceiling on family land holdings be fixed at 33.3 acres. Under this order they expected 76,712 acres to be released for the landless but in 1976 they acquired only 33,300 acres.

Recent field surveys of people from different areas and different income levels indicate that approximately 10% of Bangladesh is farmed by owners and their families. The proportion is not 83% as indicated by the Plan of the

Bangladesh government. The remaining land is cultivated by people who own no fields and possibly nor even their homestead. Owners of small farms are numerous and they own and cultivate only a small proportion of all lands. Those with farms of more than 3 acres generally rent out all or a small portion of their land under a wide variety of arrangements. Owners also rent to each other and to tenants in order to consolidate highly-fragmented holdings. Many owners may direct hired laborers while other owners living in towns and cities rent out their land on long-term arrangements. As a general rule, most land is let out on a sharecropping (Bogra) basis; the owners receive 50% of each harvest from the sharecropper and do not share in the cost of the fertilizer, water or labor cost. The remaining land is farmed on various annual cash leases. Absentee landownership is becoming important as urban dwellers continue to buy land as an investment. Whatever the terms under which the cultivator obtains land, his production costs increase sharply when he pays rent to the land owners. A recent study of land occupancy data shows that 10% the households own 50% of the cultivable land and 33% of rural households are without cultivable land (Jannuzi and Peach, 1979).

In short, the "small" farmer does not cultivate his land. Instead, he hires millions of tenants and landless laborers. Rather than being "small" in the sense of being poor, he represents the rural elite and has managed to minimize his

obligations of agricultural production. Regardless of how much the sharecropper produces, the owner (malik) is guaranteed at least 50% of the product (Januzzi and Peach, 1979).

Farm size and several other factors may influence the adoption of new technology but the existing tenurial structure between the landed and the landless may have a significant impact on the adoption of a technology in Bangladesh agriculture. For instance, the sharecroppers are responsible to buy all the inputs for their production. This creates a disincentive to the tenant farmers to adopt a new technology and buy all the inputs for its application (Januzzi and Peach, 1979).

vi. **Socioeconomic Characteristics**

Several economists and administrators have attempted to explain the problems of Bangladesh in terms of the socioeconomic classes. Very little attention has been paid to the socioeconomic aspects of agricultural development of Bangladesh. As Bertolli states, "multiplicity of individual links into the institutional framework of the rural economy, the nature of which has been virtually unstudied (1979).

Pervasive to the agrarian structure is the patron-client relationships of multiple forms and the evolvment of rival factions and groups fighting for human and material control. The landowners have control and power in the rural economy due to their higher status and educational levels, easier access to government institutions and services, and control over agricultural inputs as irrigation, fertilizers, and the management of cooperatives. The land-owning and the money lending and the labor hiring classes are the patrons while the clients are the landless (World Bank Report, 1979). The existing patron-client relationship and the conflict of interests does not help much in the harmonization of the development process in Bangladesh. Inter-group rivalries and competition pose hindrances to forming cooperative groups for irrigation or for credit purposes.

There are differences among landless laborers whose main source of income is primarily or secondarily as field labor. The migrant workers who travel in pursuit of work on a seasonal basis drive down the wages, particularly the wage of the landless workers who are permanent residents (Franda, 1982). Furthermore, there are differences in the patron-client relationship with the malik (landowner) between the landless workers and the migrant workers. Landless workers have only their food needs to satisfy and are very willing to work for low wages. Agricultural cultivators are forced to work for wages below the going rate



to maintain their homestead, farm tools and to purchase inputs.

Franda (1982) provides further insights to the socioeconomic issues of Bangladesh. There may be moral and cultural factors that causes interpersonal and intergroup conflict. He refers to "takdir" which refers to "the pre-destined limits and potentialities bestowed by Allah on each individual life," and "takbir," "the obligation of each individual to realize via maximum effort the fullness of one's given potentialities." Bertocci (1979) explains that the opportunity for one to achieve economic goals for oneself is directly linked to attaching oneself to someone who is powerful and prestigious. The conflict in all the above beliefs promotes interpersonal and intergroup conflict.

vii. **Control of Credit**

Control of credit is another big problem in rural Bangladesh. Sometimes control of credit is more important than the ownership of land in determining the recipient of new seeds. The use of land is so closely tied to credit that it is difficult to separate the two. Sharecropping requires credit for inputs, and leases require cash payment in advance.

A sharecropper in some situation has to release the entire crop to the owner in order to pay the rent and to repay the input loans. The control of credit

and ownership of land determines who uses the seed, and at what price. Public crop production programs benefit the landowners who hold local administrative positions and have the minimum acreage required for membership in such programs.

Thus we find that institutional treatment of credit and tenure dynamic places added burden on cultivators. The tenure terms are deteriorating against cultivation because of increasing competition for land and because credit and agricultural input are controlled by the elites. As a consequence, crop production and on -farm employment growth rates have fallen over the last decade.

### **III. THE PUBLIC FOOD DISTRIBUTION SYSTEM**

The objective of the Public Food Distribution System (PFDS) was to provide a certain amount of foodgrain to a targeted group at a controlled price. The main purpose was to maintain a stable price environment (Shahabuddin, 1991). PFDS originated in 1943 during the Bengal famine.

The PFDS grew very quickly in the 1970s, distributing twice as much as was distributed in the 1960s. The foodgrain offtake in the 1979/1980 and in 1990/1991 were the same, although there were substantial variations from year to year in the 1980s. In 1990/91 the foodgrain offtake was 2.45 million metric tons,

roughly 13% of all foodgrains consumed in Bangladesh (Ahmed, 1992).

There were several programs such as Statutory Rationing (SR) and Modified Rationing (MR) and covering the urban population , covering armed forces, police, and other essential forces." These two schemes fell under the monetized programs; there was a continued effort to reduce the subsidies under the monetized programs and as a result of that the importance of the SR and MR declined. There has been ample documentation of the failure of the MR to provide consistent food supplies and enormous amount of food supplies have leaked out of the system. The program was replaced with a new rural rationing scheme called the Palli Rationing (PR) (Alwang, 1991). The PR scheme was implemented to subsidize the food needs of the rural poorest. Past evidence shows the food distribution system of the government benefitted the relatively well-off section of the urban population instead of the rural population whose food needs were the greatest. Alleviation of poverty and better food distribution in the rural areas are receiving government's attention (Ahmed, 1991). At present the PR can only at its best partially support the large sparsely distributed rural population, and hard to reach areas with inadequately equipped infrastructure. One study (Ahmed, 1991) reports of corruption and inefficiency in the PR scheme.

There exist a lack of proper supervision, inexperienced ration staff and plenty of scope for rent seeking. The PR scheme did benefit 31% of the targeted population which is only 1.8% of the rural population. Furthermore the Household Expenditure Survey (1989/90) estimated that 48.0% of the rural population was below the poverty line, and 29.5% were below the "hardcore" level.

A study on the nutritional effectiveness of the PFDS is currently under way to examine the effectiveness of the current food distributional system. Further studies are necessary to compare the PR with the other schemes such as SR and MR and examine what measures should be taken to improve the rural subsidy program (Ahmed 1991).

#### **IV. POPULATION PRESSURE ON FOOD AVAILABILITY**

Bangladesh has an area of 147,960 sq km and an estimated population of 110 million in 1991. It is one of the densely populated countries in the world with about 740 people per sq km. In 1980 the estimated population of the country was approximately 90 million. At present the population is growing at 2.4% per year. The crude birth rate of Bangladesh is considered one of the lowest among the low income countries, 32 per thousand and a crude death rate of 11 per thousand. The

fertility rate of Bangladesh women has fallen from 6.8% in 1965 to 4.2% in 1991. Infant mortality rate is considered high approximating 10.3% and the life expectancy is 51 years (EIU Country Profile, Bangladesh, 1993/94).

During 1901-51 the rate of growth was about 1%. After 1951 the growth rate showed an increase, elevating to 1.9% for the period 1951-61, and 2.6% between 1961 through 1974. One way to comprehend this growth rate is to examine the figures of population this rate would result in the future. A constant growth rate of 2.6% would result in a population of about 152.4 million in the year 2000 (Hong, 1980).

Another way to grasp the population growth is to examine the age and sex pyramid. The young age group population is rapidly growing and inevitably gives rise to rapid growth of population in the future (Hong, 1980).

**i. Dependency Ratio**

The population of Bangladesh is disproportionately very young; 0-14 year age group covers more than 45% of the total population and only 4% of the population is over 60 year old age group since 1960 (Table 10). The dependency ratio fluctuated very little between 1911 and 1951 but by 1961 the age structure indicates that the dependency ratio had worsened.

Given the above discussion on the population situation of Bangladesh it seems quite evident that a growing population with such a high dependency rate has added burden on the country to feed its people. The consumption of food intake is usually the highest among the young and the youth. Even though foodgrain production has increased over the past two decades the increase in population has resulted in food shortage and availability in Bangladesh.

### **CONCLUSION**

There arise questions as to whether there is a true and serious commitment from the Government to real distribution of land to agriculture to improve the food production and rate of growth of production in agriculture. Importantly, what effective measures will be taken to improve the Public Food Distribution Scheme to alleviate the sufferings of the poor.

The population growth has out paced the growth in agricultural production; technology is quite traditional relying on primitive and inefficient methods. New seeds and technology if introduced have largely benefitted the rich landowners. The inequity in income and land holdings continue to increase such that the agrarian structure is characterized with poverty.

There exists rhetoric about poverty in Bangladesh. Most government programs are justified by their poverty alleviation objectives. It seems evident though that political stability may be an important and major concern for the leaders. The urban /middle class constitute a very low percentage of the total population. Urban groups of private business people, civil servants, and army officers maintain strong family ties with the villages and continue to procure land. Economic and political instability gives rise to buying of land. The enactment and implementation of tenancy reform legislation by the urban middle class may be quite impossible.

Land reforms and tenancy acts may be possible; attitudes are changing and functional definitions may be implemented. Some landowners who recognize the need for change may initiate it. This change in attitude may come from their concern and care for the country or from their fear of rural unrest. Absentee owners may see that modernization may benefit them and there may be some gain rather than have agricultural stagnation.

At present there is wide recognition at the national level that there has been a lack of public attention for competitive pricing and suitable tenure relationship, which may be favorable for the economy.

## REFERENCES

- Ahmed, Akhter, U. 1991. "Operational Performance of the Rural Rationing Program in Bangladesh." Food Policy in Bangladesh, Working Paper No. 5. IFPRI.
- Ahmed, R., Chowdhury, N., Ahmed, A.U. 1993. "Determination of Procurement Price of Rice in Bangladesh." Food Policy in Bangladesh, Working Paper No. 6. IFPRI.
- Alwang, Jeffrey. 1991. "A Literature Review of Public Food Distribution in Bangladesh." Food Policy in Bangladesh, Working Paper No. 1. IFPRI.
- Bangladesh Bureau of Statistics, Statistical Yearbook. 1988.
- Bertocci, Peter. 1979. "Structural Fragmentation and Peasant Classes in Bangladesh." Journal of Social Studies. Dhaka. Bangladesh.
- Franda, Marcus. 1982. "The Very Poor in Bangladesh: Food Policy and Politics." Report No. 18. UFSI.
- Goletti, F., Ahmed, R., Chowdhury, N. 1991. "Optimal Stock for the Public Foodgrain Distribution System in Bangladesh." Food Policy in Bangladesh, Working Paper No. 4. IFPRI.
- Hossain, Mahabub. 1988. "Nature and Impact of the Green Revolution in Bangladesh." Research Report No. 67. IFPRI.



- Hossain, M., and Akash, Mokaddem M. "Public Rural Works for Relief and Development: A Review of the Bangladesh Experience." Working Papers on Food Subsidies No. 7. IFPRI.
- Januzzi, F., and Peach, J.T. 1980. Agrarian Structure of Bangladesh: An Impediment to Development. Boulder, CO. Westview Press.
- Just, F and Parkinson, J.R. 1976. "Bangladesh: The Test Case of Development." Boulder, CO. Westview Press.
- Osmani, S.R. 1990. "Food Deprivation and Undernutrition in Rural Bangladesh." Wider Working Papers, WP82.
- Rahman, A., and T. Gaque. 1988. "Poverty and Inequality in Bangladesh in the Eighties: An Analysis of Some Recent Evidence." Research Report No.91. Dhaka. Bangladesh Institute of Development Studies.
- Shahabuddin, Q. 1991. "A Disaggregated Model for Stabilization of Rice Prices in Bangladesh. Food Policy in Bangladesh, Working Paper No. 3. IFPRI.
- Thamarajakshi, R., and Ravallion, M. 1991. "The Relation Between Rice Prices and Wage Rates in Bangladesh." Food Policy in Bangladesh, Working Paper No. 2. IFPRI.
- World Bank Report. 1982. "Bangladesh: Foodgrain Self-Sufficiency and Crop Diversification."
- World Bank Report. 1979. Bangladesh: Food Policy Issues.

TABLE 1

Foodgrain Production and Availability, 1974/75-1987/88

Year	Production (gross)			Net production <sup>a</sup>	Total availability	Per capita availability
	Rice	Wheat	Total			
	(1,000 metric tons)					(ounces/day)
1974/75	11,287	117	11,404	10,263	11,919	14.73
1975/76	12,762	218	12,980	11,682	12,955	15.65
1976/77	11,752	259	12,011	10,810	11,954	14.10
1977/78	12,967	348	13,316	11,984	13,305	15.32
1978/79	12,849	394	13,343	12,009	13,473	15.15
1979/80	12,737	823	13,560	12,203	14,307	15.15
1980/81	13,832	1,092	14,974	13,476	13,990	15.02
1981/82	13,630	967	14,597	13,137	14,903	15.64
1982/83	14,215	1,095	15,310	13,779	15,519	15.68
1983/84	14,506	1,211	15,718	14,146	15,930	16.01
1984/85	14,620	1,464	16,084	14,476	16,690	16.46
1985/86	15,037	1,042	16,079	14,471	15,663	15.09
1986/87	15,496	1,091	16,587	14,928	16,361	15.90
1987/88	15,346	1,050	16,396	14,756	17,017	15.79

<sup>a</sup>Net production is gross production minus 10 percent for see, feed, and waste.

Source: Thamarajakshi and Ravallion, "The Relation Between Rice Prices and Wage Rates in Bangladesh," Working Paper No. 2.

TABLE 2  
Total Production of Rice, 1972/73-1989/90

Year <sup>a</sup>	Aman	Boro	Aus	Share of Rice Production		
				Aman	Boro	Aus
	(1,000 metric tons)			(percent)		
1972/73	5,587	2,071	2,274	56	21	23
1973/74	6,699	2,220	2,802	57	19	24
1974/75	6,000	2,250	2,859	54	20	26
1975/76	7,045	2,286	3,230	56	18	26
1976/77	6,906	1,650	3,010	60	14	26
1977/78	7,422	2,239	3,104	58	18	24
1978/79	7,429	1,929	3,288	59	15	26
1979/80	7,303	2,427	2,809	58	19	22
1980/81	7,964	2,630	3,289	57	19	24
1981/82	7,209	3,152	3,270	53	23	24
1982/83	7,604	3,546	3,067	53	25	22
1983/84	7,936	3,350	3,222	55	23	22
1984/85	7,930	3,909	2,783	54	27	19
1985/86	8,542	3,671	2,828	57	24	19
1986/87	8,267	4,010	3,130	54	26	20
1987/88	7,690	4,731	2,993	50	31	19
1988/89	6,857	5,831	2,856	44	38	18
1989/90	9,202	6,166	2,488	52	35	14

<sup>a</sup>The fiscal years starts in July.

Source: Goletti, Ahmed and Chowdhury, "Optimal Stock for the Public Foodgrain Distribution System in Bangladesh," Working Paper No. 4, IFPRI.

TABLE 3

## Comparison of Results from National Nutrition Surveys for Rural Bangladesh

Indicator	Institute of Nutrition and Food Science		Helen Keller International,	Bangladesh Bureau of Statistics,
	1975/76	1981/82	1982/83	1985/86
Stunting (percent)	73.7	57.3	42.0	57.6
Wasting (percent)	21.6	20.0	6.0	8.2
Sample size	430	510	4,443	1,500
Age range (months)	0-59	0-59	3-71	6-71
Reference Standard	Harvard	Harvard	National Center for Health Statistics	National Center for Health Statistics

Source: Alwang, "A Literature Review of Public Food Distribution in Bangladesh," Working Paper No. 1, IFPRI

TABLE 4

Estimates from Anthropometric Studies of Nutritional  
Status of Rural Children in Bangladesh

Degree of Malnutrition <sup>a</sup>	1975/76	1981/82	1985/86	1989/90
	(percent of total sample)			
Mild malnutrition	17.7	28.8	33.1	38.8
Moderate malnutrition	53.0	46.1	52.0	47.9
Severe malnutrition	25.8	15.1	9.6	7.4

<sup>a</sup>Mild malnutrition is at least 75 percent but less than 90 percent of National Center for Health Statistics reference median weight-for-age. Moderate malnutrition is at least 60 percent but less than 75 percent of reference median weight-for-age. Severe malnutrition is defined as less than 60 percent of reference for median weight-for-age.

Source: Alwang, "A Literature Review of Public Food Distribution in Bangladesh," Working Paper No. 1, IFPRI

TABLE 5

Distribution of Deficit Households According to Landownership, 1989/90

Landownership Category	Total Households	Chronic or Occasionally Deficit Households	Households with Chronic Deficits
		(percent)	
Landless	16	19	29
Functionally landless (0.01-0.49 acres)	33	40	55
Marginal owner (0.50-1.49 acres)	21	21	11
Small owner (1.50-2.49 acres)	11	10	3
Medium owner (2.50-4.99 acres)	12	8	1
Large owner (over 5 acres)	7	2	1
Total	100	100	100

Source: Thamarajakshi and Ravallion, "The Relation Between Rice Prices and Wage Rates in Bangladesh," Working Paper No. 2, IFPRI.

TABLE 6  
Wages and Food Prices

Year	Money Wages	Real Wages at 1973-74 Prices	Price of Coarse Rice/Kilogram	Wage Rate in Kilogram of Coarse Rice
	(Taka per person per day)		(Taka per kg)	(Kg per day)
1960	1.95	9.83	0.72	2.71
1961	2.18	10.88	0.72	3.03
1962	2.25	10.55	0.79	2.83
1963	2.41	11.28	0.79	3.05
1964	2.65	12.72	0.76	3.49
1965	2.34	10.62	0.83	2.82
1966	2.40	9.10	1.05	2.29
1967	2.60	9.19	1.14	2.28
1968	2.75	9.78	1.08	2.55
1969/70	2.96	9.40	1.10	2.69
1970/71	3.13	9.42	1.03	3.03
1971/72	3.38	7.43	1.38	2.45
1972/73	4.72	6.71	2.18	2.17
1973/74	6.69	6.69	2.93	2.28
1974/75	9.05	5.33	5.97	1.52
1975/76	8.82	7.09	3.77	2.34
1976/77	8.93	7.32	3.25	2.75
1977/78	9.40	6.41	4.13	2.28
1978/79	10.88	7.28	4.53	2.41
1979/80	12.46	6.79	6.09	2.05
1980/81	13.98	7.12	5.23	2.67
1981/82	15.38	6.40	6.41	2.40
1982/83	17.05	6.76	7.09	2.41
1983/84	19.58	6.84	7.78	2.52
1984/85	24.45	7.55	8.83	2.77
1985/86	29.53	8.72	8.12	3.64
1986/87	32.92	8.46	10.05	3.28
Growth rate 1960-87	12.02	-1.89	12.26	-0.20

Source: Thamarajakshi and Ravallion, "The Relation Between Prices and Wage Rates in Bangladesh," Working Paper No. 2.

TABLE 7

Population Size and Population Density: Bangladesh, 1901-74

Year	Population (1,000)			Population density (sq. mile)
	Male	Female	Total	
1901	14,713	14,215	28,928	534
1911	16,106	15,419	31,555	583
1921	17,071	16,183	33,254	614
1931	18,303	17,281	35,604	656
1941	21,757	20,240	41,997	776
1951	21,938	19,995	41,932	761
1961	26,349	24,491	50,840	922
1974	37,071	34,407	71,479	1,286
1980	46,325	43,390	89,715	1,614

Source: Demographic Characteristics of Bangladesh, Sawong Hong, 1980, Dhaka, Bangladesh.



**TABLE 8**  
**Dependency Ratios: Bangladesh, 1911-74**

Year	Population Distribution				Dependency Ratio		
	0-14	15-59	60+	All	Total	Child	Old-Age
1911	42.2	53.4	4.4	100.0	87.2	79.1	8.2
1921	42.2	53.7	4.1	100.0	86.1	78.5	7.6
1931	41.9	54.9	3.2	100.0	82.1	76.3	5.9
1941	41.3	55.0	3.7	100.0	81.9	75.2	6.7
1951	42.0	53.6	4.5	100.0	86.8	78.5	8.3
1961	46.1	78.7	5.2	100.0	105.4	94.7	10.7
1974	45.2	50.8	4.0	100.0	96.7	89.0	7.8

Source: Demographic Characteristics of Bangladesh, Sawong Hong, 1980. Dhaka, Bangladesh.